Acknowledgement ......

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" SCOOBY DOO"
(STATS & LR REGULAR BOOK)

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(Praveen Jain & Kalpana Jain)

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The **FIRST** edition is also dedicated towards all my dear students without whom this would not be possible

Vote Of Thanks !!!!!!!!!!!!

- **CA MEGHA NAHTA**

INDEX

CH - 1	**STATISTICAL DESCRIPTION OF DATA**

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

1. Which of the following statements is false?

   (a) Statistics is derived from the Latin word 'Status'

   (b) Statistics is derived from the Italian word 'Statista'

   (c) Statistics is derived from the French word 'Statistik'

   (d) None of these.

2. Statistics is defined in terms of numerical data in the

   (a) Singular sense   (b) Plural sense   (c) Either (a) or (b)   (d) Both (a) and (b).

3. Statistics is applied in

   (a) Economics   (b) Business management   (c) Commerce and industry   (d) All these.

4. Statistics is concerned with

   (a) Qualitative information   (b) Quantitative information   (c) (a) or (b)   (d) Both (a) and (b).

5. An attribute is

   (a) A qualitative characteristic   (b) A quantitative characteristic

   (c) A measurable characteristic   (d) All these.

6. Annual income of a person is

   (a) An attribute   (b) A discrete variable   (c) A continuous variable   d) (b) or (c).

7. Marks of a student is an ex. Of:

   (a) An attribute   (b) A discrete variable   (c) A continuous variable   d) None of these.

8.   Nationality of a student is

(a) An attribute   (b) A continuous variable   (c) A discrete variable   (d) (a) or (c).

9.   Drinking habit of a person is

(a) An attribute   (b) A variable   (c) A discrete variable   (d) A continuous variable.

10.   Age of a person is

(a) An attribute   (b) A discrete variable   (c) A continuous variable   (d) A variable.

11.   Data collected on religion from the census reports are

(a) Primary data   (b) Secondary data   (c) Sample data   d) (a) or (b)

12.   The data collected on the height of a group of students after recording their heights with a measuring tape are

(a) Primary data   (b) Secondary data   (c) Discrete data   (d) Continuous data.

13.   The primary data are collected by

(a) Interview method   (b) Observation method   (c) Questionnaire method   (d) All these.

14.   The quickest method to collect primary data is

(a) Personal interview   (b) Indirect interview   (c) Telephone interview   (d) By observation.

15.   The best method to collect data, in case of a natural calamity, is

(a) Personal interview   (b) Indirect interview

(c) Questionnaire method   (d) Direct observation method.

16.   In case of a rail accident, the appropriate method of data collection is by

(a) Personal interview   (b) Direct interview   (c) Indirect interview   (d) All these.

17.   Which method of data collection covers the widest area?

(a) Telephone interview method   (b) Mailed questionnaire method

(c) Direct interview method   (d) All these.

18.   The amount of non-responses is maximum in:

(a) Mailed questionnaire method   (b) Interview method

(c) Observation method   (d) All these.

19. Some important sources of secondary data are

(a) International and Government sources

(b) International and primary sources

(c) Private and primary sources

(d) Government sources.

20. Internal consistency of the collected data can be checked when

(a) Internal data are given   (b) External data are given

(c) Two or more series are given   (d) A number of related series are given.

21. The accuracy and consistency of data can be verified by

(a) Internal checking   (b) External checking   (c) Scrutiny   (d) Both (a) and (b).

22. The mode of presentation of data are

(a) Textual, tabulation and diagrammatic   (b) Tabular, internal and external

(c) Textual, tabular and internal   (d) Tabular, textual and external.

23. The best method of presentation of data is

(a) Textual   (b) Tabular   (c) Diagrammatic   (d) (b) and (c).

24. The most attractive method of data presentation is

(a) Tabular   (b) Textual   (c) Diagrammatic   (d) (a) or (b).

25. For tabulation, 'caption' is

(a) The upper part of the table   (b) The lower part of the table

(c) The main part of the table   (d) The upper part of a table that describes the column and sub-column.

26. 'Stub' of a table is the

(a) Left part of the table describing the columns   (b) Right part of the table describing the columns

(c) Right part of the table describing the rows   (d) Left part of the table describing the rows.

27. The entire upper part of a table is known as

(a) Caption   (b) Stub   (c) Box head   (d) Body.

28. The unit of measurement in tabulation is shown in

(a) Box head   (b) Body   (c) Caption   (d) Stub.

29. In tabulation source of the data, if any, is shown in the

(a) Footnote   (b) Body   (c) Stub   (d) Caption.

30. Which of the following statements is untrue for tabulation?

(a) Statistical analysis of data requires tabulation

(b) It facilitates comparison between rows and not columns

(c) Complicated data can be presented

(d) Diagrammatic representation of data requires tabulation.

31. Hidden trend, if any, in the data can be noticed in

(a) Textual presentation   (b) Tabulation   (c) Diagrammatic representation   (d) All these.

32. Diagrammatic representation of data is done by

(a) Diagrams   (b) Charts   (c) Pictures   (d) All these.

33. The most accurate mode of data presentation is

(a) Diagrammatic method   (b) Tabulation   (c) Textual presentation   (d) None of these.

34. The chart that uses logarithm of the variable is known as

(a) Line chart   (b) Ratio chart   (c) Multiple line chart   d) Component line chart.

35. Multiple line chart is applied for

(a) Showing multiple charts

(b) Two or more related time series when the variables are expressed in the same unit

(c) Two or more related time series when the variables are expressed in different unit

(d) Multiple variations in the time series.

36. Multiple axis line chart is considered when

(a) There is more than one time series   (b) The units of the variables are different

(c) (a) or (b)   (d) (a) and (b).

37. Horizontal bar diagram is used for

(a) Qualitative data   (b) Data varying over time

(c) Data varying over space   (d) (a) or (c).

38. Vertical bar diagram is applicable when

(a) The data are qualitative   (b) The data are quantitative

(c) When the data vary over time   (d) (a) or (c).

39. Divided bar chart is considered for

(a) Comparing different components of a variable   (c) (a) or (b)

(b) The relation of different components to the table   (d) (a) and (b).

40. In order to compare two or more related series, we consider

(a) Multiple bar chart   (b) Grouped bar chart   (c) (a) or (b)   (d) (a) and (b).

41. Pie-diagram is used for

(a) Comparing different components and their relation to the total

(b) Representing qualitative data in a circle

(c) Representing quantitative data in circle

(d) (b) or (c).

42.. A frequency distribution

(a) Arranges observations in an increasing order

(b) Arranges observation in terms of a number of groups

(c) Relaters to a measurable characteristic

(d) All these.

43. The frequency distribution of a continuous variable is known as

(a) Grouped frequency distribution   (b) Simple frequency distribution

(c) (a) or (b)   (d) (a) and (b).

44. The distribution of shares is an ex. of the frequency distribution of

(a) A discrete variable   (b) A continuous variable   (c) An attribute   (d) (a) or (c).

45. The distribution of profits of a blue-chip company relates to

(a) Discrete variable   (b) Continuous variable   (c) Attributes   (d) (a) or (b).

46. Mutually exclusive classification

(a) Excludes both the class limit

(b) Excludes the upper class limit but includes the lower class limit

(c) Includes the upper class limit but excludes the upper class limit

(d) Either (b) or (c).

47. Mutually inclusive classification is usually meant for

(a) A discrete variable   (b) A continuous variable

(c) An attribute   (d) All these.

48. Mutually exclusive classification is usually meant for

(a) A discrete variable   (b) A continuous variable

(c) An attribute   (d) Any of these.

49. The LCB is

(a) An upper limit to LCL   (b)A lower limit to LCL   (c) (a) and (b)   (d) (a) or (b).

50. The UCB is

(a) An upper limit to UCL   (b) A lower limit to LCL   (c) Both (a) and (b)   (d) (a) or (b).

51. length of a class is

(a) The difference between the UCB and LCB of that class

(b) The difference between the UCL and LCL of that class

(c) (a) or (b)

(d) Both (a) and (b).

52. For a particular class boundary, the less than cumulative frequency and more than cumulative frequency

add up to

(a) Total frequency   (b) Fifty per cent of the total frequency

(c) (a) or (b)   (d) None of these.

53 Frequency density corresponding to a class interval is the ratio of

(a) Class frequency to the total frequency   (b) Class frequency to the class length

(c) Class length to the class frequency   (d) Class frequency to the cumulative frequency.

54. Relative frequency for a particular class

(a) Lies between 0 and 1   (b) Lies between 0 and 1, both inclusive

(c) Lies between –1 and 0   (d) Lies between –1 to 1.

55. Mode of a distribution can be obtained from

(a) Histogram   (b) Less than type ogives   (c) More than type ogives   (d) Frequency polygon.

56. Median of a distribution can be obtained from

(a) Frequency polygon   (b) Histogram   (c) Less than type ogives   (d) None of these.

57. A comparison among the class frequencies is possible only in

(a) Frequency polygon   (b) Histogram   (c) Ogives   (d) (a) or (b).

58. Frequency curve is a limiting form of

(a) Frequency polygon   (b) Histogram   (c) (a) or (b)   (d) (a) and (b).

59. Most of the commonly used frequency curves are

(a) Mixed   (b) Inverted J-shaped   (c) U-shaped   (d) Bell-shaped

60. The distribution of profits of a company follows

(a) J-shaped frequency curve   (b) U-shaped frequency curve

(c) Bell-shaped frequency curve   (d) Any of these.

Set B – (Practical Question)

1. Out of 1000 persons, 25 per cent were industrial workers and the rest were agricultural workers. 300 persons

enjoyed world cup matches on TV. 30 per cent of the people who had not watched world cup matches were industrial workers. What is the number of agricultural workers who had enjoyed world cup matches on TV?

(a) 260   (b) 240   (c) 230   (d) 250

2. A sample study of the people of an area revealed that total number of women were 40% and the percentage Of coffee drinkers were 45 as a whole and the percentage of male coffee drinkers was 20. What was the percentage of female non-coffee drinkers?

(a) 10   (b) 15   (c) 18   (d) 20

3. Cost of sugar in a month under the heads raw materials, labour, direct production and others were 12, 20, 35 and 23 units respectively. What is the difference between the central angles for the largest and smallest components of the cost of sugar?

(a) 72°   (b) 48°   (c) 56°   (d) 92°

4. The number of accidents for seven days in a locality are given below :

No. of accidents:	0	1	2	3	4	5	6
Frequency :	15	19	22	31	9	3	2

What is the number of cases when 3 or less accidents occurred?

(a) 56   (b) 6   (c) 68   (d) 87

5. The following data relate to the incomes of 86 persons :

Income in Rs. :	500–999	1000–1499	1500–1999	2000–2499
No. of persons :	15	28	36	7

What is the percentage of persons earning more than Rs. 1500?

(a) 50   (b) 45   (c) 40   (d) 60

6. The following data relate to the marks of a group of students:

Marks :	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students :	15	38	65	84	100

How many students got marks more than 30?

(a) 65   (b) 50   (c) 35   (d) 43

7. Find the number of observations between 250 and 300 from the following data Value :

Class Interval :	More than 200	More than 250	More than 300	More than 350

| No. of observations : | 56 | 38 | 15 | 0 |

(a) 56   (b) 23   (c) 15   (d) 8

ANSWERS

Set A

1.	(c)	2.	(b)	3.	(d)	4.	(d)	5.	(a)	6.	(b)
7.	(b)	8.	(a)	9.	(a)	10.	(c)	11.	(b)	12.	(a)
13.	(d)	14.	(c)	15.	(a)	16.	(c)	17.	(b)	18.	(a)
19.	(a)	20.	(d)	21.	(c)	22.	(a)	23.	(b)	24.	(c)
25.	(d)	26.	(d)	27.	(c)	28.	(a)	29.	(a)	30.	(b)
31.	(c)	32.	(d)	33.	(b)	34.	(b)	35.	(b)	36.	(d)
37.	(d)	38.	(b)	39.	(d)	40.	(c)	41.	(a)	42.	(d)
43.	(a)	44.	(a)	45.	(b)	46.	(b)	47.	(a)	48.	(b)
49.	(b)	50.	(a)	51.	(a)	52.	(a)	53.	(b)	54.	(a)
55.	(a)	56.	(c)	57.	(b)	58.	(d)	59.	(d)	60.	(c)

Set B

1.	(a)	2.	(b)	3.	(d)	4.	(d)	5.	(a)	6.	(c)
7.	(b)										

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov 06

[1]   The quickest method to collect primary data is :

(a) Personal Interview

(b) Indirect Interview

(c) Mailed Questionnaire Method

(d) Telephonic Interview

[2] Which of the following statement is true?

(a) Statistics is derived from the French word 'Statistic

(b) Statistics is derived from the Italian word 'Statista'.

(c) Statistics is derived from the Latin word 'Statistique'.

(d) None of these.

[3] The following data relates to the incomes of 90 persons :

Income in Rs. :	1500-1999	2000-2499	2500-2999	3000-3499
No. of Persons :	13	32	20	25

What is the percentage of persons earning more than Rs. 2,500 ?

(a) 45   (b) 50   (c) 52   (d) 55

Feb 07

[4] In tabulation, source of data, if any, is shown in the :

(a) Stub   (b) Body   (c) Caption   (d) Footnote

[5] Divided bar chart is good for:

(a) Comparing various components of a variable

 (b) Relating the different components to the whole.

(c) (a) and (b)

(d) (a) or (b)

May 07

[6] Relative frequency for a particular class lies between :

(a) 0 and 1   (b) 0 and 1, both inclusive   (c) -1 and 0   (d) -1 and 1

[7] Find the number of observations between 350 and 400 from the following' data:

Value :	More than	More than	More than	More than
	200	350	400	450
No. of observations :	48	25	12	0

(a) 13   (b) 15   (c) 17   (d) 19

[8] When the width of all classes is same, frequency polygon has not the same area as the Histogram :

(a) False   (b) True   (c) Both   (d) None

[9] The graphical representation of a cumulative frequency distribution is called :

(a) Histogram   (b) Ogive   (c) Both   (d) None

Aug 07

[10] A table has parts.

(a) Four   (b) Two   (c) Five   (d) None

[11] Cost of sugar in a month under the heads raw materials, labour, direct production and others were

12, 20, 35 and 23 units respectively. What is the difference between the central angles for the

largest and smallest components of the cost of sugar ?

(a) 72°   (b) 48°   (c) 56°   (d)' 92°

[12] Frequency density corresponding to a class interval is the ratio of:

(a) Class Frequency to the Total Frequency

(b) Class Frequency to the Class Length

(c) Class Length to the Class Frequency

(d) Class Frequency to the Cumulative Frequency.

Nov 07

[13] In order to compare two or more related series, we consider:

(a) Multiple Bar Chart   (b) Grouped Bar Chart

(c) (a) or (b)   (d) (a) and (b)

[14] An area diagram is :

(a) Histogram   (b) Ogive   (c) Frequency Polygon   (d) None of these

[15] Most extreme values which would ever be included in a class interval are called:

(a) Class Interval   (b) Class Limits   (c) Class Boundaries   (d) None of these.

[16] In 2000, out of total of 1,750 workers of a factory, 1,200 were members of a trade union. The

number of women employed was 200 of which 175 did not belong to a trade union. In 2004, there

were 1,800 employees who belong to a trade union and 50 who did not belong to trade union. Of all

the employees in 2004,300 were women of whom only 8 did not belong to the trade union. On the

basis of this information, the ratio of female members of the trade union in 2000 and 2004 is

(a) 292 : 25   (b) 8 : 175   (c) 175:8   (d) 25:292

Feb 08

[17] The lower class boundary is :

(a) An upper limit to Lower Class Limit   (b) A lower limit to Lower Class Limit

(c) Both (a) & (b)   (d) None of these

[18] The distribution of profits of a company follows :

(a) J - shaped frequency curve   (b) U - shaped frequency curve

(c) Bell - shaped frequency curve   (d) Any of these

[19] Out of 1000 persons, 25 per cent were industrial workers and the rest were agricultural workers. 300 persons enjoyed world cup matches on T.V. 30 per cent of the people who had not watched world cup matches were industrial workers. What is the number of agricultural workers who had enjoyed world cup matches on TV?

(a) 230   (b) 250   (c) 240   (d) 260

[20] Median of a distribution can be obtained from ;

(a) Histogram   (b) Frequency Polygon

'(c) Less than type Ogives   (d) None of these

June 08

[21] In indirect oral investigation :

(a) Data is not capable of numerical expression

(b) Not possible or desirable to approach informant directly.

(c) Data is collected from the books.

(d) None of these

[22] Circular diagrams are always :

(a) One - dimensional   (b) Two - dimensional

(c) Three - dimensional   (d) Cartograms

[23] The column headings of a table are known as :

(a) Body   (b) Stub   (c) Box – head   (d) Caption

[24] Some important sources of secondary data are :

(a) International and Government sources

(b) International and primary sources

(c) Private and primary sources

(d) Government sources

Dec 08

[25] From the following data find the number class intervals if class length is given as 5.
73, 72, 65, 41,54, 80, 50, 46, 49, 53.

(a) 6   (b) 5   (c) 7   (d) 8

[26] The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is:'

(a) Histogram   (b) Pie-diagram   (c) Frequency polygon   (d) Line graph.

[27] Which of the following is a statistical data ?

(a) Ram is 50 years old.

(b) Height of Ram is 5'6" and of Shyam and Hari is 5'3" and 5'4" respectively.

(c) Height of ham is 5'6" and weight is 90kg

(d) Sale of A was more than B and C.

[28] Sales of XYZ Ltd. for 4 months is :

Months	Sales
Jan.	10,000
Feb.	15,000

May	18,000
Apr.	9,000

The above data represents :

(a) Discrete   (b) Continuous   (c) Individual   (d) None of these.

June 09

[29] Mid values are also called _____

(a) Lower limit   (b) Upper limit   (c) Class mark   (d) None.

[30] Which of the following is not a two-dimensional figure ?

(a) Line Diagram   (b) Pie Diagram

(c) Square Diagram   (d) Rectangle Diagram.

[31] Less than type and more than type gives meet at a point known as : "

(a) Mean   (b) Median   (c) Mode

Dec 09

[32] Arrange the dimensions of Bar diagram, Cube diagram, Pie diagram in sequence.

(a) 1,2,3   (b) 2,1,3   (c) 2,3, 0   (d) 3,2, 1

[33] With the help of histogram one can find.

(a) Mean   (b) Median   (c) Mode   (d) First Quartile.

[34] Nationality of a person is :

(a) Discrete variable   (b) An attribute

(c) Continuous variable   (d) None

[35] If we plot less than and more than type frequency distribution, then the graph plotted is .

(a) Histogram   (b) Frequency Curve   (c) Ogive   (d) None of these

June10

[36] The primary rules that should be observed in classification:

(i) As far as possible, the class should be of equal width

(ii) The classes should be exhaustive

(iii) The classes should be unambiguously defined.

Then which of the following is correct:

(a) only (i) and (ii)   (b) only (ii) and'(iii)

(c) only (i) and (iii)   (d) all (i), (ii) and (iii).

[37] Using Ogive Curve, we can determine:

(a) Median   (b) Quartile   (c) Both (a) and (b)   (d) None.

[38] With the help of histogram one can find.

(a) Mean   (b) Median   (c) Mode   (d) First Quartile.

[39] Mode can be obtained from:

(a) Frequency polygon.   (b) Histogram.

(c) Ogive   (d) All of the above.

[40] The most appropriate diagram to represent the data relating to the monthly expenditure on

different items by a family is:

(a) Histogram   (b) Pie-diagram.   (c) Frequency polygon   (d) Line graph.

Dec 10

[41] The data obtained by the internet are:

(a) Primary data   (b) Secondary data

(c) Both (a) and (b)   (d) None of these.

[42] The statistical measure computed from the sample observations alone have been termed as:

(a) estimate   (b) parameter   (c) statistic   (d) attribute.

June II

[43] When the two curves of ogive intersect, the point of intersection provides:

(a) First Quartile   (b) Second Quartile   (c) Third Quartile   (d) Mode

[44] Frequency Density can be termed as:

(a) Class frequency to the cumulative frequency

(b) Class frequency to the total frequency

(c) Class frequency to the class length

(d) Class length to the class frequency.

[45] The Chronological classification of data are classified on the basis of:

(a) Attributes   (b) Area   (c) Time   (d) Class Interval

[46] Arrange the following dimension wise : pie-diagram, bar- diagram and cubic diagram.

(a) 1,2,3   (b) 3,1,2   (c) 3,2,1   (d) 0,2,3

Dec II

[47] The frequency of class 20-30 in the following data is:

Class	0-10	10-20	20-30	30-40	40-50
Cumulative Frequency	5	13	28	34	38

(a) 5   (b) 28   (c) 15   (d) 13

[48] The Graphical representation by which median is calculated is called

(a) Ogive Curve   (b) Frequency Curve   (c) Line diagram   (d) Histogram

[49] Which of the following is not a two dimensional diagram?

(a) Square diagram   (b) Line diagram

(c) Rectangular diagram   (d) Pie-chart

June 12

[50] From which graphical representation, we can calculate partition values ?

(a) Lorenz curve   (b) Ogive curve   (c) Histogram   (d) None of the above.

[51] The data given below refers to the marks gained by a group of students:

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of Students	15	38	65	84	100

Then the no. of students getting marks more than 30 would be .

(a) 50   (b) 53   (c) 35   (d) 62

[52] Cost of Sugar in a month under the heads raw materials, labour, direct production and others were 12,20,35 & 23 units respectively. The difference between their central angles for the largest & smallest components of the cost of Sugar is:

(a) 92°   (b) 72°   (c) 48°   (d) 56°

[53] What is a exclusive series?

(a) In which both upper and lower limit are not included in class frequency.

(b) In which lower limit is not included in class frequency.

(c) In which upper limit is not included in class frequency.

(d) None of the above.

[54] A pie diagram is used to represent the following data:

Source:	Customs	Excise	Income tax	Wealth tax
Revenue in million rupees:	120	160	240	180

The central angles in the pie diagram corresponding to income tax and wealth tax respectively:

(a) (120°, 90°)   (b) (90°, 120°)   (c) (60°, 120°)   (d) (90°, 60°)

Dec 13

[55] Difference between the maximum and minimum value of a given data is called:

(a) Width   (b) Size   (c) Range   (d) Class

[56] If class interval is 10 - 14, 15 - 19, 20 - 24, then the first class is:

(a) 10-15.   (b) 9.5-14.5   (c) 10.5-15.5   (d) 9-15

[57] The difference between the upper and lower limit of a class is called _____.

(a) Class Interval   (b) Mid Value   (c) Class boundary   (d) Frequency

June 14

[58] There were 200 employees in an office in which 150 were married. Total male employees were 160

out of which 120'were married. What was the number of female unmarried employees?

(a) 30   (b) 10   (c) 40   (d) 50

[59] "The less than Ogive" is a:

(a) U-Shaped Curve   (b) J-Shaped Curve

(c) S-Shaped   (d) Bell Shaped Curve

[60]

Marks	No. of Students
More than 70%	07
More than 60% '	18

More than 50%	40
More than 40%	60
More than 30%	75
More than 20%	100

How many students have got marks less than 50%?

(a) 60   (b) 82   (c) 40   (d) 53

[61] To draw Histogram, the frequency distribution should be:

(a) Inclusive type   (b) Exclusive type

(c) Inclusive and Exclusive type   (d) None of these.

Dec 14

[62] The most appropriate diagram to represent the five - year plan outlay of India in different economic sectors is:

(a) Pie diagram   (b) Histogram   (c) Line-Graph   (d) Frequency Polygon

[63] If the fluctuations in the observed value are very small as compared to the size of the item, it is presented by:

(a) Z chart   (b) Ogive curve   (c) False base line   (d) Control chart

[64] For constructing a histogram, the class-intervals of a frequency distribution must be:

(a) equal   (b) unequal   (c) equal or unequal   (d) none of these

[65] 100 persons are classified into male/female and graduate/non-graduate classes. This data

classification is:

(a) Cardinal data   (b) Ordinal data   (c) Spatial Series data   (d) Temporal data

June 15

[66] If we draw a perpendicular on x-axis from the point of inter section of both 'less than' and 'more

than' frequency curves we will get the value of _____

(a) mode   (b) median   (c) arithmetic mean   (d) third quartile

[67] Histogram is used for the presentation of the following type of series:

(a) Time series   (b) Continuous frequency distribution

(c) Discrete frequency distribution   (d) Individual observation

[68] Curve obtained by joining the points whose x co-ordinates are the upper limits of the class intervals

and y coordinates are the corresponding cumulative frequencies is called:

(a) Frequency Polygon   (b) Frequency curve

(c) Histogram   (d) Ogive.

[69] The number of observations between 150 and 200 based on the following data is:

Value:	More than	More than	More than	More than
	100	150	200	250
No. of observations:	76	63	28	05

(a) 46   (b) 35   (c) 28   (d) 23

[70] The number of car accidents in seven days in a locality are given below:

No. of accidents:	0	1	2	3	4	5	6	7
Frequency:	12	9	11	13	8	9	6	3

What will be the number of cases when 4 or more accidents occurred?

(a) 32   (b) 41   (c) 26   (d) 18

[71] The most common form of diagrammatic representation of a grouped frequency distribution is:

(a) Histogram   (b) Ogive   (c) Both   (d) None

Dec 15

[72] Classification is of _____ kinds:

(a) Two   (b) Three   (c) One   (d) Four

[73] The chart that uses logarithm of variable is known as:

(a) Ratio chart   (b) Line chart

(c) Multiple line chart   (d) Component line chart

[74] Find the number of observation between 250 and 300 from the following data:

Value more than:	200	250	300	500
No. of observation:	56	38	15	0

(a) 38   (b) 23   (c) 15   (d) None of the above

June 16

[75] Data collected on religion from the census reports are:

(a) Primary data   (b) Secondary data

(c) Sample data   (d) (a) or (b)

Dec 16

[76] In collection of data which of the following interview methods:

(a) Personal interview method

(b) Telephone interview method

(c) Published data

(d) (a) and (b)

[77] For constructing a histogram the class intervals of a frequency distribution must be of the following type:

(a) Equal   (b) Unequal

(c) Equal or Unequal   (d) None of these

[78] Profits made by XYZ Bank in different years refer to:

(a) An attribute   (b) A discrete variable

(c) A continuous variable   (d) None of these.

[79] Mode of presentation data:

(a) Textual presentation   (b) Tabulation

(c) Oral presentation   (d) (a) and (b)

June17

[80] If the data represent costs spent on conducting an

examination under various needs, then the most suitable diagram will be:

(a) Pie diagram   (b) Frequency diagram

(c) Bar diagram   (d) Multiple bar diagram

[81] Frequency density corresponding to class interval is the ratio of:

(a) Class frequency to the total frequency

(b) Class frequency to the class length

(c) Class length to the class frequency

(d) Class frequency to the cumulative frequency

[82] The point of intersection of less than ogive and greater than ogive curve gives us:

(a) Mean   (b) Mode   (c) Median   (d) None of the above.

ANSWERS

1	D	11	D	21	B	31	B	41	B	51	C	61	B	71	A
2	B	12	B	22	B	32	C	42	C	52	A	62	A	72	D
3	B	13	C	23	D	33	C	43	B	53	C	63	C	73	A
4	D	14	A	24	A	34	B	44	B	54	A	64	A	74	B
5	C	15	C	25	D	35	C	45	C	55	C	65	B	75	B
6	A	16	D	26	B	36	B	46	D	56	B	66	B	76	D
7	A	17	B	27	B	37	C	47	C	57	A	67	B	77	C
8	A	18	C	28	C	38	C	48	A	58	B	68	D	78	C
9	B	19	D	29	C	39	B	49	D	59	C	69	B	79	D
10	c	20	C	30	B	40	B	50	B	60	A	70	C	80	A

81	B
82	C

STUDENTS NOTES

| CH - 2 | **MEASURES OF CENTRAL TENDENCY & DISPERSION** | |

UNIT I: MEASURES OF CENTRAL TENDENCY

ARITHMETIC MEAN

Q.1 *Following are the daily wages in Rupees of a sample of 9 workers: 58, 62, 48, 53, 70, 52, 60, 84, 75.*

Compute the mean wage.

Sol. Let x denote the daily wage in rupees.

Then as given, x1=58, x2=62, x3= 48, x4=53, x5=70, x6=52, x7=60, x8=84 and x9=75.

The mean wage is given by,

$$\overline{x} = \frac{\sum_{i_1}^{9} x_i}{9}$$

$$= \text{Rs.} \frac{(58+62+48+53+70+52+60+84+75)}{9}$$

$$= \text{Rs.} \frac{562}{9}$$

$$= \text{Rs.}62.44$$

Q.2 *Compute the mean weight of a group of BBA students of St. Xavier's College from the following data:*

Weight in kgs.	44 – 48	49 – 53	54 – 58	59 – 63	64 – 68	69 – 73

No. of Students	3	4	5	7	9	8

Sol.

Q.3 | *Find the AM for the following distribution:*

Class Interval	350 –369	370 –389	390 –409	410 – 429	430 –449	450 –469	470 –489
Frequency	23	38	58	82	65	31	11

Sol. | Since the amount of computation involved in finding the AM is much more compared to **Example 2**.

Any mid value can be taken as A. However, usually A is taken as the middle most mid-value for an odd number of class intervals and any one of the two middle most mid-values for an even number of class intervals. The class length is taken as C.

Computation of AM

Class Interval (1)	Frequency(f_i) (2)	Mid-Value(x_i) (3)	$d_i = \dfrac{x_i - A}{c}$ $= \dfrac{x_i - 419.50}{20}$ (4)	$f_i d_i$ (5) = (2)X(4)
350 – 369	23	359.50	– 3	– 69
370 – 389	38	379.50	– 2	– 76
390 – 409	58	399.50	– 1	– 58
410 – 429	82	419.50 (A)	0	0
430 – 449	65	439.50	1	65
450 – 469	31	459.50	2	62
470 – 489	11	479.50	3	33
Total	308	–	–	– 43

The required AM is given by

$$\bar{x} = A + \frac{\Sigma f_i d_i}{N} \, X \, C$$

$$= 419.50 + \frac{(-43)}{308} X \, 20$$

$$= 419.50 - 2.79 \ = 416.71$$

Q.4 *Given that the mean height of a group of students is 67.45 inches. Find the missing frequencies for*

the following incomplete distribution of height of 100 students.

Height in inches	60 –62	63 –65	66 –68	69 – 71	72 – 74
No. of Students	5	18	-	-	8

Sol

Q.5 *The mean salary for a group of 40 female workers is Rs. 5,200 per month and that for a group of 60 male workers is Rs. 6800 per month. What is the combined mean salary?*

Sol.

MEDIAN – PARTITION VALUES

Q.6 *Find the missing frequency from the following data, given that the median mark is 23.*

Mark :	0 – 10	10 – 20	20 –30	30 – 40	40 – 50
No. of students :	5	8	?	6	3

Sol.

Q.7 *Following are the wages of the labourers: Rs. 82, Rs. 56, Rs. 90, Rs. 50, Rs. 120, Rs. 75, Rs. 75, Rs. 80, Rs.130, Rs. 65. Find Q1, D6 and P82.*

Sol. Arranging the wages in an ascending order, we get Rs. 50, Rs. 56, Rs. 65, Rs. 75, Rs. 75, Rs. 80, Rs. 82

Rs. 90, Rs. 120, Rs. 130.

Hence, we have

$Q_1 = \frac{(n+1)}{4}$th value

$\quad = \frac{(10+1)}{4}$th value

$\quad = 2.75$th value

$\quad = $ 2nd value $+ 0.75 \times$ difference between the third and the 2nd values.

$\quad = $ Rs. $[56 + 0.75 \times (65 - 56)]$

$\quad = $ Rs. 62.75

$D6 = (15 + 1) \times \frac{6}{10}$ th value

$\quad = 6.60$th value

$\quad = $ 6th value $+ 0.60 \times$ difference between the 7th and the 6th values.

$\quad = $ Rs. $(80 + 0.60 \times 2)$

$\quad = $ Rs. 81.20

$P_{82} = (10+1)$ x $\frac{82}{100}$ th value

$\quad = 9.02$th value

$\quad = $ 9th value $+ 0.02 \times$ difference between the 10th and the 9th values

$\quad = $ Rs. $(120 + 0.02 \times 10)$

$\quad = $ Rs. 120.20

Next, let us consider one problem relating to the grouped frequency distribution.

MODE

Q.8   *For a moderately skewed distribution of marks in statistics for a group of 200 students, the mean mark and median mark were found to be 55.60 and 52.40. What is the modal mark?*

Sol.

Q.9	If y = 2 + 1.50x and mode of x is 15, what is the mode of y?
Sol.	$Y_{mo} = 2 + 1.50 \times 15$
	= 24.50.

GEOMETRIC MEAN AND HARMONIC MEAN

Q.10	Find the GM of 3, 6 and 12.
Sol.	

Q.11	Find the GM for the following distribution:

x :	2	4	8	16
f :	2	3	3	2

Sol.	

Q.12	Find the HM for 4, 6 and 10.
Sol.	We have

$$H = \frac{3}{\frac{1}{4}+\frac{1}{6}+\frac{1}{10}}$$

$$= \frac{3}{0.25+0.17+0.10}$$

$$= 5.77$$

Q.13	Find the HM for the following data:

x:	2	4	8	16
f:	2	3	3	2

Sol.	

Q.14	Compute AM, GM, and HM for the numbers 6, 8, 12, 36.
Sol	In accordance with the definition, we have

$$AM = \frac{6+8+12+36}{4} = 15.50$$

$$GM = (6 \times 8 \times 12 \times 36)^{1/4}$$

$$= = (2^8 \times 3^4)^{1/4} = 12$$

$$HM = \frac{4}{\frac{1}{6}+\frac{1}{8}+\frac{1}{12}+\frac{1}{36}} = 9.93$$

Q.15	Find the weighted AM and weighted HM of first n natural numbers, the weights being equal to the squares of the corresponding numbers.

Sol.

Q 16 *The AM and GM for two observations are 5 and 4 respectively. Find the two observations.*

Solution

Q.17   *Find the mean and median from the following data:*

Marks :	less than 10	less than 20	less than 30	less than 40	less than 50
No. of Students :	5	13	23	27	30

Also compute the mode using the approximate relationship between mean, median and mode.

Sol.   What we are given in this problem is less than cumulative frequency distribution.

We need to convert this cumulative frequency distribution to the corresponding frequency

distribution and thereby compute the mean and median.

Computation of Mean Marks for 30 students

Marks Class Interval (1)	No. of Students (f_i) (2)	Mid - Value (x_i) (3)	$f_i x_i$ (4)= (2)×(3)
0 – 10	5	5	25
10 – 20	13 – 5 = 8	15	120
20 – 30	23 – 13 = 10	25	250
30 – 40	27 – 23 = 4	35	140
40 – 50	30 – 27 = 3	45	135
Total	30	–	670

Hence the mean mark is given by

$$\bar{X} = \frac{\Sigma f_i x_i}{N}$$

$$= \frac{670}{30}$$

$$= 22.23$$

Computation of Median Marks

Marks (Class Boundary)	No.of Students (Less than cumulative Frequency)
0	0
10	5
20	13
30	23
40	27
50	30

Since $\frac{N}{2} = \frac{30}{2} = 15$ lies between 13 and 23,

we have $l1 = 20$, $Nl = 13$, $Nu = 23$

and $C = l2 - l1 = 30 - 20 = 10$

Thus,

Median $= 20 + \frac{15-13}{23-13}$ X 10

$= 22$

Since Mode = 3 Median – 2 Mean (approximately), we find that

Mode = 3x22 – 2x22.33

$=\ 21.34$

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

1. Measures of central tendency for a given set of observations measures

    (a) The scatterness of the observations   (b) The central location of the observations

    (c) Both (a) and (b)   (d) None of these

2. While computing the AM from a grouped frequency distribution, we assume that

    (a) The classes are of equal length

    (b) The classes have equal frequency

    (c) All the values of a class are equal to the mid-value of that class

    (d) None of these.

3. Which of the following statements is wrong?

    (a) Mean is rigidly defined

(b) Mean is not affected due to sampling fluctuations

(c) Mean has some mathematical properties

(d) All these

4.   Which of the following statements is true?

(a) Usually mean is the best measure of central tendency

(b) Usually median is the best measure of central tendency

(c) Usually mode is the best measure of central tendency

(d) Normally, GM is the best measure of central tendency

5.   For open-end classification, which of the following is the best measure of central tendency?

(a) AM   (b) GM

(c) Median   (d) Mode

6.   The presence of extreme observations does not affect

(a) AM   (b) Median

(c) Mode   (d) Any of these.

7.   In case of an even number of observations which of the following is median?

(a) Any of the two middle-most value

(b) The simple average of these two middle values

(c) The weighted average of these two middle values

(d) Any of these

8.   The most commonly used measure of central tendency is

(a) AM   (b) Median

(c) Mode   (d) Both GM and HM.

9.   Which one of the following is not uniquely defined

(a) Mean   (b) Median

(c) Mode   (d) All of these measures

10.   Which of the following measure of the central tendency is difficult to compute?

(a) Mean   (b) Median

(c) Mode   (d) GM

11.   Which measure(s) of central tendency is(are) considered for finding the average rates?

(a) AM   (b) GM

(c) HM   (d) Both (b) and (c)

12.   For a moderately skewed distribution, which of he following relationship holds?

(a) Mean – Mode = 3 (Mean – Median)

(b) Median – Mode = 3 (Mean – Median)

(c) Mean – Median = 3 (Mean – Mode)

(d) Mean – Median = 3 (Median – Mode)

13.   Weighted averages are considered when

(a) The data are not classified

(b) The data are put in the form of grouped frequency distribution

(c) All the observations are not of equal importance

(d) Both (a) and (c).

14.   Which of the following results hold for a set of distinct positive observations?

(a) AM $\geq$ GM $\geq$ HM   (b) HM $\geq$ GM $\geq$ AM

(c) AM > GM > HM   (d) GM > AM > HM

15.   When a firm registers both profits and losses, which of the following measure of central tendency

cannot be considered?

(a) AM   (b) GM

(c) Median   (d) Mode

16. Quartiles are the values dividing a given set of observations into

(a) Two equal parts   (b) Four equal parts

(c) Five equal parts   (d) None of these

17. Quartiles can be determined graphically using

(a) Histogram   (b) Frequency Polygon

(c) Ogive   (d) Pie chart

18. Which of the following measure(s) possesses (possess) mathematical properties?

(a) AM   (b) GM

(c) HM   (d) All of these

19. Which of the following measure(s) satisfies (satisfy) a linear relationship between two variables?

(a) Mean   (b) Median

(c) Mode   (d) All of these

20. Which of he following measures of central tendency is based on only fifty percent of the central values?

(a) Mean   (b) Median

(c) Mode   (d) Both (a) and (b)

Set B – (Practical Question)

1. If there are 3 observations 15, 20, 25 then the sum of deviation of the observations from their AM is

(a) 0   (b) 5

(c) –5   (d) None of these.

2. What is the median for the following observations?

5, 8, 6, 9, 11, 4.

(a) 6   (b) 7

(c) 8   (d) None of these

3. What is the modal value for the numbers 5, 8, 6, 4, 10, 15, 18, 10?

    (a) 18   (b) 10

    (c) 14   (d) None of these

4. What is the GM for the numbers 8, 24 and 40?

    (a) 24   (b) 12

    (c) $8\sqrt[3]{15}$ (d) 10

5. The harmonic mean for the numbers 2, 3, 5 is

    (a) 2.00   (b) 3.33

    (c) 2.90   (d) $-\sqrt[3]{30}$

6. If the AM and GM for two numbers are 6.50 and 6 respectively then the two numbers are

    (a) 6 and 7   (b) 9 and 4

    (c) 10 and 3   (d) 8 and 5.

7. If the AM and HM for two numbers are 5 and 3.2 respectively then the GM will be

    (a) 16.00   (b) 4.10

    (c) 4.05   (d) 4.00.

8. What is the value of the first quartile for observations 15, 18, 10, 20, 23, 28, 12, 16?

    (a) 17   (b) 16

    (c) 12.75   (d) 12

9. The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is

    (a) 13   (b) 10.70

    (c) 11   (d) 11.50

10. If there are two groups containing 30 and 20 observations and having 50 and 60 as arithmetic means,

    then the combined arithmetic mean is

    (a) 55   (b) 56

(c) 54   (d) 52.

11.   The average salary of a group of unskilled workers is Rs. 10,000 and that of a group of skilled workersis

Rs. 15,000. If the combined salary is Rs. 12,000, then what is the percentage of skilled workers?

(a) 40%   (b) 50%

(c) 60%   (d) none of these

12.   If there are two groups with 75 and 65 as harmonic means and containing 15 and 13 observation then

the combined HM is given by

(a) 65   (b) 70.36

(c) 70   (d) 71.

13.   What is the HM of 1,1/2, 1/3,...............1/n?

(a) n   (b) 2n

(c) $\frac{2}{(n+1)}$ (d) $\frac{n(n+1)}{2}$

14.   An aeroplane flies from A to B at the rate of 500 km/hour and comes back from B to A at the rate of 700

km/hour. The average speed of the aeroplane is

(a) 600 km. per hour   (b) 583.33 km. per hour

(c) 100 $\sqrt{35}$ km. per hour   (d) 620 km. per hour.

15.   If a variable assumes the values 1, 2, 3...5 with frequencies as 1, 2, 3...5, then what is the AM?

(a)11/3   (b) 5

(c) 4   (d) 4.50

16.   Two variables x and y are given by y= 2x – 3. If the median of x is 20, what is the median of y?

(a) 20   (b) 40

(c) 37   (d) 35

17.	If the relationship between two variables u and v are given by $2u + v + 7 = 0$ and if the AM of u is 10, then the AM of v is

(a) 17   (b) –17

(c) –27   (d) 27.

18. If x and y are related by $x–y–10 = 0$ and mode of x is known to be 23, then the mode of y is

(a) 20   (b) 13

(c) 3   (d) 23.

19. If GM of x is 10 and GM of y is 15, then the GM of xy is

(a) 150   (b) log 10 X log 15

(c) log 150   (d) None of these.

20. If the AM and GM for 10 observations are both 15, then the value of HM is

(a) Less than 15   (b) More than 15

(c) 15 .   (d) Can not be determined

ANSWERS

Set A

1.	(b)	2.	(c)	3.	(b)	4.	(a)	5.	(c)	6.	(b)
7.	(b)	8.	(a)	9.	(c)	10.	(d)	11.	(d)	12.	(a)
13.	(c)	14.	(c)	15.	(b)	16.	(b)	17.	(c)	18.	(d)
19.	(d)	20.	(b)								

Set B											
1.	(a)	2.	(b)	3.	(b)	4.	(c)	5.	(c)	6.	(b)
7.	(d)	8.	(c)	9.	(b)	10.	(c)	11.	(a)	12.	(c)
13.	(c)	14.	(b)	15.	(a)	16.	(c)	17.	(c)	18.	(b)
19.	(a)	20.	(c)								

STUDENT NOTES

UNIT II: MEASURES OF DISPERSION

RANGE

Q 1 Following are the wages of 8 workers expressed in Rupees. 82, 96, 52, 75, 70, 65, 50, 70. Find the range and also its coefficient

Sol. The largest and the smallest wages are L = Rs. 96 and S= Rs. 50

Thus range = Rs. 96 – Rs. 50 = Rs. 46

Coefficient of range= $\frac{96-50}{96+50}$ X 100

$= 31.51$

Q 2 What is the range and its coefficient for the following distribution of weights?

Weights in kgs. :	50 – 54	55 – 59	60 – 64	65 – 69	70 – 74
No. of Students :	12	18	23	10	3

Sol.

Q 3 If the relationship between x and y is given by 2x+3y=10 and the range of x is Rs. 15, what would be the range of y?

Sol.

MEAN DEVIATION

Q 4 What is the mean deviation about mean for the following numbers   5, 8, 10, 10, 12, 9.

Sol.

Q 5	Find mean deviations about median and also the corresponding coefficient for the following profits ('000 Rs.) of a firm during a week.
	82, 56, 75, 70, 52, 80, 68.
Sol.	The profits in thousand rupees is denoted by x. Arranging the values of x in an ascending order, we get
	52, 56, 68, 70, 75, 80, 82.
	Therefore, Me = 70. Thus, Median profit = Rs. 70,000.

Computation of Mean deviation about median

X_i	$|x_i - Me|$
52	18
56	14
68	2
70	0
75	5
80	10
82	12
Total	61

Thus mean deviation about median $= \frac{\sum|x_i - Median|}{n}$

= Rs. 61/7

= Rs. 8714.28

Coefficient of mean deviation $= \dfrac{\text{MD about median}}{\text{Median}} \times 100$

$= \dfrac{8714.28}{70000} \times 100$

$= 12.45$

Q 6 Compute the mean deviation about the arithmetic mean for the following data:

x :	1	3	5	7	9
f :	5	8	9	2	1

Also find the coefficient of the mean deviation about the AM.

Sol.

Q 7	If x and y are related as $4x+3y+11 = 0$ and mean deviation of x is 5.40, what is the mean deviation of y?
Sol.	Since $4x + 3y + 11 = 0$
	Therefore, $y = \left(\frac{-11}{3}\right) + \left(\frac{-4}{3}\right)x$
	Hence MD of y= $\|b\| \times$ MD of x
	$\qquad = \frac{4}{3}$ X 5.40
	$\qquad = 7.20$

STANDARD DEVIATION

Q 8	Find the standard deviation and the coefficient of variation for the following numbers: 5, 8, 9, 2, 6
Sol.	

Q 9	Find the SD of the following distribution:

Weight (kgs.) :	50-52	52-54	54-56	56-58	58-60
No. of Students :	17	35	28	15	5

Sol.

<div align="center">Computation of SD</div>

Weight (kgs.) (1)	No. of Students (f_i) (2)	Mid-value (x_i) (3)	$d_i = \dfrac{x_i - 55}{2}$ (4)	$f_i d_i$ (5)=(2)×(4)	$f_i d_i^2$ (6)=(5)×(4)
50-52	17	51	−2	−34	68
52-54	35	53	−1	−35	35
54-56	28	55	0	0	0
56-58	15	57	1	15	15
58-60	5	59	2	10	20
Total	100	–	–	− 44	138

we get the SD of weight as

$$= \sqrt{\frac{\Sigma f_i d_i^2}{N} - \left(\frac{\Sigma f_i d_i}{N}\right)^2} \times C$$

$$= \sqrt{\frac{138}{100} - \frac{(-44)^2}{100}} \; X \; 2kgs$$

$$= \sqrt{1.38 - 0.1936} \; X \; 2kgs$$

$$= 2.18kgs$$

Q 10	If AM and coefficient of variation of x are 10 and 40 respectively, what is the variance of (15−2x)?

Sol.

Q 11   Compute the SD of 9, 5, 8, 6, 2.

Without any more computation, obtain the SD of

Sample I	−1,	−5,	−2,	−4,	−8,
Sample II	90,	50,	80,	60,	20,
Sample III	23,	15,	21,	17,	9.

Sol.

Q 12 For a group of 60 boy students, the mean and SD of stats. marks are 45 and 2 respectively. The same figures for a group of 40 girl students are 55 and 3 respectively. What is the mean and SD of marks if the two groups are pooled together?

Sol.

QUARTILE DEVIATION

Q 13. | Following are the marks of the 10 students : 56, 48, 65, 35, 42, 75, 82, 60, 55, 50. Find quartile

deviation and also its coefficient.

Sol.

Q 14. If the quartile deviation of x is 6 and $3x + 6y = 20$, what is the quartile deviation of y?

Sol. $3x + 6y = 20$

$\Rightarrow$ $y = \left(\frac{20}{6}\right) + \left(\frac{-3}{6}\right)x$

Therefore, quartile deviation of $y = \frac{|-3|}{6}$ X quartile deviation of x

$$= \frac{1}{2} X 6$$

$$= 3$$

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

1. Which of the following statements is correct?

(a) Two distributions may have identical measures of central tendency and dispersion.

(b) Two distributions may have the identical measures of central tendency but different measures of dispersion.

(c) Two distributions may have the different measures of central tendency but identical measures of dispersion.

(d) All the statements (a), (b) and (c).

2. Dispersion measures

(a) The scatterness of a set of observations

(b) The concentration of a set of observations

(c) Both (a) and (b)

(d) Neither (a) and (b).

3. When it comes to comparing two or more distributions we consider

(a) Absolute measures of dispersion

(b) Relative measures of dispersion

(c) Both (a) and (b)

(d) Either (a) or (b).

4. Which one is easier to compute?

(a) Relative measures of dispersion

(b) Absolute measures of dispersion

(c) Both (a) and (b)

(d) Range

5. Which one is an absolute measure of dispersion?

(a) Range

(b) Mean Deviation

(c) Standard Deviation

(d) All these measures

6. Which measure of dispersion is most usefull?

(a) Standard deviation

(b) Quartile deviation

(c) Mean deviation

(d) Range

7. Which measures of dispersions is not affected by the presence of extreme observations?

(a) Range

(b) Mean deviation

(c) Standard deviation

(d) Quartile deviation

8. Which measure of dispersion is based on the absolute deviations only?

(a) Standard deviation

(b) Mean deviation

(c) Quartile deviation

(d) Range

9. Which measure is based on only the central fifty percent of the observations?

(a) Standard deviation

(b) Quartile deviation

(c) Mean deviation   (d) All these measures

10. Which measure of dispersion is based on all the observations?

(a) Mean deviation   (b) Standard deviation

(c) Quartile deviation   (d) (a) and (b) but not (c)

11. The appropriate measure of dispersion for open-end classification is

(a) Standard deviation   (b) Mean deviation

(c) Quartile deviation   (d) All these measures

12. The most commonly used measure of dispersion is

(a) Range   (b) Standard deviation

(c) Coefficient of variation   (d) Quartile deviation.

13. Which measure of dispersion has some desirable mathematical properties?

(a) Standard deviation   (b) Mean deviation

(c) Quartile deviation   (d) All these measures

14. If the profits of a company remains the same for the last ten months, then the standard deviation of

profits for these ten months would be ?

(a) Positive   (b) Negative

(c) Zero   (d) (a) or (c)

15. Which measure of dispersion is considered for finding a pooled measure of dispersion after combining

several groups?

(a) Mean deviation   (b) Standard deviation

(c) Quartile deviation   (d) Any of these

16. A shift of origin has no impact on

(a) Range   (b) Mean deviation

(c) Standard deviation   (d) All these and quartile deviation.

17.	The range of 15, 12, 10, 9, 17, 20 is
	(a) 5 (b) 12
	(c) 13 (d) 11.
18.	The standard deviation of 10, 16, 10, 16, 10, 10, 16, 16 is
	(a) 4 (b) 6
	(c) 3 (d) 0.
19.	For any two numbers SD is always
	(a) Twice the range (b) Half of the range
	(c) Square of the range (d) None of these
20.	If all the observations are increased by 10, then
	(a) SD would be increased by 10
	(b) Mean deviation would be increased by 10
	(c) Quartile deviation would be increased by 10
	(d) All these three remain unchanged.
21.	If all the observations are multiplied by 2, then
	(a) New SD would be also multiplied by 2
	(b) New SD would be half of the previous SD
	(c) New SD would be increased by 2
	(d) New SD would be decreased by 2.

Set B – (Pratical Question)

1.	What is the coefficient of range for the following wages of 8 workers? 80, Rs. 65, Rs. 90, Rs. 60, Rs. 75, Rs. 70, Rs. 72, Rs. 85.
	(a) Rs. 30 (b) Rs. 20

(c) 30   (d) 20

2. If Rx and Ry denote ranges of x and y respectively where x and y are related by 3x+2y+10=0, what would be the relation between x and y?

(a) Rx = Ry   (b) 2 Rx= 3 Ry

(c) 3 Rx= 2 Ry   (d) Rx= 2 Ry

3. What is the coefficient of range for the following distribution?

Class Interval : 10-19 20-29 30-39 40-49 50-59

Frequency: 11 25 16 7 3

(a) 22   (b) 50

(c) 72.46   (d) 75.82

4. If the range of x is 2, what would be the range of –3x +50 ?

(a) 2   (b) 6

(c) –6   (d) 44

5. What is the value of mean deviation about mean for the following numbers?

5, 8, 6, 3, 4.

(a) 5.20   (b) 7.20

(c) 1.44   (d) 2.23

6. What is the value of mean deviation about mean for the following observations? 50, 60, 50, 50, 60, 60, 60, 50, 50, 50, 60, 60, 60, 50.

(a) 5   (b) 7

(c) 35   (d) 10

7. The coefficient of mean deviation about mean for the first 9 natural numbers is

(a) 200/9   (b) 80

(c) 400/9   (d) 50.

8. If the relation between x and y is 5y–3x = 10 and the mean deviation about mean for x is 12, then the

mean deviation of y about mean is

(a) 7.20   (b) 6.80

(c) 20   (d) 18.80.

9. If two variables x and y are related by 2x + 3y –7 =0 and the mean and mean deviation about mean of

x are 1 and 0.3 respectively, then the coefficient of mean deviation of y about its mean is

(a) –5   (b) 12

(c) 50   (d) 4.

10. The mean deviation about mode for the numbers 4/11, 6/11, 8/11, 9/11, 12/11, 8/11 is

(a) 1/6   (b) 1/11

(c) 6/11   (d) 5/11.

11. What is the standard deviation of 5, 5, 9, 9, 9, 10, 5, 10, 10?

(a) $\sqrt{14}$ (b) $\frac{\sqrt{42}}{3}$

(c) 4.50   (d)   8

12. If the mean and SD of x are a and b respectively, then the SD of $\frac{a-x}{b}$ is

(a) –1   (b) 1

(c) ab   (d) a/b.

13. What is the coefficient of variation of the following numbers? 53, 52, 61, 60, 64.

(a) 8.09   (b) 18.08

(c) 20.23   (d) 20.45

14. If the SD of x is 3, what us the variance of (5–2x)?

(a) 36   (b) 6

(c) 1   (d) 9

15.	If x and y are related by $2x+3y+4 = 0$ and SD of x is 6, then SD of y is
	(a) 22
	(b) 4
	(c) $\sqrt{5}$
	(d) 9.
16.	The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is
	(a) 10
	(b) 20
	(c) 25
	(d) 8.30.
17.	If x and y are related as $3x+4y = 20$ and the quartile deviation of x is 12, then the quartile deviation of y is:
	(a) 16
	(b) 14
	(c) 10
	(d) 9
18.	If the SD of the 1st n natural numbers is 2, then the value of n must be
	(a) 2
	(b) 7
	(c) 6
	(d) 5.
19.	If x and y are related by $y = 2x + 5$ and the SD and AM of x are known to be 5 and 10 respectively, then the coefficient of variation is
	(a) 25
	(b) 30
	(c) 40
	(d) 20

ANSWERS

Set A

1.	(d)	2.	(a)	3.	(b)	4.	(d)	5.	(d)	6.	(a)
7.	(d)	8.	(b)	9.	(b)	10.	(d)	11.	(c)	12.	(b)
13.	(a)	14.	(c)	15.	(b)	16.	(d)	17.	(d)	18.	(c)
19.	(b)	20.	(d)	21.	(a)						

Set B

1.	(d)	2.	(c)	3.	(c)	4.	(b)	5.	(c)	6.	(a)
7.	(c)	8.	(a)	9.	(b)	10.	(b)	11.	(b)	12.	(b)
13.	(a)	14.	(a)	15.	(b)	16.	(a)	17.	(d)	18.	(b)
19.	(c)	20.	(a)								

ADDITIONAL QUESTION BANK

1 Each value is considered only once for

(a) simple average   (b) weighted average

(c) both   (d) none

2 Each value is considered as many times as it occurs for

(a) simple average   (b) weighted average

(c) both   (d) none

3 — — — — is useful in averaging ratios, rates and percentages

(a) A.M   (b) G.M   (c) H.M   (d) none

4 H.M is defined when no observation is

(a) 3   (b) 2   (c) 1   (d) 0

5 Between first & second quartile, the frequency is equal to

(a) 3N/4   (b) N /2   (c) N /4   (d) none

6	Between second & upper quartile, the frequency is equal to

(a) 3N/4   (b) N /4   (c) N /2   (d) none

7	The length of a rod is measured by a tape 10 times. You are to estimate the length of the rod by averaging these 10 determinations.

What is the suitable form of average in this case?

(a) A.M   (b) G.M   (c) H.M   (d) none

8	A person purchases 5 rupees worth of eggs from 10 different markets. You are to find the average no. of eggs per rupee for all the markets taken together. What is the suitable form of average in this case?

(a) A.M   (b) G.M   (c) H.M   (d) none

9	— — — — — & — — — — — — can not be calculated if any observation is zero.

(a) G.M & A.M   (b) H.M & A.M   (c) H.M & G. M   (d) None.

ANSWERS

1	2	3	4	5
A	b	b	d	C
6	7	8	9	
B	a	c	c	

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov- 06

[1] If x and y are related by x - y -10 = 0 and mode of x is known to be 23, then the mode of y is :

(a) 20   (b) 13

(c) 3   (d) 23

[2] A man travels at a speed of 20 km/hr and then returns at a speed of 30 km/ hr. His average speed of the

whole journey is:

a) 25 km/ hr   (b) 24.5 km/hr

(c) 24 km/hr   (d) None

[3] A student obtained the mean and standard deviation of 100 observations as 40 and 5.1 respectively.

It was later discovered that he had wrongly copied down an observation as 50 instead of 40. The

correct standard deviation is:

(a) 5   (b) 6

(c) 3   (d) 7

[4] For a moderately skewed distribution, quartile deviation and the standard deviation are related by:

(a) S. D.$=\frac{2}{3}$ Q.D   (b) S. D.$=\frac{3}{4}$ Q.D

(c) S. D.$=\frac{4}{3}$ Q.D

(d) S. D.$=\frac{3}{2}$ Q.D

Feb 07

[5] The median of the data 13, 8, 11,6, 4,15, 2, 18, is :

(a) 5

(b) 8

(c) 11

(d) 9.5

[6] The sum of the squares of deviations of a set of observations has the smallest value, when the

deviations are taken from their:

(a) A . M.

(b) H. M.

(c) G. M.

(d) None

[8] If two variables × and y are related by 2x + 3y - 7 = 0and the mean and mean deviation about mean

of x are 1 and 0.3 respectively, then the co-efficient of mean deviation of y about mean is :

(a) -5

(b) 4

(c) 12

(d) 50

May07

[9] Which of the following result hold for a set of distinct positive observations?

(a) A . M. ≥ G. M. ≥ H. M.

(b) G. M. > A. M. > H. M.

(c) G. M. ≥ A.M. ≥ H. M.

(d) A . M. > G. M. > H. M.

[10] Measures of dispersion are called averages of the _____ order.

(a) 1st (b) 2nd

(c) 3rd (d) None

[11] For a set of 100 observations, taking assumed mean as 4, the sum of the deviations is -11 cm, and the

sum of the squares of these deviations is 257 cm^2. The coefficient of variation is :

(a) 41.13% (b) 42.13%

(c) 40.13% (d) None

Aug 07

[12] the A. M, and H.M. for two numbers are 5 and 3.2 respectively then the G.M. will be:

(a) 4.05 (b) 16

(c) 4 (d) 4,10

[13] _____ are used for measuring central tendency, dispersion and skewness:

(a) Median (b) Deciles

(c) Percentiles (d) Quartiles

[14] Which of the following companies A or B is more consistent so far as the payment of dividend is

concerned?

Dividend paid by A :	5	9	6	12	15	10	8	10
Dividend paid by B :	4	8	7	15	18	9	6	6

(a) A   (b) B

(c) both A & B   (d) Neither A nor B

[15] What is the coefficient of range for the following distribution?

Class Interval:	10-19	20 29	30-39	40-49	50-59
Frequency:	11	25	16	7	3

(a) 22   (b) 50

(c) 75.82   (d) 72.46

Nov 07

[16] An aeroplane flies from A to B at the rate of 500 km / hr and comes back from B to A at the rate of

700 km / hr. The average speed of the aeroplane is:

(a) 600 km / hr   (b) 583.33 km / hr

(c) $100\sqrt{35}$ km / hr   (d) 620 km/hr.

[17] For a moderately skewed distribution, which of the following relationship holds ?

(a) Mean - Median = 3 (Median - Mode)

(b) Median - Mode = 3 (Mean - Median)

(c) Mean - Mode = 3 (Mean - Median)

(d) Mean - Median = 3 (Mean - Mode)

[18] ____ & ____ are called ratio averages:

(a) H. M. & G. M.   (b) H. M. &A. M.

(c) A. M. & G. M.   (d) None

[19] A sample of 35 observations has the mean 80 and S.D. as 4. A second sample of 65 observations from

the same population has mean 70 and S.D. 3. The S.D. of the combined sample is :

(a) 5.85   (b) 5.58

(c) 10.23   (d) None of these

[20] If x and y are related as 3x - 4y = 20 and the quartile deviation of x is 12, then the quartile deviation

of y is :

(a) 14   (b) 15

(c) 16   (d) 9

Feb 08

[21] Extreme values have ____ effect on mode.

(a) High   (b) low

(c) No   (d) None of these

[22] The mean salary for a group of 40 female workers is Rs. 5,200 per month and that for a group of 60

male workers is Rs. 6,800 per month. What is the combined salary ?

(a) Rs. 6,160   (b) Rs. 6,280

(c) Rs. 6,890   (d) Rs. 6,920

[23] The best measure of dispersion is:

(a) Q. D.   (b) M. D.

(c) Range   (d) S. D.

[24] If the mean and S.D. of x are a and b respectively, then the S.D. of $\frac{x-a}{b}$ is:

(a) a/b   (b) -1   (c) 1   (d) ab

[25] Suppose a population A has 100 observations 101, 102, 103, ...200 anti another population B has

100 observations 151,152,153, 250. If V_A and V_B represents the variance of the two populations

respectively, then $V_A / V_B =$:

(a) 9/4   (b) 1   (c) 4/9   (d) 2/3

June 08

[26] If there are two groups with 75 and 65 as harmonic means and containing 15 and 13 observations.

Then the combined H.M. is given by.

(a) 70   (b) 80

(c) 70.35   (d) 69.48

[27] The G.M. of 4, **6** and **8** is :

(a) 4.77   (b) 5.32

(c) 6.14   (d) 5.77

[28] The Mean and S.D. for group of 100 observations are 65 and 7.03 respectively If 60 of these

observations have mean and S.D. as 70 and 3 respectively, what is the S.D. for the group comprising

40 observations?

(a) 2.03   (b) 4.03   (c) 8.03   (d) 9.33

[29] The quartile deviation for the data is:

x :	2	3	4	5	6
f :	3	4	8	4	1

(a) ¼   (b) ½   (c) 1   (d) 0

Dec 08

[30] If X and Y are two random variables then v (x + y) is :

(a) v(x) + v(y)   .(b) v (x) + v (y)-2 v (x, y)

(c) v (x) + v (y) + **2** v (x, y)   (d) v (x) - v (y)

[31] M is a better measure than others when,

(a) ratios and percentages are given   (b) interval of scale is given

(c) Both (a) and (b)   (d) Either (a) or (b)

[32] Mean and S. D. of x is 50 and 5 respectively. Find mean and S.D. of $\frac{x-50}{5}$

(a) (1,0)   (b) (0,1)   (c) (1,:)   (d) (0,-1)

[33] Mean and S. D. of a given set of observations is 1,500 and 400 respectively. If there is an increment of

100 in the first year and each observation is hiked by 20% in 2nd years, then find new mean and S.D.

(a) 1920, 480   (b) 1920, 580   (c) 1600,480   (d) 1600,400

[34] If 5 is subtracted from each observation of some certain item then its co-efficient of variation is 10%

and if 5 is added to each item then its coefficient of variation is **6**%. Find original coefficient of

variation.

(a) **8**%   (b) 7.5%   (c) 4%   (d) None of these

June 09

[35] The median of x, $\frac{X}{2}, \frac{X}{3}, \frac{X}{5}$ is 10. Find x where x > 0

(a) 24   (b) 32   (c) 8   (d) 16

[36] The average salary of 50 men was Rs. 80 but it was found that salary of 2 of them were Rs. 46 and Rs.

28 which was wrongly taken as Rs. 64 and Rs. 82. The revised average salary is :

(a) Rs. 80   (b) Rs. 78.56   (c) Rs. 85.26   (d) Rs. 82.92

[37] Inter Quartile Range is _____ of Quartile Deviation.

(a) Half   (b) Double   (c) Triple   (d) Equal

[38] The sum of squares of deviation from mean of 10 observations is 250. Mean of the data is 10. Find

the co-efficient of variation.

(a) 10%   (b) 25%   (c) 50 %   (d) 0 %

[39] If A be the A.M. of two positive unequal quantities X and Y and G be their G.M., then ;

(a) A < G   (b) A > G   (c) A ≤ G   (d) A ≥ G

Dec 09

[40] When mean is 3.57 and mode is 2.13 then the value of median is _____.

(a) 3.09   (b) 5.01   (c) 4.01   (d) None of these

[41] If L_1 = highest observation and L_2 = smallest observation, then Coefficient of Range =

(a) $\frac{L_1 \times L_2}{L_1 / L_2} \times 100$ (b) $\frac{L_1 - L_2}{L_1 + L_2} \times 100$ (c) $\frac{L_1 + L_2}{L_1 - L_2} \times 100$ (d) $\frac{L_1 / L_2}{L_1 \times L_2} \times 100$

[42] The equation of a line is $5x + 2y = 17$. Mean deviation of y about mean is 5. Calculate mean

deviation of x about mean.

(a) - 2   (b) 2   (c) -4   (d) None

[43] If variance of x is 5, then find the variance of $(2 - 3x)$

(a) 10   (b) 15   (c) 5   (d) -13

June 10

[44] The harmonic mean of 1, 1/2, 1/3 1/n is

(a) $1/(n + 1)$ (b) $2/(n + 1)$ (c) $(n + 1)/2$ (d) $1/(n\ 1)$

[45] The mean weight of 15 students is 110 kg. The mean weight of 5 of them is 100 kg. and of another

five students is 125 kg. then the mean weight of the remaining students is :

(a) 120   (b) 105   (c) 115   (d) None of these

[46] In a class of 11 students, 3 students were failed in a test. 8 students who passed secured 10,11, 20,

15, 12, 14, 26 and 24 marks respectively. What will be the median marks of the students?

(a) 12   (b) 15   (c) 13   (d) 13.5

Dec 10

[47] The variance of data : 3,4,5,8 is

(a) 4.5   (b) 3.5   (c) 5.5   (d) 6.5

[48] A lady travel at a speed of 20km/h and returned at quicker speed. If her average speed of the

whole journey is 24km/h, find the speed of return journey (in km/h)

(a) 25   (b) 30   (c) 35   (d) 38

[49] Let the mean of the variable 'x' be 50, then the mean of $u = 10 + 5x$ will be :

(a) 250   (b) 260   (c) 265   (d) 273

[50] Given the observations : 4,9,11,14,37. The Mean deviation about the Median is

(a) 11   (b) 8.5   (c) 7.6   (d) 7.45

June 11

[51] If the difference between mean and Mode is 63, then the difference between Mean and Median will

be _____.

(a) 63   (b) 31.5   (c) 21   (d) None of the above.

[52] If the Arithmetic mean between two numbers is 64 and the Geometric mean between them is 16.

The Harmonic Mean between them is _____.

(a) 64   (b) 4   (c) 16   (d) 40

[53] all observations in a distribution are increased by 6, then the variance of the series will be _____.

(a) Increased   (b) Decreased   (c) Unchanged   (d) None of these.

[54] The average of 5 quantities is 6 and the average of 3 is 8. what is the average of the remaining two.

(a) 4   (b) 5   (c) 3   (d) 3.5

Dec 11

[55] The standard deviation of the weights (in kg) of the students of a class of 50 students was

calculated to be 4.5 kg. Later on it was found that due to some fault in weighing machine, the

weight of each student was under measured by 0.5 kg. The Correct standard deviation of the

weight will be:

(a) Less than 4.5   (b) Greater than 4.5

(c) Equal to 4.5   (d) Can not be determined

[56] For Normal distribution the relation between quartile deviation (Q.D) and standard deviation

(S.D) is

(a) Q.D > S.D   (b) Q.D < S.D   (c) Q.D = S.D   (d) None of the above

[57] The median of following numbers, which are given is ascending order is 25. Find the Value of X.

11 13 15 19 (x+ 2) (x+ 4) 30 35 39 46

(a) 22   (b) 20   (c) 15   (d) 30

[58] The average age of a group of 10 students was 20 years. The average age increased by two years

when two new students joined the group. What is the average age of two new students who joined

the group?

	(a) 22 years (b) 30 years (c) 44 years (d) 32 years

June 12

[59] If standard deviation of first 'n' natural numbers is 2 then value of 'n' is

(a) 10   (b) 7   (c) 6   (d) 5

[60] Geometric Mean of three observations 40,50 and X is 10. The value of X is

(a) 2   (b) 4   (c) ½   (d) None of the above.

[61] The mean of first three term is 14 and mean of next two terms is 18. The mean of all five term is :

(a) 14.5   (b) 15   (c) 14   (d) 15.6

[62] The standard deviation is independent of change of

(a) Scale

(b) Origin

(c) Both origin and scale

(d) None of these.

[63] In a normal distribution, the relationship between the three most commonly used measures of

dispersion are:

(a) Standard Deviation > Mean Deviation > Quartile Deviation

(b) Mean Deviation > Standard Deviation > Quartile Deviation

(c) Standard Deviation > Quartile Deviation > Mean Deviation

(d) Quartile Deviation > Mean Deviation > Standard Deviation

[64] If Standard deviation of x is σ , then standard deviation of ax +b , where a, b and c (c$\pm$ 0) are

arbitrary constants, will be

(a) σ (b) $\frac{a\sigma + b}{c}$ (c) $\frac{a}{c} - \sigma$ (d) $\left|\frac{a}{c}\right|\sigma$

[65] The mean salary of a group of 50 persons is Rs. 5,850. Later on it is discovered that the salary of

one employee has been wrongly taken as Rs. 8,000 instead of Rs. 7,800. The corrected mean salary is:

(a) Rs. 5,854   (b) Rs. 5,846   (c) Rs. 5,650   (d) None of the above.

Dec 12

[66] Which of the following measures of dispersion is used for calculating the consistency between two

series?

(a) Quartile deviation   (b) Standard deviation

(c) Coefficient of variation   (d) None of the above.

[67] If the mode of a data is 18 and mean is 24, then median is _____.

(a) 18   (b) 24   (c) 22   (d) 21

[68] For data on frequency distribution of weights:

70, 73, 49, 57, 56, 44, 56, 71, 65, 62, 60, 50, 55, 49, 63 and 45

If we assume class length as 5, the number of class intervals would be

(a) 5   (b) 6   (c) 7   (d) 8

[69] The point of intersection of the "less than" and "more than" ogives correspond to

(a) Mean   (b) Mode   (c) Median   (d) 10th Percentile

[70] A man travels from Agra to Gwalior at an average speed of 30 km per hour and back at an average

speed of 60 km per hour. What is his average speed?

(a) 38 km per hour   (b) 40 km per hour

(c) 45 km per hour   (d) 35 km per hour

June 13

[71] If sum of squares of the values = 3390, N = 30 and standard deviation = 7, find out the mean.

(a) 113   (b) 210   (c) 8   (d) None of these

[72] If the mean of a frequency distribution is 100 and coefficient of variation is 45% then standard

deviation is:

(a) 45   (b) 0.45   (c) 4.5   (d) 450

[73] Which of the following measures of central tendency cannot be calculated by graphical method?

(a) Mean .   (b) Mode   (c) Median   (d) Quartile

[74] Geometric mean of 8, 4, 2 is

(a) 4   (b) 2   (c) 8   (d) None of these

[75] The average age of 15 students of a class is 15 years. Out of them, the average age of 5 students is

14 years and that of the other 9 students is 16 years. The age of the 15th student is:

(a) 11 years   (b) 14 years   (c) 15 years   (d) None of these

Dec 13

[76] Find at the variance given that the Arithmetic Mean = $(8 + 4)/2$

(a) 2   (b) 6   (c) 1   (d) 4

[77] In normal distribution mean, median and mode are

(a) Equal   (b) Not Equal   (c) Zero   (d) None of above

[78] Coefficient of mean deviation about mean for the first 9 natural numbers is

(a) 200/9 '   (b) 80   (c) 400/9   (d) 50

[79] The price of averages whose value can be determined graphically?

(a) Mode, Median   (b) Mean, Mode

(c) Mean, Median   (d) None of the above

[80] If mean = 5, Standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient

of quartile deviation equals

(a) 35 | (b) 39 | (c) 30 | (d) 32

June 14

[81] What will be the probable value of mean deviation? When $Q_3 = 40$ and $Q_1 = 15$

(a) 17.50 | (b) 18.75 | (c) 15.00 | (d) None of the above

[82] Which of the following statements is true?

(a) Median is based on all the observations

(b) The mode is the mid value

(c) The median is the, second quartile

(d) The mode is the fifth decile.

[83] The mean of the following data is 6. Find the value of P

x:	2	4	6	10	P+5
f:	3	2	3	1	2

(a) 4 | (b) 6 | (c) 8 | (d) 7

[84] The formula for range of middle 50% items of a series is:

(a) $Q_3 - Q_1$ | (b) $Q_3 - Q_2$ | (c) $Q_2 - Q_1$ | (d) $\frac{Q_3 - Q_1}{2}$

Dec 14

[85] The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12, is:

(a) 13   (b) 10.70   (c) 11   (d) 11.50

[86] A random variable X has uniform distribution on the interval (-3, 7). The mean of the distribution is:

(a) 2   (b) 4   (c) 5   (d) 6

[87] If the first quartile is 142 and semi-inter quartile range is 18, then the value of median Is:

(a) 151   (b) 160   (c) 178   (d) None of these

[88] The quartile deviation is:

(a) 2/3 of S.D.   (b) 4/5 of S.D.

(c) 5/6 of S.D   (d) None of these

[89] If the arithmetic mean of two numbers is 10 and the geometric mean of these numbers is 8, then

the harmonic mean is:

(a) 9   (b) 8.9   (c) 6.4   (d) None of these

June 15

[90] The standard deviation of a variable x is known to be 10. The standard deviation of 50 + 5x is

(a) 50   (b) 100   (c) 10   (d) 500

[91] The harmonic mean H of two numbers is 4 and their arithmetic mean A and the geometric mean G

satisfy the equation $2A + G^2 = 27$, then the numbers are

(a) (1,3)   (b) (9,5)   (c) (6,3)   (d) (12,7)

[92] Coefficient of quartile deviation is equal to

(a) Quartile deviation × 100/ median

(b) Quartile deviation × 100 / mean

(c) Quartile deviation × 100 / mode

(d) None

[93] If all the observations are increased by 5, then

(a) S.D. would be increased by 5

(b) Mean deviation would be increased by 5

(c) Quartile deviation would be increased by 5

(d) All the three would not be increased by **5**

[94] What is value of mean deviation about mean from the number 5, 8,6, 3 and 4 ?

(a) 5.20   (b) 7.20   (c) 1.44   (d) 2.23

[95] For the observation of 6, 4, 1,6, 5, 10, 4, 8 the range is:

(a) 10   (b) 9   (c) 8   (d) None

Dec 15

[96] If a variance of a random variable Y is 23, then what is variance of 2x + 10?

(a) 56   (b) 33   (c) 46   (d) 92

[97] If variance $= 148.6$ and $\bar{x} = 40$, then the coefficient of variation is:

(a) 37.15   (b) 30.48   (c) 33.75   (d) None of the above

[98] Quartiles can be determined graphically using:

(a) Histogram   (b) Frequency polygon

(c) Ogive curve   (d) Pie chart

[99] In a class of 50 students, 10 have failed and their average marks in 2.5. The total marks secured by

the entire class were 281. The average marks who have passed is:

(a) 5.32   (b) 7.25   (c) 6.40   (d) None of the above.

June 16

[100] The SD of first n natural number is _____

(a) $\sqrt{\frac{n^2-1}{12}}$ (b) $\sqrt{\frac{n(n+1)}{12}}$ (c) $\sqrt{\frac{n(n-1)}{6}}$ (d) None of these.

[101] If mean and coefficient of variation of the marks of 10 students is 20 and 80 respectively. What will

be variance of them?

(a) 256   (b) 16   (c) 25   (d) None of these.

[102] If same amount is added to or subtracted from all the values of an individual series then the

standard deviation and variance both shall be _____.

(a) changed   (b) unchanged   (c) same   (d) none of these

[103] If the mean of two numbers is 30 and geometric mean is 24 then what will be these two numbers?

(a) 36 and 24   (b) 30 and 30

(c) 48 and 12   (d) None of these

[105] Mean for the data 6, 4, 1, 6, 5, 10, 3 is 5 when each observation added by 2, what is mean of the

data

(a) 5   (b) 6   (c) 7   (d) 10

[106] The average of 10 observations is 14.4. If the average of first 4 observations is 16.5. The average of

remaining 6 observations is:

(a) 13.6   (b) 13.0   (c) 13.2   (d). 12.5

[107] The ordering of a particular design of a cloth show room, a ____ size be more appropriate.

(a) median   (b) mean   (c) mode   (d) all of these

[108] The second and third moments of a sample of seven observation (-6, -4, -2, 0, 2,4, 6) are

(a) (12, 0)   (b) (0,12)   (c) (0,16)   (d) (16, 0)

[109] The geometric mean of three numbers 40,50 and x is 10, the value of x is

(a) 5   (b) 4   (c) 2   (d) $\frac{1}{2}$

[109] The geometric mean of three numbers 40,50 and x is 10, the value of x is

(a) 5   (b) 4   (c) 2   (d) $\frac{1}{2}$

June 17

[110] The rates of returns from three different shares are 100%, 200% and 400% respectively. The

average rate of return will be:

(a) 350%   (b) 233.33%   (c) 200%   (d) 300%

[111] If geometric mean is 6 and arithmetic mean is 6.5, then harmonic mean will be:

(a) $\frac{6^2}{6.5}$ (b) $\frac{6}{6.5^2}$ (c) $\frac{6}{6.5}$ (d) None of the above

[112] A company's past 10 years average earning is Rs. 40 crores. To have the same average earning for

11 years including these 10 years: how much earning must be made by the company in the

eleventh year?

(a) Rs. 40 crores   (b) Rs. $\frac{40 \times 10}{??}$ Crores

(c) More than Rs. 40 crores   (d) None of the above.

[113] A person purchases 5 rupees worth of eggs from 10 different markets. You are to find the average

number of eggs per rupee purchased from all the markets taken together. The suitable average in

this case is:

(a) A.M.   (b) G.M.   (c) H.M.   (d) None of the above.

[114] For a moderately skewed distribution, the relationship between mean, median and mode is :

(a) Mean - Mode = 2 (Mean - Median)

(b) Mean - Median = 3 (Mean - Mode)

(c) Mean - Median = 2 (Mean - Mode)

(d) Mean - Mode = 3 (Mean - Median).

[115] If arithmetic mean and coefficient of variation of x are 10 and 40, respectively then the variance of

$- 15 + \frac{3x}{2}$ will be:

(a) 64   (b) 81   (c) 49   (d) 36

ANSWERS

1	B	11	A	21	C	31	A	41	B	51	C
2	C	12	C	22	A	32	B	42	B	52	B
3	A	13	D	23	D	33	A	43	B	53	C
4	D	14	A	24	C	34	B	44	B	54	C

5	D	15	D	25	B	35	A	45	B	55	C
6	A	16	B	26	A	36	B	46	A	56	B
7	C	17	C	27	D	37	B	47	B	57	A
8	C	18	A	28	B	38	C	48	B	58	D
9	D	19	A	29	C	39	B	49	B	59	B
10	B	20	D	30	A	40	A	50	C	60	C

61	D	71	C	81	C	91	C	101	A	111	A
62	B	72	A	82	C	92	A	102	B	112	A
63	A	73	A	83	D	93	D	103	C	113	C
64	D	74	A	84	D	94	C	104	C	114	D
65	B	75	A	85	B	95	B	105	C	115	D
66	C	76	D	86	A	96	D	106	B		
67	C	77	A	87	B	97	B	107	C		
68	C	78	C	88	A	98	C	108	D		

| 69 | C | 79 | A | 89 | C | 99 | C | 109 | D | | |
| 70 | B | 80 | C | 90 | A | 100 | A | 110 | C | | |

STUDENTS NOTES

| CH - 3 | PROBABILITY & EXPECTED VALUE BY MATHEMATICAL EXPECTATION | |

Q 1   A committee of 7 members is to be formed from a group comprising 8 gentlemen and 5 ladies. What

is the probability that the committee would comprise:

(a) 2 ladies,

(b) at least 2 ladies.

Solution:

Q 2 | The following data relate to the distribution of wages of a group of workers:

Wages in Rs.: 50-60	60-70	70-80	80-90	90-100	100-110	110-120
No. of workers: 15	23	36	42	17	12	5

If a worker is selected at random from the entire group of workers, what is the probability that

(a) his wage would be less than Rs. 50?

(b) his wage would be less than Rs. 80?

(c) his wage would be more than Rs. 100?

(d) his wages would be between Rs. 70 and Rs. 100?

Solution: As there are altogether 150 workers, n = 150.

(a) Since there is no worker with wage less than Rs. 50, the probability that the wage of a

randomly selected worker would be less than Rs. 50 is $P(A) = \frac{0}{150} = 0$

(b) Since there are (15+23+36) or 74 worker having wages less than Rs. 80 out of a group of

150 workers, the probability that the wage of a worker, selected at random from the group, would be

less than Rs. 80 is

P(B) $= \frac{74}{150} = \frac{37}{75}$

(C)There are (12+5) or 17 workers with wages more than Rs. 100. Thus the probability of finding a

worker, selected at random, with wage more than Rs. 100 is

P(C) $= \frac{17}{150}$

(d) There are (36+42+17) or 95 workers with wages in between Rs. 70 and Rs. 100. Thus

P(D) $= \frac{95}{100} = \frac{19}{30}$

Q 3   *Three events A, B and C are mutually exclusive, exhaustive and equally likely.*

What is the probability of the complementary event of A?

Solution:

Q 4   *A number is selected from the first 25 natural numbers. What is the probability that it would be*

divisible by 4 or 7?

Solution: Let A be the event that the number selected would be divisible by 4 and B, the event that the

selected number would be divisible by 7. Then AUB denotes the event that the number would be

divisible by 4 or 7. Next we note that A = {4, 8, 12, 16, 20, 24} and B = {7, 14, 21} whereas S = {1, 2, 3,

.... 25}. Since $A \cap B = \emptyset$, the two events A and B are mutually exclusive and as such we have

$P(A \cup B) = P(A) + P(B)$

Since $P(A) = \frac{n(A)}{n(S)} = \frac{6}{25}$

And $P(B) = \frac{n(B)}{n(S)} = \frac{3}{25}$

Thus from (1), we have

$P(A \cup B) = \frac{6}{25} + \frac{3}{25}$

$= \frac{9}{25}$

Hence the probability that the selected number would be divisible by 4 or 7 is 9/25 or 0.36

Q 5   *A coin is tossed thrice. What is the probability of getting 2 or more heads?*

Solution: If a coin is tossed three times, then we have the following sample space.

S = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT} 2 or more heads imply 2 or 3 heads.

If A and B denote the events of occurrence of 2 and 3 heads respectively, then we find that

A = {HHT, HTH, THH} and B = {HHH}

$P(A) = \frac{n(A)}{n(S)} = \frac{3}{8}$

And $P(B) = \frac{n(B)}{n(S)} = \frac{1}{8}$

As A and B are mutually exclusive, the probability of getting 2 or more heads is

$P(A \cup B) = P(A) + P(B)$

$= \frac{3}{8} + \frac{1}{8}$

$= 0.50$

Q 6 *A number is selected at random from the first 1000 natural numbers. What is the probability that it would be a multiple of 5 or 9?*

Solution:

Q 7 *The probability that an Accountant's job applicant has a B. Com. Degree is 0.85, that he is a CA is*

0.30 and that he is both B. Com. and CA is 0.25 out of 500 applicants, how many would be B. Com.

or CA?

Solution: Let the event that the applicant is a B. Com. be denoted by B and that he is a CA be

denoted by C Then as given,

$P(B) = 0.85$, $P(C) = 0.30$ and $P(B \cap C) = 0.25$

The probability that an applicant is B. Com. or CA is given by

$P(B \cup C) = P(B) + P(C) - P(B \cap C)$

$= 0.85 + 0.30 - 0.25$

$= 0.90$

Expected frequency $= N \times P(B \cup C)$

Expected frequency $= 500 \times 9.90 = 450$

Q 8 *If P(A−B) = 1/5, P(A) = 1/3 and P (B) = 1/2, what is the probability that out of the two events*

A and B, only B would occur?

Solution:

Q 9   *Rupesh is known to hit a target in 5 out of 9 shots whereas David is known to hit the same target in 6 out of 11 shots. What is the probability that the target would be hit once they both try?*

Solution:

Q 10   *A pair of dice is thrown together and the sum of points of the two dice is noted to be 10.*

What is the probability that one of the two dice has shown the point 4?

Solution:

Q 11	In a group of 20 males and 15 females, 12 males and 8 females are service holders. What is the
	probability that a person selected at random from the group is a service holder given that the
	selected person is a male?
Solution:	Let S and M stand for service holder and male respectively. We are to evaluate P (S / M).
	We note that (S ∩ M) represents the event of both service holder and male.
	Thus $P(S/M) = \frac{P(S \cap M)}{P(M)}$
	$= \frac{12/35}{20/35} = 0.60$
Q 12	In connection with a random experiment, it is found that
	$P(A) = 2/3$, $P(B) = 3/5$ and $P(A \cup B) = 5/6$
	Evaluate the following probabilities:
	(i) P(A/B) (ii) P(B/A) (iii) P(A'/ B) (iv) P(A/ B') (v) P(A'/ B')
Solution:	

Q 13 *The odds in favour of an event is 2 : 3 and the odds against another event is 3 : 7. Find the*

probability that only one of the two events occurs.

Solution:

Q 14

There are three boxes with the following compositions :

Box \ Colour	Blue	Red	White	Total
I	5	8	10	23
II	4	9	8	21
III	3	6	7	16

One ball in drawn from each box. What is the probability that they would be of the same colour?

Solution: Either the balls would be Blue or Red or White. Denoting Blue, Red and White balls by B, R and W

respectively and the box by lower suffix, the required probability is

$= P(B1 \cap B2 \cap B3) + P(R1 \cap R2 \cap R3) + P(W1 \cap W2 \cap W3)$

$= P(B1) \times P(B2) \times P(B3) + P(R1) \times P(R2) \times P(R3) + P(W1) \times P(W2) \times P(W3)$

$= \frac{5}{23} \times \frac{4}{21} \times \frac{3}{16} + \frac{8}{23} \times \frac{9}{21} \times \frac{6}{16} + \frac{10}{23} \times \frac{8}{21} \times \frac{7}{16}$

$= \frac{60+432+560}{7728}$

$= \frac{1052}{7728}$

Q 15

Mr. Roy is selected for three separate posts. For the first post, there are three candidates, for the

second, there are five candidates and for the third, there are 10 candidates. What is the probability

that Mr. Roy would be selected?

Solution: Denoting the three posts by A, B and C respectively, we have

P(A) = 1/3, P(A) = 1/5 and P(C) = 1/10

The probability that Mr. Roy would be selected (i.e. selected for at least one post).

$= P(A \cup B \cup C)$

$= 1 - P[(A \cup B \cup C)']$

$= 1 - P(A' \cap B' \cap C')$ (by De-Morgan's Law)

$= 1 - P(A') \times P(B') \times P(C')$ (As A , B and C are independent, so are their complements)

$= 1 - \left(1 - \frac{1}{3}\right) \times \left(1 - \frac{1}{5}\right) \times \left(1 - \frac{1}{10}\right) = \frac{13}{25}$

Q 16 *There are two urns containing 5 red and 6 white balls and 3 red and 7 white balls respectively. If two balls are drawn from the first urn without replacement and transferred to the second urn and then a draw of another two balls is made from it, what is the probability that both the balls drawn are red?*

Solution:

Q 17

There are 3 boxes with the following composition :

Box I : 7 Red + 5 White + 4 Blue balls

Box II : 5 Red + 6 White + 3 Blue balls

Box III : 4 Red + 3 White + 2 Blue balls

One of the boxes is selected at random and a ball is drawn from it. What is the probability that the

drawn ball is red?

Solution:

EXPECTED VALUE OF A RANDOM VARIABLE

Q 18

An unbiased coin is tossed three times. Find the expected value of the number of heads

and also its standard deviation.

X :	0	1	2	3
P :	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$

Solution:

Q 19 *A random variable has the following probability distribution:*

X :	4	5	7	8	10
P :	0.15	0.20	0.40	0.15	0.10

Find E [x − E(x)]². Also obtain v(3x −4)

Solution:

Q 20   *In a business venture, a man can make a profit of Rs. 50,000 or incur a loss of Rs. 20,000. The*

probabilities of making profit or incurring loss, from the past experience, are known to be 0.75 and

0.25 respectively. What is his expected profit?

Solution: If the profit is denoted by x, then we have the following probability distribution of x:

X : Rs. 50,000 Rs. –20,000

P : 0.75 0.25

Thus his expected profit

$E(x) = p_1 x_1 + p_2 x_2$

$= 0.75 \quad Rs. 50,000 + 0.25 \quad (Rs. - 20,000)$

= Rs. 32,500

Q 21   *A random variable x has the following probability distribution :*

X :	0	1	2	3	4	5	6	7
P(X) :	0	2k	3k	k	2k	k^2	$7k^2$	$2k^2+k$

Find (i) the value of k

(ii) P(x < 3)

(iii) P(x ≥ 4)

(iv) P(2 < x ≤ 5)

Solution:

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

1. Initially, probability was a branch of

   (a) Physics   (b) Statistics

   (c) Mathematics   (d) Economics

2. Two broad divisions of probability are

   (a) Subjective probability and objective probability

   (b) Deductive probability and non–deductive probability

   (c) Statistical probability and Mathematical probability

   (d) None of these.

3. Subjective probability may be used in

   (a) Mathematics   (b) Statistics

   (c) Management   (d) Accountancy

4. An experiment is known to be random if the results of the experiment

   (a) Can not be predicted

   (b) Can be predicted

   (c) Can be split into further experiments

   (d) Can be selected at random

5. An event that can be split into further events is known as

   (a) Complex event   (b) Mixed event

(c) Simple event   (d) Composite event

6. Which of the following pairs of events are mutually exclusive?

(a) A : The student reads in a school. B : He studies Philosophy.

(b) A : Raju was born in India. B : He is a fine Engineer.

(c) A : Ruma is 16 years old. B : She is a good singer.

(d) A : Peter is under 15 years of age. B : Peter is a voter of Kolkata.

7. If P(A) = P(B), then

(a) A and B are the same events

(b) A and B must be same events

(c) A and B may be different events

(d) A and B are mutually exclusive events.

8. If P(A ∩ B) = 0, then the two events A and B are

(a) Mutually exclusive   (b) Exhaustive

(c) Equally likely   (d) Independent

9. If for two events A and B, P(AUB) = 1, then A and B are

(a) Mutually exclusive events

(b) Equally likely events

(c) Exhaustive events

(d) Dependent events.

10. If an unbiased coin is tossed once, then the two events Head and Tail are

(a) Mutually exclusive   (b) Exhaustive

(c) Equally likely   (d) All these (a), (b) and (c).

11. If P(A) = P(B), then the two events A and B are

(a) Independent   (b) Dependent

(c) Equally likely   (d) Both (a) and (c).

12 If for two events A and B, P(A ∩ B) ≠ P(A) x P(B), then the two events A and B are

(a) Independent   (b) Dependent

(c) Not equally likely   (d) Not exhaustive.

13. If P(A/B) = P(A), then

(a) A is independent of B   (b) B is independent of A

(c) B is dependent of A   (d) Both (a) and (b).

14. If two events A and B are independent, then

(a) A and the complement of B are independent

(b) B and the complement of A are independent

(c) Complements of A and B are independent

(d) All of these (a), (b) and (c).

15. If two events A and B are independent, then

(a) They can be mutually exclusive

(b) They can not be mutually exclusive

(c) They can not be exhaustive

(d) Both (b) and (c).

16. If two events A and B are mutually exclusive, then

(a) They are always independent

(b) They may be independent

(c) They can not be independent

(d) They can not be equally likely.

17. If a coin is tossed twice, then the events 'occurrence of one head', 'occurrence of 2 heads'

and 'occurrence of no head' are

(a) Independent   (b) Equally likely

(c) Not equally likely   (d) Both (a) and (b).

18. The probability of an event can assume any value between

(a) – 1 and 1   (b) 0 and 1

(c) – 1 and 0   (d) none of these

19. If P(A) = 0, then the event A

(a) will never happen   (b) will always happen

(c) may happen   (d) may not happen.

20. If P(A) = 1, then the event A is known as

(a) symmetric event   (b) dependent event

(c) improbable event   (d) sure event

21. If p : q are the odds in favour of an event, then the probability of that event is

(a) p/q   (b) p/p+q

(c) q/p+q   (d) none of these

22. If P(A) = 5/9, then the odds against the event A is

(a) 5 : 9   (b) 5 : 4

(c) 4 : 5   (d) 5 : 14

23.   If A, B and C are mutually exclusive and exhaustive events, then P(A) + P(B) + P(C) equals to

(a) 1/3   (b) 1

(c) 0   (d) any value between 0 and 1.

24   If A denotes that a student reads in a school and B denotes that he plays cricket, then

(a) $P(A \cap B) = 1$ (b) $P(A \cap B) = 1$

(c) $P(A \cap B) = 0$ (d) P(A) = P(B).

25.   P(B/A) is defined only when

(a) A is a sure event   (b) B is a sure event

(c) A is not an impossible event   (d) B is an impossible event.

26.   P(A/B') is defined only when

(a) B is not a sure event   (b) B is a sure event

(c) B is an impossible event   (d) B is not an impossible event

27.   For two events A and B, $P(A \cup B) = P(A) + P(B)$ only when

(a) A and B are equally likely events

(b) A and B are exhaustive events

(c) A and B are mutually independent

(d) A and B are mutually exclusive.

28.   Addition Theorem of Probability states that for any two events A and B,

(a) $P(A \cup B) = P(A) + P(B)$

(b) $P(A \cup B) = P(A) + P(B) + P(A \cap B)$

(c) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

(d) $P(A \cup B) = P(A) \times P(B)$

29. For any two events A and B:

(a) $P(A) + P(B) > P(A \cap B)$ (b) $P(A) + P(B) < P(A \cap B)$

(c) $P(A) + P(B) \geq P(A \cap B)$ (d) $P(A) \times P(B) \leq P(A \cap B)$

30. For any two events A and B,

(a) $P(A-B) = P(A) - P(B)$ (b) $P(A-B) = P(A) - P(A \cap B)$

(c) $P(A-B) = P(B) - P(A \cap B)$ (d) $P(B-A) = P(B) + P(A \cap B)$.

31. The limitations of the classical definition of probability is:

(a) it is applicable when the total number of elementary events is finite

(b) it is applicable if the elementary events are equally likely

(c) it is applicable if the elementary events are mutually independent

(d) (a) and (b).

32. According to the statistical definition of probability, the probability of an event A is the

(a) limiting value of the ratio of the no. of times the event A occurs to the number of times the experiment is repeated

(b) the ratio of the frequency of the occurrences of A to the total frequency

(c) the ratio of the frequency of the occurrences of A to the non-occurrence of A

(d) the ratio of the favourable elementary events to A to the total number of elementary events.

33. The Theorem of Compound Probability states that for any two events A and B.

(a) $P(A \cap B) = P(A) \times P(B/A)$ (b) $P(A \cup B) = P(A) \times P(B/A)$

(c) $P(A \cap B) = P(A) \times P(B)$ (d) $P(A \cup B) = P(B) + P(B) - P(A \cap B)$.

34. If A and B are mutually exclusive events, then

(a) $P(A) = P(A-B)$.   (b) $P(B) = P(A-B)$.

(c) $P(A) = P(A \cap B)$.   (d) $P(B) = P(A \cap B)$.

35. If $P(A-B) = P(B-A)$, then the two events A and B satisfy the condition

(a) $P(A) = P(B)$.   (b) $P(A) + P(B) = 1$

(c) $P(A \cap B) = 0$ (d) $P(A \cup B) = 1$

36. The number of conditions to be satisfied by three events A, B and C for complete independence is

(a) M2   (b) 3   (c) 4   (d) any number.

37. If two events A and B are independent, then $P(A \cap B)$

(a) equals to $P(A) + P(B)$ (b) equals to $P(A) \times P(B)$

(c) equals to $P(A) \times P(B/A)$ (d) equals to $P(B) \times P(A/B)$.

38. Values of a random variable are

(a) always positive numbers.   (b) always positive real numbers.

(c) real numbers.   (d) natural numbers.

39. Expected value of a random variable

(a) is always positive   (b) may be positive or negative

(c) may be positive or negative or zero   (d) can never be zero.

40. If all the values taken by a random variable are equal then

(a) its expected value is zero

(b) its standard deviation is zero

(c) its standard deviation is positive

(d) its standard deviation is a real number.

41. If x and y are independent, then

(a) $E(xy) = E(x) \times E(y)$ (b) $E(xy) = E(x) + E(y)$

(c) $E(x - y) = E(x) + E(y)$ (d) $E(x - y) = E(x) + x\,E(y)$

42. If a random variable x assumes the values x1 , x2 , x3 , x4 with corresponding probabilities p1 , p2 , p3 ,

p4 then the expected value of x is

(a) p1 + p2 + p3 + p4

(b) x1 p1 + x2 p3 + x3 p2 + x4 p4

(c) p1 x1 + p2 x2 + p3 x3 + p4 x4

(d) none of these.

43. f(x), the probability mass function of a random variable x satisfies

(a) f(x) > 0   (b) $\sum_x f(x)=1$

(c) both (a) and (b)   (d) $f(x) \geq 0$ and $\sum_x f(x)=1$

44. Variance of a random variable x is given by

(a) $E\,(x - \mu\,)^2$ (b) $E\,[x - E(x)]^2$ (c) $E\,(x2 -)$ (d) (a) or (b)

45. If two random variables x and y are related by y = 2 – 3x, then the SD of y is given by

(a) –3 X SD of x   (b) 3 X SD of x.   (c) 9 X SD of x   (d) 2 X SD of x.

46. Probability of getting a head when two unbiased coins are tossed simultaneously is

(a) 0.25   (b) 0.50   (c) 0.20   (d) 0.75

47. If an unbiased coin is tossed twice, the probability of obtaining at least one tail is

(a) 0.25   (b) 0.50   (c) 0.75   (d) 1.00

48. If an unbiased die is rolled once, the odds in favour of getting a point which is a multiple of 3 is

(a) 1:2   (b) 2:1   (c) 1:3   (d) 3:1

49. A bag contains 15 one rupee coins, 25 two rupee coins and 10 five rupee coins. If a coin is selected at

random from the bag, then the probability of not selecting a one rupee coin is

(a) 0.30   (b) 0.70   (c) 0.25   (d) 0.20

50. A, B, C are three mutually independent with probabilities 0.3, 0.2 and 0.4 respectively. What is

$P(A \cap B \cap C)$?

(a) 0.400   (b) 0.240   (c) 0.024   (d) 0.500

51. If two letters are taken at random from the word HOME, what is the Probability that none of the letters

would be vowels?

(a) 1/6   (b) ½   (c) 1/3   (d) ¼

52. If a card is drawn at random from a pack of 52 cards, what is the chance of getting a Spade or an ace?

(a) 4/13   (b) 5/13   (c) 0.25   (d) 0.20

53. If x and y are random variables having expected values as 4.5 and 2.5 respectively, then the expected

value of (x–y) is

(a) 2   (b) 7   (c) 6   (d) 0

54. If variance of a random variable x is 23, then what is the variance of 2x+10?

(a) 56   (b) 33   (c) 46   (d) 92

55. What is the probability of having at least one 'six' from 3 throws of a perfect die?

(a) 5/6   (b) $(5/6)^3$ (c) $1-(1/6)^3$ (d) $1-(5/6)^3$

Set B – (Practical Question)

1. Two balls are drawn from a bag containing 5 white and 7 black balls at random. What is the probability

    that they would be of different colours?

    (a) 35/66   (b) 30/66   (c) 12/66   (d) None of these

2. What is the chance of throwing at least 7 in a single cast with 2 dice?

    (a) 5/12   (b) 7/12   (c) 1/4   (d) 17/36

3. What is the chance of getting at least one defective item if 3 items are drawn randomly from a lot

    containing 6 items of which 2 are defective item?

    (a) 0.30   (b) 0.20   (c) 0.80   (d) 0.50

4. If two unbiased dice are rolled together, what is the probability of getting no difference of points?

    (a) 1/2   (b) 1/3   (c) 1/5   (d) 1/6

5. If A, B and C are mutually exclusive independent and exhaustive events then what is the probability

    that they occur simultaneously?

    (a) 1   (b) 0.50   (c) 0   (d) any value between 0 and 1

6. There are 10 balls numbered from 1 to 10 in a box. If one of them is selected at random, what is the

    probability that the number printed on the ball would be an odd number greater that 4?

    (a) 0.50   (b) 0.40   (c) 0.60   (d) 0.30

7. Following are the wages of 8 workers in rupees:

    50, 62, 40, 70, 45, 56, 32, 45

If one of the workers is selected at random, what is the probability that his wage would be lower than the average wage?

(a) 0.625   (b) 0.500   (c) 0.375   (d) 0.450

8. A, B and C are three mutually exclusive and exhaustive events such that P (A) = 2 P (B) = 3P(C). What is P (B)?

(a) 6/11   (b) 3/11   (c) 1/6   (d) 1/3

9. For two events A and B, P (B) = 0.3, P (A but not B) = 0.4 and P (not A) = 0.6. The events A and B are

(a) exhaustive   (b) independent

(c) equally likely   (d) mutually exclusive

10. A bag contains 12 balls which are numbered from 1 to 12. If a ball is selected at random, what is the probability that the number of the ball will be a multiple of 5 or 6 ?

(a) 0.30   (b) 0.25   (c) 0.20   (d) 1/3

11. Given that for two events A and B, P (A) = 3/5, P (B) = 2/3 and P (A B) = 3/4, what is P (A/B)?

(a) 0.655   (b) 13/60   (c) 31/60   (d) 0.775

12. For two independent events A and B, what is P (A+B), given P(A) = 3/5 and P(B) = 2/3?

(a) 11/15   (b) 13/15   (c) 7/15   (d) 0.65

13. If P (A) = p and P (B) = q, then

(a) P(A/B) ≤ p/q   (b) P(A/B) ≤ p/q

(c) P(A/B) ≤ q/p   (d) None of these

15. If P ($\bar{A}$ ∪ $\bar{B}$) = 5/6, P(A) = ½ and P (B) = 2/3, , what is P (A ∪ B) ?

(a) 1/3   (b) 5/6   (c) 2/3   (d) 4/9

16.	If for two independent events A and B, P (A ∪ B) = 2/3 and P (A) = 2/5, what is P (B)?
	(a) 4/15 (b) 4/9 (c) 5/9 (d) 7/15
17.	If P (A) = 2/3, P (B) =3/4, P (A/B) = 2/3, then what is P (B / A)?
	(a) 1/3 (b) 2/3 (c) ¾ (d) ½
18.	If P (A) = a, P (B) = b and P (P (A ∩ B) = c then the expression of P (A' ∩ B') in terms of a, b and
	c is
	(a) 1 – a – b – c (b) a + b – c (c) 1 + a – b – c (d) 1 – a – b + c
19.	For three events A, B and C, the probability that only A occur is
	(a) P (A) (b) P (A ∪ B ∪ C) (c) P (A' ∩ B ∩ C) (d) P (A ∩ B' ∩ C')
20.	It is given that a family of 2 children has a girl, what is the probability that the other child is also a girl ?
	(a) 0.50 (b) 0.75 (c) 1/3 (d) 2/3
21.	Two coins are tossed simultaneously. What is the probability that the second coin would show a tail
	given that the first coin has shown a head?
	(a) 0.50 (b) 0.25 (c) 0.75 (d) 0.125
22	If a random variable x assumes the values 0, 1 and 2 with probabilities 0.30, 0.50 and 0.20, then its
	expected value is
	(a) 1.50 (b) 3 (c) 0.90 (d) 1
23.	If two random variables x and y are related as y = −3x + 4 and standard deviation of x is 2, then the
	standard deviation of y is
	(a) – 6 (b) 6 (c) 18 (d) 3.50
24.	If 2x + 3y + 4 = 0 and v(x) = 6 then v (y) is

(a) 8/3   (b) 9   (c) – 9   (d) 6

ANSWERS

Set A

1. (c)	2. (a)	3. (c)	4. (d)	5. (d)	6. (d)
7. (c)	8. (a)	9. (c)	10. (d)	11. (c)	12. (b)
12. (d)	14. (d)	15. (b)	16. (c)	17. (c)	18. (b)
19. (a)	20. (d)	21. (b)	22. (c)	23. (b)	24. (c)
25. (c)	26. (a)	27. (d)	28. (c)	29. (c)	30. (b)
31. (d)	32. (a)	33. (a)	34. (a)	35. (a)	36. (c)
37. (b)	38. (c)	39. (c)	40 (b)	41. (a)	42. (c)
43. (d)	44. (d)	45. (b)	46. (b)	47. (c)	48. (a)
49. (b)	50. (c)	51. (a)	52. (a)	53. (a)	54. (d)
55. (d)					

Set B

1. (a)	2. (b)	3. (c)	4. (d)	5. (c)	6. (d)
7. (b)	8. (b)	9. (d)	10. (d)	11. (d)	12. (b)
12. (a)	14. (c)	15. (b)	16. (c)	17. (d)	18. (d)
19. (c)	20. (a)	21. (c)	22. (b)	23. (a)	

ADDITIONAL QUESTION BANK

1. What is the probability that a leap year selected at random would contain 53 Saturdays?

(a) 1/7   (b) 2/7

(c) 1/12   (d) ¼

2. What is the probability that 4 children selected at random would have different birthdays?

(a) $\dfrac{364 \; X \; 363 \; X 362}{(365)^3}$ (b) $\dfrac{6 \; X \; 5 \; X \; 4}{7^3}$

(c) 1/365   (d) $(1/7)^3$

3	A packet of 10 electronic components is known to include 3 defectives. If 4 components

are selected from the packet at random, what is the expected value of the number of defective?

(a) 1.20   (b) 1.21   (c) 1.69   (d) 1.72

ANSWERS

1. (b)   2. (a)   3. (a)

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov 06

[1] ~~There are six slips in a box and numbers 1,1,2, 2, 3, 3 are written on these slips. Two slips are taken~~

~~at random from the box. The expected values of the sum of numbers on the two slips is:~~

~~(a) 5~~   ~~(b) 3~~   ~~(c) 4~~   ~~(d) 7~~

[2] A letter is taken out at random from the word RANGE and another is taken out from the word

PAGE. The probability that they are the same letters is:

(a) 1/20   (b) 3/20   (c) 3/5   (d) ¾

[3] An urn contains 9 balls two of which are red, three blue and four black. Three balls are drawn at

random. The probability that they are of same colour is:

(a) $\frac{3}{27}$ (b) $\frac{20}{31}$ (c) $\frac{5}{84}$ (d) None

Feb 07

[5] In a non - leap year, the probability of getting 53 Sundays or 53 Tuesdays or 53 Thursdays is :

(a) $\frac{4}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{1}{7}$

[6] If A and B are two events and $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$, $P(A \cap B) = \frac{1}{4}$, then the value of $P(A' \cup B')$ is :

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{5}{8}$ (d) $\frac{5}{4}$

[7] The probability that there is at least one error in an account statement prepared by A is 0.3 and for

B and C, they are 0.4 and 0.45 respectively. A, B and C prepared 20, 10 and 40 statements

respectively. The expected number of correct statements in all is :

(a) 32   (b) 45   (c) 42   (d) 25

May 07

[8] From a pack of cards, two are drawn, the first being replaced before the second is drawn. The

chance that the first is a diamond and the second is king is :

(a) $\frac{1}{52}$ (b) $\frac{3}{2704}$ (c) $\frac{4}{13}$ (d) $\frac{3}{52}$

[9] The theory of compound probability states that for any two events A and B :

(a) $P(A \cap B) = P(A) \times P(B)$

(b) $P(A \cap B) = P(A) \times P(B/A)$

(c) $P(A \cup B) = P(A) \times P(B/A)$

(d) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

[10] The probability of getting qualified in IIT- JEE and AIEEE by a student are respectively $\frac{1}{5}$ and $\frac{3}{5}$. The

probability that the student gets qualified for one of the these tests is:

(a) $\frac{17}{25}$ (b) $\frac{22}{25}$ (c) $\frac{8}{25}$ (d) $\frac{3}{25}$

[11] Amitabh plays a game of tossing a dice. If the number less than 3 appears, he is getting Rs. a,

otherwise he has to pay Rs. 10. If the game is fair, find a :

(a) 25   (b) 20   (c) 22   (d) 18

Aug 07

[12] Suppose E and F are two events of a random experiment. If the probability of occurrence of E is

1/5 and the probability of occurrence of F given E is 1/10, then the probability of non- occurrence

of at least one of the events E and F is:

(a) $\frac{1}{50}$ (b) $\frac{1}{25}$ (c) $\frac{13}{50}$ (d) $\frac{49}{50}$

[13] A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without

replacement. The probability that the first draw will produce 3 white balls and second 3 red balls is:

(a) $\frac{6}{255}$ (b) $\frac{5}{548}$ (c) $\frac{7}{429}$ (d) $\frac{3}{233}$

[14] A box contains 12 electric lamps of which 5 are defectives. A man selects three lamps at random.

What is the expected number of defective lamps in his selection ?

(a) 1.25   (b) 2.50   (c) 1.05   (d) 2.03

Nov 07

[15] Three identical dice are rolled. The probability that the same number will appear on each of them is:

(a) 1/6   (b) 1/12   (c) 1/36   (d) 1

[16] Among the examinees in an examination 30%, 35% and 45% failed in Statistics, in Mathematics

and in at least one of the subjects respectively. An examinee is selected at random. Find the

probability that he failed in Mathematics only:

(a) 0.245   (b) 0.25   (c) 0.254   (d) 0.55

[17] An article consists of two parts A and B. The manufacturing process of each part is such that

probability of defect in A is 0.08 and that B is 0.05. What is the probability that the assembled

product will not have any defect?

(a) 0.934   (b) 0.864   (c) 0.85   (d) 0.874

[18] Daily demand for calculators is having the following probability distribution :

Demand :	1	2	3	4	5	6
Probability :	0.10	0.15	0.20	0.25	0.18	0.12

Determine the variance of the demand.

(a) 2.54   (b) 2.93   (c) 2.22   (d) 2.19

Feb 08

[19] If 10 men, among whom are A and B, stand in a row, what is the probability that there will be

exactly 3 men between A and B ?

(a) 11/15   (b) 4/15   (c) 1/15   (d) 2/15

[20] The probability of an event can assume any value between:

(a) 0 and 1   (b) - 1 and 0   (c) - 1 and 1   (d) None of these

[21] The odds are 9 : 5 against a person who is 50 years living till he is 70 and 8 : 6 against a person

who is 60 living till he is 80. Find the probability that at least one of them will be alive after 20 years:

(a) $\frac{11}{14}$ (b) $\frac{22}{49}$ (c) $\frac{31}{49}$ (d) $\frac{35}{49}$

[22] An urn contains 6 white and 4 black balls. 3 balls are drawn without replacement. What is the

expected number of black balls that will be obtained ?

(a) 6/5   (b) 1/5   (c) 7/5   (d) 4/5

June 08

[23] If P(A) = p and P (B) = q, then :

(a) P (A / B) ≤ q / p   (b) P(A/B) ≥ p/q

(c) P (A / B) ≤ p / q   (d) P (A / B) ≥ q / p

[24] The probability that a trainee will remain with a company is 0.8. The probability that an employee

earns more than Rs. 20,000 per month is 0.4. The probability that an employee, who was a trainee

and remained with the company or who earns more than Rs. 20,000 per month is 0.9. What is the

probability that an employee earns more than Rs. 20,000 per month given that he is a trainee, who

stayed with the company?

(a) 5/8   (b) 3/8   (c) 1/8   (d) 7/8

[25] Find E (X²) and E (2X + 5).

(a) 6 and 7 respectively   (b) 5 and 7 respectively

(c) 7 and 5 respectively   (d) 7 and 6 respectively

Dec 08

[26] The limiting relative frequency of probability is :

(a) Axiomatic   (b) Classical

(c) Statistical   (d) Mathematical

[27] If a probability density function is f (x) = $\begin{cases} 1 \text{ if } 0 < x < 1 \\ 0 \text{ otherwise} \end{cases}$ then find E (x)

(a) ∞   (b) 0   (c) 1   (d) - ∞

[28] If:

x :	-2	3	1
P(x):	1/3	1/2	1/6

then find E (2x + 5)

(a) 7   (b) 6   (c) 9   (d) 4

June 09

[29] If A and B are two independent events and P(AUB) = 2/5; P(B) = 1/3. Find P(A).

(a) 2/9   (b) -1/3   (c) 2/10   (d) 1/10

[30] A bag contains 12 balls of which 3 are red 5 balls are drawn at random. Find the probability that in

5 balls 3 are red.

(a) 3/132   (b) 5/396   (c) 1/36   (d) 1/22

[31] A random variable X has the following probability distribution.

X	0	1	2	3
P(x)	0	2K	3K	K

Then, P (x < 3) would be:

(a) 1/6   (b) 1/3   (c) 2/3   (d) 5/6

Dec 09

[32] P(A) = 2/3; P (B) = 3/5; P(A∪B) = 5/6. Find P (B/A)

(a) 11/20   (b) 13/20   (c) 13/18   (d) None

[33] If P (A B) = P (A) × P (B), then the events are:

(a) Independent events   (b) Mutually exclusive events

(c) Exhaustive events   (d) Mutually inclusive events

[34] E (XY) is also known as:

(a) E (X) + E (Y)   (b) E(X)E(Y)   (c) E (X) - E (Y)   (d) E (X) - 4E (Y)

[35] In a bag, there were 5 white, 3 red, and 2 black balls. Three balls are drawn at a time what is the

probability that the three balls drawn are white?

(a) 1/12   (b) 1/24   (c) 1/120   (d) None of these

[36] In how many ways can the letters of 'REGULATION' be arranged so that the vowels come at odd

places?

(a) 1/252   (b) 1/144   (c) 144/252   (d) None of these

June 10

[37] In a pack of playing cards with two jokers probability of getting king of spade is

(a) 4/13   (b) 4/52   (c) 1/52   (d) 1/54

[38] Consider two events A and B not mutually exclusive, such that $P(A) = 1/4$, $P(B) = 2/5$, $P(A *B) = 1/2$, then $P(A* \overline{B})$ is

(a) 3/7   (b) 2/10   (c) 1/10   (d) None of the above

[39] If x be the sum of two numbers obtained when two die are thrown simultaneously then $P(x \geq 7)$ is

(a) 5/12   (b) 7/12   (c) 11/15   (d) 3/8

[40] $E (13x + 9) = $ _____.

(a) 13x   (b) 13E(x)   (c) 13E(x) + 9   (d) 9

Dec 10

[41] A dice is thrown once. What is the mathematical expectation of the number on the dice ?

(a) 16/6   (b) 13/2   (c) 3.5   (d) 4.5

[42] If $P(A/B) = P(A)$, then A and B are

(a) Mutually exclusive events   (b) Dependent events

(c) Independent events   (d) Composite events

[43] A bag contains 3 white and 5 black balls and second bag contains 4 white and 2 black balls. If one ball is taken from each bag, the probability that both the balls are white is _____

(a) 1/3　　　　　(b) ¼　　　　　(c) ½　　　　　(d) None of these

[44] The odds in favour of A solving a problem is 5:7 and odds against B solving the same problem is 9:6. What is the probability that if both of them try, the problem will be solved?

(a) 117/180　　　　(b) 181/200　　　　(c) 147/180　　　　(d) 119/180

[45] Consider:- Urn I: 2 white balls, 3 black balls

Urn II: 4 white balls, 6 black balls

One ball is randomly transferred from first to second Urn, then one ball is drawn from II Urn. The probability that drawn ball is white is

(a) 22/65　　　　(b) 22/46　　　　(c) 22/55　　　　(d) 21/45

June 11

[46] If $P(A \cup B) = P(A)$, Find $P(A \cap B)$.

(a) $P(A).P(B)$　　　　(b) $P(A) + P(B)$　　　　(c) 0　　　　(d) $P(B)$

[47] In how many ways a team of 5 can be made out of 7 Boys and 8 Girls, if 2 Girls are compulsory to form a Team.

(a) 2,646　　　　(b) 1,722　　　　(c) 2,702　　　　(d) 980

[48] A bag contains 5 Red balls, 4 Blue Balls and 'm' Green Balls. If the random probability of picking

two green balls is 1/7. What is the no. of green Balls (m).

(a) 5   (b) 7   (c) 6   (d) None of the above

[49] The probability of Girl getting scholarship is 0.6 and the same probability for Boy is 0.8. Find the

probability that at least one of the categories getting scholarship.

(a) 0.32   (b) 0.44   (c) 0.92   (d) None of the above.

[50] if 15 persons are to be seated around 2 round tables, one occupying 8 persons and another 7

persons. Find the number of ways in which they can be seated.

(a) $\frac{15!}{18!}$ (b) $^{15}C_7 \frac{7!}{8!}$ (c) 7!.8!   (d) $2.^{15}C_7$ 6! 7!

[51] A coin is tossed 5 times, what is the probability that exactly 3 heads will occur.

(a) $\frac{5}{16}$ (b) $\frac{1}{32}$ (c) $\frac{5}{36}$ (d) $\frac{3}{32}$

[52] Exactly 3 girls are to be selected from 5 Girls and 3 Boys. The probability of selecting 3 Girls will be___

(a) $\frac{5}{28}$ (b) $\frac{1}{56}$ (c) $\frac{15}{28}$ (d) None.

Dec 11

[53] Two unbiased dice are thrown. The Expected value of the sum of numbers on the upper side is;

(a) 3.5   (b) 7   (c) 12   (d) 6

[54] One Card is drawn from pack of 52, what is the probability that it is a king or a queen?

(a) 11/13   (b) 2/13   (c) 1/13   (d) None of these

[55] In a packet of 500 pens, 50 are found to be defective. A pen is selected at random. Find the

probability that it is non defective.

(a) 8/9   (b) 7/8   (c) 9/10   (d) 2/3

[56] Four married couples have gathered in a room. Two persons are selected at random amongst

them, find the probability that selected persons are a gentleman and a lady but not a couple.

(a) 1/7   (b) 3/7   (c) 1/8   (d) 3/8

[57] A team of 5 is to be selected from 8 boys and three girls. Find the probability that it includes two

particular girls.

(a) 2/30   (b) 1/5   (c) 2/11   (d) 8/9

June 12

[58] Let A and B two events in a sample space S such that P(A)

$= \frac{1}{2}$; $P(\overline{B}) = \frac{5}{8}$, $P(A \cup B) = \frac{3}{4}$; Find P $(\overline{A} \cap \overline{B})$

(a) 3/4   (b) ¼   (c) 3/16   (d) None of these

[59] A card is drawn out of a standard pack of 52 cards. What is the probability of drawing a king or red

colour ?

(a) 1/4   (b) 4/13   (c) 7/13   (d) ½

[60] A player tosses two fair coins, he wins Rs. 5 if 2 heads appear, Rs. 2 if one head appears and Rs. 1 if

no head occurs. Find his expected amount of winning.

(a) 2.5   (b) 3.5   (c) 4.5   (d) 5.5

[61] Arun & Tarun appear for an interview for two vacancies. The probability of Arun's selection is 1/3

and that of Tarun's selection is 1/5 Find the probability that only one of them will be selected.

(a) 2/5   (b) 4/5   (c) 6/5   (d) 8/5

[62] A copany employed 7 CA's, 6 MBA's and 3 Engineer's. In how many ways the company can form a

committee, if the committee has • two members of each type.

(a) 900   (b) 1,000   (c) 787   (d) 945

Dec 12

[63] Two dice are thrown together. Find the probability of getting a multiple of 2 on one dice and

multiple of 3 on the other.

(a) 2/3   (b) 1/6   (c) 1/3   (d) None of the above.

[64] The odds against A solving a certain problem are 4 to 3 and the odds in favour of B solving the

same problem are 7 to 5.

What is the probability that the problem will be solved if they both try ?

(a) 15/21   (b) 16/21   (c) 17/21   (d) 13/21

Dec 12

[65] Find the expected value of the following probability distribution

x :	-20	-10	30	75	80
p(x):	3/20	1/5	1/2	1/10	1/20

(a) 20.5   (b) 21.5   (c) 22.5   (d) 24.5

[66] A bag contains 6 red balls and some blue balls. **If** the probability of drawing a blue ball form the

bag is twice that of a red ball, find the number of blue balls in the bag

(a) 10   (b) 12   (c) 14   (d) 16

June 13

[67] The probability of selecting a sample of size 'n' out of a population of size N by simple random

sampling with replacement is:

(a) 1/N   (b) $1/N^n$ (c) $1/{^N}cn_n$ (d) $\dfrac{1}{{}_{N\_C_n}n!}$

[68] A box contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the

probability that none of the balls drawn is blue?

(a) 10/21   (b) 11/21   (c) 2/7   (d) 5/7

[69] The odds that a book will be favourably received by 3 independent reviewers are 5 to 2,4 to 3 and

3 to 4 respectively. What is the probability that out of 3 reviewers a majority will be favourable?

(a) $\dfrac{209}{343}$ (b) $\dfrac{209}{434}$ (c) $\dfrac{209}{443}$ (d) $\dfrac{209}{350}$

[70] A player tosses 3 fair coins. He wins Rs. 5 if three heads appear, Rs.3 if two heads appear, Rs.1 if

one head occurs. On the other hand, he losses Rs. 15 if 3 tails occur. Find expected gain of the

player:

(a) 0.15   (b) 0.25   (c) 0.35   (d) 0.45

[71] Find the probability of drawing a spade on each of two consecutive draws from a well shuffled

pack of cards, without replacement

(a) $\frac{2}{51}$ (b) $\frac{1}{221}$ (c) $\frac{4}{51}$ (d) $\frac{5}{51}$

Dec 13

[72] If P(A) = 0.45, P(B) = 0.35 and P(A&B) = 0.25, then P(A/B) = ?

(a) 1.4   (b) 1.8   (c) 0.714   (d) 0.556

[73] The probability of a cricket team winning match at Kanpur is 2/5 and hosing match at Delhi is 1/7

what is the Probability of the team winning atleast one match?

(a) 3/35   (b) 32/35   (c) 18/35   (d) 17/35

[74] Find the expected value of the following probability distribution

X:	-20	-10	30	75	80
P(x):	3/20	1/5	½	1/10	1/20

(a) 20.5   (b) 21.5   (c) 22.5   (d) 24.5

Dec 13

[75] Two coins are tossed simultaneously. Find the probability of getting exactly are head.

(a) 3/4   (b) 2/3   (c) ¼   (d) ½

June 14	
[76]	If a pair of dice is thrown then the probability that the sum of the digit is neither 7 nor 11 is .
	(a) $\frac{1}{6}$ (b) $\frac{1}{18}$ (c) $\frac{2}{9}$ (d) $\frac{7}{9}$
[77]	An urn contains 2 red and 1 green balls. Another urn contains 2 red and 2 green balls. An urn was
	selected at random and then a ball was drawn from it. If it was found to be red then the probability
	that it has been drawn from urn one is ____.
	(a) $\frac{4}{7}$ (b) $\frac{3}{7}$ (c) $\frac{2}{3}$ (d) $\frac{7}{12}$
[78]	For any two events A_1, A_2 let $P.(A_1) = \frac{2}{3}$, $P(A_2) = \frac{3}{8}$ and $P(A_1 \cap A_2) = \frac{1}{4}$ then A_1, A_2 are:
	(a) Mutually exclusive but not independent events
	(b) Mutually exclusive and independent events
	(c) Independent but not mutually exclusive
	(d) None of these
Dec 14	
[79]	An unbiased die is thrown twice. The probability of the sum of numbers obtained on the two faces
	being divisible by 4 is:
	(a) 7/36 (b) 1/3 (c) 11/36 (d) ¼
[80]	Let the distribution function of a random variable X be $F(X) = P(X \ X)$. Then F(5) - F(2) is:

	(a) P(2 < X < 5) (b) P(2 X < 5) (c) P(2 X 5) (d) P(2 < X 5)
Dec 14	
[81]	A discrete random variable X takes three values -1, 2 and 3 with probabilities
	p(-1) = $\frac{1}{3}$, P(2) = $\frac{1}{3}$, p(3) = $\frac{1}{3}$, then E(|X|) is:
	(a) 3/2 (b) 5/2 (c) 2 (d) 9/2
June 15	
[82]	The sum of numbers obtained in throw of a dice twice is S. Probability of S will be maximum if S is
	(a) 5 (b) 7 (c) 6 (d) 8
[83]	An unbiased coin is tossed three times. The expected value of the number of heads is
	(a) 2.5 (b) 1.0 (c) 1.5 (d) 2.0
[84]	For two events A$_1$ and A$_2$, let P(A$_1$) = $\frac{2}{3}$ and P(A$_2$) = $\frac{3}{8}$ and P(A$_1$ ∩ A$_2$) = $\frac{1}{4}$, then
	(a) mutually exclusive but not independent
	(b) mutually exclusive and independent
	(c) independent but not mutually exclusive
	(d) none of these
[85]	From 6 positive and 8 negative numbers, 4 numbers are chosen at random without replacement
	and are then multiplied. The probability that the product of the chosen numbers will be positive
	number is

(a) $\frac{409}{1001}$ (b) $\frac{70}{1001}$ (c) $\frac{505}{1001}$ (d) $\frac{420}{1001}$

Dec 15

[86] If an unbaised die is rolled once, the odds in favour of getting a point which is multiple of 3 is:

(a) 1:2   (b) 2:1   (c) 1:3   (d) 3:1

[87] A bag contains 15 one rupee coins, 25 two rupees coins and 10 five rupees coins, if a coin is

selected at random then probability for not selecting a one rupee coin is:

(a) 0.30   (b) 0.20   (c) 0.25   (d) 0.70

Dec 15

[88] Three coins are tossed together, the probability of getting exactly two head is:

(a) $\frac{5}{8}$ (b) $\frac{3}{8}$ (c) $\frac{1}{8}$ (d) None

[89] If two letters are taken at random from the word "HOME", what is the probability that none of the

letters would be vowels?

(a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

June 16

[90] In a game, cards are thoroughly shuffled and distributed equally among four players. What is the

probability that a specific player gets all the four kings?

(a) $\frac{^{13}C_4 \times ^{48}C_{13}}{^{52}C_{13}}$ (b) $\frac{^{4}C_4 \times ^{48}C_9}{^{52}C_{13}}$ (c) $\frac{^{13}C_4 \times ^{52}C_4}{^{52}C_{13}}$ (d) $\frac{^{4}C_4 \times ^{39}C_9}{^{52}C_{13}}$

[91] A bag contains 4 Red and 5 Black balls. Another bag contains 5 Red and 3 Black balls. If one ball is

drawn at random from each bag. Then the probability that one Red and one Black drawn is -

(a) $\frac{12}{72}$ (b) $\frac{25}{72}$ (c) $\frac{37}{72}$ (d) $\frac{13}{72}$

[92] If $P(A) = \frac{2}{3}$, $P(B) = \frac{3}{5}$ and $P(A \cup B) = \frac{5}{6}$ then $P\left(\frac{A}{B^1}\right)$ is

(a) $\frac{7}{12}$ (b) $\frac{5}{12}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

[93] If two unbiased dice are rolled, what is the probability of getting points neither 3 nor 6?

(a) 0.25   (b) 0.50   (c) 0.75   (d) 0.80

[94] Two dice are tossed. What is the probability that the total is divisible by 3 or 4.

(a) $\frac{20}{36}$ (b) $\frac{21}{36}$ (c) $\frac{14}{36}$ (d) None of these.

Dec 16

[95] If two events A, B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cup B) = \frac{2}{3}$ then $P(A \cap B)$ is:

(a) $\frac{1}{4}$ (b) $\frac{1}{6}$ (c) $\frac{2}{3}$ (d) $\frac{1}{2}$

Dec 16

[96] A bag contains 6 white and 5 red balls. One ball is drawn. The probability that it is red is:

(a) $\frac{5}{11}$ (b) $\frac{6}{11}$ (c) $\frac{1}{11}$ (d) None of these

[97] For two events A, B let $P(A) = \frac{2}{3}$, $P(B) = \frac{3}{8}$ and $P(A \cap B) = \frac{1}{4}$ then A and B are:

(a) Mutually exclusive but not independent

(b) Independent but not mutually exclusive

(c) Mutually exclusive and independent

(d) None of these

June 17

[98] Let A and B are two events with $P(A) = \frac{2}{3}$, $P(B) \frac{1}{4}$ and

$P(A \cap B) = \frac{1}{12}$, then $P(B/A)$ will be :

(a) 7/8   (b) 1/3   (c) 1/8   (d) 8/7

[99] What is the probability of having at least one 'SIX' from 3 throws of an unbaised die?

(a) $\frac{5}{8}$ (b) $\left(\frac{5}{6}\right)^3$ (c) $1 - \left(\frac{1}{6}\right)^3$ (d) $1 - \left(\frac{5}{6}\right)^3$

[100] For any two events A and B:

(a) $P(A - B) = P(A) - P(B)$ (b) $P(A - B) = P(A) - P(A \cap B)$

(c) $P(A - B) = P(B) - P(A \cap B)$ (d) $P(B - A) = P(B) + P(A \cap B)$

ANSWERS

1	C	11	B	21	C	31	D	41	C	51	A	61	A	71	B	81	C	91	C
2	B	12	D	22	A	32	B	42	C	52	A	62	D	72	C	82	B	92	A
3	C	13	C	23	C	33	A	43	B	53	B	63	B	73	B	83	C	93	D
4	A	14	A	24	B	34	B	44	A	54	B	64	B	74	B	84	C	94	A
5	C	15	C	25	A	35	A	45	C	55	C	65	B	75	D	85	B	95	B
6	B	16	A	26	C	36	A	46	D	56	B	66	B	76	D	86	A	96	A
7	C	17	D	27	C	37	D	47	C	57	C	67	B	77	C	87	D	97	B
8	A	18	C	28	A	38	D	48	C	58	B	68	A	78	C	88	B	98	C
9	B	19	D	29	D	39	B	49	C	59	C	69	A	79	D	89	A	99	D
10	A	20	D	30	D	40	C	50	D	60	A	70	B	80	D	90	B	100	B

STUDENT NOTES

CH - 4	**THEORITICAL DISTRIBUTION**	

Applications of Binomial Distribution

Q 1 *A coin is tossed 10 times. Assuming the coin to be unbiased, what is the probability of getting*

(i) 4 heads?

(ii) at least 4 heads?

(iii) at most 3 heads?

Solution: We apply binomial distribution as the tossing are independent of each other. With every tossing, there

are just two outcomes either a head, which we call a success or a tail, which we call a failure and the

probability of a success (or failure) remains constant throughout.

Let X denotes the no. of heads. Then X follows binomial distribution with parameter n = 8 and

p = 1/2 (since the coin is unbiased). Hence q = 1 – p = ½

The probability mass function of X is given by

$f(x) = {}^n c_x \, p^x \, q^{n-x}$

$= {}^{10} c_x \cdot (1/2)^x \cdot (1/2)^{10-x}$

$$= \dfrac{{}^{10}c_x}{2^{10}}$$

$= {}^{10}c_x / 1024$ for x = 0, 1, 2, ...10

(i) probability of getting 4 heads

$= f(4)$

$= {}^{10}c4 / 1024$

$= 210 / 1024$

$= 105 / 512$

(ii) probability of getting at least 4 heads

$= P(X \geq 4)$

$= P(X = 4) + P(X = 5) + P(X = 6) + P(X = 7) + P(X = 8)$

$= {}^{10}c4 / 1024 + {}^{10}c5 / 1024 + {}^{10}c6 / 1024 + {}^{10}c7 / 1024 + {}^{10}c8 / 1024$

$= \dfrac{210 + 252 + 210 + 210 + 45}{1024}$

$= 837/1024$

(iii) probability of getting at most 3 heads

$= P(X \leq 3)$

$= P(X = 0) + P(X = 1) + P(X = 2) + P(X = 3)$

$= f(0) + f(1) + f(2) + f(3)$

$= {}^{10}c0 / 1024 + {}^{10}c1 / 1024 + {}^{10}c2 / 1024 + {}^{10}c3 / 1024$

$= \dfrac{1 + 10 + 45 + 120}{1024}$

$= 176/1024$

$= 11/64$

Q 2 *If 15 dates are selected at random, what is the probability of getting two Sundays?*

Solution: If X denotes the number at Sundays, then it is obvious that X follows binomial distribution

with parameter n = 15 and p = probability of a Sunday in a week = 1/7 and

q = 1 – p = 6 / 7.

Then $f(x) = {}^{15}c_x \, (1/7)^x . (6/7)^{15-x}$.

for x = 0, 1, 2,........... 15.

Hence the probability of getting two Sundays

= f(2)

$= {}^{15}c_2 \, (1/7)^2 . (6/7)^{15-2}$

$= \dfrac{105 \, X \, 6^{13}}{7^{15}}$

$\cong 0.29$

Q 3   *Find the probability of a success for the binomial distribution satisfying the following relation*

4P(x = 4) = P (x = 2) and having the parameter n as six.

Solution:

Q 4   *Find the binomial distribution for which mean and standard deviation are 6 and 2 respectively*

Solution:

Q 5   *An experiment succeeds thrice as after it fails. If the experiment is repeated 5 times,*

what is the probability of having no success at all ?

Solution:

Q 6   *What is the mode of the distribution for which mean and SD are 10 and 5 respectively.*

Solution: As given np = 10 .... (1)

And $\sqrt{npq} = \sqrt{5}$

     npq = 5 .... (2)

on solving (1) and (2), we get n = 20 and p = ½

Hence mode   = Largest integer contained in (n+1)p

         = Largest integer contained in (20+1) × ½

         = Largest integer contained in 10.50

         = 10.

Q 7   *X and Y are 2 independent binomial variables with parameters 6 and ½ and 4 and 1/2 respectively,*

what is P (x + y ≥ 1)?

Solution:

POISSON DISTRIBUTION

Q 8

Find the mean and standard deviation of x where x is a Poisson variate satisfying the condition

P (x = 2) = P (x = 3).

Solution:

Q 9 *The probability that a random variable x following Poisson distribution would assume a positive value is $(1 - e^{-2.7})$. What is the mode of the distribution?*

Solution:

Q 10 *The standard deviation of a Poisson variate is 1.732. What is the probability that the variate lies between −2.3 to 3.68?*

Solution: Let x be a Poisson variate with parameter m.

Then SD of x is $\sqrt{m}$

As given $\sqrt{m} = 1.732$

$m = (1.732)^2 = 3$.

The probability that x lies between –2.3 and 3.68

$= P(-2.3 < x < 3.68)$

$= f(0) + f(1) + f(2) + f(3)$ (As x can assume 0, 1, 2, 3, 4 .....)

$= \dfrac{e^{-3}.3^0}{0!} + \dfrac{e^{-3}.3^1}{1!} + \dfrac{e^{-3}.3^2}{2!} + \dfrac{e^{-3}.3^3}{3!}$

$= e^{-3} (1+3+9/2 +27/6)$

$= 13e^{-3}$

$= \dfrac{13}{e^3}$

$= \dfrac{13}{(2.71828)^3}$ (as e = 2.71828)

$\cong 0.65$

Q 11	*X is a Poisson variate satisfying the following relation:*
	P (X = 2) = 9P (X = 4) + 90P (X = 6). What is the standard deviation of X?
Solution:	

NORMAL OR GAUSSIAN DISTRIBUTION

Q 12   *For a random variable x, the probability density function is given by*

$$f(x) = \frac{e^{-(x-4)^2}}{\sqrt{\pi}} \qquad \text{for } -\infty < X < \infty$$

Identify the distribution and find its mean and variance.

Solution:

Q 13   *If the two quartiles of a normal distribution are 47.30 and 52.70 respectively, what is the mode of the distribution? Also find the mean deviation about median of this distribution.*

Solution: The 1st and 3rd quartiles of N (μ, σ^2) are given by $(\mu - 0.675\,\sigma)$ and $(\mu + 0.675\,\sigma)$ respectively.

As given,

$\mu - 0.675\,\sigma = 47.30$ .... (1)

$\mu + 0.675\,\sigma = 52.70$ .... (2)

Adding these two equations, we get

$2\mu = 100$ or $\mu = 50$

Thus Mode = Median = Mean = 50. Also $\sigma = 4$.

Also Mean deviation about median

= mean deviation about mode

= mean deviation about mean

$\cong 0.80\ \sigma$

$= 3.20$

Q 14	Find the points of inflexion of the normal curve

$$f(x) = \frac{1}{4\sqrt{2\pi}}\, e^{-(X-10)^2/32} \qquad\qquad \text{for } -\infty < X < \infty$$

Solution:

Q 15	X follows normal distribution with mean as 50 and variance as 100. What is $P(x \geq 60)$?

Given $\emptyset\ (1) = 0.8413$

Solution:

Q 16

If a random variable x follows normal distribution with mean as 120 and standard deviation as 40,

what is the probability that P (120 ≤ x ≤ 150 / x ≥ 120)?

Given that the area of the normal curve between z = 0 to z = 0.75 is 0.2734

Solution:

Q 17

X is a normal variable with mean = 25 and SD 10. Find the value of b such that the probability of

the interval [2 5, b] is 0.4772 given ∅ (2) = 0.9772.

Solution:

Q 18   *In a sample of 500 workers of a factory, the mean wage and SD of wages are found to be 500*

and 48 respectively. Find the number of workers having wages:

(i) more than 600

(ii) less than 450

(iii) between 548 and 600.

Solution: Let X denote the wage of the workers in the factory. We assume that X is normally distributed

with mean wage as 500 and standard deviation of wages as 48 respectively

(i) Probability that a worker selected at random would have wage more than 600

$= P (X > 600)$

$= 1 – P (X \leq 600)$

$= 1 – P \left(\frac{X-500}{48} \leq \frac{600-500}{48} \right)$

$= 1 – P (z \leq 2.08)$

$= 1 - \emptyset(2.08)$

= 1 – 0.9812 (From Biometrika Table)

= 0.0188

Thus the number of workers having wages less than 600

= 500 × 0.0188

= 9.4

$\cong 9$

(ii) Probability of a worker having wage less than 450

$= P\ (\ X < 450\ )$

$= P\left(\frac{X-500}{48} < \frac{450-500}{48}\right)$

$=\ P(z < -\ 1.04\ )$

$= \emptyset\ (-1.04\ )$

$= 1 - \emptyset\ (\ 1.04\ )$

= 1 – 0.8508   (from Biometrika Table)

= 0.1492

Hence the number of workers having wages less than 450

= 500 × 0.1492

$\cong 75$

(iii) Probability of a worker having wage between 548 and 600.

$= P\ (\ 548 < x < 600\ )$

$= P\left(\frac{548-500}{48} < \frac{X-500}{48} < \frac{600-500}{48}\right)$

$= P\ (\ 1 < z < 2.08\ )$

$= \emptyset\ (\ 2.08\ ) - \emptyset\ (\ 1\ )$

= 0.9812 – 0.8413   (consulting Biometrika)

= 0.1399

So the number of workers with wages between 548 and 600

= 500 × 0.1399

$\cong$ 70.

Q 19   *The distribution of wages of a group of workers is known to be normal with mean 500 and SD*

100.If the wages of 100 workers in the group are less than 430, what is the total number of

workers in the group?

Solution:

Q 20   *The mean height of 2000 students at a certain college is 165 cms and SD 9 cms. What is the*

probability that in a group of 5 students of that college, 3 or more students would have height

more than 174 cm?

Solution: | Let X denote the height of the students of the college. We assume that X is normally distributed with

mean as 165 cms and SD as 9 cms. If p denotes the probability that a student selected at random

would have height more than 174 cms., then

$p = P (X > 174)$

$= 1 - P (X \leq 174)$

$= 1 - P (\frac{X-165}{9} \leq \frac{174-165}{9})$

$= 1 - P (\cancel{z} \leq 1)$

$= 1 - \emptyset (1)$

$= 1 - 0.8413$

$= 0.1587$

If y denotes the number of students having height more than 174 cm. in a group of 5 students then

$y \sim \beta$ (n, p) where n = 5 and p = 0.1587. Thus the probability that 3 or more students would be more

than 174 cm.

$= p (y \geq 3)$

$= p (y = 3) + p (y = 4) + p (y = 5)$

$= 5c_3 (0.1587)^3 . (0.8413)^2 + 5C_4 (0.1587)^4 \times (0.8413) + 5C_5 (0.1587)^5$

$= 0.02829 + 0.002668 + 0.000100$

$= 0.03106.$

Q 21	*The mean of a normal distribution is 500 and 16 per cent of the values are greater than 600. What*
	is the standard deviation of the distribution?
	(Given that the area between z = 0 to z = 1 is 0.34)
Solution:	

Q 22 *X and Y are independent normal variables with mean 100 and 80 respectively*

and standard deviation as 4 and 3 respectively. What is the distribution of (x + y)?

Solution:

"PRACTICE & PRACTICE MAKES STATS PERFECT"

<u>Set A – (Theory Question)</u>

1.	A theoretical probability distribution.
	(a) does not exist. (b) exists only in theory.
	(c) exists in real life (d) both (b) and (c).
2.	Probability distribution may be
	(a) discrete. (b) continuous. (c) infinite (d) (a) or (b).
3.	An important discrete probability distribution is
	(a) Poisson distribution. (b) Normal distribution.
	(c) Cauchy distribution. (d) Log normal distribution
4.	An important continuous probability distribution
	(a) Binomial distribution. (b) Poisson distribution .
	(c) Geometric distribution. (d) Normal distribution
5.	Parameter is a characteristic of
	(a) population. (b) sample.
	(c) probability distribution . (d) both (a) and (b).
6.	An example of a parameter is
	(a) sample mean. (b) population mean.
	(c) binomial distribution. (d) sample size
7.	A trial is an attempt to
	(a) make something possible.
	(b) make something impossible.
	(c) prosecute an offender in a court of law.
	(d) produce an outcome which is neither certain nor impossible
8.	The important characteristic(s) of Bernoulli trials

(a) each trial is associated with just two possible outcomes

(b) trials are independent

(c) trials are infinite

(d) both (a) and (b).

9. The probability mass function of binomial distribution is given by

(a) $f(x) = p^x q^{n-x}$.

(b) $f(x) = {}^n c_x p^x q^{n-x}$.

(c) $f(x) = {}^n c_x q^x p^{n-x}$

(d) $f(x) = {}^n c_x p^{n-x} q^x$.

10. If x is a binomial variable with parameters n and p, then x can assume

(a) any value between 0 and n.

(b) any value between 0 and n, both inclusive.

(c) any whole number between 0 and n, both inclusive.

(d) any number between 0 and infinity.

11. A binomial distribution is

(a) never symmetrical

(b) never positively skewed.

(c) never negatively skewed.

(d) symmetrical when p = 0.5.

12. The mean of a binomial distribution with parameter n and p is

(a) n (1– p).

(b) np (1 – p)

(c) np.

(d) $\sqrt{np(1- p)}$

13. The variance of a binomial distribution with parameters n and p is

(a) $np^2 (1 – p)$

(b) $\sqrt{np(1- p)}$

(c) nq (1 – q).

(d) $n^2 p^2 (1- p)^2$.

14. An example of a bi-parametric discrete probability distribution is

(a) binomial distribution

(b) poisson distribution.

(c) normal distribution.

(d) both (a) and (b)

15. For a binomial distribution, mean and mode

(a) are never equal.   (b) are always equal.

(c) are equal when q = 0.50.   (d) do not always exist.

16. The mean of binomial distribution is

(a) always more than its variance.

(b) always equal to its variance.

(c) always less than its variance

(d) always equal to its standard deviation.

17. For a binomial distribution, there may be

(a) one mode   (b) two modes.   (c) (a)   (d) (a) or (b)

18. The maximum value of the variance of a binomial distribution with parameters n and p is

(a) n/2   (b) n/4   (c) np (1 – p).   (d) 2n.

19. The method usually applied for fitting a binomial distribution is known as

(a) method of least square.   (b) method of moments.

(c) method of probability distribution.   (d) method of deviations

20. Which one is not a condition of Poisson model?

(a) the probability of having success in a small time interval is constant.

(b) the probability of having success more than one in a small time interval is very small.

(c) the probability of having success in a small interval is independent of time and also of

earlier success.

(d) the probability of having success in a small time interval (t, t + dt) is kt for a positive

constant k.

21. Which one is uniparametric distribution?

(a) Binomial.   (b) Poisson   (c) Normal.   (d) Hyper geometric.

22.	For a Poisson distribution,
	(a) mean and standard deviation are equal.
	(b) mean and variance are equal.
	(c) standard deviation and variance are equal
	(d) both (a) and (b)
23.	Poisson distribution may be
	(a) unimodal (b) bimodal. (c) Multi-modal. (d) (a) or (b).
24.	Poisson distribution is
	(a) always symmetric. (b) always positively skewed.
	(c) always negatively skewed (d) symmetric only when m = 2.
25.	A binomial distribution with parameters n and p can be approximated by a Poisson
	distribution with parameter m = np is
	(a) $n \to \infty$ (b) $p \to 0$.
	(c) $n \to \infty$ and $p \to 0$. (d) $p \to \infty$ and $p \to 0$ so that np remains finite.
26.	For Poisson fitting to an observed frequency distribution,
	(a) we equate the Poisson parameter to the mean of the frequency distribution.
	(b) we equate the Poisson parameter to the median of the distribution.
	(c) we equate the Poisson parameter to the mode of the distribution.
	(d) none of these
27.	The most important continuous probability distribution is known as
	(a) Binomial distribution. (b) Normal distribution .
	(c) Chi-square distribution. (d) Sampling distribution
28.	The probability density function of a normal variable x is given by

(a) $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{1}{2}(\frac{x-\mu}{\sigma})^2}$ for $-\infty < x < \infty$

(b) $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ for $-\infty < x < \infty$

(c) $f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ for $-\infty < x < \infty$

(d) none of these.

29. The total area of the normal curve is

(a) one.   (b) 50 per cent.

(c) 0.50.   (d) any value between 0 and 1.

30. The normal curve is

(a) Bell-shaped.   (b) U- shaped.

(c) J-shaped.   (d) Inverted J-shaped

31. The normal curve is

(a) positively skewed   (b) negatively skewed.

(c) symmetrical.   (d) all these.

32. Area of the normal curve

(a) between $-\infty$ to μ is 0.50.   (b) between μ to ∞ is 0.50.

(c) between $-\infty$ to ∞ is 0.50.   (d) both (a) and (b).

33. The cumulative distribution function of a random variable X is given by

(a) $F(x) = P(X \leq x)$.   (b) $F(X) = P(X \leq x)$.

(c) $F(x) = P(X \geq x)$.   (d) $F(x) = P(X = x)$.

34. The mean and mode of a normal distribution

(a) may be equal.   (b) may be different.

(c) are always equal.   (d) (a) or (b).

35.	The mean deviation about median of a standard normal variate is
	(a) 0.675 σ. (b) 0.675 (c) 0.80 σ (d) 0.80.
36.	The quartile deviation of a normal distribution with mean 10 and SD 4 is
	(a) 0.675. (b) 67.50 (c) 2.70. (d) 3.20.
37.	For a standard normal distribution, the points of inflexion are given by
	(a) $\mu - \sigma$ and $\mu + \sigma$. (b) $-\sigma$ and σ
	(c) –1 and 1. (d) 0 and 1.
38.	The symbol Ø(a) indicates the area of the standard normal curve between
	(a) 0 to a. (b) a to ∞ (c) $-\infty$ to a. (d) $-\infty$ to ∞
39.	The interval ($\mu - 3\sigma$, $\mu + 3\sigma$) covers
	(a) 95% area of a normal distribution.
	(b) 96% area of a normal distribution.
	(c) 99% area of a normal distribution.
	(d) all but 0.27% area of a normal distribution
40.	Number of misprints per page of a thick book follows
	(a) Normal distribution. (b) Poisson distribution.
	(c) Binomial distribution. (d) Standard normal distribution.
41.	The results of ODI matches between India and Pakistan follows
	(a) Binomial distribution. (b) Poisson distribution.
	(c) Normal distribution. (d) (b) or (c).
42.	The wage of workers of a factory follow
	(a) Binomial distribution (b) Poisson distribution
	(c) Normal distribution (d) Chi-square distribution

43 If X and Y are two independent normal random variables, then the distribution of (X+Y) is

(a) normal.   (b) standard normal.   (c) T.   (d) chi-square.

Set B – (Practical Question)

1. What is the standard deviation of the number of recoveries among 48 patients when the

probability of recovering is 0.75?

(a) 36.   (b) 81.   (c) 9.   (d) 3.

2. X is a binomial variable with n = 20. What is the mean of X if it is known that x is symmetric?

(a) 5.   (b) 10.   (c) 2.   (d) 8.

3. 3. If X ~ B (n, p), what would be the greatest value of the variance of x when n = 16?

(a) 2.   (b) 4   (c) 8.   (d) .$\sqrt{5}$

4. If x is a binomial variate with parameter 15 and 1/3, what is the value of mode of the distribution?

(a) 5 and 6.   (b) 5   (c) 5.50.   (d) 6.

5. What is the number of trials of a binomial distribution having mean and SD as 3 and 1.5 respectively?

(a) 2.   (b) 4.   (c) 8.   (d) 12

6. What is the probability of getting 3 heads if 6 unbiased coins are tossed simultaneously?

(a) 0.50   (b) 0.25.   (c) 0.3125.   (d) 0.6875.

7. If the overall percentage of success in an exam is 60, what is the probability that out of a group of 4

students, at least one has passed?

(a) 0.6525.   (b) 0.9744   (c) 0.8704.   (d) 0.0256.

8. What is the probability of making 3 correct guesses in 5 True – False answer type questions?

(a) 0.3125   (b) 0.5676 .   (c) 0.6875.   (d) 0.4325

9. If the standard deviation of a Poisson variate X is 2, what is P (1.5 < X < 2.9)?

(a) 0.231	(b) 0.158.	(c) 0.15	(d) 0.144.

10. If the mean of a Poisson variable X is 1, what is P (X = takes the value at least 1)?

(a) 0.456	(b) 0.821	(c) 0.632	(d) 0.254.

11. If X ~ P (m) and its coefficient of variation is 50, what is the probability that X would assume only

non-zero values?

(a) 0.018	(b) 0.982.	(c) 0.989.	(d) 0.976.

12. If 1.5 per cent of items produced by a manufacturing units are known to be defective, what is the

probability that a sample of 200 items would contain no defective item?

(a) 0.05.	(b) 0.15.	(c) 0.20	(d) 0.22.

13. For a Poisson variate X, P (X = 1) = P (X = 2). What is the mean of X?

(a) 1.00	(b) 1.50	(c) 2.00.	(d) 2.50

14. If 1 per cent of an airline's flights suffer a minor equipment failure in an aircraft, what is the

probability that there will be exactly two such failures in the next 100 such flights?

(a) 0.50	(b) 0.184.	(c) 0.265.	(d) 0.256.

15. If for a Poisson variable X, $f(2) = 3 f(4)$, what is the variance of X?

(a) 2.	(b) 4.	(c) $\sqrt{2}$	(d) 3.

18. If the two quartiles of N (μ, σ^2) are 14.6 and 25.4 respectively, what is the standard deviation of the

distribution?

(a) 9.	(b) 6.	(c) 10.	(d) 8.

19. If the mean deviation of a normal variable is 16, what is its quartile deviation?

(a) 10.00	(b) 13.50	(c) 15.00	(d) 12.05.

20. If the points of inflexion of a normal curve are 40 and 60 respectively, then its mean deviation is

(a) 40.	(b) 45.	(c) 50.	(d) 60

21. If the quartile deviation of a normal curve is 4.05, then its mean deviation is

(a) 5.26   (b) 6.24.   (c) 4.24.   (d) 4.80

22. If the Ist quartile and mean deviation about median of a normal distribution are 13.25 and 8

respectively, then the mode of the distribution is

(a) 20   (b) 10.   (c) 15   (d) 12.

23. If the area of standard normal curve between $z = 0$ to $z = 1$ is 0.3413, then the value of $\emptyset$ (1) is

(a) 0.5000   (b) 0.8413   (c) –0.5000.   (d) 1

24. If X and Y are 2 independent normal variables with mean as 10 and 12 and SD as 3 and 4, then (X+Y)

is normally distributed with

(a) mean = 22 and SD = 7.

(b) mean = 22 and SD = 25.

(c) mean = 22 and SD = 5.

(d) mean = 22 and SD = 49

ANSWERS

ANSWERS

Set : A

1. (d)	2. (d)	3. (a)	4. (d)	5. (a)	6. (b)	7. (d)	8. (d)
9. (b)	10. (c)	11. (d)	12. (c)	13. (c)	14. (a)	15. (c)	16. (a)
17. (c)	18. (b)	19. (b)	20. (a)	21. (b)	22. (b)	23. (d)	24. (b)
25. (d)	26. (a)	27. (b)	28. (a)	29. (a)	30. (a)	31. (c)	32 (d)
33. (a)	34. (c)	35. (d)	36. (c)	37. (c)	38. (c)	39. (d)	40. (b)
41. (a)	42. (c)	43. (a)					

Set : B

1. (d)	2. (b)	3. (b)	4. (b)	5. (d)	6. (c)	7. (b)	8. (a)
9. (d)	10. (c)	11. (b)	12. (a)	13. (c)	14. (b)	15. (a)	16. (c)
17. (c)	18. (d)	19. (b)	20. (a)	21. (d)	22. (a)	23. (b)	24. (c)

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov 06

[1] Parameter is a characteristic of :

(a) Population   (b) Sample

(c) Probability distribution   (d) Both (a) & (b)

[2] What is the probability of making 3 correct guesses in 5 True-False answer type questions ?

(a) 0.4156   (b) 0.32   (c) 0.3125   (d) 0.5235

[3] ~~The 1.Q.'s of army volunteers in a given year are normally distributed with Mean = 110 and~~

~~Standard Deviation = 10. The army wants to give advance training to 20% of those recruits with the~~

~~highest scores. What is the lowest 1 .Q score acceptable for the advanced training? The value of Z for~~

	~~the area 0.3 = 0.84.~~
	~~(a) 0.84 (b) 118.4 (c) 138.4 (d) 115.4~~
Feb 07	
[4]	~~The number of calls arriving at an internal switch board of an office is 96 per hour. Find the~~
	~~probability that there will be :~~
	~~(i) not more than 3 calls on the board,~~
	~~(ii) at least three calls in a minute on the board. [Given : e^{-1.6} = 0.2019]~~
	~~(a) 0.08 and 0.92 respectively (b) 0.19 and 0.92 respectively~~
	~~(c) 0.92 and 0.13 respectively (d) 0.92 & 0.08 respectively~~
[5]	For a normal distribution with mean 150 and S.D. 45; find Q, and Q_3:
	(a) 119.35 and 190.65 respectively (b) 119.65 and 180.35 respectively
	(c) 180.35 and 119.65 respectively (d) 123.45 and 183.65 respectively
[6]	The probability density function of a normal variable x is given by:
	(a) $f(x) = \frac{1}{\sigma\sqrt{2\pi}}.\, e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ for $0 < x < -\infty$
	(b) $f(x) = \frac{1}{\sqrt{2\pi}\sigma}.e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ for $-\infty < x < -\infty$
	(c) $f(x) = \frac{1}{\sigma\sqrt{2\pi}}\, e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$ for $-\infty < x < -\infty$
	(d) None of these

May 07	
[7]	The Interval ($\mu - 3\delta$, $\mu + 3\delta$) covers:.
	(a) 95% area of normal distribution
	(b) 96% area of normal distribution
	(c) 99% area of normal distribution
	(d) All but 0.27% area of a normal distribution
[8]	The overall percentage of failure in a certain examination is 0.30. What is the probability that out of
	a group of 6 candidates at least 4 passed the examination ?
	(a) 0.74 (b) 0.71 (c) 0.59 (d) 0.67
[9]	A manufacturer, who produces medicine bottles, finds that 0.1 % of the bottles are defective. The
	bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the
	producer of bottles. Using Poisson distribution, find how many boxes will contains at least two
	defectives: [Given: $e^{-0.5} = 0.6065$]
	(a) 7 (b) 13 (c) 9 (d) 11
Aug 07	
[10]	The number of methods of fitting the norma! curve is :
	(a) 4 (b)3 (c) 2 (d) 1

[11] Suppose that weather records show that on an average 5 out of 31 days in October are rainy days.

Assuming a binomial distribution with each day of October as an independent trial, then the

probability that the next October will have at most three rainy days is :

(a) 0.4403   (b) 0.2403   (c) 0.3403   (d) None

[12] If 5% of the families in Kolkata do not use gas as a fuel, what will be the probability of selecting 10

families in a random sample of **100** families who do not use gas as fuel? [Given : $e^{-5} = 0.0067$]

(a) 0.038   (b) 0.028   (c) 0.048   (d) 0.018

[13] If the 1st quartile and Mean Deviation about median of a normal distribution are 13.25 and 8

respectively, then the mode of the distribution is :

(a) 20   (b) 10   (c) 15   (d) 23

Nov 07

[14] If 15 dates are selected at random, then the probability of getting two Sundays is:

(a) 0.29   (b) 0.99   (c) 0.49   (d) 0.39

[15] if X is a Poisson variate with $P(X = 0) = P(X = 1)$, then $P(X = 2) =$

(a) $\frac{1}{2e}$ (b) $\frac{e}{6}$ (c) $\frac{1}{2e}$ (d) $\frac{e}{3}$

[16] A sample of 100 dry battery cells tested to find the length of life produced the following results : $\bar{x} =$

12 hours, $\sigma = 3$ hours. What percentage of battery cells are expected to have life less than 6 hours ?

[Area under the normal curve from z = 0 to z = 2 is 0.4772]

(a) 2.28%   (b) 2.56%   (c) 4.56%   (d) 1.93%

Feb 08

[17] The method usually applied for fitting a binomial distribution is known as:

(a) Method of probability distribution   (b) Method of deviations

(c) Method of moments   (d) Method of least squares.

[18] If X follows a normal distribution with $\mu = 50$ and $\sigma = 10$.

What is the value of $P\left(\frac{50 \leq x \leq 60}{x \geq 50}\right)$: [Area under the normal curve from z = 0 to z = 1 is 0.3413].

(a) 0.6826   (b) 0.7354   (c) 0.1983   (d) 0.5492

[19] In a certain manufacturing process, 5% of the tools produced turn out to be defective. Find the

probability that in a sample of 40 tools, atmost 2 will be defective : [Given : $e^{-2} = 0.135$]

(a) 0.555   (b) 0.932   (c) 0.785   (d) 0.675

[20] Examine the validity of the following:

Mean and standard Deviation of a binomial distribution are 10 and 4 respectively.

(a) Not valid   (b) Valid   (c) Both (a) & (b)   (d) Neither (a) nor (b)

June 08

[21] An experiment succeeds twice as often as it fails. What is the probability that in next five trials there

will be at least three successes ?

(a) $\frac{33}{81}$ (b) $\frac{46}{81}$ (c) $\frac{64}{81}$ (d) $\frac{25}{81}$

[22] The probability than a man aged 45 years will die within a year is 0.012. What is the probability that

of 10 men, at least 9 will reach their 46th birthday? [Given : $e^{-0.12} = 0.88692$]

(a) 0.0935   (b) 0.9934   (c) 0.9335   (d) 0.9555

[23] For a certain normal variate X, the mean is 12 and S.D. is 4. Find $P(X \geq 20)$: [Area under the normal

curve from $z = 0$ to $z = 2$ is 0.4772]

(a) 0.5238   (b) 0.0472   (c) 0.7272   (d) 0.0228

[24] In Poisson Distribution, probability of success is very close to:

(a) -1   (b) 0   (c) 1   (d) None

Dec 08

[25] If x and y are two independent standard normal variables, then the distribution of $\frac{x}{y}$ is :

(a) Normal Distribution   (b) Exponential Distribution

(c) Couchy's Distribution   (d) Binomial Distribution

[26] If X and Y are two independent random variables such that $X \sim X^2_m$ and $Y \sim X^2_n$, then the distribution

of $(x + y)$ is

(a) normal   (b) standard normal   (c) T   (d) Chi-square

[27] If the mean of a poisson variable X is 1, what is P (x = at least one)?

(a) 0.456   (b) 0.821   (c) 0.632   (d) 0.254

[28] What is the probability of getting 3 heads if 6 unbiased coins are tossed simultaneously?

(a) 0.3125   (b) 0.25   (c) 0.6875   (d) 0.50

June 09

[29] In a poisson distribution P (x = 0) = P (X = 2). Find E (x).

(a) $\sqrt{2}$ (b) 2   (c) – 1   (d) 0

Dec 09

[30] Shape of Normal Distribution Curve:

(a) Depends on its parameters

(b) Does not depend on its parameters

(c) Either (a) or (b)

(d) Neither (a) nor (b)

[31] For binomial distribution E(x) = 2, V (x) = 4/3. Find the value of n.

(a) 3   (b) 4   (c) 5   (d) 6

[32] What are the parameters of binomial distribution?

(a) n   (b) p   (c) Both n and p   (d) None of these

June 10

[33] The Variance of standard normal distribution is

(a) 1   (b) μ (c) σ^2 (d) 0

[34] For a Poisson distribution P (x = 3) = 5 P(x = 5), then S.D. is

(a) 4   (b) 2   (c) 16   (d) $\sqrt{2}$

[35] For a Binomial distribution B (6, p), P(x = 2) = 9p(x = 4), then P is

(a) ½   (b) 1/3   (c) 10/13   (d) ¼

[36] In Binomial distribution n = 9 and P = 1/3, what is the value of variance:

(a) 8   (b) 4   (c) 2   (d) 16

Dec 10

[37] If standard deviation of a poisson distribution is 2, then its

(a) Mode is 2   (b) Mode is 4   (c) Modes are 3 and 4   (d) Modes are 4 and 5

[38] The area under the Normal curve is

(a) 1   (b) 0   (c) 0.5   (d) -1

[39] For a normal distribution N(μ,σ^2),

P (μ-3σ < x < μ+3σ) is equal to

(a) 0.9973   (b) 0.9546   (c) 0.9899   (d) 0.9788

[40] If for a Binomial distribution B (n,p,) the mean = 6 and Variance = 2 then 'p' is

(a) 2/3   (b) 1/3   (c) 3/5   (d) 1/4

June 11

[41] If the inflexion points of a Normal Distribution are 6 and 14. Find its Standard Deviation ?

(a) 4   (b) 6   (c) 10   (d) 12.

[42] In a Binomial Distribution, if mean is k-times the variance, then the value of 'k' will be _____.

(a) p   (b) $\frac{1}{p}$ (c) 1 – P   (d) $\frac{1}{1-p}$

[43] If x ~ N (3,36) and y ~ N (5,64) are two independent Normal variate with their standard parameters

of distribution, then if (x + y) ~ N (8,A) also follows normal distribution. The value of A will be ____

(a) 100   (b) 10   (c) 64   (d) 36

Dec 11

[44] The mean of Binomial distribution is 20 and Standard deviation is 4 then;

(a) n = 100, p = 1/5, q = 4/5

(b) n = 50, p = 2/5, q = 2/5

(c) n = 100, p = 2/5, q = 4/5

(d) n = 100, p = 1/5, q = 3/5

[45] A Company has two cars which it hires out during the day. The number of Cars demanded in a day

has poison distribution with mean 1.5. Then percentage of days on which only one car was in

demand is equal to

(a) 23.26   (b) 33.47   (c) 44.62   (d) 46.40

[Given Exp (-1.5) = 0.2231]

[46] The binomial distribution with mean 3 & variance 2 is:

(a) $\left(\frac{2}{3}+\frac{1}{3}\right)^{2\to9}$ (b) $\left(\frac{2}{6}+\frac{1}{6}\right)^{2\to9}$ (c) $\left(\frac{2}{3}+\frac{1}{3}\right)^{2\to9}$ (d) $\left(\frac{2}{5}+\frac{1}{5}\right)^{2\to9}$

June 12

[47] For binomial distribution

(a) Variance < Mean   (b) Variance = Mean   (c) Variance > Mean   (d) None of the these

[48] If x is a Poisson variate and E(x) = 1, then P(x > 1) is

(a) $1-\frac{e^{-1}}{2}$ (b) $1-e^{-1}$ (c) $1-2e^{-1}$ (d) $1-\frac{5}{2}e$

[49] The mean and the variance of a random variable X having the probability density function

$P(X=x)= \exp\ \{- (x - 4)^2\}/\sqrt{\pi},\ -\infty < x < \infty$ is:

(a) $4, \frac{1}{2}$ (b) $4, \frac{1}{\sqrt{2}}$

(c) 2, 2   (d) $2, \frac{1}{2}$

Dec 12

[50] In a Normal Distribution

(a) The first and second quartile are equidistant from median

(b) The second and third quartiles are equidistant from the median

(c) The first and third quartiles are equidistant from the median

(d) None of the above.

[51] If parameters of a binomial distribution are n and p then, this distribution tends to a Poisson

distribution when

(a) $n \to \infty$, $p \to 0$ (b) $p \to 0$, $np = \lambda$

(c) $n \to \infty$, $np = \lambda$ (d) $n \to \infty$, $p \to 0$, $np = \lambda$

where 'λ' is a finite constant

[52] If a random variable x follows Poisson distribution such that E(x) = 30, then the variance of the distribution is

(a) 7   (b) 5   (c) 30   (d) 20

[53] In a normal distribution quartile deviation is 6, the standard deviation will be

(a) 4   (b) 9   (c) 7.5   (d) 6

June 13

[54] The mode of the Binomial Distribution for which the mean is 4 and variance 3 is equal to?

(a) 4   (b) 4.25   (c) 4.5   (d) 4.1

[55] For Poisson Distribution:

(a) Mean and Standard Deviations are equal

(b) Mean and variance are equal

(c) Standard Deviation and variance are equal

(d) Both (a) and (b) are correct

[56] Which of the following is not a characteristic of a normal probability distribution?

(a) Mean of the normally distributed population lies at the centre of its normal curve.

(b) It is multi-modal

(c) The mean, median and mode are equal

(d) It is a symmetric curve

[57] An approximate relation between quartile deviation (QD) and standard deviation (S.D) of normal

distribution is:

(a) 5 QD = 4 SD   (b) 4QD = 5SD   (c) 2 QD = 3 SD   (d) 3 QD = 2 SD

[58] In a binomial Distribution with 5 independent trials, probability of 2 and 3 successes are 0.4362 and

0.2181 respectively. Parameter 'p' of the binomial distribution is:

	(a) 3/4 (b) 1/3 (c) 2/3 (d) ¼
Dec 13	
[59]	In a certain Poisson frequency distribution, the probability corresponding to two successes is half
	the probability corresponding to three successes. The mean of the distribution is
	(a) 6 (b) 12 (c) 3 (d) 2.45
June14	
[60]	Mean and Variance of a binomial variance are 4 and $\frac{4}{3}$ respectively then $P(x \geq 1)$ will be _____.
	(a) $\frac{728}{729}$ (b) $\frac{1}{729}$ (c) $\frac{723}{729}$ (d) None of the above.
[61]	5,000 students were appeared in an examination. The mean of marks was 39.5 with a Standard
	Deviation 12.5 marks. Assuming the distribution to be normal, find the number of students recorded
	more than 60% marks. Given: When Z = 1.64, Area of normal curve = 0.4495
	(a) 1,000 (b) 505 (c) 252 (d) 2,227
[62]	If a variate X has, mean > variance, then its distribution will be _____.
	(a) Binomial distribution (b) Poisson distribution
	(c) Normal distribution (d) T-distribution
Dec 14	

[63] If six coins are tossed simultaneously. The probability of obtaining exactly two heads are:

(a) 1/64　　　　(b) 63/64　　　　(c) 15/64　　　　(d) None of these

[64] If **x** and y are two independent normal random variables, then the distribution of **x** + y is:

(a) Normal　　　　(b) T-distribution　　　　(c) Chi-square　　(d) F-distribution

[65] For a normal distribution having mean = 2 and variance = 4, the fourth central moment μ_4 is:

(a) 16　　　　(b) 32　　　　(c) 48　　　　(d) 64

[66] T-test can be used only when the sample has been taken from

(a) Binomial Population　　　　　　(b) Poisson Population

(c) Normal Population　　　　　　(d) Exponential Population

[67] For a binomial distribution with mean = 4 and variance = 3, the third central moment μ_3 is:

(a) 5/2　　　　(b) 7/4　　　　(c) 3/2　　　　(d) 1/3

June 15

[68] If x is a binomial variable with parameters n and p, then x can assume\

(a) any value between 0 and n

(b) any value between 0 and n, both inclusive

(c) any whole number between 0 and n, both inclusive

(d) any number between 0 and infinity

[69]   In _____ distribution, mean = variance

(a) Normal   (b) Binomial   (c) Poisson   (d) None

[70]   Under a normal curve $\bar{x} \pm 3\sigma$ covers _____

(a) 100% of the area (item values)   (b) 99%   (c) 99.73%   (d) 99.37%

Dec 15

[71]   Y is a binomial variable with parameter 15 and $\frac{1}{3}$, then the value of the mode of the distribution:

(a) 5   (b) 5 and 6   (c) 5.50   (d) 6

[72]   Standard deviation of binomial distribution is:

(a) $\sqrt{np}$ (b) $(np)^2$ (c) $\sqrt{npq}$ (d) $(npq)^2$

[73]   The wages of workers of factory follows:

(a) Binomial distribution   (b) Poisson distribution

(c) Normal distribution   (d) Chi-square distribution

June 16

[74]   The normal curve is:

(a) Positively skewed   (b) Negatively skewed   (c) Symmetrical   (d) All these

[75]   For a Poisson variate X, P (X = 1) = P (X = 2), what is the mean of X ?

(a) 1   (b) $\frac{3}{2}$ (c) 2   (d) $\frac{5}{2}$

[76] In a discrete random variable X follows uniform distribution and assumes only the values 8,9,11,15,18,20. Then P (X ≤ 15) is _____

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{2}{5}$

Dec 16

[77] If x and y are independent normal variates with Mean and Standard Deviation as μ_1 and μ_2 and σ_1

and σ_2 respectively, then z = x+y also follows normal distribution with

(a) Mean = $\mu_1 + \mu_2$ and S.D. = 0 respectively

(c) Mean = $\mu_1 + \mu_2$ and S.D. = $\sqrt{\sigma_1^2 + \sigma_2^2}$

(d) None of these.

[78] A Poisson random variable has $\mu_4 = 2$, its variance i.e. μ_2 is

(a) $\frac{2}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{3}{2}$

[79] Name the distribution which has Mean = Variance

(a) Binomial   (b) Poisson   (c) Normal   (d) Chi-square

[80] An example of a bi-parametric probability distribution:

(a) Binomial   (b) Poisson   (c) Normal   (d) (a) and (b)

June 17

[81] If X ~ N (50,16), then which of the following is not possible:

(a) P(X > 60) = 0.30

(b) P(X < 50) = 0.50

(c) P(X < 60) = 0.40

(d) P(X > 50) = 0.50

[82] If for a distribution mean = variance, then the distribution is said to be:

(a) Normal   (b) Binomial   (c) Poisson   (d) None of the above.

[83] For a Binomial distribution if variance = (Mean)^2, then the values of n and p will be:

(a) 1 and $\frac{1}{2}$ (b) 2 and $\frac{1}{2}$ (c) 3 and $\frac{1}{2}$ (d) 1 and 1

ANSWERS

1	A	11	B	21	C	31	D	41	A	51	D	61	C	71	A
2	C	12	D	22	B	32	C	42	D	52	C	62	A	72	C
3	B	13	A	23	D	33	C	43	B	53	B	63	C	73	C
4	D	14	A	24	B	34	D	44	A	54	A	64	A	74	C
5	B	15	C	25	A	35	D	45	B	55	B	65	C	75	C
6	C	16	A	26	D	36	C	46	C	56	B	66	C	76	C
7	D	17	C	27	C	37	C	47	A	57	D	67	C	77	C
8	A	18	A	28	A	38	A	48	C	58	B	68	C	78	A
9	C	19	D	29	A	39	A	49	A	59	A	69	C	79	B
10	C	20	A	30	A	40	A	50	C	60	A	70	C	80	C

81	C
82	C
83	A

STUDENT NOTES

CH - 5

CORRELATION & REGRESSION

KARL PEARSON'S COEFFICIENT OF CORRELATION

Q 1. *Compute the correlation coefficient between x and y from the following data n = 10, $\sum XY = 220$,*

$\Sigma x^2 = 200$, $\Sigma y^2 = 262$, $\Sigma x = 40$ and $\Sigma y = 50$

Solution: From the given data, we have by applying,

$$r = \frac{n\sum xy - \sum x \times \sum y}{\sqrt{n\sum x^2 - (\sum x)^2} \times \sqrt{n\sum y^2 - (\sum y)^2}}$$

$$= \frac{10 x 200 - 40 x 50}{\sqrt{10 x 200 - (40)^2} X \sqrt{10 x 262 - (50)^2}}$$

$$= \frac{2200 - 2000}{\sqrt{2000 - 1600} \, X \sqrt{2620 - 2500}}$$

$$= \frac{200}{20 \, X \, 10.9545}$$

$$= 0.91$$

Thus there is a good amount of positive correlation between the two variables x and y.

Alternately ,   As given, $\bar{X} = \frac{\sum X}{n} = \frac{40}{10} = 4$

$\bar{Y} = \frac{\sum Y}{n} = \frac{50}{10} = 5$

Cov (x, y) $= \frac{\sum XY}{n} = -\bar{X}\bar{Y}$

$= \frac{220}{10}$ -4.5 $= 2$

S_x $= \sqrt{\frac{\sum X2}{n} - (\bar{X})^2}$

$$= \sqrt{\frac{200}{10} - 4^2}$$

$S_y \qquad = \sqrt{\frac{\sum Y_i^1}{n} - (\bar{Y})^2}$

$$= \sqrt{\frac{262}{10} - 5^2}$$

$$= \sqrt{26.20 - 25} = 1.0954$$

Thus applying formula, we get

$r \qquad = \dfrac{cov(x,y)}{S_x S_y}$

$$= \frac{2}{2 X 1.0954} = 0.91$$

Q 2. *Find product moment correlation coefficient from the following information:*

x:	2	3	5	5	6	8
y:	9	8	8	6	5	3

Solution:

SPEARMAN'S RANK CORRELATION COEFFICIENT

Q 3.   Compute the coefficient of rank correlation between sales and advertisement expressed in

thousands of rupees from the following data:

Sales :	90	85	68	75	82	80	95	70
Advertisement:	7	6	2	3	4	5	8	1

Solution:

Q 4. *Compute rank correlation from the following data relating to ranks given by two judges in a contest:*

Serial No. of Candidate :	1	2	3	4	5	6	7	8	9	10
Rank by Judge A :	10	5	6	1	2	3	4	7	9	8
Rank by Judge B :	5	6	9	2	8	7	3	4	10	1

Solution: We directly apply formula ranks are already given.

Computation of Rank Correlation Coefficient between the ranks given by 2 Judges

Serial No.	Rank by A (x_i)	Rank by B (y_i)	$d_i = x_i - y_i$	d_i^2
1	10	5	5	25
2	5	6	−1	1
3	6	9	−3	9
4	1	2	−1	1
5	2	8	−6	36
6	3	7	−4	16
7	4	3	1	1
8	7	4	3	9
9	8	10	−2	4
10	9	1	8	64
Total	—	—	0	166

The rank correlation coefficient is given by

$$r_R = 1 - \frac{6 \sum d_2^i}{n(n^2 - 1)}$$

$$= 1 - \frac{6 \times 166}{10(10^2 - 1)}$$

$$= -0.006$$

The very low value (almost 0) indicates that there is hardly any agreement between the ranks

given by the two Judges in the contest

Q 5. *Compute the coefficient of rank correlation between Eco. marks and stats. Marks as given below:*

Eco Marks	80	56	50	48	50	62	60
Stats Marks	90	75	75	65	65	50	65

Solution:

Q 6. *For a group of 8 students, the sum of squares of differences in ranks for Mathematics and*

Statistics marks was found to be 50 what is the value of rank correlation coefficient?

Solution: As given n = 8 and $\sum d_i^2 = 50$. Hence the rank correlation coefficient between marks in

Mathematics and Statistics is given by

$$r_R = 1 - \frac{6\sum d_2^i}{n(n^2-1)}$$

$$= 1 - \frac{6 \ X \ 50}{8(8^2-1)}$$

$$= 0.40$$

Q 7. *For a number of towns, the coefficient of rank correlation between the people living below the*

poverty line and increase of population is 0.50. If the sum of squares of the differences in ranks

awarded to these factors is 82.50, find the number of towns.

Solution:

Q 8. While computing rank correlation coefficient between profits and investment for 10 years of a firm, the difference in rank for a year was taken as 7 instead of 5 by mistake and the value of rank correlation coefficient was computed as 0.80. What would be the correct value of rank correlation coefficient after rectifying the mistake?

Solution:

CONCURRENT DEVIATION METHOD

9.   *Find the coefficient of concurrent deviations from the following data.*

Year :	1990	1991	1992	1993	1994	1995	1996	1997
Price :	25	28	30	23	35	38	39	42
Demand :	35	34	35	30	29	28	26	23

Solution:

REGRESSION ANALYSIS

Q 10.   *Find the two regression equations from the following data:*

x:	2	4	5	5	8	10
y:	6	7	9	10	12	12

Hence estimate y when x is 13 and estimate also x when y is 15.

| Solution: | **Computation of Regression Equations** |

x_i	y_i	$x_i y_i$	x_i^2	y_i^2
2	6	12	4	36
4	7	28	16	49
5	9	45	25	81
5	10	50	25	100
8	12	96	64	144
10	12	120	100	144
34	56	351	234	554

On the basis of the above table, we have

$$\bar{X} = \frac{\sum X_i}{n} = \frac{34}{6} = 5.6667$$

$$\bar{Y} = \frac{\sum Y_i}{n} = \frac{56}{6} = 9.3333$$

$$\text{cov (x, y)} = \frac{\sum X_i Y_i}{n} - \bar{X}\bar{Y}$$

$$= \frac{351}{6} - 5.6667 \times 9.3333$$

$$= 58.50 - 52.8890$$

$$= 5.6110$$

$$S_x^2 = \frac{\sum X_i^2}{n} - \bar{X}^2$$

$$= \frac{234}{6} - (5.6667)^2$$

$$= 39 - 32.1115$$

$$= 6.8885$$

$$S_Y^2 = \frac{\sum Y_i^2}{n} - \bar{Y}^2$$

$$= \frac{554}{6} - (9.3333)^2$$

= 92.3333-87.110

= 5.2228

The regression line of y on x is given by

y = a + bx

Where $b\hat{} = \frac{COV(X,Y)}{S_X^2} = \frac{5.6110}{6.8885}$

= 0.8145

and $a\hat{} = \bar{Y} - b\bar{X}$

= 9.3333 – 0.8145 x 5.6667

= 4.7178

Thus the estimated regression equation of y on x is

y = 4.7178 + 0.8145x

When x = 13, the estimated value of y is given by $y\hat{} = 4.7178 + 0.8145 \times 13 = 15.3063$

The regression line of x on y is given by

$x = a\hat{} + b\hat{} y$

where $b\hat{} = \frac{COV(X,Y)}{S_Y^2} = \frac{5.6110}{5.2228}$

= 1.0743

and $a\hat{} = \bar{X} - b\hat{} \bar{Y}$

= 5.6667 – 1.0743 × 9.3333

= – 4.3601

Thus the estimated regression line of x on y is

x = –4.3601 + 1.0743y

When y = 15, the estimate value of x is given by

| | $x^\wedge = -4.3601 + 1.0743 \times 15$ |
| | $= 11.75$ |

Q 11. *The following data relate to the mean and SD of the prices of two shares in a stock Exchange:*

Share	Mean (in Rs.)	SD (in Rs.)
Company A	44	5.60
Company B	58	6.30

Coefficient of correlation between the share prices = 0.48

Find the most likely price of share A corresponding to a price of Rs. 60 of share B and also the

most likely price of share B for a price of Rs. 50 of share A.

Solution:

Q 12 *The following data relate the expenditure or advertisement in thousands of rupees and the*

corresponding sales in lakhs of rupees.

Expenditure on Ad	8	10	10	12	15
Sales :	18	20	22	25	28

Find an appropriate regression equation.

Solution:	Since sales (y) depend on advertisement (x), the appropriate regression equation is of y on x i.e. of

sales on advertisement. We have, on the basis of the given data,

$n = 5$, $\sum x = 8+10+10+12+15 = 55$

$\sum y = 18+20+22+25+28 = 113$

$\sum xy = 8×18+10×20+10×22+12×25+15×28 = 1284$

$\sum x^2 = 8^2+10^2+10^2+12^2+15^2 = 633$

$$\therefore b = \frac{n\sum xy - \sum x \times \sum y}{n\sum x^2 - (\sum x)^2}$$

$$= \frac{5 \times 1284 - 55 \times 113}{5 \times 633 - (55)^2}$$

$$= \frac{205}{140}$$

$$= 1.4643$$

a $= \bar{Y} - b\bar{X}$

$= \frac{113}{5} - 1.4643 \times \frac{55}{5}$

$= 22.60 - 16.1073$

$= 6.4927$

Thus, the regression line of y or x i.e. the regression line of sales on advertisement is given by

$y = 6.4927 + 1.4643x$

Q 13.	*If the relationship between two variables x and u is u + 3x = 10 and between two other variables*

y and v is 2y + 5v = 25, and the regression coefficient of y on x is known as 0.80, what would

be the regression coefficient of v on u?

Solution:

Q 14 For the variables x and y, the regression equations are given as $7x - 3y - 18 = 0$ and $4x - y - 11$

$= 0$ (i) Find the arithmetic means of x and y.

(ii) Identify the regression equation of y on x.

(iii) Compute the correlation coefficient between x and y.

(iv) Given the variance of x is 9, find the SD of y.

Solution: (i) Since the two lines of regression intersect at the point $(\bar{X}, \bar{Y})$, replacing x and y by x and y

respectively in the given regression equations, we get

$7\bar{X} - 3\bar{Y} - 18 = 0$

And $4\bar{X} - \bar{Y} - 11 = 0$

Solving these two equations, we get $\bar{X} = 3$ and $\bar{Y} = 1$

Thus the arithmetic means of x and y are given by 3 and 1 respectively.

(ii) Let us assume that $7x - 3y - 18 = 0$ represents the regression line of y on x and $4x - y - 11 = 0$

represents the regression line of x on y.

Now $7x - 3y - 18 = 0$

$y = (-6) + \frac{(7)}{3}x$

$b_{yx} = \frac{7}{3}$

Again $4x - y - 11 = 0$

$x = \frac{(11)}{4} + \frac{(1)}{4}y$ $b_{xy} = \frac{1}{4}$

Thus $r^2 = b^{yx} \times b^{xy}$

$= \frac{7}{3} X \frac{1}{4}$

$= \frac{7}{12} < 1$

Since $l\, r\, l \leq 1 \Rightarrow r^2 \leq 1$, our assumptions are correct. Thus, $7x - 3y - 18 = 0$ truly represents the

regression line of y on x.

(iii) since $r^2 = 7/12$

$r = \sqrt{\frac{7}{12}}$ (We take the sign of r as positive since both the regression coefficients are positive)

$= 0.7638$

(iv) byx $= r\, X \frac{S_y}{S_X}$

$\frac{7}{3} = 0.7638 \text{ X} \frac{S_y}{3}$ (Sx² = 9 as given)

$S_y = \frac{7}{0.7638} = 9.1647$

PROBABLE ERROR

Q 15	Compute the Probable Error assuming the correlation coefficient of 0.8 from a sampleof 25 pairs of items.
Solution:	r = 0.8 , n = 25
	P.E. = 0.6745 ×SE
	= 0.6745 × 0.07 = 0.0486
Q 16	If r = 0.7 ; and n = 64 find out the probable error of the coefficient of correlation and determine the limits for the population correlation coefficient:
Solution:	

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

1. Bivariate Data are the data collected for

(a) Two variables   (b) More than two variables

(c) Two variables at the same point of time   (d) Two variables at different points of time.

2. For a bivariate frequency table having (p + q) classification the total number of cells is

(a) p   (b) p + q   (c) q   (d) pq

3. Some of the cell frequencies in a bivariate frequency table may be

(a) Negative   (b) Zero   (c) a or b   (d) Non of these

4. For a p x q bivariate frequency table, the maximum number of marginal distributions is

(a) p   (b) p + q   (c) 1   (d) 2

5. For a p x q classification of bivariate data, the maximum number of conditional distributions is

(a) p   (b) p + q   (c) pq   (d) p or q

6. Correlation analysis aims at

(a) Predicting one variable for a given value of the other variable

(b) Establishing relation between two variables

(c) Measuring the extent of relation between two variables

(d) Both (b) and (c).

7. Regression analysis is concerned with

(a) Establishing a mathematical relationship between two variables

(b) Measuring the extent of association between two variables

(c) Predicting the value of the dependent variable for a given value of the independent variable

	(d) Both (a) and (c).
8.	What is spurious correlation?
	(a) It is a bad relation between two variables.
	(b) It is very low correlation between two variables.
	(c) It is the correlation between two variables having no causal relation.
	(d) It is a negative correlation
9.	Scatter diagram is considered for measuring
	(a) Linear relationship between two variables
	(b) Curvilinear relationship between two variables
	(c) Neither (a) nor (b)
	(d) Both (a) and (b).
10.	If the plotted points in a scatter diagram lie from upper left to lower right, then the correlation is
	(a) Positive (b) Zero (c) Negative (d) None of these
11.	If the plotted points in a scatter diagram are evenly distributed, then the correlation is
	(a) Zero (b) Negative (c) Positive (d) (a) or (b).
12.	If all the plotted points in a scatter diagram lie on a single line, then the correlation is
	(a) Perfect positive (b) Perfect negative
	(c) Both (a) and (b) (d) Either (a) or (b).
13.	The correlation between shoe-size and intelligence is
	(a) Zero (b) Positive (c) Negative (d) None of these.
14.	The correlation between the speed of an automobile and the distance travelled by it after applying
	the brakes is
	(a) Negative (b) Zero (c) Positive (d) None of these

15.	Scatter diagram helps us to
	(a) Find the nature correlation between two variables
	(b) Compute the extent of correlation between two variables
	(c) Obtain the mathematical relationship between two variables
	(d) Both (a) and (c).
16.	Pearson's correlation coefficient is used for finding
	(a) Correlation for any type of relation
	(b) Correlation for linear relation only
	(c) Correlation for curvilinear relation only
	(d) Both (b) and (c).
17.	Product moment correlation coefficient is considered for
	(a) Finding the nature of correlation
	(b) Finding the amount of correlation
	(c) Both (a) and (b)
	(d) Either (a) and (b).
18.	If the value of correlation coefficient is positive, then the points in a scatter diagram tend to cluster
	(a) From lower left corner to upper right corner
	(b) From lower left corner to lower right corner
	(c) From lower right corner to upper left corner
	(d) From lower right corner to upper right corner.
19.	When r = 1, all the points in a scatter diagram would lie
	(a) On a straight line directed from lower left to upper right
	(b) On a straight line directed from upper left to lower right

(c) On a straight line

(d) Both (a) and (b).

20. Product moment correlation coefficient may be defined as the ratio of

(a) The product of standard deviations of the two variables to the covariance between them

(b) The covariance between the variables to the product of the variances of them

(c) The covariance between the variables to the product of their standard deviations

(d) Either (b) or (c).

21. The covariance between two variables is

(a) Strictly positive

(b) Strictly negative

(c) Always 0

(d) Either positive or negative or zero

22. The coefficient of correlation between two variables

(a) Can have any unit.

(b) Is expressed as the product of units of the two variables

(c) Is a unit free measure

(d) None of these.

23. What are the limits of the correlation coefficient?

(a) No limit   (b) –1 and 1

(c) 0 and 1, including the limits   (d) –1 and 1, including the limits

24. In case the correlation coefficient between two variables is 1, the relationship between the two

variables would be

(a) $y = a + bx$

(b) y = a + bx, b > 0

(c) y = a + bx, b < 0

(d) y = a + bx, both a and b being positive.

25. If the relationship between two variables x and y in given by $2x + 3y + 4 = 0$, then the value of the correlation coefficient between x and y is

(a) 0   (b) 1   (c) –1   (d) negative.

26. For finding correlation between two attributes, we consider

(a) Pearson's correlation coefficient

(b) Scatter diagram

(c) Spearman's rank correlation coefficient

(d) Coefficient of concurrent deviations

27. For finding the degree of agreement about beauty between two Judges in a Beauty Contest, we use

(a) Scatter diagram

(b) Coefficient of rank correlation

(c) Coefficient of correlation

(d) Coefficient of concurrent deviation.

28. If there is a perfect disagreement between the marks in Geography and Statistics, then what would be the value of rank correlation coefficient?

(a) Any value   (b) Only 1   (c) Only –1   (d) (b) or (c)

29. When we are not concerned with the magnitude of the two variables under discussion, we

Consider

(a) Rank correlation coefficient

(b) Product moment correlation coefficient

(c) Coefficient of concurrent deviation

(d) (a) or (b) but not (c).

30. What is the quickest method to find correlation between two variables?

(a) Scatter diagram

(b) Method of concurrent deviation

(c) Method of rank correlation

(d) Method of product moment correlation

31. What are the limits of the coefficient of concurrent deviations?

(a) No limit

(b) Between –1 and 0, including the limiting values

(c) Between 0 and 1, including the limiting values

(d) Between –1 and 1, the limiting values inclusive

32. If there are two variables x and y, then the number of regression equations could be

(a) 1   (b) 2   (c) Any number   (d) 3.

33. Since Blood Pressure of a person depends on age, we need consider

(a) The regression equation of Blood Pressure on age

(b) The regression equation of age on Blood Pressure

(c) Both (a) and (b)

(d) Either (a) or (b).

34. The method applied for deriving the regression equations is known as

(a) Least squares   (b) Concurrent deviation

(c) Product moment   (d) Normal equation.

35. The difference between the observed value and the estimated value in regression analysis is known

	As
	(a) Error (b) Residue (c) Deviation (d) (a) or (b).
36.	The errors in case of regression equations are
	(a) Positive (b) Negative (c) Zero (d) All these.
37	The regression line of y on x is derived by
	(a) The minimisation of vertical distances in the scatter diagram
	(b) The minimisation of horizontal distances in the scatter diagram
	(c) Both (a) and (b)
	(d) (a) or (b).
38.	The two lines of regression become identical when
	(a) $r = 1$ (b) $r = -1$ (c) $r = 0$ (d) (a) or (b).
39	What are the limits of the two regression coefficients?
	(a) No limit
	(b) Must be positive
	(c) One positive and the other negative
	(d) Product of the regression coefficient must be numerically less than unity.
40	The regression coefficients remain unchanged due to a
	(a) Shift of origin (b) Shift of scale
	(c) Both (a) and (b) (d) (a) or (b).
41	If the coefficient of correlation between two variables is –0 9, then the coefficient of determination
	Is
	(a) 0.9 (b) 0.81 (c) 0.1 (d) 0.19.
42	If the coefficient of correlation between two variables is 0.7 then the percentage of variation

unaccounted for is

(a) 70%   (b) 30%   (c) 51%   (d) 49%

Set B – (Practical Question)

1. If for two variable x and y, the covariance, variance of x and variance of y are 40, 16 and 256

respectively, what is the value of the correlation coefficient?

(a) 0.01   (b) 0.625   (c) 0.4   (d) 0.5

2. If cov(x, y) = 15, what restrictions should be put for the standard deviations of x and y?

(a) No restriction.

(b) The product of the standard deviations should be more than 15.

(c) The product of the standard deviations should be less than 15.

(d) The sum of the standard deviations should be less than 15.

3. If the covariance between two variables is 20 and the variance of one of the variables is 16, what

would be the variance of the other variable?

(a) More than 100   (b) More than 10

(c) Less than 10   (d) More than 1.25

4. If y = a + bx, then what is the coefficient of correlation between x and y?

(a) 1   (b) –1

(c) 1 or –1 according as b > 0 or b < 0   (d) none of these.

5. If r = 0.6 then the coefficient of non-determination is

(a) 0.4   (b) –0.6   (c) 0.36   (d) 0.64

6. If u + 5x = 6 and 3y – 7v = 20 and the correlation coefficient between x and y is 0.58 then what

would be the correlation coefficient between u and v?

(a) 0.58   (b) −0.58   (c) −0.84   (d) 0.84

7. If the relation between x and u is $3x + 4u + 7 = 0$ and the correlation coefficient between x and y is

−0.6, then what is the correlation coefficient between u and y?

(a) −0.6   (b) 0.8   (c) 0.6   (d) −0.8

8. From the following data

x:	2	3	5	4	7
y:	4	6	7	8	10

Two coefficient of correlation was found to be 0.93. What is the correlation between u and v

as given below?

u:	−3	−2	0	−1	2
v:	−4	−2	−1	0	2

(a) −0.93   (b) 0.93   (c) 0.57   (d) −0.57

9. Referring to the data presented in Q. No. 8, what would be the correlation between u and v?

u: 10   15   25   20   35
v: −24   −36   −42   −48   −60

(a) −0.6   (b) 0.6   (c) −0.93   (d) 0.93

10. If the sum of squares of difference of ranks, given by two judges A and B, of 8 students in 21, what

is the value of rank correlation coefficient?

(a) 0.7   (b) 0.65   (c) 0.75   (d) 0.8

11. If the rank correlation coefficient between marks in management and mathematics for a group of

student in 0.6 and the sum of squares of the differences in ranks in 66, what is the number of

students in the group?

| (a) 10 | (b) 9 | (c) 8 | (d) 11 |

12. While computing rank correlation coefficient between profit and investment for the last 6 years of a company the difference in rank for a year was taken 3 instead of 4. What is the rectified rank correlation coefficient if it is known that the original value of rank correlation coefficient was 0.4?

| (a) 0.3 | (b) 0.2 | (c) 0.25 | (d) 0.28 |

13. For 10 pairs of observations, No. of concurrent deviations was found to be 4. What is the value of the coefficient of concurrent deviation?

| (a) $\sqrt{0.2}$ | (b) $-\sqrt{0.2}$ | (c) 1/3 | (d) –1/3 |

14. The coefficient of concurrent deviation for p pairs of observations was found to be $1/\sqrt{3}$. If the number of concurrent deviations was found to be 6, then the value of p is

| (a) 10 | (b) 9 | (c) 8 | (d) none of these |

15. What is the value of correlation coefficient due to Pearson on the basis of the following data:

x:	–5	–4	–3	–2	–1	0	1	2	3	4	5
y:	27	18	11	6	3	2	3	6	11	18	27

| (a) 1 | (b) –1 | (c) 0 | (d) –0.5 |

16. Following are the two normal equations obtained for deriving the regression line of y and x:

5a + 10b = 40

10a + 25b = 95

The regression line of y on x is given by

| (a) 2x + 3y = 5 | (b) 2y + 3x = 5 | (c) y = 2 + 3x | (d) y = 3 + 5x |

17. If the regression line of y on x and of x on y are given by 2x + 3y = –1 and 5x + 6y = –1 then the arithmetic means of x and y are given by

| | (a) (1, –1) | (b) (–1, 1) | (c) (–1, –1) | (d) (2, 3) |

18. Given the regression equations as $3x + y = 13$ and $2x + 5y = 20$, which one is the regression equation of y on x?

(a) 1st equation   (b) 2nd equation

(c) both (a) and (b)   (d) none of these.

19. Given the following equations: $2x – 3y = 10$ and $3x + 4y = 15$, which one is the regression equation of x on y ?

(a) 1st equation   (b) 2nd equation

(c) both the equations   (d) none of these

20. If $u = 2x + 5$ and $v = –3y – 6$ and regression coefficient of y on x is 2.4, what is the regression coefficient of v on u?

(a) 3.6   (b) –3.6   (c) 2.4   (d) –2.4

21. If $4y – 5x = 15$ is the regression line of y on x and the coefficient of correlation between x and y is 0.75, what is the value of the regression coefficient of x on y?

(a) 0.45   (b) 0.9375   (c) 0.6   (d) none of these

22. If the regression line of y on x and that of x on y are given by $y = –2x + 3$ and $8x = –y + 3$ respectively, what is the coefficient of correlation between x and y?

(a) 0.5   (b) $–1/\sqrt{2}$ (c) –0.5   (d) none of these

23. If the regression coefficient of y on x, the coefficient of correlation between x and y and variance of y are $–3/4, \sqrt{3}/2$ and 4 respectively, what is the variance of x?

(a) $2/\sqrt{3}/2$ (b) 16/3   (c) 4/3   (d) 4

24. If $y = 3x + 4$ is the regression line of y on x and the arithmetic mean of x is –1, what is the arithmetic mean of y?

(a) 1   (b) –1   (c) 7   (d) none of these

ANSWERS

Set A

1.	(c)	2.	(d)	3.	(b)	4.	(d)	5.	(b)	6.	(d)
7.	(d)	8.	(c)	9.	(d)	10.	(c)	11.	(a)	12.	(d)
13.	(a)	14.	(a)	15.	(a)	16.	(b)	17.	(c)	18.	(a)
19.	(a)	20.	(c)	21.	(d)	22.	(c)	23.	(d)	24.	(b)
25.	(c)	26.	(c)	27.	(b)	28.	(c)	29.	(c)	30.	(b)
31.	(d)	32.	(b)	33.	(a)	34.	(a)	35.	(d)	36.	(d)
37.	(a)	38.	(d)	39.	(d)	40.	(a)	41.	(b)	42.	(c)

Set B

1.	(b)	2.	(b)	3.	(a)	4.	(c)	5.	(d)	6.	(b)
7.	(c)	8.	(b)	9.	(c)	10.	(c)	11.	(a)	12.	(b)
13.	(d)	14.	(a)	15.	(c)	16.	(c)	17.	(a)	18.	(b)
19.	(d)	20.	(b)	21.	(a)	22.	(c)	23.	(b)	24.	(a)

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov 06

[1] The coefficient of correlation r between x and y when :

Cov (x, y) = -16.5, Var (x) = 2.89, Var (y) = 100 is :

(a) -0.97   (b) 0.97   (c) 0.89   (d) -0.89

[2] ~~Take 200 and 150 respectively as the assumed mean for X and Y series of 11 values, then dx = X - 200,~~

~~dy = Y - 150, $\sum dx = 13$, $\sum dx^2 = 2667$, $\sum dy = 42$, $\sum dy^2 = 6964$, $\sum dx\, dy = 3943$. The value of r is:~~

~~(a) 0.77   (b) 0.98   (c) 0.92   (d) 0.82~~

[3]

For some bivariate data, the following results were obtained for the two variables x and y :

$\bar{x} = 53.2, \bar{y} = 27.9, b_{yx} = -1.5, b_{xy} = -0.2$

The most probable value of y when x = 60 is :

(a) 15.6   (b) 13.4   (c) 19.7   (d) 17.7

Feb 07

[4]

If the sum of squares of the rank difference in mathematics and physics marks of 10 students is 22,

then the coefficient of rank correlation is:

(a) 0.267   (b) 0.867   (c) 0.92   (d) None

[5]

Two random variables have the regression lines 3x + 2y = 26 and 6x + y = 31. The coefficient of

correlation between x and y is :

(a) -0.25   (b) 0.5   (c) -0.5   (d) 0.25

May 07

[6]

The coefficient of correlation between X and Y is 0.6. U and V are two variables defined as $U = \frac{X-3}{2}$,

$V = \frac{Y-2}{3}$, then the coefficient of correlation between U and V is :

(a) 0.6   (b) 0.4   (c) 0.8   (d) 1

[7]

For the following data, the coefficient of rank correlation is :

Rank in Botany:	1	2	3	4	5
Rank in Chemistry	2	3	1	5	4

(a) 0.93   (b) 0.4   (c) 0.6   (d) None

[8] The following data is given, based on 450 students for marks in Statistics and Economics at a certain

examination :

Mean marks in Statistics   = 40   Mean marks in Economics   = 48

S.D. of marks (Statistics)   = 12   Variance of marks (Economics) = 256

Sum of the products of deviations of marks from their respective mean = 42075

The average marks in Economics of candidates who obtained 50 marks in Statistics is:

(a) 45   (b) 54.5   (c) 54   (d) 47.5

Aug 07

[9] For 10 pairs of observations, number of concurrent deviations was found to be 4. What is the value of the

coefficient of concurrent deviation?

(a) $\sqrt{0.2}$ (b) $1/3$ (c) $-1/3$ (d) $-\sqrt{0.2}$

[10] If the covariance between two variables is 20 and the variance of one of the variables is 16, what would be

the variance of the other variable?

(a) More than 10   (b) More than 100   (c) More than 1.25   (d) Less than 10

Nov 07

[11] Assume 69 and 112 as the mean values for X and Y respectively.

$\sum dx = 47, \sum dx^2 = 1475, \sum dy = 108, \sum dy^2 = 3468, \sum dx\, dy = 2116$ and N = 8.

~~Where dx = X - 69, dy = Y - 112. Then the value of r is :~~

~~(a) 0.95~~   ~~(b) 0.65~~   ~~(c) 0.75~~   ~~(d) 0.85~~

[12] In rank correlation, the association need not be linear:

(a) True   (b) False   (c) Partly True   (d) Partly False

[13] The lines of regression are as follows :

5x - 145 = - 10y; 14y - 208 = - 8x. The mean values (x, y) is :

(a) (12,5)   (b) (5,7)   (c) (7, 12)   (d) (5, 12)

Feb 08

[14] The coefficient of rank correlation of marks obtained by 10 students, in English and Economics was

found to be 0.5. It was later discovered that the difference in ranks in the two subjects obtained by

one student was wrongly taken as 3 instead of 7. The correct coefficient of rank correlation is:

(a) 0.32   (b) 0.26   (c) 0.49   (d) 0.93

[15] Given the following data :

b_{xy} = 0.4 & b_{yx} = 1.6. The coefficient of determination is :

(a) 0.74   (b) 0.42   (c) 0.58 .   (d) 0.64

[16] The method applied for deriving regression equations is known as :

(a) Concurrent deviation   (b) Product moment

(c) Least squares   (d) Normal equation

June 08

[17] ~~The coefficient of correlation between x and y series from the following data :~~

	X series	Y series
~~Number of pairs of observations~~	~~15~~	~~15~~
~~Arithmetic Mean~~	~~25~~	~~18~~
~~Standard Deviation~~	~~3.01~~	~~3.03~~
~~Sum of the squares of deviation from mean~~	~~136~~	~~138~~

~~Sum of the product of the deviations of x and y series from their respective means = 122, is :~~

~~(a) 0.89~~   ~~(b) 0.99~~   ~~(c) 0.69~~   ~~(d) 0.91~~

[18] If the lines of regression in a bivariate distribution are given by x + 2y = 5 and 2x + 3y = 8, then

the coefficient of correlation is :

(a) 0.866   (b) -0.666   (c) 0.667   (d) -0.866

[19] If the correlation coefficient between two variables is 1, then the two lines of regressions are :

(a) Parallel   (b) At right angles   (c) Coincident   (d) None of these

Dec 08

[20] If the sum of square of differences of rank is 50 and number of items is 8 then what is the

value of rank correlation coefficient.

(a) 0.59   (b) 0.40   (c) 0.36   (d) 0.63

[21] If coefficient of correlation between x and y is 0.46. Find coefficient of correlation between x and $\frac{y}{2}$

(a) 0. 46   (b) 0.92   (c) -0.46   (d) -0.92

[22] Given the regression equations as $3x + y = 13$ and $2x + 5y = 20$. Find regression equation of y on x.

(a) $3x + y = 13$ (b) $2X + y = 20$ (c) $3x + 5y = 13$ (d) $2x + 5\,y = 20$

[23] The coefficient of correlation is significant if:

(a) r > 5 P. E   (b) r < 6 P. E   (c) r ≥ 6 P. E   (d) r = 6P.E

June 09

[24] The two regression equations are :

$2x + 3y + 18 = 0$

$x + 2y - 25 = 0$

find the value of y if x = 9

(a) - 8   (b) 8   (c) – 12   (d) 0

[25] The correlation coefficient between x and y is- 1/2. The value of $^bxy = - 1/8$. Find by x.

(a) -2   (b) -4   (c) 0   (d) 2

[26] Ranks of two _____ characteristics by two judges are in reverse order then find the value of

Spearman rank correlation co-efficient,

(a) - 1   (b) 0   (c) 1   (d) 0.75

[27] Which of the following regression equations represent regression line of Y on X :

$7x + 2y + 15 = 0, 2x + 5y + 10 = 0$

(a) $7x + 2y + 15 = 0$ (b) $2x + 5y + 10 = 0$

(c) Both (a) and (b)   (d) None of these

Dec 09

[28] the rank correlation co-efficient between marks in Management and Mathematics for a group of

students is 0.6 and the sum of the squares of the difference in ranks is 66. Then what is the

number of students in the group?

(a) 9   (b) 10   (c) 11   (d) 12

[29] Correlation coefficient between X and Y will be negative when:-

(a) X and Y are decreasing -   (b) X is increasing, Y is decreasing

(c) X and Y are increasing   (d) None of these

[30] The two regression lines are $7x - 3y - 18 = 0$ and $4x - y - 11 = 0$. Find the values of b_{yx} and b_{xy}

(a) 7/3, 1/4   (b) -7/3,-1/4   (c) -3/7,-1/4   (d) None of these.

June 10

[31] If 'P' is the simple correlation coefficient, the quantity P^2 is known as:

(a) Coefficient of determination   (b) Coefficient of Non-determination

(c) Coefficient of alienation   (d) None of the above.

[32] _____ of the regression Coefficients is greater than the correlation coefficient

(a) Combined mean   (b) Harmonic mean

(c) Geometric mean   (d) Arithmetic mean.

[33] the correlation coefficient between x and y is r, then

between $U = \frac{x-5}{10}$ and $V = \frac{y-7}{2}$ is

(a) r   (b) –r   (c) (r-5)/2   (d) (r -7)/10

[34] If the two lines of regression are x + 2y -5 =0 and 2x + 3y - 8 = 0

The regression line of y on x is

(a) x + 2y – 5 = 0   (b) 2x + 3y – 8 = 0

(c) Any of the two line   (d) None of the two lines.

Dec 10

[35] If the sum of the product of deviations of x and y series from their means is zero, then the

coefficient of correlation will be

(a) 1   (b) -1   (c) 0   (d) None of these

[36] ranks of five participants given by two judges are

	A	B	C	D	E
Judge 1	1	2	3	4	5
Judge 2	5	4	3	2	1

Rank correlation coefficient between ranks will be

(a) 1   (b) 0   (c) -1   (d) 1/2

[37] Regression coefficient are _____

(a) dependent of change of origin and of scale.

(b) independent of both change of origin and. of scale.

(c) dependent of change of origin but not of scale.

(d) independent of change of origin but not of scale

[38] Given : $\bar{x} = 16$, $\sigma x = 4.8$

$\bar{y}$ - 20 , $\sigma y = 9.6$

the coefficient of correlation between x and y is 0.6. What will be the regression coefficient of 'x' on 'y'?

(a) 0.03   (b) 0.3   (c) 0.2   (d) 0.05

[39] If the two lines of regression are x + 2y -5 =0 and 2x + 3y - 8 = 0. The regression line of y on x is

(a) x+2y-5=0   (b) 2x+3y-8=0   (c) Any of the two line   (d) None of the two lines.

June 11

[40] The covariance between two variables X and Y is 8.4 and their variances are 25 and 36 respectively.

Calculate Karl Pearson's coefficient of correlation between them.

(a) 0.82   (b) 0.28   (c) 0.01   (d) 0.09

[41] For a bivariate data, two times of regression are 40x -18y = 214 and 8x -10y + 66 = 0, then

find the values of $\bar{x}$ and $\bar{y}$

(a) 17 and 13   (b) 13 and 17   (c) 13 and-17   (d) -13 and 17

[42] Three competitors in a contest are ranked by two judges in the order 1,2,3 and 2,3,1 respectively.

Calculate the Spearman's rank correlation coefficient.

(a) -0.5   (b) -0.8   (c) 0.5   (d) 0.8

Dec 11

[43] Out of the following which one affects the regression coefficient.

(a) Change of Origin Only

(b) Change of scale Only

(c) Change of scale & origin both

(d) Neither Change of origin nor change of scale

[44] For a bivariate data, the lines of regression of Y on X, and of X on Y are respectively 2.5Y - X = 35 and

10X - Y = 70, then the Correlation coefficient r is equal to:

(a) 0.2   (b) - 0.2   (c) 0.5   (d) - 0.5

[45] If one of regression coefficient is _____ unity, the other must be unity.

(a) more than, more then   (b) Less than, Less then

(c) more than, less than   (d) Positive, Negative

[46] If Y is dependent variable and X is Independent variable and x the S.D of X and Y are 5 and 8

respectively and Co- efficient of co-relation between X and Y is 0.8. Find the Regression coefficient of Y on X.

(a) 0.78   (b) 1.28   (c) 6.8   (d) 0.32

June 12

[47] The regression lines are 8x - 10y + 66 = 0 and 40x - 18y = 214, the correlation coefficient between 'x'

and 'y' is :

(a) 1   (b) 0.6   (c) - 0.6   (d) -1

[48] The coefficient of correlation between two variables x and y is the simple _____ of the two regression

coefficients.

(a) Arithmetic Mean   (b) Geometric Mean

(c) Harmonic Mean   (d) None of the above.

[49] If 2 variables are uncorrelated, their regression lines are:

(a) Parallel   (b) Perpendicular   (c) Coincident   (d) Inclined at 45 degrees.

[50] If the covariance between variables X and Y is 25 and variance of X and Y are respectively 36 and 25,

then the coefficient of correlation is

(a) 0.409   (b) 0.416   (c) 0.833   (d) 0.0277

[51] If $\bar{x}$, $\bar{y}$ denote the arithmetic means, σ_x, σ_y denotes, the standard deviations, b_{xy}, b_{yx} denote the

regression coefficients of the variables 'x' and 'y' respectively, then the point of intersection of regression

lines x on y & y on x is _____.

(a) $(\bar{x}, \bar{y})$ (b) (σ_x, σ_y) (c) (b_{xy}, b_{yx}) (d) (σ_x^2, σ_y^2)

Dec 12

[52] In Spearman's Correlation Coefficient, the sum of the differences of ranks between two variables

shall be _____.

(a) 0   (b) 1   (c) -1   (d) None of the above.

[53] For certain x and y series which are correlated, the two lines of regression are

5x - 6y + 9 = 0 & 15x - 8y - 130 = 0

The correlation coefficient is

(a) 4/5   (b) ¾   (c) 2/3   (d) ½

[54] The Coefficient of correlation between x and y series is -0.38. The linear relation between x & u and y & v are

3x + 5v = 3 and -8x - 7v = 44, what is the coefficient of correlation between u & v?

(a) 0.38   (b) -0.38   (c) 0.40   (d) None of the above.

[55] If y = 18x + 5 is the regression line of y on x value of b_{xy} is

(a) 5/18   (b) 18   (c) 5   (d) 1/18

June 13

[56] If 'r' be the Karls Pearson's coefficient of correlation in a bivariate distribution then the two regression lines

are at right angle if:

(a) r = ± 1

(b) r = 0

(c) r = ± any finite value whose numerical value is less than 1

(d) None of these

[57] If the regression equations are 8x-3y+50 = 0 and 14x-7y - 60 = 0 and standard deviation of y is 1.

The coefficient of correlation is _____

(a) 2   (b) 1   (c) 0.87   (d) -0.87

[58] The coefficient of correlation between two variables x and y is 0.28. Their covariance is 7.6. If the

variance of x is 9, then the standard deviation of y is:

(a) 8.048   (b) 9.048   (c) 10.048   (d) 11.048

[59] Two variables x and y are related according to 4x + 3y = 7. Then x and y are:

(a) Positively correlated.   (b) Negatively correlated.

(c) Correlation is zero.   (d) None of these.

[60] Determine the coefficient of correlation between x and y series:

Particulars	x Series	y Series
No. of items	15	15
Arithmetic mean	25	18
Sum of sq. of		

	deviation of mean	136	138

Sum of product of deviation of x and y series from mean = 122

(a) -0.89   (b) 0.89   (c) 0.69 .   (d) - 0.69

Dec 13

[61] Price and Demand is the example for

(a) No correlation   (b) Positive correlation   (c) Negative   (d) None of the above

[62] If mean of x and y variables is 20 and 40 respectively and the regression coefficient of y on x is 1.608,

then the regression line of y on x is

(a) y = 1.608x + 7.84   (b) y = 1.5x + 4.84

(c) y = 1.608x + 4.84   (d) y = 1.56x + 7.84

[63] When the value of correlation coefficient is +1 or -1, then the two regression lines will _____.

(a) have 30° angle between them

, (b) have 45° angle between them.

(c) coincide.

(d) be perpendicular to each other

June 14

[64] Two regression lines for a bivariate data are: 2x-5y+6=0 and 5x - 4y + 3 = 0. Then the

coefficient of correlation should be:

(a) $\frac{-2\sqrt{2}}{5}$ (b) $\frac{2}{5}$ (c) $\frac{-2\sqrt{2}}{5}$ (d) $\frac{\sqrt{2}}{5}$

[65] When each individual gets the exactly opposite rank by the two Judges, then the rank correlation

will be _____.

(a) 0   (b) -1   (c) +1   (d) $\frac{1}{2}$

[66] If the mean of the two variables 'x' and 'y' are 3 and 1 respectively, Then the equation of two

regression lines are _____.

(a) 5x+7y-22=0, 6x+2y-20=0   (b) 5x+7y-22=0, 6x+2y+20=0

(c) 5x+7y+22=0, 6x+2y-20=0   (d) 5x+7y+22=0, 6x+2y+20=0

[67] The equation of two lines of regression for 'x' and 'y' are 5x=22+y and 64x = 24 + 45y then the

value of regression coefficient of 'y' on 'x' will be _____.

(a) 5   (b) $\frac{1}{5}$ (c) $\frac{64}{45}$ (d) $\frac{45}{64}$

Dec 14

[68] If the correlation coefficient between two variables is zero, then the lines of regression are:

(a) Parallel   (b) Perpendicular   (c) Coincide   (d) None of these

[69] If the value of correlation coefficient between x & y is 1, then the value of correlation

coefficient between x - 2 and $\frac{-y}{2}$ + 1 is:

(a) 1   (b) -1   (c) -1/2   (d) ½

[70] The equations of two regression lines are $x + y = 6$ and $x + 2y = 10$, then the value of correlation

coefficient between x and y is:

(a) -1/2 (b) +1/2 (c) $-1/\sqrt{2}$ (d) $+1/\sqrt{2}$

June 15

[71] Two regression lines are

$16x - 20y + 132 = 0$ & $80x - 36y - 428 = 0$

The value of the correlation coefficient is

(a) 0.6 (b) -0.6 (c) 0.54 (d) 0.45

[72] When the correlation coefficient r is equal to + 1, all the points in a scatter diagram would be

(a) On a straight line directed from upper left to lower right

(b) On a straight line directed from lower left to upper right

(c) On a straight line

(d) Both (a) and (b)

Dec 15

[73] Out of following which is correct?

(a) $b_{yx} = r\frac{\sigma_x}{\sigma_y}$ (b) $b_{yx} = r\frac{\sigma_y}{\sigma_x}$ (c) $b_{yx} = \frac{\pi.\Sigma xy}{\sigma_x}$ (d) $b_{yx} = \frac{\pi.\Sigma xy}{\sigma_y}$

[74] In case of "Insurance Companies" profits and the number of claims they have to pay

there is _____ correlation:

	(a) Positive (b) Negative (c) No correlation (d) None of the above
June 16	
[75]	Two regression equations are as follows:
	Regression equation of. x on y : 5x - y = 22
	Regression equation of y on x : 64x - 45y = 24
	What will be the mean of x and y?
	(a) $\bar{x} = 8$, $\bar{y} = 6$ (b) $\bar{x} = 6$, $\bar{y} = 6$ (c) $\bar{x} = 6$, $\bar{y} = 8$ (d) $\bar{x} = 8$, $\bar{y} = 8$
[76]	If the coefficient of correlation between X and Y variables is +0.90 then what will be the coefficient
	of determination?
	(a) 0.30 (b) 0.81 (c) 0.94 (d) None of these
[77]	The two lines of regression become identical when
	(a) r = 1 (b) r = - 1 (c) r = 0 (d) (a) or (b)
[78]	r = 0.6, then the coefficient of determination is.
	(a) 0.4 b) -0.6 (c) 0.36 (d) 0.64
Dec 16	
[79]	The two regression lines passing through
	(a) Represent means (b) Represent S.Ds (c) (a) and (b) (d) None of these.
[80]	Out of the following the one which effects the regression coefficient is

(a) Change of origin only

(β) Change of scale only

(c) Change of scale and origin both

(d) Neither change in origin nor change of scale

[81] The regression equation x and y is $3x + 2y = 100$, the value of b

(a) $-\frac{2}{3}$ (b) $\frac{100}{3}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

[82] In a beauty contest there were 10 competitors. Rank of these candidates are assigned by two judges

A and B. The sum of squares of differences of ranks is 44. The value of rank correlation is:

(a) 0.70   (b) 0.73   (c) 0.80   (d) 0.60

June 17

[83] The coefficient of correlation between the temperature of environment and power consumption is

always:

(a) Positive   (b) Negative   (c) Zero   (d) Equal to 1

[84] If two regression lines are $x + y = 1$ and $x - y = 1$ then mean values of x and y will be:

(a) 0 and 1   (b) 1 and 1   (c) 1 and 0   (d) -1 and -1

[85] The coefficient of correlation between x and y is 0.6. If x and y values are multiplied by -1, then the

coefficient of correlation will be:

(a) 0.6   (b) -0.6   (c) $\frac{1}{0.6}$ (d) 1 - 0.6

ANSWERS

1	A	11	A	21	A	31	A	41	B	51	A	61	C	71	A
2	C	12	A	22	D	32	D	42	A	52	D	62	A	72	B
3	D	13	D	23	C	33	A	43	B	53	C	63	C	73	B
4	B	14	B	24	B	34	C	44	A	54	B	64	C	74	B
5	C	15	D	25	A	35	C	45	C	55	D	65	B	75	C
6	A	16	C	26	A	36	C	46	B	56	B	66	A	76	B
7	C	17	A	27	B	37	D	47	B	57	C	67	C	77	D
8	B	18	D	28	B	38	B	48	B	58	B	68	B	78	C

| 9 | C | 19 | C | 29 | B | 39 | | 49 | B | 59 | B | 69 | B | 79 | A |
| 10 | B | 20 | B | 30 | A | 40 | B | 50 | C | 60 | B | 70 | C | 80 | B |

Ans 39 .: Please refer 2010 - June [34]

81	82	83	84	85
A	B	A	C	A

STUDENT NOTES

UNIT I - INDEX NUMBER

Eg. 1

Compute Fisher's Ideal Index from the following data:

Commodities	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Show how it satisfies the time and factor reversal tests

Solution:

Commodities	P_0	Q_0	P_1	Q_1	P_0Q_0	P_1Q_0	P_0Q_1	P_1Q_1
A	4	3	6	2	12	18	8	12
B	5	4	6	4	20	24	20	24
C	7	2	9	2	14	18	14	18
D	2	3	1	5	6	3	10	5
					52	63	52	59

Ideal Index: $P\,01 = \sqrt{\frac{\Sigma P_1 Q_0}{\Sigma P_0 Q_0} \; X \; \frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_1}} X\,100 = \sqrt{\frac{63}{52} X \frac{59}{52}} x\,100$

$$= \sqrt{1.375}\,X\,100 = 1.172\,X\,100 = 117.3$$

Time Reversal Test:

$$P01 \; X \; P10 = \sqrt{\frac{63}{52} X \frac{59}{52} X \frac{52}{59} X \frac{52}{63}} = \sqrt{1} = 1$$

Time Reversal Test is satisfied.

Factor Reversal Test:

$$P01 \; X \; P01 = \sqrt{\frac{63}{52} X \frac{59}{52} X \frac{52}{59} X \frac{52}{63}} = \sqrt{\frac{59}{52} X \frac{59}{52}} = \frac{59}{52}$$

Since, $\frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0}$ is also equal to 59/52 the Factor Reversal Test is satisfied.

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

Choose the most appropriate option (a) (b) (c) or (d).

1. A series of numerical figures which show the relative position is called

   a) index number   b) relative number   c) absolute number   d) none

2. Index number for the base period is always taken as

   a) 200   b) 50   c) 1   d) 100

3. _____ play a very important part in the construction of index numbers.

   a) weights   b) classes   c) estimations   d) none

4. _____ is particularly suitable for the construction of index numbers.

   a) H.M.   b) A.M.   c) G.M.   d) none

5. Index numbers show _____ changes rather than absolute amounts of change.

   a) relative   b) percentage   c) both   d) none

6. The _____ makes index numbers time-reversible.

   a) A.M.   b) G.M.   c) H.M.   d) none

7. Price relative is equal to

   a) $\dfrac{\text{Price in the given year} \times 100}{\text{Price in the base year}}$ b) $\dfrac{\text{Price in the year base year} \times 100}{\text{Price in the given year}}$

   c) Price in the given year X 100   d) Price in the base year X 100

8. Index number is equal to

   a) sum of price relatives   b) average of the price relatives

   c) product of price relative   d) none

9. The _____ of group indices given the General Index

   a) H.M.   b) G.M.   c) A.M.   d) none

10. Circular Test is one of the tests of

    a) index numbers   b) hypothesis   c) both   d) none

11.	_____ is an extension of time reversal test
	a) Factor Reversal test b) Circular test c) both d) none
12.	Weighted G.M. of relative formula satisfy _____test
	a) Time Reversal Test b) Circular test c) Factor Reversal Test d) none
13.	Factor Reversal test is satisfied by
	a) Fisher's Ideal Index b) Laspeyres Index c) Paasches Index d) none
14.	Laspeyre's formula does not satisfy
	a) Factor Reversal Test b) Time Reversal Test
	c) Circular Test d) all the above
15.	A ratio or an average of ratios expressed as a percentage is called
	a) a relative number b) an absolute number
	c) an index number d) none
16.	The value at the base time period serves as the standard point of comparison
	a) false b) true c) both d) none
17.	An index time series is a list of _____ numbers for two or more periods of time
	a) index b) absolute c) relative d) none
18.	Index numbers are often constructed from the
	a) frequency b) class c) sample d) none
19.	_____ is a point of reference in comparing various data describing individual behaviour.
	a) Sample b) Base period c) Estimation d) none
20.	The ratio of price of single commodity in a given period to its price in the preceding year price is
	called the

(a) base period   (b) price ratio   (c) relative price   (d) none

21. $\dfrac{\text{Sum of all commodity prices in the current year} \times 100}{\text{Sum of all commodity prices in the base year}}$ is

a) Relative Price Index   b) Simple Aggregative Price Index

c) both   d) None

22. Chain index is equal to

a) $\dfrac{\text{link relative of current year} \times \text{chain index of the current year}}{100}$

b) $\dfrac{\text{link relative of previous year} \times \text{chain index of the current year}}{100}$

c) $\dfrac{\text{link relative of current year} \times \text{chain index of the previous year}}{100}$

d) $\dfrac{\text{link relative of previous year} \times \text{chain index of the previous year}}{100}$

23. P_{01} is the index for time

(a) 1 on 0   (b) 0 on 1   (c) 1 on 1   (d) 0 on 0

24. P_{10} is the index for time

(a) 1 on 0   (b) 0 on 1   (c) 1 on 1   (d) 0 on 0

25. When the product of price index and the quantity index is equal to the corresponding value

index then the test that holds is

(a) Unit Test   (b) Time Reversal Test   (c) Factor Reversal Test   (d) none holds

26. The formula should be independent of the unit in which or for which price and quantities are

quoted in

(a) Unit Test   (b) Time Reversal Test   c) Factor Reversal Test   (d) none

27. Laspeyre's method and Paasche's method do not satisfy

(a) Unit Test   (b) Time Reversal Test   c) Factor Reversal Test   (d) b & c

28.	The purpose determines the type of index number to use
	(a) yes (b) no (c) may be (d) may not be
29.	The index number is a special type of average
	(a) false (b) true (c) both (d) none
30.	The choice of suitable base period is at best temporary solution
	(a) true (b) false (c) both (d) none
31.	Fisher's Ideal Formula for calculating index numbers satisfies the _____ tests
	(a) Unit Test (b) Factor Reversal Test (c) both (d) none
32.	Fisher's Ideal Formula dose not satisfy _____ test
	(a) Unit Test (b) Circular Test (c) Time Reversal Test (d) none
33.	_____ satisfies circular test
	a) G.M. of price relatives or the weighted aggregate with fixed weights
	b) A.M. of price relatives or the weighted aggregate with fixed weights
	c) H.M. of price relatives or the weighted aggregate with fixed weights
	d) none
34.	Laspeyre's and Paasche's method _____ time reversal test
	(a) satisfy (b) do not satisfy (c) are (d) are not
35.	There is no such thing as unweighted index numbers
	(a) false (b) true (c) both (d) none
36.	Theoretically, G.M. is the best average in the construction of index numbers but in practice, mostly the A.M. is used
	(a) false (b) true (c) both (d) none
37	Laspeyre's or Paasche's or the Fisher's ideal index do not satisfy
	(a) Time Reversal Test (b) Unit Test (c) Circular Test (d) none
38.	_____ is concerned with the measurement of price changes over a period of years, when it is desirable to shift the base
	(a) Unit Test (b) Circular Test (c) Time Reversal Test (d) none

39. The test of shifting the base is called

(a) Unit Test   (b) Time Reversal Test   (c) Circular Test   (d) none

40. The formula for conversion to current value

a) Deflated value $= \dfrac{\text{Price Index of the current year}}{\text{previous value}}$

b) Deflated value $= \dfrac{\text{Price Index of the current year}}{\text{current value}}$

c) Deflated value $= \dfrac{\text{Price Index of the previous year}}{\text{previous value}}$

d) Deflated value $= \dfrac{\text{Price Index of the previous year}}{\text{previous value}}$

41. Shifted price Index $= \dfrac{\text{Original Price} \times 100}{\text{Price Index of the year on which it has to be shifted}}$

(a) True   (b) false   (c) both   (d) none

42. The number of test of Adequacy is

(a) 2   (b) 5   (c) 3   (d) 4

43. We use price index numbers

(a) To measure and compare prices   (b) to measure prices

(c) to compare prices   (d) none

44. Simple aggregate of quantities is a type of

(a) Quantity control   (b) Quantity indices   (c) both   (d) none

ANSWERS

1. (a)	2. (d)	3. (a)	4. (c)	5. (b)	6. (b)	7. (a)	8. (
9. (c)	10. (a)	11. (b)	12. (a)	13. (a)	14. (d)	15. (c)	16. (
17. (a)	18. (c)	19. (b)	20. (c)	21. (b)	22. (c)	23. (a)	24. (
25. (c)	26. (a)	27. (d)	28. (a)	29. (b)	30. (a)	31. (c)	32. (
33. (a)	34. (b)	35. (a)	36. (b)	37. (c)	38. (b)	39. (c)	40. (
41. (a)	42. (d)	43. (a)	44. (b)				

ADDITIONAL QUESTION BANK

1	Each of the following statements is either True or False write your choice of the answer by writing T for True
	(a) Index Numbers are the signs and guideposts along the business highway that indicate to the businessman how he should drive or manage
	(b) "For Construction index number, the best method on theoretical ground is not the best method from practical point of view".
	(c) Weighting index numbers makes them less representative.
	(d) Fisher's index number is not an ideal index number.
2	Each of the following statements is either True or False. Write your choice of the answer by writing F for false.
	(a) Geometric mean is the most appropriate average to be used for constructing an index number.
	(b) Weighted average of relatives and weighted aggregative methods render the same result.
	(c) "Fisher's Ideal Index Number is a compromise between two well known indices – not a right compromise, economically speaking".
	(d) "Like all statistical tools, index numbers must be used with great caution".
3	The best average for constructing an index numbers is
	(a) Arithmetic Mean (b) Harmonic Mean
	(c) Geometric Mean (d) None of these.
4	The time reversal test is satisfied by
	(a) Fisher's index number. (b) Paasche's index number.
	(c) Laspeyre's index number. (d) None of these.
5	The factor reversal test is satisfied by

(a) Simple aggregative index number.   (b) Paasche's index number.

(c) Laspeyre's index number.   (d) None of these.

6   The circular test is satisfied by

(a) Fisher's index number.   (b) Paasche's index number.

(c) Laspeyre's index number.   (d) None of these

7   Fisher's index number is based on

(a) The Arithmetic mean of Laspeyre's and Paasche's index numbers

(b) The Median of Laspeyre's and Paasche's index numbers

(c) the Mode of Laspeyre's and Paasche's index numbers.

(d) None of these.

8   Paaschee's index is based on

(a) Base year quantities.   (b) Current year quantities

(c) Average of current and base year.   (d) None of these

9   Fisher's ideal index number is

(a) The Median of Laspeyre's and Paasche's index numbers

(b) The Arithmetic Mean of Laspeyre's and Paasche's index numbers

(c) The Geometric Mean of Laspeyre's and Paasche's index numbers

(d) None of these.

10   Price-relative is expressed in term of

(a) $P = \dfrac{P_n}{P_o}$ (b) $P = \dfrac{P_o}{P_n}$ (c) $P = \dfrac{P_n}{P_o} \times 100$ (d) $P = \dfrac{P_o}{P_n} \times 100$

11   Paasehe's index number is expressed in terms of :

(a) $\dfrac{\sum P_n q_n}{\sum P_o q_n}$ (b) $\dfrac{\sum P_o q_o}{\sum P_n q_n}$ (c) $\dfrac{\sum P_n q_n}{\sum P_o q_n} \times 100$ (d) $\dfrac{\sum P_n q_o}{\sum P_o q_o} \times 100$

12   Time reversal Test is satisfied by following index number formula is

(a) Laspeyre's Index number

	(b) Simple Arithmetic Mean of price relative formula	
	(c) Marshall-Edge worth formula.	
	(d) None of these	
13	Cost of Living Index number (C. L. I.) is expressed in terms of :	
	(a) $\dfrac{\sum P_n q_o}{\sum P_o q_o} \times 100$ (b) $\dfrac{\sum P_n q_n}{\sum P_o q_o}$ (c) $\dfrac{\sum P_o q_n}{\sum P_n q_n} \times 100$ (d) None of these.	
~~14~~	~~If the ratio between Laspeyre's index number and Paasche's Index number is 28 : 27. Then the missing figure in the following table P is :~~	
	~~(a) 7 (b) 4 (c) 3 (d) 9~~	
15	If the prices of all commodities in a place have increased 1.25 times in comparison to the base period, the index number of prices of that place now is	
	(a) 125 (b) 150 (c) 225 (d) None of these.	
16	If the index number of prices at a place in 1994 is 250 with 1984 as base year, then the prices have increased on average by	
	(a) 250% (b) 150% (c) 350% (d) None of these.	
17	If the prices of all commodities in a place have decreased 35% over the base period prices, then the index number of prices of that place is now	
	(a) 35 (b) 135 (c) 65 (d) None of these	
18	Link relative index number is expressed for period n is	
	(a) $\dfrac{P_n}{P_{n+1}}$ (b) $\dfrac{P_0}{P_{n-1}}$ (c) $\dfrac{P_n}{P_{n-1}} \times 100$ (d) None of these.	
19	Fisher's Ideal Index number is expressed in terms of :	
	(a) $(P_{on})^F = \sqrt{\text{Laspeyre's Index} \times (\text{Paasche's Index})}$	
	(b) $(P_{on})^F = \text{Laspeyre's Index} \times \text{Paasche's Index}$	
	(c) $(P_{on})^F = \sqrt{\text{Marshall Edge worth Index} \times \text{Paasche's}}$	
	(d) None of these.	
20	Factor Reversal Test According to Fisher is $P_{01} \times Q_{01} =$	

(b) $\dfrac{\sum P_n q_n}{\sum P_o q_o}$	(b) $\dfrac{\sum P_n q_n}{\sum P_o q_o}$	(c) $\dfrac{\sum P_o q_n}{\sum P_n q_n}$ (d) None of these.

21 | Marshall-edge worth Index formula after interchange of p and q is expressed in terms of :

(a) $\dfrac{\sum q_n (P_0 + P_n)}{\sum q_0 (P_0 + P_n)}$

(b) $\dfrac{\sum P_n (q_o + q_n)}{\sum q P_0 (q_o + q_n)}$

(c) $\dfrac{\sum P_0 (q_o + q_n)}{\sum P_n (P_0 + P_n)}$

(d) None of these.

22 | If $\sum P_n q_n = 249$, $\sum P_o q_o = 150$, Paasche's Index Number = 150 and Drobiseh and Bowely's

Index number = 145, then the Fisher's Ideal Index Number is

(a) 75 (b) 60 (c) 145.97 (d) None of these.

23 | Consumer Price index number for the year 1957 was 313 with 1940 as the base year 96 the

Average Monthly wages in 1957 of the workers into factory be Rs. 160/- their real wages is

(a) Rs. 48.40 (b) Rs. 51.12 (c) Rs. 40.30 (d) None of these.

24 | If $\sum P_o q_o = 3500$, $\sum P_n q_o = 3850$, then the Cost of living Index (C.L.I.) for 1950 w.r. to base 1960 is

(a) 110 (b) 90 (c) 100 (d) None of these.

25 | From the following table by the method of relatives using Arithmetic mean the price Index number is

Commodity	Wheat	Milk	Fish	Sugar
Base Price	5	8	25	6
Current Price	7	10	32	12

(a) 140.35 (b) 148.95 (c) 140.75 (d) None of these.

From the Q.No. 26 to 29 each of the following statements is either True or False with your choice of the answer by writing F for False.

26 | (a) Base year quantities are taken as weights in Laspeyre's price Index number.

(b) Fisher's ideal index is equal to the Arithmetic mean of Laspeyre's and Paasche's index numbers.

(c) Laspeyre's index number formula does not satisfy time reversal test.

(d) None of these.

27 | (a) Current year quantities are taken as weights in Paasche's price index number.

	(b) Edge worth Marshall's index number formula satisfies Time, Reversal Test.
	(c) The Arithmetic mean of Laspeyre's and Paasche's index numbers is called Bowely's index no.
	(d) None of these.
28	(a) Current year prices are taken as weights in Paasche's quantity index number.
	(b) Fisher's Ideal Index formula satisfies factor Reversal Test.
	(c) The sum of the quantities of the base period and current period is taken as weights in
	Laspeyre's index number.
	(d) None of these
29	(a) Simple Aggregative and simple Geometric mean of price relatives formula satisfy circular Test.
	(b) Base year prices are taken as weights in Laspeyre's quantity index numbers.
	(c) Fisher's Ideal Index formula obeys time reversal and factor reversal tests.
	(d) None of these.
30	In 1980, the net monthly income of the employee was Rs. 800/- p. m. The consumer price
	index number was 160 in 1980. It rises to 200 in 1984. If he has to be rightly compensated.
	The additional D. A. to be paid to the employee is
	(a) Rs. 175/- (b) Rs. 185/- (c) Rs. 200/- (d) Rs. 125.
31	The simple Aggregative formula and weighted aggregative formula satisfy is
	(a) Factor Reversal Test (b) Circular Test
	(c) Unit Test (d) None of these.
32	"Fisher's Ideal Index is the only formula which satisfies"
	(a) Time Reversal Test (b) Circular Test
	(c) Factor Reversal Test (d) a & c.
33	"Neither Laspeyre's formula nor Paasche's formula obeys" :
	(a) Time Reversal and factor Reversal Tests of index numbers
	(b) Unit Test and circular Tests of index number.
	(c) Time Reversal and Unit Test of index number.
	(d) None of these.
34	Bowley's index number is 150. Fisher's index number is 149.95. Paasche's index number is

(a) 158   (b) 154   (c) 148   (d) 156

35 With the base year 1960 the C. L. I. in 1972 stood at 250. x was getting a monthly Salary of Rs. 500

in 1960 and Rs. 750 in 1972. In 1972 to maintain his standard of living in 1960 x has to receive as

extra allowances of

(a) Rs. 600/-   (b) Rs. 500/-   (c) Rs. 300/-   (d) none of these

36 From the following data base year :-

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Fisher's Ideal Index is

(a) 117.3   (b) 115.43   (c) 118.35   (d) 116.48

37 Which statement is False?

(a) The choice of suitable base period is at best a temporary solution.

(b) The index number is a special type of average.

(c) Those is no such thing as unweighted index numbers

(d) Theoretically, geometric mean is the best average in the construction of index numbers

but in practice, mostly the arithmetic mean is used.

38 Factor Reversal Test is expressed in terms of

(a) $\dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0}$ (b) $\dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0} \times \dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_1}$ (c) $\dfrac{\Sigma P_1 Q_1}{\Sigma Q_0 P_1}$ (d) $\dfrac{\Sigma Q_1 P_0}{\Sigma Q_0 P_0} \times \dfrac{\Sigma P_1 Q_1}{\Sigma Q_0 P_1}$

39 Circular Test is satisfied by

(a) Laspeyre's Index number

(b) Paasche's Index number

(c) The simple geometric mean of price relatives and the weighted aggregative with fixed weights.

(d) None of these

40 From the following data for the 5 groups combined

Group	Weight	Index Number
Food	35	425
Cloth	15	235
Power & Fuel	20	215
Rent & Rates	8	115
Miscellaneous	22	150

The general Index number is

(a) 270   (b) 269.2   (c) 268.5   (d) 272.5

41 From the following data with 1966 as base year

Commodity	Quantity Units	Values (₹)
A	100	500
B	80	320
C	60	150
D	30	360

The price per unit of commodity A in 1966 is

(a) Rs. 5   (b) Rs. 6   (c) Rs. 4   (d) Rs. 12

42 The index number in whole sale prices is 152 for August 1999 compared to August 1998.

During the year there is net increase in prices of whole sale commodities to the extent of

(a) 45%   (b) 35%   (c) 52%   (d) 48%

43 The value Index is expressed in terms of

(a) $\dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0} \times 100$ (b) $\dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0}$ (c) $\dfrac{\Sigma P_0 Q_0}{\Sigma P_1 Q_1} \times 100$ (d) $\dfrac{\Sigma P_0 Q_1 \times \Sigma P_1 Q_1}{\Sigma P_0 Q_0 \times \Sigma P_1 Q_0}$

44 Purchasing Power of Money is

(a) Reciprocal of price index number.

(b) Equal to price index number.

(c) Unequal to price index number

(d) None of these.

45 The price level of a country in a certain year has increased 25% over the base period. The index no is

(a) 25   (b) 125   (c) 225   (d) 2500

46	The index number of prices at a place in 1998 is 355 with 1991 as base. This means
	(a) There has been on the average a 255% increase in prices.
	(b) There has been on the average a 355% increase in price.
	(c) There has been on the average a 250% increase in price.
	(d) None of these.
47	If the price of all commodities in a place have increased 125 times in comparison to the
	base period prices, then the index number of prices for the place is now
	(a) 100 (b) 125 (c) 225 (d) None of the above
48	The wholesale price index number or agricultural commodities in a given region at a given
	date is 280. The percentage increase in prices of agricultural commodities over the base year is :
	(a) 380 (b) 280 (c) 180 (d) 80
49	If now the prices of all the commodities in a place have been decreased by 85% over the
	base period prices, then the index number of prices for the place is now (index number of prices of
	base period = 100)
	(a) 100 (b) 135 (c) 65 (d) None of these.
50.	From the data given below

Commodity	Price Relative	Weight
A	125	5
B	67	2
C	250	3

Then the suitable index number is

(a) 150.9   (b) 155.8   (c) 145.8   (d) None of these.

51	Bowley's Index number is expressed in the form of :
	(a) $\dfrac{\text{Laspeyre's index} + \text{Paasche's index}}{2}$
	(b) $\dfrac{\text{Laspeyre's index} \times \text{Paasche's index}}{2}$
	(c) $\dfrac{\text{Laspeyre's index} - \text{Paasche's index}}{2}$

(d) None of these.

52 From the following data

Commodity	Base Price	Current Pricet
Rice	35	42
Wheat	30	35
Pulse	40	38
Fish	107	120

The simple Aggregative Index is

(a) 115.8   (b) 110.8   (c) 112.5   (d) 113.4

53 With regard to Laspeyre's and Paasche's price index numbers, it is maintained that "If the

prices of all the goods change in the same ratio, the two indices will be equal for them the

weighting system is irrelevant; or if the quantities of all the goods change in the same ratio,

they will be equal, for them the two weighting systems are the same relatively". Then the above

statements satisfy.

(a) Laspeyre's Price index ≠ Paasche's Price Index.

(b) Laspeyre's Price Index = Paasche's Price Index.

(c) Laspeyre's Price Index may be equal Paasche's Price Index.

(d) None of these.

54 The quantity Index number using Fisher's formula satisfies :

(a) Unit Test   (b) Factor Reversal Test.

(c) Circular Test.   (d) Time Reversal Test.

55 For constructing consumer price Index is used :

(a) Marshall Edge worth Method.   (b) Paasche's Method.

(c) Dorbish and Bowley's Method.   (d) Laspeyre's Method.

56 The cost of living Index (C.L.I.) is always :

(a) Weighted index   (b) Price Index.

(c) Quantity Index.   (d) None of these.

57 The Time Reversal Test is not satisfied to :

(a) Fisher's ideal Index.   (b) Marshall Edge worth Method.

(c) Laspeyre's and Paasche Method.   (d) None of these.

58 Given below are the data on prices of some consumer goods and the weights attached to

the various items Compute price index number for the year 1985 (Base 1984 = 100)

Items	Unit	1984	1985	Weight
Wheat	Kg.	0.50	0.75	2
Milk	Litre	0.60	0.75	5
Egg	Dozen	2.00	2.40	4
Sugar	Kg.	1.80	2.10	8
Shoes	Pair	8.00	10.00	1

Then weighted average of price Relative Index is :

(a) 125.43   (b) 123.3   (c) 124.53   (d) 124.52

59 The Factor Reversal Test is as represented symbolically is :

(a) $P_{01} \times Q_{01} = \dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0}$ (b) $I_{01} \times I_{10}$ (c) $\dfrac{\Sigma P_0 Q_0}{\Sigma P_1 Q_1}$ (d) $\sqrt{\dfrac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0} \times \dfrac{\Sigma P_0 Q_1}{\Sigma Q_{10} P_0}}$

60 If the 1970 index with base 1965 is 200 and 1965 index with base 1960 is 150, the index 1970

on base 1960 will be :

(a) 700   (b) 300   (c) 500   (d) 600

61 Circular Test is not met by :

(a) The simple Geometric mean of price relatives

(b) The weighted aggregative with fixed weights.

(c) Laspeyre's or Paasche's or the fisher's Ideal index.

(d) None of these.

62 From the following data

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Then the value ratio is:

(a) $\dfrac{59}{52}$ (b) $\dfrac{49}{47}$ (c) $\dfrac{41}{53}$ (d) $\dfrac{47}{53}$

63 The value index is equal to :

(a) The total sum of the values of a given year multiplied by the sum of the values of the base year.

(b) The total sum of the values of a given year Divided by the sum of the values of the base year.

(c) The total sum of the values of a given year plus by the sum of the values of the base year.

(d) None of these.

64 Time Reversal Test is represented symbolically by :

(a) $P_{01} \times P_{10}$ (b) $P_{01} \times P_{10} = 1$ (c) $P_{01} \times P_{10} \neq 1$ (d) None of these.

65 In 1996 the average price of a commodity was 20% more than in 1995 but 20% less than in 1994;

and more over it was 50% more than in 1997 to price relatives using 1995 as base (1995 price

relative 100) Reduce the data is :

(a) 150, 100, 120, 80 for (1994–97)   (b) 135, 100, 125, 87 for (1994–97)

(c) 140, 100, 120, 80 for (1994–97)   (d) None of these.

66 From the following data

Commodities	Base Year 1922 Price (₹)	Current Year 1934 Price
A	6	10
B	2	2
C	4	6
D	11	12
E	8	12

The price index number for the year 1934 is :

(a) 140   (b) 145   (c) 147   (d) None of these.

67 From the following data

Commodities	Base Price 1964	Current Price 1968
Rice	36	54
Pulse	30	50
Fish	130	155
Potato	40	35
Oil	110	110

The index number by unweighted methods :

(a) 116.8   (b) 117.25   (c) 115.35   (d) 119.37

68 The Bowley's Price index number is represented in terms of :

(a) A.M. of Laspeyre's and Paasche's Price index number.

(b) G.M. of Laspeyre's and Paasche's Price index number.

(c) A.M. of Laspeyre's and Walsh's price index number.

(d) None of these.

69 Fisher's price index number equal is :

(a) G.M. of Kelly's price index number and Paasche's price index number.

(b) G.M. of Laspeyre's and Paasche's Price index number.

(c) G.M. of Bowley's price index number and Paasche's price index number.

(d) None of these.

70 ~~The price index number using simple G.M. of the n relatives is given by :~~

71 The price of a number of commodities are given below in the current year 1975 and base year 1970.

Commodities	A	B	C	D	E	F
Base Price	45	60	20	50	85	120
Current Price	55	70	30	75	90	130

For 1975 with base 1970 by the Method of price relatives using Geometrical mean, the price index is :

(a) 125.3   (b) 124.3   (c) 128.8   (d) None of these.

72 From the following data

Group	A	B	C	D	E	F
Group Index	120	132	98	115	108	95
Weight	6	3	4	2	1	4

The general Index I is given by :

(a) 111.3   (b) 113.45   (c) 117.25   (d) 114.75

73   The price of a commodity increases from Rs. 5 per unit in 1990 to Rs. 7.50 per unit in 1995 and the

quantity consumed decreases from 120 units in 1990 to 90 units in 1995. The price and quantity

in 1995 are 150% and 75% respectively of the corresponding price and quantity in 1990.

Therefore, the product of the price ratio and quantity ratio is :

(a) 1.8   (b) 1.125   (c) 1.75   (d) None of these

74   Test whether the index number due to Walsh give by :

$$I = \frac{\Sigma P_1 \sqrt{Q_0 Q_1}}{\Sigma P_0 \sqrt{Q_0 Q_1}} \times 100 \text{ Satisfies is :-}$$

(a) Time reversal Test.   (b) Factor reversal Test.

(c) Circular Test.   (d) None of these.

75.   From the following data

Group	Weight	Index Number Base : 1952–53 = 100
Food	50	241
Clothing	2	21
Fuel and Light	3	204
Rent	16	256
Miscellaneous	29	179

The Cost of living index numbers is :

(a) 224.5   (b) 223.91   (c) 225.32   (d) None of these.

76   Consumer price index number goes up from 110 to 200 and the Salary of a worker is also raised

from Rs. 325 to Rs. 500. Therefore, in real terms, to maintain his previous standard of living he

should get an additional amount of :

(a) Rs. 85   (b) Rs. 90.91   (c) Rs. 98.25   (d) None of these.

77	The prices of a commodity in the year 1975 and 1980 were 25 and 30 respectively taking 1980 as base year the price relative is :
	(a) 109.78 (b) 110.25 (c) 113.25 (d) None of these.
78	The average price of certain commodities in 1980 was Rs. 60 and the average price of the same commodities in 1982 was Rs. 120. Therefore, the increase in 1982 on the basis of 1980 was 100%. 80 The decrease in 1980 with 1982 as base is: using 1982, comment on the above statement is :
	(a) The price in 1980 decreases by 60% using 1982 as base.
	(b) The price in 1980 decreases by 50% using 1982 as base.
	(c) The price in 1980 decreases by 90% using 1982 as base.
	(d) None of these.
79	Cost of Living Index (C.L.I.) numbers are also used to find real wages by the process of
	(a) Deflating of Index number. (b) Splicing of Index number.
	(c) Base shifting. (d) None of these.
80	From the following data

Commodities		A	B	C	D
1992 Base	Price	3	5	4	1
	Quantity	18	6	20	14
1993 Current Year	Price	4	5	6	3
	Quantity	15	9	26	15

The Passche price Index number is :

(a) 146.41   (b) 148.25   (c) 144.25   (d) None of these.

81 From the following data

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	7	17	13	25
B	6	23	7	25
C	11	14	13	15
D	4	10	8	8

The Marshall Edge Worth Index number is :

(a) 148.25   (b) 144.19   (c) 147.25   (d) None of these.

82 The circular Test is an extension of

(a) The time reversal Test.   (b) The factor reversal Test.

(c) The unit Test.   (d) None of these.

83 Circular test, an index constructed for the year 'x' on the base year 'y' and for the year 'y' on the base

year 'z' should yield the same result as an index constructed for 'x' on base year 'z' i.e. $I_{01} \times I_{12} \times I_{20}$ equalis

(a) 3   (b) 2   (c) 1   (d) None of these.

84 In 1976 the average price of a commodity was 20% more than that in 1975 but 20% less than that

in 1974 and more over it was 50% more than that in 1977. The price relatives using 1975 as

base year (1975 price relative = 100) then the reduce date is :

(a) 8,.75   (b) 150,80   (c) 75,125   (d) None of these.

85 Time Reversal Test is represented by symbolically is :

(a) $P_{01} \times Q_{01} = 1$ (b) $I_{01} \times I_{10} = 1$

(c) $I_{01} \times I_{12} \times I_{23} \times \ldots I_{(n-1)n} \times I_{n0} = 1$ (d) None of these.

86 The prices of a commodity in the years 1975 and 1980 were 25 and 30 respectively, taking 1975 as

base year the price relative is :

(a) 120   (b) 135   (c) 122   (d) None of these.

87 From the following data

Year	1992	1993	1995	1996	1997
Link Index	100	103	105	112	108

(Base 1992 = 100) for the years 1993–97. The construction of chain index is :

(a) 103, 100.94, 107, 118.72   (b) 103, 108.15, 121.3, 130.82

(c) 107, 100.25, 104, 118.72   (d) None of these

88 During a certain period the cost of living index number goes up from 110 to 200 and the

salary of a worker is also raised from Rs. 330 to Rs. 500. The worker does not get really gain.

Then the real wages decreased by :

(a) Rs. 45.45   (b) Rs. 43.25   (c) Rs. 100   (d) None of these

89 Net monthly salary of an employee was Rs. 3000 in 1980. The consumer price index number

in 1985 is 250 with 1980 as base year. If the has to be rightly compensated then, 7th dearness

allowances to be paid to the employee is :

(a) Rs. 4.800.00   (b) Rs. 4,700.00   (c) Rs. 4,500.0   (d) None of these.

90 Net Monthly income of an employee was Rs. 800 in 1980. The consumer price Index number

was 160 in 1980. It is rises to 200 in 1984. If he has to be rightly compensated. The additional

dearness allowance to be paid to the employee is :

(a) Rs. 240   (b) Rs. 275   (c) Rs. 250   (d) None of these.

91 When the cost of Tobacco was increased by 50%, a certain hardened smoker, who

maintained his formal scale of consumption, said that the rise had increased his cost of

living by 5%. Before the change in price, the percentage of his cost of living was due to

buying Tobacco is

(a) 15%   (b) 8%   (c) 10%   (d) None of these.

92 If the price index for the year, say 1960 be 110.3 and the price index for the year, say 1950

be 98.4, then the purchasing power of money (Rupees) of 1950 will in 1960 is

(a) Rs. 1.12   (b) Rs. 1.25   (c) Rs. 1.37   (d) None of these.

93 If $\sum P_0 Q_0 = 1360$, $\sum P_n Q_0 = 1900$, $\sum P_0 Q_n = 1344$, $\sum P_n Q_n = 1880$ then the Laspeyre's Index number is

(a) 0.71   (b) 1.39   (c) 1.75   (d) None of these.

94 The consumer price Index for April 1985 was 125. The food price index was 120 and

other items index was 135. The percentage of the total weight of the index is

(a) 66.67   (b) 68.28   (c) 90.25   (d) None of these

95 The total value of retained imports into India in 1960 was Rs. 71.5 million per month. The

corresponding total for 1967 was Rs. 87.6 million per month. The index of volume of retained

imports in 1967 composed with 1960 (= 100) was 62.0. The price index for retained inputs

for 1967 our 1960 as base is

(a) 198.61   (b) 197.61   (c) 198.25   (d) None of these.

96 During the certain period the C.L.I. goes up from 110 to 200 and the Salary of a worker is

also raised from 330 to 500, then the real terms is

(a) Loss by Rs. 50   (b) Loss by 75   (c) Loss by Rs. 90   (d) None of these.

| 97 | From the following data |

Commodities	Q_0	P_0	Q_1	P_1
A	2	2	6	18
B	5	5	2	2
C	7	7	4	24

Then the fisher's quantity index number is

(a) 87.34   (b) 85.24   (c) 87.25   (d) None of these

| 98 | From the following data |

Then index numbers from G. M. Method is :

(a) 181.66   (b) 185.25   (c) 181.75   (d) None of these

| 99 | Using the following data |

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
X	4	10	6	15
Y	6	15	4	20
Z	8	5	10	4

the Paasche's formula for index is :

(a) 125.38   (b) 147.25   (c) 129.8   (d) None of these

| 100 | Group index number is represented by |

(a) $\dfrac{\text{Price Relative for the year}}{\text{Price Relative for the previous year}} \times 100$

(b) $\dfrac{\Sigma(\text{Price Relative} \times w)}{\Sigma w}$

(c) $\dfrac{\Sigma(\text{Price Relative} \times w)}{\Sigma w} \times 100$

(d) None of these.

ANSWERS

1. (a)	2. (c)	3. (c)	4. (a)	5. (a)
6. (d)	7. (d)	8. (b)	9. (c)	10. (c)
11. (c)	12. (c)	13. (a)	14. (b)	15. (c)
16. (b)	17. (c)	18. (c)	19. (a)	20. (b)
21. (a)	22. (d)	23. (b)	24. (a)	25. (b)
26. (b)	27. (d)	28. (c)	29. (d)	30. (c)
31. (b)	32. (d)	33. (a)	34. (a)	35. (b)
36. (a)	37. (c)	38. (a)	39. (c)	40. (b)
41. (a)	42. (c)	43. (a)	44. (a)	45. (b)
46. (a)	47. (c)	48. (c)	49. (c)	50. (a)
51. (a)	52. (b)	53. (b)	54. (d)	55. (d)
56. (a)	57. (c)	58. (b)	59. (a)	60. (b)
61. (c)	62. (a)	63. (b)	64. (b)	65. (a)
66. (d)	67. (a)	68. (a)	69. (b)	70. (b)
71. (b)	72. (a)	73. (b)	74. (a)	75. (d)
76. (b)	77. (d)	78. (b)	79. (a)	80. (a)
81. (b)	82. (a)	83. (c)	84. (b)	85. (b)
86. (a)	87. (b)	88. (c)	89. (c)	90. (a)
91. (c)	92. (a)	93. (b)	94. (a)	95. (b)
96. (a)	97. (a)	98. (a)	99. (d)	100. (b)

STUDENT NOTES

CH – 6	UNIT II - TIME SERIES	

GRAPHICAL METHOD

Q 1. *The following are figures of a Sale for the last nine years. Determine the trend by line*

by the freehand method.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Sale in lac Units	75	95	115	65	120	100	150	135	175

The trend line drawn by the freehand method can be extended to predicted values. However, since the freehand curve fitting is too subjective, the method should not be used as basis for predictions.

METHODS OF SEMI AVERAGES: Under this method the whole time series data is classified into two equal parts and the averages for each half are calculated. If the data is for even number of years, it is easily divided into two. If the data is for odd number of years, then the middle year of the time series is left and the two halves are constituted with the period on each side of the middle year.The arithmetic mean for a half is taken to be representative of the value corresponding to the midpoint of the time interval of that half. Thus we get two points. These two points are plotted on a graph and then are joined by straight line which is our

	required trend line.
2.	*Fit a trend line to the following data by the method of Semi-averages.*

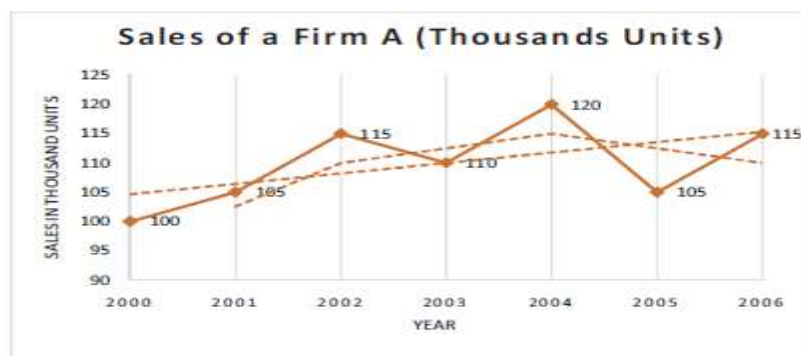| Year	2000	2001	2002	2003	2004	2005	2006
Sale in lac Units	100	105	115	110	120	105	115

Solution

Since the data consist of seven Years, the middle year shall be left out and an average of the

first three years and last three shall be obtained. The average of first three years is $\frac{100+105+115}{3}$ or

$$\frac{320}{3}$$

or 106.67 and the average of last three years $\frac{120+105+115}{3}$ or $\frac{340}{3}$ or 133.33

MOVING AVERAGE METHOD: A moving average is an average (Arithmetic mean) of fixed

number of items (known as periods) which moves through a series by dropping the first item of

the previously averaged group and adding the next item in each successive average. The value so

computed is considered the trend value for the unit of time falling at the centre of the period

used in the calculation of the average.

In case the period is odd: If the period of moving average is odd for instance for computing 3

Yearly moving average, the value of 1st, 2nd and 3rd years are added up and arithmetic mean is

found out and the answer is placed against the 2nd year; then value of 2nd, 3rd and 4th years up

are added and arithmetic mean is derived and this average is placed against 3rd year (i.e. the

middle of 2nd, 3rd and 4th) and so on.

In case of even number of years: If the period of moving average is even for instance for

computing 4 yearly moving average, the value of 1st, 2nd, 3rd and 4th years are added up&

found out and answer is placed against the middle of 2nd and 3rd year. The second average is

arithmetic mean is placed against middle of 3rd & 4th year. As this would not coincide with a

period of a given time series an attempt is made to synchronise them with the original data by

taking a two period average of the moving averages and placing them in between the periods.

corresponding time This technique is called centring& the corresponding moving averages are

called moving average centred.

Q 3. *The wages of certain factory workers are given as below. Using 3 yearly moving average indicate the trend in wages*

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Wages	1200	1500	1400	1750	1800	1700	1600	1500	1750

Solution

Table: Calculation of Trend Values by method of 3 yearly Moving Average

Year	Wages	3 yearly moving totals	3 yearly moving average i.e. trend
2004	1200	–	–
2005	1500	4100	1366.67
2006	1400	4650	1550
2007	1750	4950	1650
2008	1800	5250	1750
2009	1700	5100	1700
2010	1600	4800	1600
2011	1500	4850	1616.67
2012	1750	–	–

Q 4. *Calculate 4 yearly moving average of the following data.*

Year	2005	2006	2007	2008	2009	2010	2011	2012
Wages	1150	1250	1320	1400	1300	1320	1500	1700

Solution (First Method):

Table: Calculation of 4 year Centred Moving Average

Year (1)	Wages (2)	4 yearly moving total (3)	2 year moving total of col. 3 (centred) (4)	4 yearly moving average centred (5) [col. 4/8]
2005	1,150	–	–	–
2006	1,250	–	–	–
		5,120		
2007	1,320		10,390	1,298.75
		5,270		
2008	1,400		10,610	1,326.25
		5,340		
2009	1,300		10,860	1,357.50
		5,520		
2010	1,320		11,340	1,417.50
		5,820		
2011	1,500			
2012	1,700			

Second Method:

Calculation of 4 year Centred Moving Average

Year	Wages	4 yearly moving total (3)	4 yearly moving average (4)	2 year moving total of col. 4 (centered) (5)	4 year centered moving average (col. 5/2)	
2005	1,150	–	–	–	–	
2006	1,250	–	–	–	–	–
		5,120	1,280	–	–	
2007	1,320			2,597.75	1,298.75	
		5,270	1,317.5	–	–	
2008	1,400			2,652.5	1,326.25	
		5,340	1,335	–	–	
2009	1,300			2,715	1,357.50	
		5,520	1,380	–	–	
2010	1,320			2,835	1,417.50	
		5,820	1,455	–	–	
2011	1,500					
2012	1,700					

Calculate five yearly moving averages for the following data.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Value	123	140	110	98	104	133	95	105	150	135

Solution

Table: Computation of Five Yearly Moving Averages

Year	Value ('000 ₹)	5 yearly moving totals ('000 ₹)	5 yearly moving average ('000 ₹)
2003	123	–	–
2004	140	–	–
2005	110	575	115
2006	98	585	117
2007	104	540	108
2008	133	535	107
2009	95	587	117.4
2010	105	618	123.6
2011	150	–	–
2012	135	–	–

LEAST SQUARE METHOD

The method of least squares as studied in regression analysis can be used to find the trend lineof

best fit to a time series data.

The regression trend line (Y) is defined by the following equation – Y = a + bX

where Y = predicted value of the dependent variable

a = Y axis intercept or the height of the line above origin (i.e. when X = 0, Y = a)

b = slope of the regression line (it gives the rate of change in Y for a given change in X) (when b

Is positive the slope is upwards, when b is negative, the slope is downwards) X = independent

variable (which is time in this case)

To estimate the constants a and b, the following two equations have to be solved simultaneously

$\Sigma Y = na + B\sigma x$

$\Sigma XY = a\Sigma X + b\Sigma X^2$

To simplify the calculations, if the mid point of the time series is taken as origin, then the negative values in the first half of the series balance out the positive values in the second half so that $\Sigma x = 0$. In this case the above two normal equations will be as follows -

$\Sigma Y = na$

$\Sigma XY = b\Sigma X^2$

In such a case the values of a and b can be calculated as under -

Since $\Sigma Y = na$,

Since $\Sigma XY = b\Sigma X^2$

$b = \frac{\Sigma XY}{EX^2}; a = \frac{\Sigma Y}{n}$

Q 6.	*Fit a straight line trend to the following data by Least Square Method and estimate the sale for the year 2012.*

Year	2005	2006	2007	2008	2009	2010
Sale (in'000s)	70	80	96	100	95	114

Solution:

Table: Calculation of trend line

Year	Sales Y	Deviations from 2007.5	Deviations multiplied by 2 (X)	X²	XY
2005	70	-2.5	-5	25	-350
2006	80	-1.5	-3	9	-240
2007	96	-.5	-1	1	-96
2008	100	+.5	+1	1	100
2009	95	+1.5	+3	9	285
2010	114	+2.5	+5	25	570
	$\Sigma Y = 555$			$\Sigma X^2 = 70$	$\Sigma XY = 269$

$N = 6$

Equation of the straight line trend is $Yo = a + bX$

$a = \frac{\Sigma Y}{N} = \frac{555}{6} = 92.5; \quad b = \frac{\Sigma XY}{\Sigma X^2} = \frac{269}{70} = 3.843$

Trend equation is $Yc = 92.5 + 3.843X$

	For 2012, X = 9
	$Y_{2012} = 92.5 + 3.843 \times 9 = 92.5 + 34.587$
	= 126.59 (in '000 Rs.)
Q 7.	*Fit a straight line trend to the following data and estimate the likely profit for the year 2012.*
	Also calculate the trend values.
Solution:	**Table: Calculation of Trend and Trend Values**

Year	Profit Y	Deviation from 2006 X	X^2	XY	Trend Values ($Y_c = a + bX$) [Yc= 76 + 4.85X]
2003	60	-3	9	-180	76 + 4.85 (-3) = 61.45
2004	70	-2	4	-144	76 + 4.85 (-2) = 66.30
2005	75	-1	1	-75	76 + 4.85 (-1) = 70.15
2006	65	0	0	0	76 + 4.85 (0) = 76
2007	80	1	1	80	76 + 4.85(1) = 80.85
2008	85	2	4	170	76 + 4.85 (2) = 85.70
2009	95	3	9	285	76 + 4.85 (3) = 90.55
	$\sum y = 532$		$\sum X^2 = 28$	$\sum XY = 136$	

	N = 7
	The equation for straight line trend is $Y_c = a + bX$
	Where
	$a = \frac{\sum Y}{N} = \frac{555}{6} = 92.5$
	$b = \frac{\sum X}{\sum X^2} = \frac{269}{70} = 3.843$
	The trend equation $Y_c = 92.5 + 3.843.X$
	2012, x = 6 (2012 - 2006) $Y_c = 76 + 4.85(6) = 76 + 29.10$
	= 105.10
	The estimated profit for the year 2012 is Rs. 105.10 lakhs.
Example:	*Calculate Seasonal Indices for each quarter from the following percentages of whole sale price*
	indices to their moving averages.

Year	Quarter			
	I	II	III	IV
2003	-	-	11.0	11.0
2004	12.5	13.5	15.5	14.5
2005	16.8	15.2	13.1	15.3
2006	11.2	11.0	12.4	13.2
2007	10.5	13.3	-	

Solution

Year	Quarter			
	I	II	III	IV
Quarterly Total	51.0	53.0	52.0	54.0
Quarterly Average	12.75	13.25	13.0	13.5

Average of the Quarterly Averages $= \dfrac{52.5}{4} = 13.125$

Year	Quarter			
	I	II	III	IV
Seasonal Indices	$\dfrac{12.75 \times 100}{13.125}$ $= 97.143$	$\dfrac{13.25 \times 100}{13.125}$ $= 100.952$	$\dfrac{13.0 \times 100}{13.125}$ $= 97.143$	$\dfrac{13.5 \times 100}{13.125}$ $= 102.857$

Seasonal Indices are calculated by converting the respective quarterly averages on the basis that

the average of the quarterly average $= 100$

Q 9. *Calculate 5- year weighted moving averages for the following data, using weights 1, 1, 3, 2*

respectively:

Year	1	2	3	4	5	6	7	8	9	10
Codded Sales	40	33	72	81	76	68	91	87	98	97

Solution

Year I	Sales II	5- Year Weighted Average	IV
1	40	–	–
2	33	–	–
3	72	$\frac{1}{8}\left(40\times1+33\times1+72\times3+81\times2+76\times1\right)$	= 65.8
4	81	$\frac{1}{8}\left(33\times1+72\times1+81\times3+76\times2+68\times1\right)$	= 71.00
5	76	$\frac{1}{8}\left(72\times1+81\times1+76\times3+68\times2+91\times1\right)$	= 76.00
6	68	$\frac{1}{8}\left(81\times1+76\times1+68\times3+91\times2+87\times1\right)$	= 78.750
7	91	$\frac{1}{8}\left(76\times1+68\times1+91\times3+87\times2+90\times1\right)$	= 86.125
8	87	$\frac{1}{8}\left(68\times1+91\times1+87\times3+98\times2+97\times1\right)$	= 89.125
9	98	–	–
10	97	–	–

Q 10. *Assuming no trend, calculate Seasonal variation indices for the following data.*

Year	Quarterly Data			
	Q1	Q2	Q3	Q4
2013	3.7	4.1	3.3	3.5
2014	3.7	3.9	3.6	3.6
2015	4.0	4.1	3.3	3.1
2016	3.3	4.4	4.0	4.0

Solution:

	Quarterly Data			
	Q1	Q2	Q3	Q4
	3.7	4.1	3.3	3.5
	3.7	3.9	3.6	3.6
	4.0	4.1	3.3	3.1
	3.3	4.4	4.0	4.0
Quarterly Total	14.7	16.5	14.2	14.2
Quarterly Average	3.675	4.125	3.55	3.55

Average of Quarterly Averages $= \frac{3.675+4.125+3.55+3.55}{4} = \frac{14.9}{4} = 3.725$

Q 11. *Calculate the Seasonal Indices from the following ratio to moving averages values expressed in Percentage*

Year	Seasons		
	Summer	Rain	Winter
2009	–	101.75	107.14
2010	96.18	92.30	114.00
2011	92.45	95.20	118.18

Solution:

Year	Seasons			
	Summer	Rain	Winter	
2009	–	101.75	107.14	
2010	96.18	92.30	114.00	
2011	92.45.	95.20	118.18	
Total	188.63	289.25	339.832	
Average	94.315	96.417	113.107	303.839
Constructed Seasonal Index	93.127	95.202	111.682	

Correction Factor $= \frac{300}{303.839} = 0.9874$

Q 12. **From the following data, calculate the trend values, using Four yearly moving average.**

Years	2008	2009	2010	2011	2012	2013	2014	2015	2016
Values	506	620	1036	673	588	696	1116	738	663

Solution :

Year	Values	4 Yearly Moving Totals (a)	2 Period Moving Total of (a)	4 Yearly Moving Averages
2008	506	–	–	–
2009	620	–	–	–
2010	1036	2835	5752	719.0
2011	673	2917	5910	738.8
2012	588	2993	6066	758.3
2013	696	3073	6211	776.4
2014	1116	3138	6311	793.9
2015	738	3213	–	–
2016	663	–	–	–

"PRACTICE & PRACTICE MAKES STATS PERFECT"

Set A – (Theory Question)

Choose the most appropriate option (a) or (b) or (c) or (d).

1. An orderly set of data arranged in accordance with their time of occurrence is called:

   (a) Arithmetic series   (b) Harmonic series   (c) Geometric series   (d) Time series

2. A time series consists of:

   (a) Short-term variations   (b) Long-term variations

   (c) Irregular variations   (d) All of the above

3. The graph of time series is called:

   (a) Histogram   (b) Straight line   (c) Histogram   (d) Ogive

4. Secular trend can be measured by:

   (a) Two methods   (b) Three methods

   (d) Five methods   (d) Five methods

5. The secular trend is measured by the method of semi-averages when:

   (a) Time series based on yearly values

(b) Trend is linear

(c) Time series consists of even number of values

(d) None of them

6. Increase in the number of patients in the hospital due to heat stroke is:

a) Secular trend   (b) Irregular variation

(c) Seasonal variation   (d) Cyclical variation

7. The systematic components of time series which follow regular pattern of variations are called:

(a) Signal   (b) Noise

(c) Additive model   (d) Multiplicative model

8. The unsystematic sequence which follows irregular pattern of variations is called:

(a) Noise   (b) Signal   (c) Linear   (d) Non-linear

9. In time series seasonal variations can occur within a period of:

(a) Four years   (b) Three years   (c) One year   (d) Nine years

10. Wheat crops badly damaged on account of rains is:

(a) Cyclical movement   (b) Random movement

(c) Secular trend   (d) Seasonal movement

11. The method of moving average is used to find the:

(a) Secular trend   (b) Seasonal variation

(c) Cyclical variation   (d) Irregular variation

12. Most frequency used mathematical model of a time series is:

(a) Additive model   (b) Mixed model

(c) Multiplicative model   (d) Regression

13. A time series consists of:

(a) No mathematical model   (b) One mathematical model

(c) Two mathematical models   (d) Three mathematical models

14. In semi-averages method, we decide the data into:

(a) Two parts   (b) Two equal parts   (c) Three parts   (d) Difficult to tell

15. Moving average method is used for measurement of trend when:

(a) Trend is linear   (b) Trend is non-linear

(c) Trend is curvi linear   (d) None of them

16. When the trend is of exponential type, the moving averages are to be computed by using:

(a) Arithmetic mean   (b) Geometric mean

(c) Harmonic mean   (d) Weighted mean

17. The long term trend of a time series graph appears to be:

(a) Straight-line   (b) Upward

(c) Downward   (d) Parabolic curve or third degree curve

18. Indicate which of the following an example of seasonal variations is:

(a) Death rate decreased due to advance in science

(b) The sale of air condition increases during summer

(c) Recovery in business

(d) Sudden causes by wars

19. The most commonly used mathematical method for measuring the trend is:

(a) Moving average method   (b) Semi average method

(c) Method of least squares   (d) None of them

20. A trend is the better fitted trend for which the sum of squares of residuals is:

(a) Maximum   (b) Minimum   (c) Positive   (d) Negative

21. Decomposition of time series is called:

(a) Historigram   (b) Analysis of time series

(c) Histogram   (d) Detrending

22. The fire in a factory is an example of:

(a) Secular trend   (b) Seasonal movements

(c) Cyclical variations   (d) Irregular variations

23. Increased demand of admission in the subject of computer in Uttar Pradesh is:

(a) Secular trend   (b) Cyclical trend   (c) Seasonal trend   (d) Irregular trend

24. Damages due to floods, droughts, strikes fires and political disturbances are:

(a) Trend   (b) Seasonal   (c) Cyclical   (d) Irregular

25.	The general pattern of increase or decrease in economics or social phenomena is shown by:

(a) Seasonal trend   (b) Cyclical trend   (c) Secular trend   (d) Irregular trend

26.	In moving average method, we cannot find the trend values of some:

(a) Middle periods   (b) End periods

(c) Starting periods   (d) Between extreme periods

27.	Moving-averages:

(a) Give the trend in a straight line   (b) Measure the seasonal variations

(c) Smooth-out the time series   (d) None of them

28.	The rise and fall of a time series over periods longer than one year is called:

(a) Secular trend   (b) Seasonal variation

(c) Cyclical variation   (d) Irregular variations

29.	A time series has:

(a) Two Components   (b) Three Components

(c) Four Components   (d) Five Components

30.	The multiplicative time series model is:

(a) $Y = T + S + C + I$ (b) $Y = TSCI$ (c) $Y = a + bx$ (d) $y = a + bx + C \times 2$

31.	The additive model of Time Series

(a) $Y = T + S + C + I$ (b) $Y = TSCI$ (c) $Y = a + bx$ (d) $y = a + bx + C \times 2$

32.	A pattern that is repeated throughout a time series and has a recurrence period of at most one year is called:

(a) Cyclical variation   (b) Irregular variation

(c) Seasonal variation   (d) Long term variation

33.	If an annual time series consisting of even number of years is coded, then each coded interval is equal to:

(a) Half year   (b) One year

(c) Both (a) and (b)   (d) Two years

34.	In semi averages method, if the number of values is odd then we drop:

| | (a) First value | (b) Last value | (c) Middle value | (d) Middle two values |

35. The trend values in freehand curve method are obtained by:

(a) Equation of straight line   (b) Graph

(c) Second degree parabola   (d) All of the above

ANSWERS

SET - A

1. (d)	2. (d)	3. (c)	4. (c)	5. (b)	6. (c)	7. (a)	8. (a)	9. (c)	10. (b)
11. (a)	12. (c)	13. (c)	14. (b)	15. (a)	16. (d)	17. (b)	18. (c)	19. (b)	20. (b)
21. (d)	22. (d)	23. (b)	24. (d)	25. (b)	26. (c)	27. (c)	28. (c)	29. (c)	30. (b)
31. (a)	32. (c)	33. (c)	34. (c)	35. (b)					

"KAR LO PAST APNI MUTHI ME"

Past Exam Questions

Nov 06

[1] The number of test of Adequacy is :

(a) 2   (b) 3   (c) 4   (d) 5

[2] The consumer price index for 2006 on the basis of 2005 from the following data is :

Commodities	Quantities		Price in	Prices in
	consumed in			
	2005		2005	2006
A	6		5.75	6.00W
B	6		5.00	8.00
C	1		6.00	9.00
D	6		8.00	10.00
E	4		2.00	1.50
F	1		20.00	15.00

| | |
(a) 128.77   (b)108.77   (c) 138.77   (d) 118.77

[3] Suppose a business executive was earning Rs. 2,050 in the base period, what should be his salary in the current period if his standard of living is to remain the same? Given $\sum W = 25$ and $\sum IW = 3544$:

(a) Rs. 2096   (b) Rs.2906   (c) Rs. 2106   (d) Rs. 2306

Feb 07

[4] Bowley's index number is expressed in terms of:

(a) $\dfrac{\text{Laspeyre's + Paasche's}}{2}$

(b) $\dfrac{\text{Laspeyre's} \times \text{Paasche's}}{2}$

(c) $\dfrac{\text{Laspeyre's} - \text{Paasche's}}{2}$

(d) None of these

[5] Fisher's ideal formula for calculating index number satisfies the ____ :

(a) Unit Test   (b) Factor Reversal Test   (c) Both (a) & (b)   (d) None of these

[6] Calculate the Fisher ideal index from the following data :

	Price (Rs.)		Quantity ('000 kg.)	
Commodity	2004	2005	2004	2005
Rice	9.3	4.5	100	90
Wheat	6.4	3.7	11	10
Pulse	5.1	2.7	5	3

(a) 49.13   (b) 48.13   (c) 84.13   (d) 46.12

May 07

[7] Circular Test is satisfied by :

(a) Paasche's Index Number.

(b) The simple geometric mean of price relatives and the weighted aggregative with fixed weights

(c) Laspeyre's Index Number

(d) None of these

[8] From the following data :

Group:	A	B	C	D	E	F
Group Index :	120	132	98	115	108	95
Weight:	6	3	4	2	1	4

The general index is given by :

(a) 113.54   (b) 115.30   (c) 117.92   (d) 111.30

Aug 07

[9] Cost of living index numbers are also used to find real wages by the process of:

(a) Base shifting   (b) Splicing of index numbers

(c) Deflating of index numbers   (d) None of these

[10] The prices of a commodity in the year 1975 and 1980 were 25 and 30 respectively. Taking 1980 as

the base year the price relative is:

(a) 113.25   (b) 83.33   (c) 109.78   (d) None

[11] From the following data

Base Year		Current Year		
Commodity	Price	Quantity	Price	Quantity
A	7	17	13	25
B	6 ,	23	7	25

| C | 11 | 14 | 13 | 15 |
| D | 4 | 10 | 8 | 8 |

The Marshal Edgeworth index number is :

(a) 144.19   (b) 143.91   (c) 4900   (d) 140.31

Nov 07

[12] Net monthly salary of an employee was Rs. 3,000 in 1980. The consumer price index number in

1985 is 250 with 1980 as base year. If he has to be rightly compensated, then the Dearness Allowance to

be paid to the employee is:

(a) Rs. 4,200   (b) Rs. 4,500   (c) Rs. 4,900   (d) Rs. 7,500

[13] P_{10} is the index for time :

(a) 0 on 1   (b) 1 on 0   (c) 1 on 1   (d) 0 on 0

Feb 08

[14] An enquiry into the budgets of middle class families in a village gave the following information :

Expenses on:	Food	Rent	Clothing	Fuel	Others
Weight	30%	15%	20%	10%	25%
Price in 987:	100	20	70	20	40
Price in 2005:	90	20	60	10	55

$\sum PW = 10101.5$, $\sum W \log P = 199.494$. The price index number based on Weighted Arithmetic Mean

of price relatives is :

(a) 111.015   (b) 101.015   (c) 0.0197   (d) None

[15] Shifted Price index

$$= \frac{\text{Original Price Index}}{\text{Price index of the year on which it has to be shifted}} \times 100$$

(a) True   (b) False   (c) Partly True   (d) Partly False

[16] Given the following information

Commodity	2000		2003	
	Price	Quantity	price	Quantity
A	2	74	3	82
B	5	125	4	140
C	7	40	6	33

Which of the following is true :

(a) Marshall Edgeworth index for 2003 is 105.13

(b) Fisher's index for 2003 is 90.15.

(c) Marshall Edgeworth Index Number is good approximation to Fisher's Index Number

(d) None of these

June 08

[17] Laspeyare's and Paasche's Method _____ Time Reversal Test:

(a) Do not satisfy   (b) Satisfy   (c) Depends on the case   (d) Can't say.

[18] Chain index is equal to :

(a) $\dfrac{\text{link relative of current year} \times \text{chain index of the current year}}{100}$

(b) $\dfrac{\text{link relative of current year} \times \text{chain index of the previous year}}{100}$

(c) $\dfrac{\text{link relative of previous year} \times \text{chain index of the current year}}{100}$

(d) None of these

[19] In 2004 for working class people wheat was selling at an average price of Rs. 16 per 20 kg, cloth

at Rs. 2 per meter, house rent Rs. 30 per house and other items at Rs. 10 per unit By 2005 cost of

wheat rose by Rs. 4 per 20 Kg, house rent by Rs. 15 per house and other items doubled in price. The

working class cost of living index for the year 2005 (with 2004 as base) was 160. By how much did cloth

rose in price during the period :

(a) 1.28   (b) 0.99   (c) 1.73   (d) 1.30

[20] The ratio of price of the single commodity in a given period to its price in another period is called :

(a) Price Ratio   (b) Price Relative   (c) Base Period   (d) None of these

Dec 08

[21] Consumer Price Index Number goes up from 100 to 200 and salary of a worker is also raised

from 300 to 500

(a) 300   (b) 250   (c) 600   (d) 350

[22] Using following data, find Paasche's Index Number

Base Year		Current Year		
Commodities	Price	Quantity	Price	Quantity
A	5	25	6	30
B	3	8	4	10
C	2	10	3	8
D	10	4	3	5

(a) 109.21   (b) 105.28   (c) 110.32   (d) 120.21

[23] The Circular Test is known as :

(a) $P_{01} \times P_{12} \times P_{20} = 1$ (b) $P_{12} \times P_{01} P20 = 1$

(c) $P_{20} \times P_{12} P_{01} = 1$ (d) $P_{02} \times P_{21} P_{12} = 1$

June 09

[24] Fisher's Index is based on :-

(a) Arithmetic Mean of Laspeyre and Paasche

(b) Geometric Mean of Laspeyre and Paasche

(c) Harmonic Mean of Laspeyre and Paasche

(d) Median of Laspeyre and Paasche.

[25] In Passche's index, weights are based on :

(a) Current year quantities   (b) Base year quantities.

(c) Weighted average prices   (d) None of these

[26] Fisher's Ideal Index does not satisfy:

(a) Time Reversal Test   (b) Factor Reversal Test

(c) Unit Test   (d) Circular test

[27] $P_{01}Q_{01} = \frac{\Sigma P_1 Q_1}{\Sigma P_o Q_o}$ which of following test satisfies the above?

(a) Time Reversal Test   (b) Factor Reversal Test

(c) Circular Test   (d) None of these

Dec 09

[28] Time reversal & factor reversal are:

(a) Quantity Index   (b) Ideal Index   (c) Price Index   (d) Test of Consistency

[29] In Laspeyeres Index Number _____ are used as weights?

(a) Base year price   (b) Current year price

(c) Base year quantities   (d) Current year quantities

June 10

[30] In the data group Bowley's and Laspeyre's index number is as follows. Bowley's index number = 150,

Laspeyre's index number = 180 then Paasche's index number is

(a) 120   (b) 30   (c) 165   (d) None of these

[31] Consumer price index is commonly known as

(a) Chain Based index   (b) Ideal index

(c) Wholesale price index   (d) Cost of living index

[32 Find the paasche's index number for prices from the following data taking 1970 as the base year.

Commodity	1970		1975	
	Price	Commodity	Price	Commodity
A	1	6	3	5
B	3	5	8	5
C	4	8	10	6

(a) 261.36   (b) 265.48   (c) 274.32   (d) 282

[33] The life expectancy, E of male is o linear function of time (year). It is given that in 1980 the life

expectancy was 70 years and in 2000 it was 75 years. Make a prediction of life expectancy in 2012.

(a) 78   (b) 80   (c) 82   (d) 84

Dec 10

[34] If Laspeyre's index number is 90 and Paasche's index number is 160, then Fisher's index number will be:

(a) 144   (b) 120   (c) 125   (d) None of these

June 11

[35] Wholesale Price Index (WPI) is given by :

(a) Marshall-Edgeworth Index   (b) Laspeyre's Index

(c) Paasche's Index   (d) None of the above.

[36] Fisher's Ideal index is obtained by :

(a) Arithmetic Mean of Laspeyre's & Paasche's index

(b) Geometric Mean of Laspeyre's & Paasche's index

(c) Sum of Laspeyre's & Paasche's index.

(d) None of the above.

[37] The index number of prices at a place in the year 2008 is 225 with 2004 as the base year then there is:

(a) average 125% increase in prices.   (b) average 225% increase in prices.

(c) average 100% increase in prices.   (d) None of the above.

Dec 11

[38] The simple index number for the current year using simple aggregative method for the following

data is _____.

Commodity	Year	Current year
Base	price	price
	(P_0)	(P_1)
Wheat	80	100
Rice	100	150
Gram	120	250
Pulses	200	300

(a) 200   (b) 150   (c) 240   (d) 160

[39] Fishers Ideal Index Number not satisfies _____.

(a) Unit Test   (b) Time Reversal Test   (c) Circular Test   (d) Factor Reversal Test

[40] If the prices of all commodities in a place has increased 20% in comparison to the base period prices,

then the index number of prices for the place is now _____.

(a) 100   (b) 120   (c) 20   (d) 150

June 12

[41] If $\sum P_0 Q_0 = 116$, $\sum P_0 Q_1 = 140$, $\sum P_1 Q_0 = 97$, $\sum P_1 Q_1 = 117$

then Fisher's ideal index number is _____.

(a) 184   (b) 83.59   (c) 119.66   (d) 120

[42] Find the Paasche's Index number for prices from the following data taking 1970 as the base year.

Com-modity	1970		1975	
	Price	Commodity	price	Commodity
A	1	6	3	5
B	3	5	8	5
C	4	8	10	6

(a) 261.36   (b) 265.48   (c) 274.32   (d) 282

Dec 12

[43] If Fisher's index = 150 and Paasche's Index = 144, then Laspeyre's index is _____.

(a) 147   (b) 156.25   (c) 104.17   (d) 138

[44] Net monthly salary of an employee was Rs. 3,000. The consumer price index number in 1985 is 250 with

1980 as base year. If he has to be rightly compensated then the additional dearness allowance to be paid

to the employee is:

(a) Rs. 4,000   (b) Rs. 4,800   (c) Rs. 5,500   (d) Rs. 4,500

June13

[45] Time reversal test is satisfied by:

(a) Fisher's formula   (b) Laspeyre's formula

(c) Paasche's formula   (d) Dorbish formula

[46] In year 2005 the wholesale price index number is 286 with 1995 as base year, then how much the prices

have increased in 2005 in comparison to 1995?

(a) 286%   (b) 386%   (c) 86%   (d)186%

[47] Bowley's index = 150, Laspeyer's index = 180, then Paasche's index = _____

(a) 120   (b) 30   (c) 165   (d) None of these

Dec 13

[48] An index time series is a list of _____ number of two or more period of time, where each index

number employs the same base y can

(a) Index   (b) Absolute   (c) Relative   (d) Sample

[49] The index number for the year 2012 taking 2011 as the base year from the data given below by using

simple average of price relative method is.

Commodity	A	B	C	D	E
Price in 2011	115	108	95	80	90
Price in 2012	125	117	108	95	95

(a) 112   (b) 117   (c) 120   (d) 111

[50] What is the formula for calculating the deflated value?

(a) Current value/Price index of current year

(b) (Current value/Price index of current year) × 100

(c) Price index cf current year/Current value

(d) (Current value/Price index of last year) × 100

June 14

[51] Circular test is satisfied by which index number?

(a) Laspeyre's   (b) Paasche's   (c) Fisher's   (d) None of the above

[52] Fisher's Index Number is _____ of Laspeyre's and Paasche's Index Number

(a) A.M.   (b) G.M.   (c) H.M.   (d) None of the above.

[53] Which of the following statements is true?

(a) Paasche's Index Number is based on base year quantity

(b) Fisher's Index Number satisfies the circular test

(c) Arithmetic Mean is the most appropriate average for constructiπ the Index Number.

(d) Splicing means constructing one continuous series from two different indices on the basis of common

base.

[54] Monthly salary of an employee was Rs. 10,000 in the year 2000 and it was increased to Rs. 20,000 in year

2013 while the consumer price Index No. is 240 in year 2013 with the base year 2000. What should be

his salary in comparison of consumer price index in the year 2013?

(a) Rs. 20,000   (b) Rs. 16,000   (c) Rs. 24,000   (d) None of the above

Dec 14

[55] If $\sum P_1 Q_0 = 1180$, $\sum P_0 Q_0 = 1170$, $\sum P_1 Q_1 = 1064$, $\sum P_0 Q_1 = 1100$. The Fisher's Ideal Index is:

a) 96.73   (b) 98.795   (c) 98.77   (d) 100.86

[56] If the price of a commodity in a place have decreased by 30% over the base period prices, then the index

number of that place is:

(a) 30   (b) 60   (c) 70   (d) 80

June 15

[57] Factor reversal test is expressed in terms of

(a) $\frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0}$ (b) $\frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_0} \times \frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_1}$ (c) $\frac{\Sigma P_1 Q_1}{\Sigma Q_0 P_1}$ (d) $\frac{\Sigma Q_1 P_0}{\Sigma Q_0 P_0} \times \frac{\Sigma P_1 Q_1}{\Sigma Q_0 P_1}$

[58] If with an increase of 10% in prices, the rise in wages is 20% then the real wage has increased by

(a) 20%   (b) 10%   (c) Less than 10%   (d) More than 10%

[59] _____ play a very important role in the construction of index numbers.

(a) Weights   (b) Classes   (c) Estimations   (d) None

Dec 15

[60] Consumer price index number for the year 1977, was 313, with 1960 as the base year, and was 96 for the

year 1960. The average monthly wages in 1977 of the workers into factory be Rs. 160, their real wages is:

(a) Rs. 48.40   (b) Rs. 51.12   (c) Rs. 40.30   (d) None of the above

June 16

[61] Purchasing power of money is

(a) Reciprocal of price index number   (b) Equal to price index number

(c) Unequal to price index number   (d) None of these

[62] If $\Sigma P_0 Q_0 = 1360$, $\Sigma P_n Q_0 = 1900$, $\Sigma P_0 Q_n = 1344$, $\Sigma P_n Q_n = 1880$, then the Laspeyre's Index Number is

(a) 0.71   (b) 1.39   (c) 1.76   (d) none.

[63] In the year 2010 the monthly salary of a clerk was Rs. 24,000. The consumer price Index was 140 in

the year 2010, which rises to 224 in the year 2016. If he has to be rightly compensated, what

additional monthly salary to be paid to him?

(a) Rs. 14,400   (b) Rs. 38,400   (c) Rs. 7,200   (d) None of these

[64] The suitable index number for the comparison of changes in price level of every year is _____

(a) Fixed Base Index Number   (b) Fisher's Ideal Index Number

(c) Chain Base Index Number   (d) Both (a) and (c)

Dec 16

[65] Following is the data concerning to commodities A, B, C and D in the base period 1992 and current period

1993.

	Base Year 1992		Current Year 1993	
Commodities	Price	Quantity	Price	Quantity
A	3	18	4	15
B	5	6	5	9
C	4	20	6	26
D	1	14	3	15

The Paasche's price index number is:

(a) 148.25   (b) 146.41   (c) 144.25   (d) None of these

[66] Which method satisfy time reversal test?

(a) Laspeyer's method   (b) Paasche's method

(c) Fishers method   (d) None of these.

[67] Index number are the _____.

(a) Economic   (b) Statistics   (c) (a) and (b)   (d) None of these.

June 17

[68] The monthly income of an employee was Rs. 8,000 in 2014. The consumer price index

number was 160 in 2014, which rose to 200 in 2017. If he has to be rightly compensated, the additional

dearness allowance to be paid to him in 2017 would be:

(a) Rs. 2,400   (b) Rs. 2,750   (c) Rs. 2,500   (d) None of these.

[69] If Laspeyre's index number (L) and Paasche's index number (P) are known, then one can compute

Fisher's index number (F) by:

(a) $F = LP$ (b) $\sqrt{F} = LP$ (c) $F = \frac{1}{LP}$ (d) $F^2 = LP$

[70] Fisher's index number does not satisfy:

(a) Unit Test   (b) Circular Test   (c) Time reversal test   (d) Factor reversal test.

ANSWER

1	C	11	A	21	B	31	D	41	B	51	D	61	A
2	D	12	B	22	B	32	A	42	A	52	B	62	B
3	B	13	A	23	A	33	A	43	B	53	C	63	A
4	A	14	B	24	B	34	B	44	D	54	C	64	C
5	C	15	A	25	A	35	B	45	A	55	C	65	B
6	A	16	C	26	D	36	B	46	D	56	C	66	C
7	B	17	A	27	B	37	A	47	A	57	A	67	C
8	D	18	B	28	D	38	D	48	A	58	A	68	D
9	C	19	D	29	C	39	C	49	D	59	A	69	D

10	B	20	B	30	A	40	B	50	A	60	B	70	B

UNIT II TIME SERIES

Dec 12

[1] The tendency of trend to increase or decrease or stagnate over a long period of time is called

(a) Periodic Variation   (b) Cyclic Variation

(c) Secular Trend   (d) Random Variation

[2] The trend equation for annual sale of a product is Y= 120+36× with Year 1990 as origin. The annual

sales for year 1992 will be-

(a) 156   (b) 192   (c) 120   (d) None of the above

June 13

[3] The technique of estimating the probable value of phenomenon at a future date is called:

(a) Interpolation   (b) Extrapolation   (c) Forecasting   (d) Probability

Dec 14

[4] Which of the following is a general form of Exponential trend?

(a) $y = a + bt$ (b) $y_t = a \times b^t$ (c) $y = a - b$ (d) $y_t = a + bt + ct^2$

June 15

[5] Which of the following is forecasting on the basis of past data?

(a) Trend projection   (b) Index number

(c) Both trend and Index number   (d) Correlation.

June 16

[6] "Occurrence of floods" falls under which type of variation?

(a) Seasonal Variation   (b) Simple Variation

(c) Cyclic Variation   (d) Random Variation.

Dec 16

[7] How the data is arranged in a Time Series Analysis?

(a) In descending order of their magnitude   (b) Arranged abruptly

(c) Arranged chronologically   (d) In ascending order of their magnitude.

ANSWERS

1	C	6	D
2	B	7	C
3	C		
4	B		
5	B		

STUDENT NOTES

CH - 1	NUMBER SERIES,CODING DECODING & ODD MAN OUT

A.	NUMBER SERIES
Ex. 1	Find the missing term of the series 2, 7, 16, _____ , 46, 67, 92
Sol:	Here the terms of the series are +5, +9, +13, +17, +21 , +25...
	Thus, 2 + 5 = 6; and 7 + 9 = 16 ...
	So missing term = 16 + 13 = 29
Ex. 2	Find the wrong terms of the series 9, 29, 65, 126, 217, 344
Sol:	2^3+1 , $3^3 + 1$, $4^3 + 1$,........
	Here 29 is wrong term of series
Ex.3	Find the missing term of the series 1,9, 25, 49, 81, 121, ...
Sol:	The given terms of the series are consists square of consecutive odd number 1^2, 3^2, 5^2, 7^2, ...
	So missing value = 13^2 = 169

B.	ALPHABET SERIES
Ex. 4	Find the next term of the series BKS, DJT, FIU, HHV?
Sol:	In each term, the first letter is moved two steps forward, the second letter one step backward and third
	letter one step forward to obtain the corresponding letter of the next term. So the missing term is JGW.

C.	LETTER SERIES:
Ex.5	aab, ____, aaa, bba, ____
	(a) baa (b) abb (c) bab (d) aab
Sol:	1) The first blank space should be lled in by 'b' so that we have two a's by two b's.
	2) The second blank place should be either `a', so that we have three a's followed by three b's.
	3) The last space must be spelled in by 'a'.
	4) Thus we have two possible answers – 'baa'and 'bba'.
	5) But only 'baa'appers in the alternatives.
	So the answer (a) is correct.
	## CODING AND DECODING
	### Type 1: Letter Coding
Ex.6	If in a certain language MYSTIFY is coded as NZTUJGZ, how is MENESIS coded in that language?
Sol:	Clearly, each letter in the word MYSTIFY is moved one step forward to obtain the corresponding letter of the code.
	$$\begin{array}{c} \text{M Y S T I F Y} \\ +1 \downarrow \\ \text{N Z T U J G Z} \end{array}$$
	So, in MENESIS, N will be coded as O, E as F, M as N and so on. Thus, the code becomes NFOFTJT.
Ex.7	If TAP is coded as SZO, then how is FRIEND coded?
Sol:	Clearly each letter in the word TAP is moved one step backward to obtain the corresponding letter of the Code

SZO

-1 ↑

TAP

Thus, in FRIEND, F will be coded as E, R as Q , I as G, E as D, N as M and D as C. So, the code becomes

EQGDMC.

Ex.8	In a certain code, MENTION is written as LNEITNO. How is PRESENT written in that code?
Sol:	Clearly, to obtain the code, the rst letter of the word MENTION is moved one step backward and the

remaining letters are.

Reversed in order, taking two at a time. So, in PRESENT, P will be coded as O, and the sequence of the

remaining letter in the code would be ERESTN. Thus the code becomes OERESTN. Hence, The answer is

OERESTN.

Ex.9	If in a certain language CARROM is coded as BZQQNL, which word will be coded as HORSE?
Sol:	Each letter of the word is one step ahead of the corresponding letter of the code

BZQQNL   HORSE

| | | | | | | | | | |

CARROM   IP STF

So, H is coded as I, O as P, R as S, S as T and E as F. HORSE is coded a IPSTF.

Type 2: Number Coding

Ex.10	If in a certain language A is coded as 1, B is coded as 2, and so on, how is AICCI is coded in that code?
Sol:	As given the letters are coded as

A	B	C	D	E	F	G	H	I
1	2	3	4	5	6	7	8	9

So in AICCI, A is coded as 1, I as 9,and C as 3. Thus, AICCI is coded as 19339.

Ex11 *If PAINT is coded as 74128 and EXCEL is coded as 93596, then how would you encode ANCIENT ?*

Sol: Clearly, in the given code, the alphabets are coded as follows:

P	A	I	N	T	E	X	C	L
7	4	1	2	8	9	3	5	6

So, in ANCIENT, A is coded as 4, N is coded as 2, C as 5, I is coded as 3, E as 9, and T as 8. Hence, the correct

code is 4251928.

Ex12 *In a certain code, 2 is coded as P, 3 as N, 9 as Q, 5 as R, 4 as A and 6 as B. How is 423599 coded in*

that code?

Sol: Clearly as given, 4 as A, 2 as P, 3 as N and 5 is coded as R, 9 as Q. So, 423599 is coded as APNRQQ.

ODD MAN OUT

Ex13 *January, May, July, November*

(a) January   (b) May   (c) July   (d) November

Sol: All the months above are 31 days , whereas , November 30 days

Answer: (d)

Ex14 *10, 14, 16, 18, 23, 24 and 26*

(a) 26   (b) 17   (c) 23   (d) 9

Sol: Each of the above series are even number, except 23.

Answer: (c)

Ex15 *6, 9, 15, 21, 24, 26, 30*

(a) 9	(b) 26	(c) 24	(d) 30

Sol: All are multiples of 3, except 26, answer (b)

Answer: (b)

Ex16 1, 5, 14, 30, 51, 55, 91

(a) 5	(b) 55	(c) 51	(d) 91

Sol: Each pattern is 12, 12 + 22, 12 + 22 + 32, 12 + 22 + 32 + 42, 12 + 22 + 32 + 42+ 52, 12 +

22 + 32 + 42 +52 + 62

But 51, is not of the form.

Answer: (c)

Ex17 16, 25, 36, 62, 144, 196, 225

(a) 36	(b) 62	(c) 196	(d) 144

Sol: Each of the number except 62, is a perfect square.

Answer: (b)

"LOGIC HAI JAHA, CA HAI WAHA"

Choose the most appropriate (a) or (b) or (c) or (d).

1) 6, 11, 21, 36, 56 ?

(a) 42	(b) 51	(c) 81	(d) 91

2) 10 , 100, 200, 310 ?

(a) 400	(b) 410	(c) 420	(d) 430

3) 11, 13, 17, 19, 23, 25, 29

(a) 33	(b) 27	(c) 31	(d) 49

4) 6, 12, 21, 33 ?

(a) 33	(b) 38	(c) 40	(d) 48

5) 2, 5, 9, 14, ? , 27

(a) 20	(b) 16	(c) 18	(d) 24

6) 6, 11, 21, ? , 56, 81

(a) 42	(b) 36	(c) 91	(d) 51

7) 10, 18, 28, 40, 54, ?, 88

(a) 70	(b) 86	(c) 87	(d) 98

8) 120, 99, ?, 63, 48, 35

(a) 80	(b) 36	(c) 45	(d) 40

9) 22, 24, 28, 36, ? , 84

(a) 44	(b) 52	(c) 38	(d) 54

10) 4832, 5840, 6848, 7856 ?

(a) 8864	(b) 8815	(c) 8846	(d) 8887

11) 10, 100, 200, 310, 430 ?

(a) 560	(b) 540	(c) 550	(d) 590

12) 28, 33, 31, 36, 34 ?

(a) 38   (b) 39   (c) 40   (d) 42

13) 120, 80, 40, 45, ?, 5

(a) 15   (b) 20   (c) 25   (d) 30

14) 2, 15, 41, 80, 132 ?

(a) 184   (b) 144   (c) 186   (d) 197

15) 6, 17, 39, ?, 116

(a) 72   (b) 75   (c) 85   (d) 80

16) 1, 4, 10, 22, ?, 94

(a) 46   (b) 48   (c) 49   (d) 47

17) 4, 9, 25, 49, ? , 169, 289, 361

(a) 120   (b) 121   (c) 122   (d) 164

18) 4, 12, 36, ? , 324

(a) 107   (b) 109   (c) 108   (d) 110

19) 1, 1, 4, 8 , 9, ? , 16, 64

(a) 27   (b) 28   (c) 32   (d) 40

20) 5760, 960, 192, ? 16, 8

(a) 47   (b) 48   (c) 52   (d) 50

21) 1, 2, 6, 7, 21, 22, 66, ? , 201

(a) 69   (b) 68   (c) 67   (d) 69

22) 48, 24, 96 , ? 192

(a) 48   (b) 47   (c) 44   (d) 54

23) 165, 195, 255, 285, ?, 435

(a) 345   (b) 390   (c) 335   (d) 395

24) 2, 3, 3, 5, 10, 13, 39, ?, 172, 177

(a) 42   (b) 44   (c) 43   (d) 40

25) 7, 26, 63, 124, 215, ?, 511

(a) 342   (b) 343   (c) 441   (d) 421

26) 3, 7, 15, 31, ? 127

(a) 62   (b) 63   (c) 64   (d) 65

27) 8, 28, 116, 584, ?

(a) 1752   (b) 3502   (c) 3504   (d) 3508

28) 6, 13, 28, 59, ?

(a) 122   (b) 114   (c) 113   (d) 112

29) 2, 7, 27, 107, 427, ?

(a) 1707   (b) 4027   (c) 4207   (d) 1207

30) 5, 2, 7, 9, 16, 25, 41, 40, 26, ?

(a) 65   (b) 66   (c) 67   (d) 68

31) In a certain language, MADRAS is coded NBESBT, how DELHI is coded in that code?

(a) EMMJI   (b) EFMIJ   (c) EMFIJ   (d) JIFEM

32) | If RAMAN is written as 12325 and DINESH as 675489 how HAMAM is written?

(a) 92323   (b) 92233   (c) 93233   (d) 93292

33) | If RED is coded as 6720 then GREEN would be coded as

(a) 9207716   (b) 167129   (c) 1677209   (d) 1672091

34) | If A = 1, FAT = 27, FAITH = ?

(a) 44   (b) 45   (c) 46   (d) 36

35) | If BROTHER is coded 2456784, SISTER coded as 919684, what is coded for BORBERS?

(a) 2542889   (b) 2542898   (c) 2454889   (d) 2524889

36) | If DELHI is coded 73541 and CALCUTTA as 82589662, How can CALICUT be coded?

(a) 5279431   (b) 5978213   (c) 8251896   (d) 8543962

37) | If CLOCK is coded 34235 and TIME is 8679, what will be code of MOTEL?

(a) 72894   (b) 77684   (c) 72964   (d) 27894

38) | If PALE is coded as 2134 and EARTH is coded as 41590, how is PEARL is code?

(a) 29530   (b) 24153   (c) 25430   (d) 254313

39) | If LOSE is coded as 1357 and GAIN is coded as 2468, what do   gure 82146 stands for?

(a) NGLAI   (b) NGLIA   (c) GNLIA   (d) GNLIA

40) | If MEKLF is coded as 91782 and LLLJK as 88867, how can IHJED is coded as?

(a) 97854   (b) 64512   (c) 54610   (d) 75632

41) | If in a certain code language NAME is written as 4258 then what is coded as MEAN ?

(a) 2458   (b) 5842   (c) 8524   (d) 5824

42) | If GOLD is written as IQNF, how WIND can be written as code?

(a) YKPF   (b) VHCM   (c) XJOE   (d) DNIW

43) | If ROSE is written as TQUG, how BISCUIT can be written in that code?

(a) DKUEWKV   (b) CJTDVJU   (c) DKVEWKV   (d) DKUEWKY

LETTER: C Z N V R S W F D

CODE DIGIT: 8 6 4 7 2 9 3 5 1

(Q. No. 44-46) In each of the following questions   nd out the correctly coded alternative from amongst the

given four alternatives (a), (b), (c), (d).

44) | ZDRCVF

(a) 612875   (b) 619875   (c) 612845   (d) 612835

45) | WNCSZV

(a) 348267   (b) 318267   (c) 348957   (d) 348967

46) | RDNFVS

(a) 21679   (b) 216549   (c) 214579   (d) 218579

47) | If DELHI is coded as CCIDD, how would you encode BOMBAY?

(a) AJMTVT   (b) AMJXVS   (c) MJXVSU   (d) WXYZAX

48) | In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that

code?

(a) 318826   (b) 318286   (c) 618826   (d) 338816

49) | If PALAM could be given the code number 43, what code number can be given to SANTACRUZ?

(a) 123   (b) 85   (c) 120   (d) 125

Directions: The number in each question below is to be coded in the following code:

Digit	7	2	1	5	3	9	8	6	4
Letter	W	L	M	S	I	N	D	J	B

50) | 184632

(a) MDJBSI   (b) MDJBIL   (c) MDJBWL   (d) MDBJIL

51) | I n a certain code '256' means 'you are good', '637' means 'we are bad' and '358' means 'good and bad'.

Which of the following represents 'and' in that code?

(a) 2   (b) 5   (c) 8   (d) 3

Directions: Find odd man out of the following (52-60):

52) | 3, 5, 7, 15, 17, 19

(a) 15   (b) 17   (c) 19   (d) 7

53) | 10, 14, 16, 18, 23, 24, 26

(a) 26   (b) 23   (c) 24   (d) 18

54) | 1, 4, 9, 16, 24, 25, 36

(a) 9   (b) 24   (c) 25   (d) 36

55) | 41, 43, 47, 53, 61, 71, 73, 75

(a) 75   (b) 73   (c) 71   (d) 53

56) 16, 25, 36, 73, 144, 196, 225

(a) 36   (b) 73   (c) 196   (d) 225

57) 1, 4, 9, 16, 19, 36, 49

(a) 19   (b) 9   (c) 49   (d) 16

58) 1, 5, 14, 30, 49, 55, 91

(a) 49   (b) 30   (c) 55   (d) 91

59) 835, 734, 642, 751, 853, 981, 532

(a) 751   (b) 853   (c) 981   (d) 532

60) 4, 5, 7, 10, 14, 18, 25, 32

(a) 7   (b) 14   (c) 18   (d) 33

61) 52, 51, 48, 43, 34, 27, 16

(a) 27   (b) 34   (c) 43   (d) 48

ANSWERS

1. (c)	2. (d)	3. (c)	4. (d)	5. (a)	6. (b)	7. (a)	8. (a)	9. (b)	10. (a)
11. (a)	12. (b)	13. (a)	14. (d)	15. (a)	16. (a)	17. (b)	18. (c)	19. (a)	20. (b)
21. (c)	22. (a)	23. (a)	24. (c)	25. (b)	26. (b)	27. (d)	28. (a)	29. (a)	30. (b)
31. (b)	32. (a)	33. (c)	34. (a)	35. (a)	36. (c)	37. (a)	38. (b)	39. (a)	40. (c)
41. (d)	42. (a)	43. (a)	44. (a)	45. (d)	46. (c)	47. (a)	48. (c)	49. (a)	50. (d)
51. (c)	52. (a)	53. (b)	54. (b)	55. (a)	56. (b)	57. (a)	58. (a)	59. (a)	60. (c)
61. (b)									

STUDENT NOTES

CH - 2	**DIRECTION TEST**	

1. A man starts from a point and walks 2 km towards North, turns towards his right and walks 2 km, turns

   right again and walks. What is the direction now be is facing?

   (a) South

   (b) South-East

   (c) North

   (d) West

Sol: **Ans:**(a) The diagram given below helpful solving the questions and Direction Test. **South.**
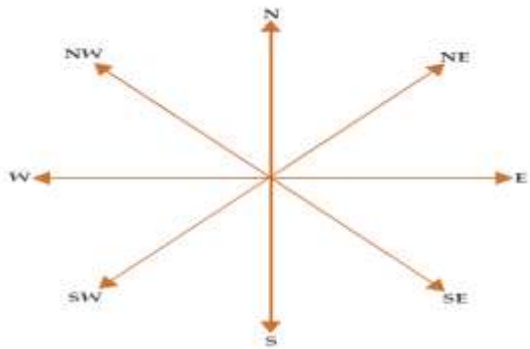
2. Ramu walks 5 kms starting from his house towards west then turns right and walks 3 km. Thereafter she

   takes left turn and walks 2 km. Further, she turn left and walks 3 km. Finally, she turns right and walks

   3 kms. In what direction she is now from her house?

   (a) West

(b) North

(c) South

(d) East

Sol:
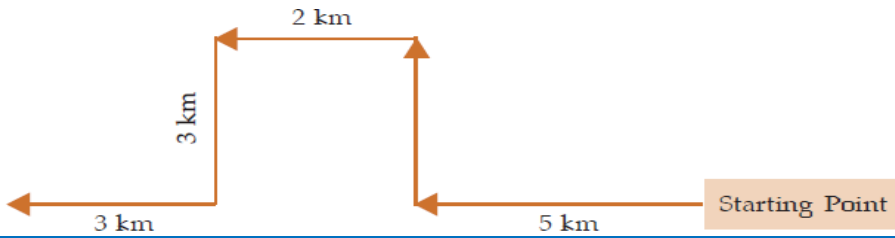
3. Gopal started walking 2 km straight from his school. Then he turned right and walked 1 km. Again he turned right and walked 1 km to reach his house. If his house is sourth-east from his school, then in which direction did Gopal start walking from the school?

(a) East

(b) West

(c) South

(d) North

Sol:
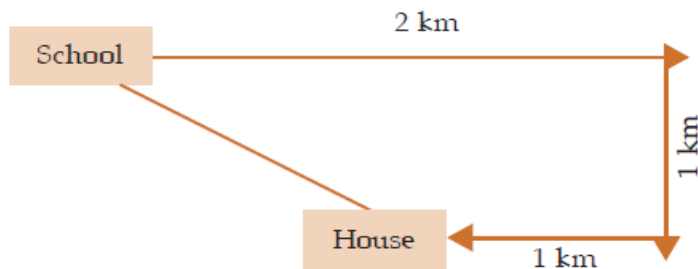
From the diagram that Gopal Started walking towards East from the school.

4. A man starts from a point, walks 2 km towards north, turns towards his right and walks 2 km, turns right again and walks. What is the direction now he is facing?

(a) South

(b) East

(c) North

(d) West

Sol:

Starting Point
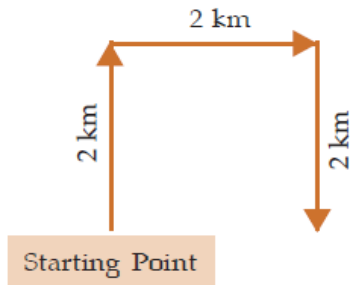
Based on the diagram the person facing towards south.

5. *Janki started from her house and walked 2 km towards North. Then she took a right turn and covered*

    one kilometre. Then she took again a right turn and walked for 2 kms. Inwhat direction is she going?

    (a) North

    (b) East

    (c) South

    (d) West

Sol:

House
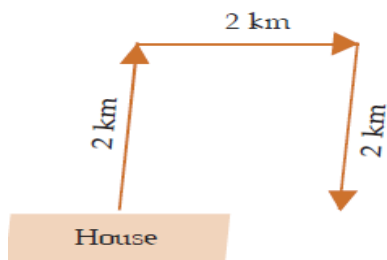
Janaki is going on South.

LOGIC HAI JAHA, CA HAI WAHA"

Choose the appropriate answer (a) or (b) or (c) or (d)

1. Mohan starts from point A and walks 1 km towards south, turns left and walks 1km. Then he turns left again and walks 1 km. Now he is facing.

   (a) East   (b) West   (c) North   (d) South-west

2. Suresh starts from a point, walks 2 miles towards south, turns right and walks 11/2 miles, turns left and walks ½ miles and then he turns back. What is the direction he is facing now?

   (a) East   (b) West   (c) South   (d) North

3. A man starts from a point, walks 4 miles towards north and turns left and walks 6 miles, turns right and walks for 3 miles and again turns right and walks 4 miles and takes rest for 30 minutes. He gets up and walks straight 2 miles in the same direction and turns right and walks one mile. What is the direction he is

   facing?

   (a) North   (b) South   (c) South-east   (d) West

4. Arun started from point A and walked 10 km East to point B, then turned to North and walked 3 km to point C and then turned West and walked 12 kms to point D, then again turned South and walked 3 kms to point E. In which direction is he from his straight point?

   (a) East   (b) South   (c) West   (d) North

5. A starts from a point and walks 5 kms north, then turns left and walks 3 kms. Then again turns left and walks 5 km. Point out the direction in which he is going now.

	(a) North	(b) South	(c) East	(d) West

6. A rat run 20 towards East and turns to right runs 10 and turns to right runs 9 and again turns to left runs 5

and then turns to left runs 12 and finally turns to left and rusn 6. Now what direction is the rat facing?

(a) East   (b) North   (c) West   (d) South

7. A driver left his village and drove North for 20 km, after which he stopped for breakfast. Then he turned

left and drove another 30 km, when he stopped for lunch. After some rest, he again turned left and drove

20 kms before stopping for evening tea. Once more he turned left and drove 30 kms to reach the town

where he had supper. After evening tea in which direction did he drive?

(a) West   (b) East   (c) North   (d) South

8. A man is facing East, then he turns left and goes 10 m, then turns right and goes 5 m then goes 5 m to the

South and from there 5 m to West. In which direction is be from his original place?

(a) East   (b) West   (c) North   (d) South

9. From her home Prerna wishes to go to school. From home she goes towards North and then turns left and

then turns right, and finally she turns left and reaches school. In which direction her school is situated with

respect to her home?

(a) North-East   (b) North-West   (c) South-East   (d) South-West

10. A child walks 25 feet towards North, turns right and walks 40 feet, turns right again and walks 45 feet. He

then turns left and walks 20 feet. He turns left again walks 20 feet. Finally, he turns to his left to walks

another 20 feet. In which direction is the child from his starting point?

(a) North   (b) South   (c) West   (d) East

11.	Raju facing North and moves 20 km, then he turned to his right and moves 20 km and then he moves 10 km
	in North-East, then he turned to his right and moves 20 km and then he turned to his right and moves 20
	km and again he turned to his left and moves 20 km. Now in which direction Rahu is facing?
	(a) South-East (b) North-East (c) South-West (d) North-West
12.	K is a place which is located 2 km away in the north-west direction from the capital P. R is another place
	that is located 2 km away in the south-west direction from K. M is another place and that is located 2 km
	away in the north-west direction from R. T is yet another place that is located 2 km away in the south-west
	direction from M. In which direction is T located in relation to P?
	(a) South-west (b) North-west (c) West (d) North
13.	Babu is Rahim's neighbour and his house is 200 meters away in the north-west direction. Joseph is Rahim's
	neighbour and his house is located 200 meter away in the south-west direction. Gopal is Joseph's
	neighbour and he stays 200 meters away in the south-east direction. Roy is Gopal's neighbour and his
	house is located 200 meters away in the
	north-east direction. Then where is the position of Roys' house in relation to Babu's ?
	(a) South-east (b) south-west (c) North (d) North-east
14.	A tourist drives 10 km towards west and turns to left and takes a drive of another 4 km. He then drives
	towards east another 4 km and then turns to his right and drives 5 km . Afterwards he turns to his left and
	travels 6 km. In which direction is je from the starting point?
	(a) North (b) East (c) West (d) South
15.	A man started walking West. He turned right, then right again and finally turned left. Towards which

direction was he walking now?

(a) North   (b) South   (c) West   (d) East

16. One evening, Raja started to walk toward the Sun. After walking a while, he turned to his right and again to

his right. After walking a while, he again turned right. In which direction is he facing?

(a) South   (b) East   (c) West   (d) North

17. Five boys A, B, C, F, E, are sitting in a park in a circle. A is facing South-West, D is facing South-East, B and E

are right opposite A and D respectively and C is equidistant between D and B. Which direction is C facing?

(a) West   (b) South   (c) North   (d) East

18. If a man on a moped starts from a point and rides 4 km South then turns left and rides 2 km and turn again

to the right to ride to go more towards which direction is he moving ?

(a) North   (b) West   (c) East   (d) South

19. A man starts from a point, walk 8 km towards North, turns right and walks 12 km, turns left and walks 7

km turns and walks 20 km towards South, turns right and walks 12 km. In which direction is he from the

starting point?

(a) North   (b) South   (c) West   (d) East

20. Daily in the morning the shadow of Gol Gumbaz falls on Bara Kaman and in the evening the shadow of Bara

Kaman falls on Gol Gumbaz exactly. So in which direction is Gol Gumbaz to Bara Kaman?

(a) Easter side   (b) Western side   (c) Northern side   (d) Southern side

21. Ashok went 8 km South and turned West and walked 3 km again he turned North and walked 5 kms. He

took a final turn to East and walked 3 kms . In which direction was Ashok from the starting point?

(a) East   (b) North   (c) West   (d) South

22. | If X stands on his head with his face towards south, to which direction will his left hand point ?

(a) East   (b) West   (c) North   (d) South

23. | I drove East for 5 miles then drove North 3 miles, then turned to my left and drove for 2 miles and again

turned to my left. Which direction am I going now?

(a) South   (b) North   (c) West   (d) North-west

24. | If A stands on his head with his face towards north. In which direction will his left hand point ?

(a) North-East   (b) North   (c) East   (d) North-West

25. | A car travelling from south covers a distance of 8 km, then turns right and runs another 9 kms and again

turns to the right and was stopped. Which direction does it face now?

(a) South   (b) North   (c) West   (d) East

26. | A taxi driver commenced his journey from a point and drove 10 km toward north and turned to his left and

drove another 5 km. After waiting to meet a friend here, he turned to his right and continued to drive

another 10 km. He has covered a distance of 25 km so far, but in which direction would he be now?

(a) South   (b) North   (c) East   (d) South-east

27. | A walks 3 kms northward and then he turns left and goes 2 km. He again turns left and goes 3 km. He

turns right and walks straight. In which direction is he walking now?

(a) East   (b) West   (c) North   (d) South

28. | Á walks southeards, then turns right, then left and then right. In which direction is he from the starting

point?

| | (a) South | (b) East | (c) West | (d) North |

29. A man starts from a point, walks 15 meters towards East, turns left and walks 10 meters, turns right again

and walks. Towards which direction is he now waking?

(a) North (b) East (c) West (d) South

30. A boy starts walking towards West, he turns right and again he turns right and then turns left at last.

Towards which direction is he walking now?

(a) West (b) North (c) South (d) East

31. I stand with my right hand extended side-ways towards South. Towards which direction will my back be ?

(a) North (b) West (c) East (d) South

32. If a person moves 4 km towards west, then turns right and moves 3 km and then turns right and moves 6

km, which is the directions in which he is now moving ?

(a) East (b) West (c) North (d) Sout

33. If Mohan sees the rising sun behind the temple and the setting sun behind the railway station from his

house, what is the direction of the temple from the railway station?

(a) South (b) North (c) East (d) West

34. Laxman went 15 km to North then he turned West and covered 10 kms. Then he turned south and covered

5 kms. Finally turning to East he covered 10 kms. In which direction he is from his house?

(a) East (b) West (c) North (d) South

35. A man starts from a point, walks 4 miles North, turns to his right and walks 2 miles, again turns to his right

and walks 2 miles, again turns to his right and walks 2 miles. In which direction would he be now?

(a) North   (b) South   (c) East   (d) West

36. I started walking down a road in the morning facing the Sun. After walking for sometime I turned to my

    left. Then I turned to my right. In which direction was I going then ?

    (a) East   (b) West   (c) North   (d) South

37. Lakshmi walked 2 furlongs north from her house and took a turn to left and continued to walk another
    one

    kilometre and finally she turned left and reached the school. Which direction is she facing now?

    (a) West   (b) North   (c) South   (d) North

38. You are going straight, first eastwards, then turn to the right, then right again, then left. In which
    direction

    would you be going now?

    (a) East   (b) West   (c) South   (d) East

39. If Ahmed travels towards North from his house, then to left, then to South covering equal distances in
    each

    direction to reach Sohan's house, in which direction is Ahmed's house now?

    (a) East   (b) South   (c) North   (d) West

40. You go North, turn right, then right again and then go to the left. In which direction are you now?

    (a) South   (b) East   (c) West   (d) North

41. Roopa starts from a point and walks 15 meter towards west, turns left and walks 12 meter, turns right

    again and walks. What is the direction she is now facing?

    (a) South   (b) West   (c) East   (d) North

42. A man starts his journey facing the sun early morning. He then turns right and walks 2 km. He then
    walks 3

    km after turning right again. Which is the direction he is facing now?

(a) North-East   (b) North   (c) West   (d) South

43. Roy walks 2 km to East, then turns North-West and walks 3 km. Then he turns South and walks 5 km. Then

again he turns West and walks 2 km. Finally he turns North and walks 6 km. In which direction, is he from

the starting point?

(a) South-West   (b) South-East   (c) North-West   (d) North-East

44. Seeta starts from a point, walks 2 km towards north, turns towards her right and walks 2 km, turns right

again and walks. What is the direction she is facing now?

(a) East   (b) West   (c) South   (d) North

45. Shyam was facing East. He walked 5 km forward and then after turning to his right walked 3 km. Again he

turned to his right and walked 4 km. After this he turned back. Which direction was he facing at that time?

(a) East   (b) West   (c) North   (d) South

46. Raju is standing facing north. He goes 30 meters ahead and turns left and goes for 15 meters. Now he turns

right and goes for 50 meters and finally turns to his right and walks. In which direction is he heading?

(a) North   (b) East   (c) South   (d) West

47. Sanmitra starts from his house and walks 3 km towards north. Then he turns right and walks 2 km and

then turns right and walks 5 km, then turns right and walks 2 km and then again turns right and walks 2

km. Which direction is he facing now?

(a) North   (b) South   (c) West   (d) East

48. Raju is Ramu's neighbour and he stays 100 meters away towards southeast. Venu is Raju's neighbour and

he stays 100 meters away towards southwest. Khader is Venu's neighbour and he stays 100 meters away towards, north-west. Then where is the position of Khader's home in relation to Ramu's?

(a) South-East   (b) South-West   (c) North-West   (d) East

49. Ramesh walked 3 km, towards West and turned to his left and walked 2 km. He, then turned to his right and walked 3 km. Finally, he turned to his right again and walked another 2 km. In which direction is Ramesh from his starting point now?

(a) East   (b) West   (c) North   (d) South

50. Deepa starts walking north towards and after a while she turns to her right. After walking some distance, she turns to his left and walks a distance of 1 km. She then urns to her left again. In which direction she moving now?

(a) North   (b) West   (c) East   (d) South

51. Raman starts walking in the morning facing the Sun. After sometime, he turned to the left later again he turned to his left. At what direction is Raman moving now?

(a) East   (b) West   (c) South   (d) North

52. A starts walking towards North turns left, again turns left, turns right, again turns right once again turns left. In which direction is A walking now?

(a) East   (b) South   (c) West   (d) South-West

53. X walks southwards and then turns right, then left and then right,. In which direction is he moving now?

(a) South   (b) North   (c) West   (d) South-West

54. A man started to walk East. After moving a distance, he turned to his right. After moving a distance, he turned to his right again. After moving a little he turned in the end to his left. In which direction was he

going now.?

(a) North   (b) South   (c) East   (d) West

ANSWERS

1. (c)	2. (d)	3. (b)	4. (c)	5. (b)
6. (b)	7. (b)	8. (c)	9. (b)	10. (d)
11. (a)	12. (c)	13. (a)	14. (d)	15. (a)
16. (a)	17. (d)	18. (d)	19. (b)	20. (a)
21. (d)	22. (b)	23. (a)	24. (c)	25. (a)
26. (b)	27. (b)	28. (a)	29. (b)	30. (b)
31. (b)	32. (a)	33. (c)	34. (c)	35. (a)
36. (a)	37. (c)	38. (c)	39. (a)	40. (b)
41. (b)	42. (c)	43. (c)	44. (c)	45. (a)
46. (b)	47. (a)	48. b	49. (b)	50. (b)
51. (b)	52. (a)	53. (c)	54. (b)	

STUDENT NOTES

CH - 3　SEATING ARRANGEMENT

Ex. 1: *Four Children's are sitting in arrow. A is occupying seat next to B but not next to C. If C is not sitting next to D? Who is occupying seat next to adjacent to D.*

(a) B　　　　　(b) B and A　　　　　(c) Impossible to tell　　　　　(d) A

Sol.:: (d) The arrangements as per given information is possible only if C is sitting next to B and D is sitting next

to A.

Therefore, two possible arrangements are C, B, A, D, or D, A, B, C Clearly, only A is sitting adjacent to D:

Ex. 2: *P, Q, R, S, T, U, V and W are sitting in a row facing North.*

(i) P is fourth to the right of T

(ii) W is fourth to the left of S

(iii) R and U, which are not at the ends, are neighbours of Q and T respectively.

(iv) W is next to the left of P and P is the neighbour of Q, who are sitting at the extreme ends

Sol.:: From information

(i) we get that there are three persons between P and TXXXP.

In the information (iv), it is given that W is next to the left of P and Q is the neighbour of P. Using the information with (i), we get TXXWPQ.

By the information (ii), TXXWPQXS
By the information (iii),

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T     U     V     W     P     Q     R     S
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So, T and S are sitting at the extreme ends.

Ex. 3: There are Five houses P, Q , R, S, T . P is right of Q and T is left of R and right of P . Q is right of S.

Which house in the middle.

(a) P   (b) Q   (c) R   (d) T

Sol.:: According to the question the houses can be arranged as follows.

S   Q   P   T   R
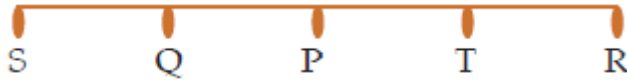
Therefore, house P is middle.

Ex. 6: Friends are sitting on a bench. A is to the left of B but on the right of C, D is to the right of B but one

the left of E. Who are at the extremes?

(a) A, B   (b) A, D   (c) C, E   (d) B, D

Sol.:: Arrangements according to the question as follows.

Left   C   A   B   D   E   Right
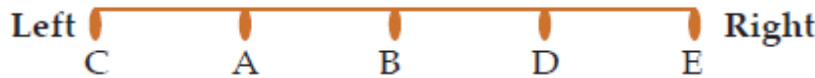
Clearly C and E are the extremes.

Ex. 7: In a college party, 5 girls are sitting in a row. F is to the left of M and to the right of O. R is sitting to

the right of N but to the left of O. Who is sitting in the middle?

(a) O   (b) R   (c) P   (d) M

Sol.:: (a) arrangements of the question as follows.

Left   N   R   O   P   M   Right
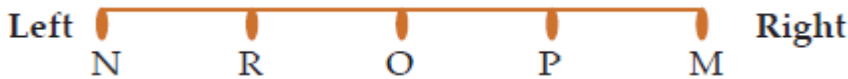
Therefore, O is sitting in the middle.

Ex. 8: Five boys A, B, C, D and E are standing in a row. D is on the right of E, B is on the left of E but on

the right of A. D is one the left of C, who is standing on the extreme right. Who is standing in the middle?

| | (a) B | (b) C | (c) D | (d) E |

Sol.:: The sequence of Boys as follows.

Left End | A | B | E | D | C | Right

There E is standing in the middle.

Ex. 9: (Q Nos. 1 to 3) *Study the following Question carefully and answer the given questions.*

Four ladies & A, B, C and D and Four Gentlemen E, F, G and H are sitting in a circle around a table

facing each other .

I. No two ladies or gentlemen are sitting side by side.
II. C, who I sitting between G and E, is facing D.
III. F is between D and A and facing G.
IV. H is to the right of B.

(1) Who is sitting left of A?

(a) E | (b) F | (c) G | (d) H

(2) E is facing whom?

(a) F | (b) B | (c) G | (d) H

(3) Who is immediate neighbour of B?

(a) G and H | (b) E and F | (c) E and H | (d) F and H

Sol.:: On the basis of given information in the question, the seating arrangements of the persons are as follows.
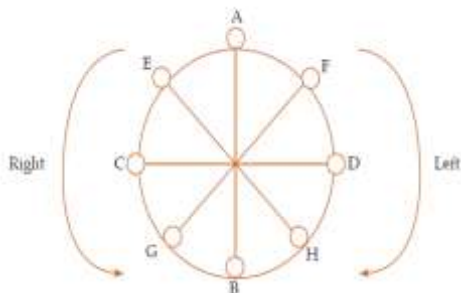
1) (b) Clearly , F is sitting left of A.

2) (d) Clearly E is facing H.

3) (a) G and H are neighbours of B.

Ex. 10: *Eight persons A, B, C, D, E, F, G and H are sitting around the circle as given in the Figure. They are facing the direction opposite to centre. If they move upto three places anti-clockwise, then.*
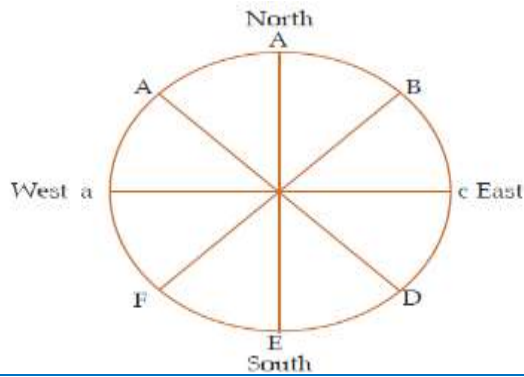
(a) B will face west   (b) E will face East   (c) H will face North-West   (d) A will face South

Sol.:: Following Seating arrangement is formed from the given in formation.
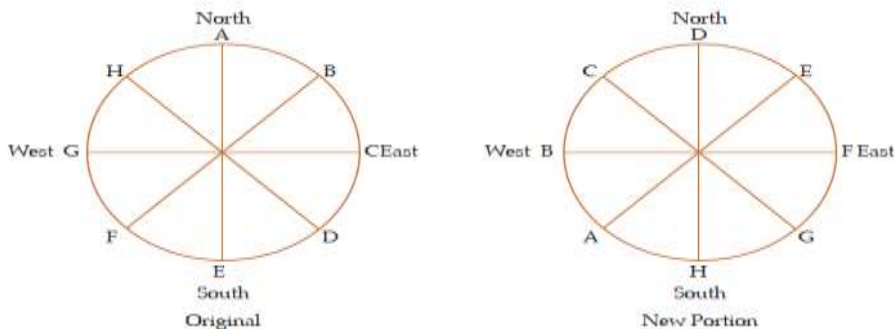
Clearly B will Face west

Ex. 11: *Five People A, B, C, D and E are seated about a round table. Every chair is spaced equidistant from adjacent*

chairs.
I. C is seated next to A .
II. A is seated two seats from D.
III. B is not seated next to A.

Which of the following must be true?
I. D is seated next to B.

II. E is seated next to A.

Select the correct from the options given below:
(a) Only I   (b) Only II   (c) Both I and II   (d) Neither I nor II

Sol.:: According to the given information there are possible Seating arrangements.
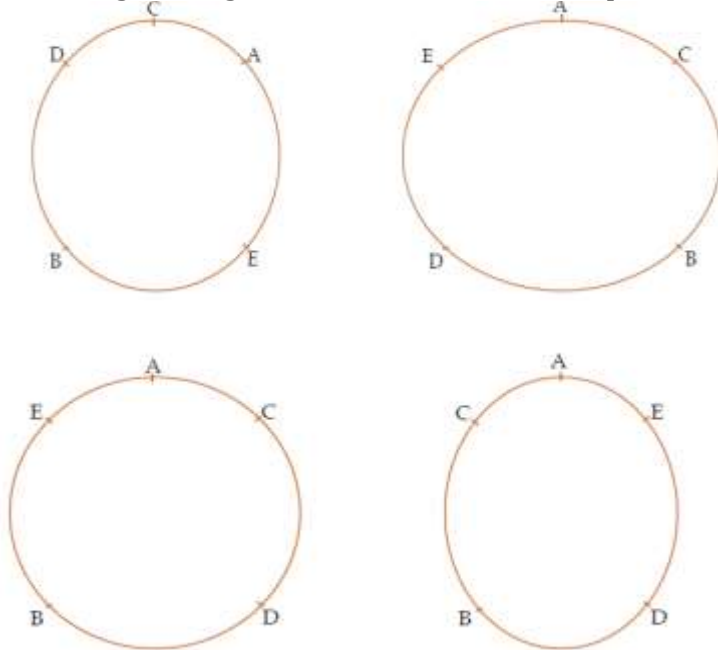
From the above arrangements. It is clear that D is seated next to B . Also E is next to A. Clearly both

statements I and II are true

Ex. 12: Study the following Question carefully and answer the given questions.

Eight friends A, B, C, D,E, G and H are sitting in a circle facing the centre, not necessarily in the same

order. D sits third to the left of A. E sits to the immediate right of A. B is third to left of D. G is to

second the right of B. C is neighbour of B. C is third to left of H.

1) Who amongst the following is sitting exactly between F and D?
(a) C   (b) E   (c) H   (d) A

2) Three of the following four are alike in a certain way based on the information given above and so form a group. Which is does not belong to that group.

(a) DC   (b) AH   (c) EF   (d) DF

3) Who amongst the following second to the left of H?

(a) E   (b) B   (c) A   (d) None of these

4) Who amongst the following are immediate neighbours of G?

(a) CA   (b) AF   (c) DC   (d) DF

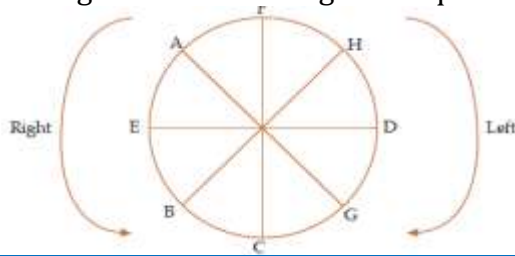5) Who amongst the following is sitting third to the right of A?

(a) F   (b) B   (c) H   (d) C

Sol.:: Arrangements according to the question is as follows

1) (c), Clearly H is sitting exactly F and D

2) (d)   DGC   AFH   EAF   C none B

Skipped   Skipped   Skipped   No member is skipped in between
So, CB does not belong to the group.

3) (d) Clearly, H is sitting exactly between F and D

4) (c) Clearly D and C immediate neighbours of G

5) (d) Clearly, C is sitting third to the right of A

"LR HAI JAHA, CA HAI WAHA"

Choose the appropriate answer (a) or (b) or (c) or (d)

1. Five boys A, B, C, D and E are sitting in a row A is to the right of B and E is to the left of B but to the right of C. A is to the left of D. Who is second from the left end? (U.P.B.Ed 2013)

   (a) D   (b) A   (c) E   (d) B

2. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle?

   (a) A   (b) B   (c) C   (d) D

3. Five friends P, Q, R, S and T are sitting in a row facing North. Here, S is between T and Q and Q is to the immediate left of R. P is to the immediate left of T. Who is in the middle?

   (a) S   (b) T   (c) Q   (d) R

4. Six children A, B, C, D, E and F are standing in a row. B is between F and D. E is between A and C. A does not stand next to eight F or D. C does not stand next to D. F is between which of the following pairs of children?

   (a) B and E   (b) B and C   (c) B and D   (d) B and A

5. There are eight books kept one over the other. Two books are on Organisation Behaviour, two books on TQM, three books on Industrial Relations and one book is on Economics. Counting from the top, the second, fifth and sixth books are on Industrial Relations. Two books on Industrial Relations are between two books on TQM. One book of Industrial Relations is between two books on Organizational Behaviour while the book above the book of Economics is a book of TQM. Which book is the last book from the top?

(a) Economics   (b) TQM   (c) Industrial Relations   (d) Organizational Behaviour

6. Five boys are standing in a row facing East. Pavan is left of Tavan, Vipin and Chavan to the left of Nakul.

Chavan is between Tavan and Vipin. Vipin is fourth from the left, then how far is Tavan to the right?

(a) First   (b) Second   (c) Third   (d) Fourth

7. Six persons M, N, O, P, Q and R are sitting in two row with three persons in each row. Both the row are in

front of each other. Q is not at the end of any row. P is second the left of R. O is the neighbour of Q and

diagonally opposite to P. N is the neighbour of R. Who is in front N?

(a) R   (b) Q   (c) P   (d) M

8. Six persons A, B, C, D, E and F are sitting in two row, three in each row.

(I) E is not at the end of any row

(II) D is second to the left of F

(III) C, the neighbor of E, is sitting diagonally opposite

(IV) B is the neighbor of F.

Which of the following are in one of the two rows?

(a) D, B and F   (b) C, E and B   (c) A, E and F   (d) F, B

Direction (Q.No.9): Read the following information carefully and answer that question that follows.

Five boys A1, A2, A3, A4 and A5 are sitting in a stair in the following way.

I. A5 is above A1
II. A4 is under A2

III. A2 is under A1
IV. A4 is between A2 and A3.

9.	Who is at the lowest position of the stair?
	(a) A1 (b) A3 (c) A5 (d) A2
10.	Five children are sitting in a row. S is sitting next to P but not T. K is sitting next to R, who is sitting on the
	extreme left and T is not sitting next to K. Who is/are adjacent to S?
	(a) K and P (b) R and P (c) Only P (d) P and T
11.	Five senior citizens are living in a multi-storeyed building. Mr. Muan lives in a feat above Mr.
	Ashokan, Mr. Lokesh in a feat below Mr. Gaurav, Mr. Ashokan lives in a feat below Mr. Gaurav
	and Mr. Rakesh lives in a feat below Mr. Lokesh. Who lives in the topmost feat? (MAT 2013).
	(a) Mr. Lokesh (b) Mr. Gaurav (c) Mr. Muan (d) Mr. Rakesh
12.	In a gathering seven members are sitting in a row. 'C' is sitting left to 'B' but on the right to 'D'.
	'A' is sitting right to 'B', 'F; is sitting right to 'E' but left to 'D'. 'H' is sitting left to 'E'. Find the
	person sitting in the middle.
	(a) C (b) D (c) E (d) F
	Directions (No: 13-17): Study the following information carefully to answer the given questions. A to H are
	seated in straight line facing North. C sits fourth left of G. D sits second to right of G.
	Only two people sit between D and A. B and F are immediate neighbours of each other. B is not an
	immediate neighbour of A. H is not neighbour of D.

13.	Who amongst the following sits exactly in the middle of the persons who sit fifth from the left and the person who sit sixth from the right?
	(a) C (b) H (c) E (d) F

14.	Who amongst the following sits third to the right of C?
	(a) B (b) F (c) A (d) E

15.	Which of the following represents persons seated at the two extreme ends of the line?
	(a) C, D (b) A, B (c) B, G (d) D, H

16.	What is the position of H with respect to F?
	(a) Third to the left (b) Immediate right (c) Second to right (d) Fourth to left

17.	How many persons are seated between A and E?
	(a) One (b) Two (c) Three (d) Four

Directions (Q. No. 18-22)

Study the following information carefully to answer the given questions.
Ten students are A to J are sitting in a row facing west.
I. B and F are not sitting on either of the edges.
II. G is sitting left of D and H is sitting to the right of J.
III. There are four persons between E and A.
IV. I is the north of B and F is the south of D.
V. J is between A and D and G is in E and F.
VI. There are two persons between H and C.

18.	Who is sitting at the seventh place counting from left?
	(a) H (b) C (c) J (d) Either H or C

19.	Who among the following is defnitely sitting at one of the ends?

(a) C   (b) H   (c) E   (d) Cannot be determined

20. | Who are immediate neighbours of I?

(a) BC   (b) BH   (c) AH   (d) Cannot determined

21. | Who is sitting second left of D?

(a) G   (b) F   (c) E   (d) J

22. | If G and A interchange their positions, then who become the immediate neighbours of E?

(a) G and F   (b) Only F   (c) Only A   (d) J and H

Directions (Q. Nos. 23-24) Read the following information carefully and then answer the questions that

follow.
A group of singers, facing the audience, are standing in line on the stage as follows.
I. D is not right to C
II. F is not standing beside G.
III. B is not left of F
IV. E is not left of A
V. C and B have one person between E and F
VI. There are two persons H and C.

23. | Who is on the Second extreme right?

(a) D   (b) F   (c) G   (d) E

24. | If we start counting from the left, on which number is B ?

(a) 1st   (b) 2nd (c) 3rd (d) 5th

Directions (Q. No. 25- 27): Study the following information carefully to answer the given questions.

Eight persons P to W are sitting in front of one another in two rows. Each row has four persons. P is

between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M

and W is to the immediate right of V.

25. Who is sitting in front of R?

(a) U   (b) Q   (c) V   (d) P

26. Who is to the immediate right of R?

(a) M   (b) U   (c) M or T   (d) None of these

27. In which of the following pairs, persons are sitting in front of each other?

(a) MV   (b) RV   (c) TV   (d) UR

28. Four girls A, B, C, D are sitting around a circle facing the centre. B and C infront of each other, which of the

following is de nitely true ?

(a) A and D infront of each other   (b) A is not between B and C

(c) D is left of C   (d) A is left of C

ANSWERS

1.	(c)	2.	(a)	3.	(a)	4.	(b)	5.	(a)	6.	(d)	7.	(b)
8.	(a)	9.	(b)	10.	(d)	11.	(c)	12.	(b)	13.	(d)	14.	(c)
15.	(d)	16.	(a)	17.	(a)	18.	(d)	19.	(c)	20.	(d)	21.	(a)
22.	(c)	23.	(b)	24.	(d)	25.	(d)	26.	(d)	27.	(a)	28.	(a)

CH - 4	BLOCK RELATIONS

BLOOD RELATIONS

1. A is B's daughter, B is C's mother. D is C's brother. How is D related to A?

   (a) Father   (b) Grandfather   (c) Brother   d) Son

Sol: A is daughter B.
B is mother of C
Therefore, D is Son of B

2. P is Q's brother. R is Q's mother. S is R's father. T is S's mother. How is P related to T

   (a) Grand-daughter   (b) Great grandson   (c) Grandson   (d) Grandmother

Sol: P is brother of Q . Therefore, P is a male.
R is mother of P and Q and R is daughter of S. S is Son of T.
S is grandfather of P.

3.. A is B's brother. C is D's father. E is B's mother. A and D are brothers. How is E related to C

   (a) Sister   (b) Sister-in-law   c) Niece   (d) Wife

Sol: A is brother of B . Therefore, A is male.
C is father of D. Therefore, C is male.
E is mother of B. Therefore, E is Female.
A and D are brothers.
Therefore, D is male.

Explanation:
(i) A and B are brothers of D
(ii) C is the father of A, B and D
(iii) C is the mother of A, B and D
(iv) E is wife of C

4. A is the sister of B. B is the brother of C. C is the son of D. How is D related to A?

   (a) Mother   (b) Daughter   (c) Son   (d) Uncle

Sol: B is brother of C
C is son of D.
A is the sister of B and C.

According to the options given, we are left with no choice. But selection option (a) is correct.

5. B is the brother of A. whose only sister is mother of C. D is maternal grandmother of C. How is A related to D?

(a) Daughter-in-law   (b) Daughter   (c) Aunt   (d) Nephew

Sol: Although sex of A is not mentioned clearly in the question. On the basis of information given is A is daughter of B.

6. A and B are sisters. R and S are brothers. A's daughter is R's sister. What is B's relation to S?

(a) Mother   (b) Grandmother   (c) Sister   (d) Aunt

Sol: A's daughter R and S.
B is sister of A. B is aunt of S.

7. E is the sister of B. A is the father of C. B is the son of C. How is A related to E?

(a) Grandfather   (b) Grand-daughter   (c) Father   (d) Great-grandfather

Sol: **B** is the Son of C and Grandson C and Grandson A.
E is sister of B.
Therefore, A is Grandfather of E.

8. Given that:
A is the mother of B.
C is the son of A.
D is the brother of E.
E is the daughter of B.

Who is grandmother of D?

(a) A   (b) B   (c) C   (d) D

Sol: E is the daughter of B and D is brother of E. Therefore B is son A and A is mother of B. Thus A, is Grandmother of D.

9. A is D' brother. D is B's father. B and C are sisters. How is A related to C?

(a) Son   (b) Grandson   (c) Father   (d) Uncle

10.	A is B's sister. C is B's mother. D is C's father. E is D's mother, then how A is related to D?
	(a) Grandfather b) Daughter (c) Grandmother (d) Granddaughter
Sol:	D is Father of C and B is mother of C. Thus, A is grandfather of D
11.	(i) F is the brother of A. (ii) G is the daughter of A. (iii) K is the sister of F. (iv) G is the brother of C.
	Who is the uncle of G?
	(a) A (b) C (c) K (d) F
Sol:	G is A and F is brother of A.
12.	A is father of C and D is son of B. E is brother of A. If C is sister of D how is B related to E?
	(a) Sister-in-law b) Sister (c) Brother (d) Brother-in-law
Sol:	C and D Children of A and B. B is mother of C and D. Therefore, B is Sister-in-law of E.
13.	C is wife of B. E is the son of C .A is the brother of B and father of D. What is the relationship of E to D?
	(a) Mother (b) Sister (c) Brother (d) Cousin
Sol:	E is son of B and C. A is uncle of E and Father of D. Therefore E is cousin of D.
14.	M is the son of P. Q is the grand-daughter of O, who is the husband of P. How is M related to O?
	(a) Son (b) Daughter (c) Mother (d) Father
Sol:	O is the Husband of P. M is the son of P. Therefore, M is son of O.

15.	*X and Y are brothers. R is the father of Y. S is the brother of T and maternal uncle of X. What is T to R?*
	(a) Mother (b) Wife c) Sister (d) Brother
Sol:	R is the Father of X and Y. S is the maternal uncle of X and Y. Considering the option (b), T is wife of R.

"LOGIC HAI JAHA, CA HAI WAHA"

Choose the appropriate answer (a) or (b) or (c) or (d)

1.	A is B's brother. C is A's mother. D is C's father, E is B's son. How is D related to A?
	(a) Son (b) Grandson (c) Grandfather (d) Great Grandfather
2.	As is B's brother. C is A's father. D is C's sister and E is D's mother. How is B related to E?
	(a) Grand-daughter (b) Great grands daughter
	(c) Grandaunt (d) Daughter
3.	A is B's Sister. C is B's Mother. D is C's Father. E is D's Mother. Then how is A related to D?
	(a) Grandmother (b) Grandfather (c) Daughter (d) Grands-daughter
4.	A is the father of B. C is the daughter of B. D is the brother of B. E is the son of A. What is the relationship between C and E?
	(a) Brother and sister (b) Cousins (c) Niece and uncle (d) Uncle and aunt
5.	If P is the husband of Q and R is the mother of S and Q. What is R to P?

	(a) Mother	(b) Sister	(c) Aunt	(d) Mother-in-law

6. P and Q are brothers. R and S are sister. P's son is S's brother. How is Q related to R?

(a) Uncle   (b) Brother   (c) Father   (d) Grandfather

7. X is the husband of Y. W is the daughter of X. Z is husband of W. N is the daughter of Z. What is the

relationship of N to Y?

(a) Cousin   (b) Niece   (c) Daughter   (d) Grand-daughter

8. A reads a book and find the name of the author familiar. The author 'B' is the paternal uncle of C.

C is the daughter of A. How is B related to A?

(a) Brother   (b) Sister   (c) Father   (d) Uncle

9. A's mother is sister of B and she has a daughter C who is 21 years old. How is B related to D?

(a) Uncle   (b) Maternal Uncle   (c) Niece   (d) Daughter

10. A is B's brother. C is A's mother. D is C's father. F is A's son. How is F related to D?

(a) Son   (b) Grandson   (c) Grand-grandson   (d) Grand-daughter

11. A is B's brother. C is A's mother. D is C's father. E is B's son. How is B related to D?

(a) Son   (b) Grand-daughter   (c) Grandfather   (d) Great grandfather

12. A is B's brother. C is A's mother. D is C's father. F a is A's son. How is B related to F's child?

(a) Aunt   (b) Cousin   (c) Nephew   (d) Grandfather

13. A is B's daughter. B is C's mother. D is C's brother. How is D related to A?

(a) Father   (b) Grandfather   (c) Brother   (d) Son

14. A is D's brother. D is B's father. B and C are sisters. How is C related to A?

(a) Cousin   (b) Niece   (c) Aunt   (d) Nephew

| 15. | A is B's brother. C is A's mother, D is C's father. E is B's son. How is D related to E ? |

(a) Grandson   (b) Great Grandson   (c) Great Grandfather   (d) Grandfather

| 16. | X and Y are the children of A. A is the father of X but Y is not his son. How is Y related to A? |

(a) Sister   (b) Brother   (c) Son   (d) Daughter

| 17. | A is B's brother. C is A's mother. D is C's father. E is B's son. How is E related to A   ? |

(a) Cousin   (b) Nephew   (c) Uncle   (d) Grandson

| 18. | Based on the statements given below, find out who is the uncle of P?
(i) K is the bother of J
(ii) M is the sister of K
(iii) P is the brother of N
(iv) N is the daughter of J |

(a) K   (b) J   (c) N   (d) M

| 19. | A and B are sisters. A is mother of D. D has a daughter C who is married to F. G is the husband of A. How is |

C related to D?

(a) Cousin   (b) Niece   (c) Aunt   (d) Sister-in-law

| 20. | R and S are brothers. X is the sister of Y and X is mother of R. What is Y to S? |

(a) Uncle   (b) brother   (c) Father   (d) Mother

| 21. | A is B's brother. C is A's mother. D is C's father. B and D's grand-daughter. How is B related to D. Who is |

A's son?

(a) Aunt   (b) Cousin   (c) Niece   (d) Grandaunt

| 22. | A is the son of B while B and C are sisters to one another. E is the mother of C. If D is the son of E, which of |

the following statements is correct?

(a) D is the maternal uncle of A   (b) E is the brother of B

(c) D is the cousin of A   (d) B and D are brother

23. P is the father of T. T is the daughter of M. M is the daughter of K. What is P to K?

(a) Father   (b) Father-in-law   (c) Brother   (d) Son-in-law

24. A and B are brothers. E is the daughter of F. F is the wife of B. What is the relation of E to A?

(a) Sister   (b) Daughter   (c) Niece   (d) Daughter

25. M and F are a married couple. A and B are sisters. A is the sister of F. Who is B to M?

(a) Sister   (b) Sister-in-law   (c) Niece   (d) Daughter

26. If A is the mother of D. B is not the son of C. C is the father of D, D is the sister of B, then how is A related to

B?

(a) Mother   (b) Brother   (c) Step son   (d) Sister

27. A and B are brother and sister respectively. C is A's father. D is C's sister and E is D's mother. How is B

related to E?

(a) Grand-daughter   (b) Great grand-daughter   (c) Aunt   (d) Daughter

28. Q is the son of P. X is the daughter of Q. R is the aunty (Bua) of X and L is the son of R, then what is L to P?

(a) Grandson   (b) Grand-daughter   (c) Daughter   (d) Nephew

29. P and Q are brothers. R and S are sisters. P's son is S's brother. How is Q related to R?

(a) Uncle   (b) Brother   (c) Father   (d) Grandfather

30. A and B are the young ones of C. If C is the mother of B but A is not the daughter of C, then what is the

relationship between C and A?

(a) Nephew and Aunty   (b) Brother and Sister   (c) Mother and son   (d) Niece and Aunty

31. A is the mother of D and sister of B. B has a daughter C who is married to F. G is the husband of A. How is G

related to D?

(a) Uncle   (b) Husband   (c) Son   (d) Father

32.   Pointing towards A, B said "your mother is the younger sister of my mother". How is A related to B?

(a) Uncle   (b) Cousin   (c) Nephew   (d) Fathe

33.   A is B's wife's husband's brother. C and D are sisters of B. How is A related to C?

(a) Brother   (b) Sister-in-law   (c) Wife   (d) Sister

34.   A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C?

(a) Father   (b) Brother   (c) Uncle   (d) Son

35.   A is B's sister. C is B's mother. D is C's father. E is D's mother. Then how is A related to D?

(a) Grandmother   (b) Grandfather   (c) Daughter   (d) Grand-daughter

36.   P, Q, R, S, T, U are 6 members of a family in which there are two married couples. T, a teacher is married to

a doctor who is mother of R and U. Q the lawyer is married to P. P has one son and one grandson. Of the

two married ladies one is a housewife. There is also one student and one male engineer in the family.

Which of the following is true about the grand-daughter of the family?

(a) She is a lawyer   (b) She is an engineer   (c) She is a student   (d) She is a doctor

37.   Six members of a family namely A, B, C, D, E and F are travelling together. 'B' is the son of C but C is not the

mother of B. A and C are married couple. E is the brother of C. D is the daughter of A. F is the brother of B.

How many male members are there in the family?

(a) 3   (b) 2   (c) 4   (d) 1

38.   A's mother is sister of B and has a daughter C. How can A be related to B from among the following?

(a) Niece   (b) Uncle   (c) Daughter   (d) Father

39.   Rajiv is the brother of Atul. Sonia is the sister of Sunil. Atul is the son of Sonia. How is Rajiv related to

Sonia?

(a) Nephew   (b) Son   (c) Brother   (d) Father

40.   Sita is the niece of Ashok. Ashok's mother is Lakshmi. Kalyani is Lakhshmi's mother. Kalyani's husband is

Gopal. Parvathi is the mother-in-law of Gopal. How is Sita related to Gopal?

(a) Great grandson's daughter   (b) Gopal's Sita's father

(c) Sita is Gopal's great grand-daughter   (d) Grand niece

41.   Seema is the daughter-in-law of Sudhir and sister-in-law of Ramesh. Mohan is the son of Sudhir and only

brother of Ramesh. Find the relation between Seema and Mohan.

(a) Sister-in-law   (b) Aunt   (c) Cousin   (d) Wife

42.   Suresh introduces a man as "He is the son of the woman who is the mother of the husband of my mother".

How is Suresh related to the man?

(a) Uncle   (b) Son   (c) Cousin   (d) Grandson

43.   Pointing to a lady in a photograph. Meera said. "Her father's only son's wife is my mother-in-law "How is

Meera's husband related to that lady in the photo?

(a) Nephew   (b) Uncle   (c) Son   (d) Father

44.   Pointing to a photograph Vikas said "She is the daughter of my grandfather's only son". How is the related

to Vikas in the photograph?

(a) Father   (b) Brother   (c) Sister   (d) Mothe

45. | Suresh's sister is the wife of Ram. Ram is Rani's brother. Ram's father is Madhur. Sheetal is Ram's grandmother. Rema is Sheetal is daughter-in-law. Rohit is Rani's brother's son. Who is Rohit to Suresh?

(a) Brother-in-law   (b) Son   (c)   Brother   (d) Nephew

46. | Vinod introduces Vishal as the son of the only brother of his father's wife. How is Vinod related to Vishal?

(a) Cousin   (b) Brother   (c) Son   (d) Uncle

47. | Among her children, Ganga's favourites are Ram and Rekha. Rekha is the mother of Sharat, who is loved most by his uncle Mithun. The head of the family is Ram Lal, who is succeeded by his sons Gopal and Mohan. Gopal and Ganga have been married for 35 years and have 3 children. What is the relation between Mithun and Mohan?

(a) Uncle   (b) Son   (c) Brother   (d) Nephew and uncle

48. | Rahul and Robin are brothers. Promod is Rohin's father. Sheela is Pramod's sister. Prema is Promod's niece. Shubha is Sheela's grand-daughter. How is Rahul related to Shubha?

(a) Brother   (b) Cousin   (c) Uncle   (d) Nephew

49. | Preeti has a son, named Arun. Ram is Preeti's brother. Neeta too has a daughter named Reema. Neeta is Ram's sister. What is Arun's relationship to Reema?

(a) Brother   (b) Nephew   (c) Cousin   (d) Uncle

50. | There are 2 firm stars. One is the father of the other's son. What is the relationship of the two with each other?

(a) Grandfather and Grandson   (b) Grandfather and son   (c) Husband and wife   (d) Father and Son

51. | Ramu's mother said to Ramu,"My mother has a son whose son is Achyut". How is Achyu relation to Ramu?

	(a) Uncle	(b) Cousin	(c) Brother	(d) Nephew

52. Ravi's father has a son Rohit who has an aunt Laxmi who has a husband Rao whose father-in-law is

Mohan. What is the relation of Mohan to Ravi?

(a) Nephew   (b) Grandfather   (c) Son   (d) Uncle

53. Vijay says, Ananda's mother is the only daughter of my mother". How is Ananda relation to Vijay?

(a) Brother   (b) Father   (c) Nephew   (d) Grandfather

54. Introducing a man, a woman said, "His wife is the only daughter of my mother." How is the woman related

with the man?

(a) Sister-in-law   (b) Wife   (c) Aunt   (d) Mother-in-law

55. A prisoner introduced a boy who came to visit him to the jailor as "Brothers and sisters I have none, he is

my father's son's son". Who is the boy?

(a) Nephew   (b) Son   (c) Cousin   (d) Uncle

ANSWERS

1. (c)	2. (a)		3. (d)	4. (c)
5. (d)	6. (a)		7. (d)	8. (a)
9. (b)	10. (c)		11. (b)	12. (d)
13. (c)	14. (b)		15. (c)	16. (d)
17. (b)	18. (a)		19. (a)	20. (a)
21. (a)	22. (a)		23. (d)	24. (c)
25. (b)	26. (a)		27. (a)	28. (a)
29. (a)	30. (c)		31. (d)	32. (b)
33. (a)	34. (c)		35. (d)	36. (c)
37. (c)	38. (a)		39. (b)	40. (c)
41. (d)	42. (b)		43. (a)	44. (c)
45. (d)	46. (a)		47. (d)	48. (c)
49. (c)	50. (d)		51. (b)	52. (b)
53. (c)	54. (b)		55. (b)	

STUDENT NOTES

CH - 5	SYLLOGISM	

Ex.1

Statements
I All A's are C's
II All D's are C's

Conclusion
I All D's are C's
II. Some D's are not A's

(a) Only I follows

(b) Only II follows

(c) Both I and II follows

(d) None follows

Sol: **(a)** Now, taking conclusion I, it is clear that all D's are also C's but taking conclusion II, we cannot

say that some D's are not A's because from Statement I it is clear that all D's are A's.

Hence, only Conclusion I follows.

"LOGIC HAI JAHA, CA HAI WAHA"

Directions (Qs. 1 - 25) : Each of the following questions contains two statements followed by two

conclusions numbered I and II. You have to consider the two statements to be true, even if they seen to be

at variance at the commonly known facts. You have to decide which of the given conclusions definitely

follows from the given statements.

Give answer (a) if only I follows; (b) if only conclusion II follows; (c) if either I or II follows; (d) if

neither I nor II follows and (e) if both I and II follow.

1. **Statement:** Some Chairs are glasses.
                  All trees are Chairs.

   Conclusions: I. Some trees are glasses
                    II. Some glasses are trees.

2. **Statement:** No man is a lion.
                  Ram is a man.

   Conclusions: I. Ram is not a lion.
                    II. All men are not Ram.

3. **Statement:** All boys are Fathers.
                  All Fathers are Mothers.

   Conclusions: I. All Fathers are boys.
                    II. All boys are Mothers.

4. **Statement:** All pens are cups.
                  All cups are bowls.

   Conclusions: I. All pens are bowls.
                    II. All cups are pots.

5. **Statement:** All students are boys.
                  No boy is dull

Conclusions: I. There are no girls in the class
                                II. No student is dull.

6.   **Statement:** Some cats are kittens.
                        All Rats are kittens.

Conclusions: I. Some cats are Rats.
                                II. Some Rats are cats.

7.   **Statement:** All names are dogs.
                            No dogs are foxes.

Conclusions: I. All names are foxes.
                                  II. No dogs are names.

8.   **Statement:** All pens are dogs.
                        Some pens are lights.

Conclusions: I. Some dogs are lights.
                                  II. Some lights are not dogs

9.   **Statement:** Some animals are clouds.
                            Horse is a animal.

Conclusions: I. Some clouds are animal.
                                II. Hen is not a cloud.

10. **Statement:** All tables are rats.
                            Some Rats are chairs.

Conclusions: I. All rats are tables
                                  II. Some chairs are not rats.

11. **Statement:** All tigers are birds.
                        Some birds are cows.

Conclusions: I. Some cows are birds.
                                II. Some tigers are cows.

12. **Statement**: All papers are pens.
                        All pens are erasers.

Conclusions: I. Some erases are papers.
                                  II. Some pens are no papers.

13. **Statement:** Some trees are monkeys.
                            Some ships are trees.

Conclusions: I. Some Monkeys are ships.
                                  II. Some trees are neither ships nor monkeys.

14. **Statement:** All glasses are mirrors.

Some mirrors are Black.

Conclusions: I. All mirrors are glasses.
II. Some glasses are black.

15. **Statement:** Some dogs are monkeys.
No monkey is black.

Conclusions: I. Some dogs are black.
II. Some monkeys are dogs.

16. **Statement:** All roads are poles.
No poles are Bungalows.

Conclusions: I. Some roads are Bungalows.
II. Some Bungalows are poles.

17. **Statement:** Many actors are directors.
All Directors are dancers.

Conclusions: I. Some actors are dancers.
II. No director is an actor.

18. **Statement:** Only dogs are animals.
No historian is an animal.

Conclusions: I. Some dogs are not historians.
II. Some historians are not dogs.

19. **Statement:** Some chairs are caps.
No cap is red.

Conclusions: I. Some caps are chairs.
II. No Chair is red.

20. **Statement:** Some cups are belts.
No belt is black.

Conclusions: I. Some cups are black.
II. Some cups are not black.

21. **Statement:** Some girls are flowers.
Some flowers are books.

Conclusions: I. Some girls are books.
II. No books are girls.

22. **Statement:** Some files are rats.
All animals are rats.

Conclusions: I. All files are rats.
II. Some rats are animals.

23. **Statement:** All cricketers are tall.
Rajesh is tall.

Conclusions: I. Rajesh is a cricketer.
II. Rajesh is not cricketer.

24. **Statement:** Some cats are cows.
All cows are horses.

Conclusions: I. Some horses are cats.
II. Some cats are horses.

25. **Statement:** All scientists are hard working.
No scientists are superstitious.

Conclusions: I. No scientists are superstitious.
II. All superstitious are not scientists.

ANSWERS

1. (d)	2. (e)	3. (b)	4. (d)	5. (e)
6. (d)	7. (d)	8. (a)	9. (a)	10. (b)
11. (a)	12. (e)	13. (b)	14. (d)	15. (b)
16. (d)	17. (a)	18. (a)	19. (a)	20. (b)
21. (c)	22. (b)	23. (c)	24. (e)	25. (e)

CHAPTER 1
NUMBER SERIES,CODING DECODING & ODD MAN OUT

ADDITIONAL QUESTIONS

"MORE REASONING YOU FIND, MORE EASY WILL BE THE

MYSTERY OF CA JOURNERY"

1. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.

   In the alphabet given above, which is 13th letter to the left of 8th letter from your right?

   (a) E   (b) F   (c) U   (d) H

   Ans.: (b)

2. There are two letters in the word 'SCIENTIFIC' such that the number of letters between them is the same

   as the number of letters between them in the alphabet. The letter which comes later in the alphabet is your

   answer. If no such pair of letters is possible, then your answer is 'X'.

   (a) E   (b) C   (c) I   (d)X

   Ans.: (a)

3. How many pairs of two letters of the word 'INDUCTIVE' are there, which have as many letters between

them in the word as in the alphabet?

(a) None   (b) 3   (c) 1   (d) 4

Ans.: (c)

4.   If the following series is written in reverse order, then which will be 12th letter to the right of 10th letter

from your right?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) X   (b) U   (c) V   (d) None of these

Ans.: (a)

5.   If in the following series all the letters at the even places are deleted and the order of deleting begins from

B, then which will be the third letter to the left of 5th letter from your right?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) I   (b) W   (c) M   (d) None of these

Ans.: (d)

6.   If in the following series the letters at the even places are denoted by lower letters as b for B, d for D and so

on then how will the next month of November be written?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) DECEMbEr   (b) deCeMber   (c) dEcEMbER   (d) dECEMbEr

Ans.: (d)

7. In the following series which is the 9th letter to the left of 7th letter from your left?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) K   (b) O   (c) P   (d) None of these

Ans.: (c)

8. Which is the 7th letter to the right of 9th letter from your right in the following series?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) Y   (b) L   (c) J   (d) None of these

Ans.: (d)

9. Which is the 10th letter to the left of 15lh letter from your right in the following series?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

(a) U   (b) B   (c) V   (d) None of these

Ans.: (b)

10. If the first and sixth letters of the word 'CREDENTIALS' were interchanged, also the

second and seventh letters and so on, which of the following would be 8th letter from your right?

(a) A   (b) T   (c) D   (d) None of these

Ans.: (a)

11. If the first and 11th letters of the word 'DISTURBANCE' were interchanged, also the second and 10th letters

and so on, which would be the 7th letter from your right?

(a) R   (b) B   (c) A   (d) None of these

Ans.: (b)

12. If with the first, fourth, fifth and eighth letters of the word 'LAUREATE' a meaningful word can be formed,

which would be the first letter of that word? If no meaningful word is possible then X is the answer and if

more than one, words are possible then M is the answer.

(a) X   (b) E   (c) M   (d) None of these

Ans.: (c)

13. If with the second, fourth, sixth and 10th letters of the word 'SHOPKEEPER' a meaningful word can be

formed, which would be the last letter of that word? If no meaningful word is possible then 'X' is the

answer and if more than one, words can be formed, then the answer is 'M'.

(a) M   (b) X   (c) P   (d) None of these

Ans.: (b)

14. If with the first, fifth, eighth and 10ᵗʰ letters of the word 'HOMOGENEOUS' a meaningful word can be

formed, which would be the first letter of that word? If no meaningful word can be formed then the answer

is 'X' and if more than one, words can be formed then 'M' is the answer.

(a) H   (b) X   (c) M   (d) None of these

Ans.: (a)

15. Two letters of the word 'YESTERDAY' have as many letters between them in the word as in the alphabet.

The letter which comes earlier in the alphabet. The letter which comes earlier in the alphabet is your

answer. If no such pair is there, then your answer will be 'XT

(a) R   (b)S   (c) X   (d) M

Ans.: (a)

16. Which one of the following numbers is different from the rest?

(a) 13   (b) 21   (c) 17   (d) 19

Ans.: (b)

17. Which one of the following groups of letters is different from the rest?

(a) NP   (b) PR   (c) US   (d) EG

Ans.: (c)

Directions — In each of the questions from 18 to 29, which one of the alternatives is different

from the rest?

18.

(a) 4-7   (b) 7-16   (c) 17-36   (d) 16-32

Ans.: (d)

19.

(a) 51-28   (b) 37-62   (c) 81-104   (d) 99-76

Ans.: (b)

20.

(a) 111-11   (b) 15-105   (c) 7-91   (d) 3-81

Ans.: (a)

21.

(a) 63, 18   (b) 29,46   (c) 47,34   (d)28, 41

Ans.: (c)

22.

(a) 9-27   (b) 15-45   (c) 10-30   (d) 20-60

Ans.: (a)

23.

(a) 10-45   (b) 20-85   (c) 40-180   (d) 60-270

Ans.: (b)

24.

(a) 2437   (b) 2419   (c) 5407   (d) 1459

Ans.: (d)

25.

(a) 2547   (b) 3456   (c) 3715   (d) 5678

Ans.: (c)

26. (a) 15-40   (b) 18-56   (c) 24-76   (d) 12-28

Ans.: (b)

27. (a) 6-36   (b) 5-25   (c) 7-49   (d)3-9

Ans.: (a)

28. (a) 9-40   (b) 20-95   (c) 17-80   (d) 16-78

Ans.: (b)

29. (a) 200   (b) 500   (c) 700   (d) 600

Ans.: (d)

Directions— In each of the questions from 30 to 41, which letters group is different from the rest?

30. (a) MNW   (b) OPY   (c) JKT   (d)GHO

Ans.: (d)

31. (a) FRY   (b) HAN   (c) CUT   (d) DOT

Ans.: (a)

32. (a) TEAM   (b) THAN   (c) TATA   (d) TILE

Ans.: (c)

33. (a) KMPTZ   (b) DFIMR   (c) HJMQV   (d) ACFJO

Ans.: (a)

| 34. | (a) CROTON | (b) CRUSH | (c) CRIMP | (d) CRINGE |

Ans.: (a)

| 35. | (a) CORDIAL | (b) CORIANDER | (c) CORDATE |

Ans.: (c)

| 36. | (a) CRY | (b) JOY | (c) FRY | (d) TRY |

Ans.: (b)

| 37. | (a) FAMOUS | (b) FRUCTUOUS | (c) FANCIED | (d) FAVOUR |

Ans.: (b)

| 38. | (a) GLARY | (b) GLAZE | (c) GLARE | (d) GLADE |

Ans.: (a)

| 39. | (a) GILD | (b) GIFT | (c) GIMP | (d) GIBE |

Ans.: (d)

| 40. | (a) NOM | (b) BCA | (c) JIH | (d) RSQ |

Ans.: (c)

| 41. | (a) MQT | (b)ADG | (c) HKN | (d)RUX |

Ans.: (a)

Directions— In each of the following questions find out the odd one.

| 42. | (a) Flower | (b) Stem | (c) Branch | (d) Roots |

Ans.: (d)

43.

(a) Day   (b) Week   (c) Time   (d) Month

Ans.: (c)

44.

(a) College-students   (b) Hospital-patient

(c) Bus stand-driver   (d) Stadium-viewer

Ans.: (c)

45.

Find the odd word out:

(a) Cotton   (b) Terene   (c) Silk   (d) Wool

Ans.: (b)

46.

Which one is different from the rest?

(a) Sparrow   (b) Chicken   (c) Pigeon   (d) Owl

Ans.: (b)

Directions— (47-53) In each of the following questions find the word or pair of words which is different from the other three words or pairs of words.

47.

(a) Shirt-Dress   (b) Boy-Girl   (c) Book-Library   (d) Table-Furniture

Ans.: (b)

48.

(a) Mango-Fruit   (b) Rice-Corn   (c) Student-Class   (d) Tomato-Potato

Ans.: (d)

| 49. | (a) Sweet-Sour | (b) Unhappy-Sad | (c) In-Out | (d) Up-Down |

Ans.: (b)

| 50. | (a) Lake | (b) Brook | (c) Stream | (d) River |

Ans.: (a)

| 51. | (a) Light-heavy | (b) Broad-Wide | (c) Big-Large | (d) Tiny-Small |

Ans.: (a)

| 52. | (a) Unique | (b) Peerless | (c) Common place | (d) Unequalled |

Ans.: (c)

| 53. | (a) Cover-Page | (b) Circle-Radius | (c) Chair-Leg | (d) Flower-Petal |

Ans.: (a).

54. If in a certain code 'MANISH' is written as 'NZMRHS', then how will 'RANJITA' be written in the same code?

| (a) IZMQRGZ | (b) IZMPRGZ | (c) IZMQRHZ | (d) IZMQRIZ |

Ans.: (a)

55. If in a certain code 'CANDLE' is written as 'FDQGOH' then how will 'MINUTE' be written in the same code?

| (a) PQLHXW | (b) PHWQLX | (c) PLQHWX | (d)PLOXWH |

Ans.: (d)

56. If 'THRASH' is coded as 'UGSZTG', then how will 'HEAD' be coded?

| (a) IECD | (b)GDZC | (c) IDBC | (d)GDBC |

Ans.: (c)

57. If 'TOMB' is coded as 'MBOR', then how will 'GOAL' be coded?

(a) ALOG   (b) ALOE   (c) LOAG   (d)EALO

Ans.: (b)

58. If 'CAMERA' is coded as 'CMRCMR', then how will 'CHAPRA' be coded?

(a) CARCAR   (b) CARHPA   (c) HPACAR   (d) RACRAC

Ans.: (a)

59. If 'GOAL' is coded as 'HPBM' and 'FROCK' is coded as 'GSPTU then • how will 'LOFAR' be coded?

(a) MPGZO   (b)MNEBS   (c) MPGBS'   (d)MPEBR

Ans.: (c)

60. If TORCH' is coded as 'SXILG' then how will 'MANUAL' be coded?

(a) OBFMZN   (b) OZEOZN   (c) OZFMZN   (d)NZFMZK

Ans.: (c)

61. If 'INSURE' is coded as 951395, then how will 'PATRIOT be coded?

(a) 7129962   (b) 7129962   (c) 7129962   (d) 7129962

Ans.: (c)

62. If TAME' is coded as 'SULA' and 'NIDUS' as 'MACOR' then how will EMOTIONS' be coded?

(a) ALISEIMR   (b) DLNSHNMR   (c) ALISEIOR   (d) ANIUEIOT

Ans.: (a)

63. If 'BEAR' is coded as 'FISH', 'FISH' as 'CROW', 'CROW' as 'DOG' 'DOG' as 'ELEPHANT and 'ELEPHANT

as 'ASS', then who can not remain alive in other place than water?

(a) FISH ,   (b) ELEPHANT   (c) DOG   (d) CROW

Ans.: (d)

64. . 'Vehicle' is coded as 'Book', 'Book' as 'Flower', 'Flower' as 'Sweet' 'Sweet' as 'House', 'House' as 'Mental

Hospital', and 'Mental Hospital' as Temple', then where is treasure of huge amount of knowledge hidden?

(a) Book   (b) Sweet   (c) Vehicle   (d) Flower

Ans.: (d)

65. If in a certain code '493' means 'Friendship difficult challenge', '961', means, 'Struggle difficult Exam., and

'178' means 'Exam believable subject', then which digit is used for 'believable'?

(a) 7 or 8   (b) 7 or 9   (c) 8   (d) 8 or 1

Ans.: (a)

66. How many M's are there in the following letter series which are not immediately preceded by H but

immediately followed by R? HPMXTMRHMRCKMHPTLMRNUS

(a) 3   (b) 5   (c) 1   (d) 2

Ans.: (d)

67. In the following number series how many times have 2, 3 and 8 come together in such a way that 2 is in the

middle and 3 and 8 are at extreme positions?

2 4 5 2 3 8 2 3 4 6 7 3 2 8 8 2 34 5 6 8 2 3 6 2 8 3 2 8

(a) 3　　　　　　(b) 2　　　　　　(c) More than 4　　　　　　(d) 4

Ans.: (c)

68. In the following series how many times an odd number is followed by two consecutive even numbers?

4 2 3 2 5 4 2 5 3 2 6 4 3 5 7 2 8 6 7 9 4 5 4 2 9 6 1 3 2

(a) 4　　　　　(b) More than 4　　　　　(c) 2　　　　　(d) 3

Ans.: (a)

69. In the following number series, how many such 8's are there which are divisible by its just preceding

number but not divisible by its just following number?

2 8 4 3 2 8 5 4 8 2 6 7 8 5 8 2 4 8 2 6 8 2 4 8 6 7 8 2

(a) 2　　　　　(b) 3　　　　　(c) 1　　　　　(d) None of these

Ans.: (a)

70. In the following number series how many such 5's are there which are neither preceded by 3 nor followed

by 7?

2 7 5 3 4 5 7 6 3 5 2 1 2 5 4 6 5 9 3 5 7 5

(a) 4　　　　　(b) 5　　　　　(c) 3　　　　　(d) 2

Ans.: (c)

71. How many such odd digits are there in the given series which are followed by an odd digit?

(a) 4   (b) 6   (c) More than 6   (d) 3

Ans.: (b)

72. How many such even digits are there in the given series which are preceded by an odd number and

followed by an even number?

(a) 1   (b)2   (c) 4   (d) 3

Ans.: (d)

73. How many such odd digits are there in the given series which are preceded and followed by any even digit?

(a) 4   (b) 2   (c) 5   (d) 3

Ans.: (a)

74. How many such groups of 3 digits are there in the following number series in which middle digit is an

even number while atleast one of the two remaining digits is an odd number?

3 4 3 2 4 2 3 5 1 7 2 5 9 6 4 3 5 8 2 1 4 6 5 6 7 4

(a) 6   (b) 5   (c) 4   (d) More than 6

Ans.: (d)

75. In the following number series how many such groups of 4, 5 and 9 are there in which prime number of

these three digits must be in the middle? 45969457495674954359449 5549

(a) 3   (b) 4   (c) 2   (d) More than 4

Ans.: (c)

76.   In the following letter series how many such groups of L, S and W are there in which W should be the

middle of the group?

M L W S A L S W N B Q W S L W P L S N O L W T R W S L

(a) 2   (b) 3   (c) 4   (d) None of these

Ans.: (d)

77.   How many such H's are in the series, which are preceded by P and followed by E?

P H C R Q P H E T P H L H C P E H P S R Q E H P H C P H

(a) 2   (b) 3   (c) 1   (d) 4

Ans.: (c)

78.   How many X's are in the following series which are preceded by E and followed by N?

P E X R T N E X L R E N X U P E X T A X F E X L N E X

(a) 2   (b) 3   (c) 1   (d) None of these

Ans.: (d)

79.   In the following series which number will replace the question mark: 4,32, 16, 128,64,?

(a) 612   (b) 512   (c) 362   (d) 412

Ans.: (b)

80.   In the following series, which number will replace the question mark:

2, 5, 12, 39, 160, 805, ?

(a) 4936   (b) 4930   (c) 4830   (d) 4836

Ans.: (d)

81. In the following series, which number will replace the question mark: 23, 29,31,37,41,43,?

(a) 45   (b) 53   (c) 47   (d) 49

Ans.: (c)

82. In the following series which number will replace the question mark?

0, 6,24, 60, 120, 210,?

(a) 336   (b) 343   (c) 300   (d) 332

Ans.: (a)

83. Q1F, S2E, U6D, W21C, ?

(a) Y66B   (b) Y88B   (c) 288B   (d) Y44B

Ans.: (b)

84. 3F, 6G, 111, 18L,?

(a) 210   (b) 25N   (c) 27Q   (d) 27P

Ans.: (d)

85. CFL, EIK, GLJ, IOI, ?

(a) KRH   (b)KRJ   (c) JRH   (d)KQH

Ans.: (a)

86.	BF, CH, ?, HO, LT.

(a) EM   (b) EK   (c) FJ   (d) EL

Ans.: (b)

87.	XDA, WED, VFG, UGJ, THM, ?

(a) JRQ   (b) QKN   (c) PLO   (d) SIP

Ans.: (d)

88.	In the following letter-series some letters are missing. The missing letters are given in the proper sequence

as one of the alternatives. Find the correct alternative.

ab—abcab—abc—bca—c

(a) abac   (b)bcac   (c) ccab   (d) bbac

Ans.: (c)

*	**Directions:** (89 - 96) In each of the questions find out the group of letters in place of question in the letter series.

89.	EIO, JOU, OUA,?

(a) UAI   (b) UAE   (c) AEI   (d) EIO

Ans.: (b)

90.	EFI, FGJ, GHK, ?, 1JM

(a) HIL   (b) HIM   (c) HIK   (d) GHL

Ans.: (a)

91.

PNR, QKQ, SHO, VEL, ZBH, ?

(a) EZC   (b)EYC   (c) DYB   (d)FZB

Ans.: (b)

92.

ISR, 2UO, 5WL, 16YI, ?

(a) 49AF   (b) 33BG   (c) 65AF   (d) 65AG

Ans.: (c)

93.

A2E, B7D, D17B, G37Y, ?

(a) K87V   (b) K67U   (c) R57U   (d) K77U

Ans.: (d)

94.

BOM, D1L, G1J, K2G, ?

(a) Q4C   (b) P5C   (c) P3C   (d) P3B

Ans.: (c)

95.

$\frac{1}{R}, \frac{3}{O}, \frac{5}{K}, \frac{9}{F}, \frac{13}{Z}, ?$

(a) $\frac{19}{S}$ (b) $\frac{20}{T}$ (c) $\frac{19}{T}$ (d) $\frac{21}{R}$

Ans.: (a)

96.

$.\frac{4}{Z}, \frac{11}{W}, \frac{25}{Q}, \frac{46}{H}, ?$

(a) $\frac{67}{W}$ (b) $\frac{74}{V}$ (c) $\frac{60}{U}$ (d) $\frac{81}{V}$

Ans.: (b)

Directions: (97-104) In the following series find the number in place of question mark?

97.

25, 22, 30, ?, 35.

(a) 27   (b) 26   (c) 28   (d) 29

Ans.: (a)

98.

8, 13, 18, 11, 16,21, 16, 21, 26, ?, ?, ?

(a) 28,33,38   (b) 23, 28, 33   (c) 22,27,32   (d) 21,26, 31

Ans.: (b)

99.

3, 5, 6, 8,11,13,?

(a) 17   (b) 18   (c) 15   (d) 20

Ans.: (b)

100.

2, 4, 12, 6, 12, 36, 18, 36, 108, ?

(a) 72   (b) 54   (c) 90   (d) 108

Ans.: (b)

101.

2,7,15,26,40,57,?

(a) 80   (b) 81   (c) 75   (d) 77

Ans.: (d)

102.

11,5, 20, 12, ? ,26, 74, 54.

(a) 30   (b) 38   (c) 48   (d) 28

Ans.: (b)

103. 1,4, 7, 10, ?, 16, 19, ?

(a) 13,22   (b) 11, 22   (c) 13,21   (d) 13, 23

Ans.: (a)

104. 5, 13, ?, 109, 325, 973.

(a) 39   (b) 36   (c) 37   (d) 35

Ans.: (c)

CHAPTER 2

DIRECTION SENSE TEST

"*MORE REASONING YOU FIND, MORE EASY WILL BE THE*

MYSTERY OF CA JOURNERY"
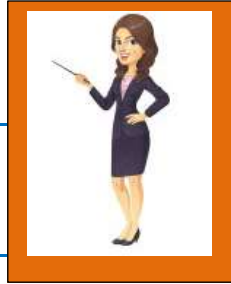
ADDITIONAL QUESTIONS

1. If South-East becomes North and South becomes North-East and all the rest directions are changed in the same

    manner, the what will be the direction for West?

    (a) North-East   (b) North-West   (c) South-East   (d) South-West

2. I walk 30 metres in North-West direction from my house and then 30 metres in South-west direction. After this

    I walk 30 metres in South-East direction. Now, I turn to my house, in what direction am I going?

    (a) North-East   (b) North-West   (c) South-East   (d) South-West

3. Mohan was facing east. He walked 4 km forward and then after turning to his right walked 3 km. Again he turned to

    his right and walked 4 km. After this he turned back. Which direction was he facing at that time?

    (a) East   (b) West   (c) North   (d) South

4. A man walks 1 km to East and then he turns to South and walks 5 km. Again he turns to East and

    walks 2 km. After this he turns to North and walks 9 km. Now, how far is he from his starting point?

(a) 3 km.   (b) 4 km.   (c) 5 km.   (d) 7 km.

5. If Rahim moves 20 metres in East direction and then turns to his left and then moves 15 metres and then he turns to

his right and moves 25 metres. After this he turns to his right and moves 15 metres. Now, how jar is he from starting

point ?

(a) 40 metres   (b) 50 metres   (c) 25 metres   (d) 45 metres

6. A cyclist goes 30 km to North and then turning to East he goes 40 km. Again he turns to his right and goes 20 km.

After this he turns to his right and goes 40 km. How far is from his starting point ?

(a) 40   (b) 50   (c) 25   (d) 10

7. A man faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and

walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres.

Finally, he turns to the right and moves 40 metres. In which direction is he from his starting point ?

(a) South-West   (b) South   (c) North-west   (d) South-East

8. A man leaves from his office for his home. He walks towards East. After moving a distance of 20 metres,

he turns South and walks 10 metres. Then he walks 35 metres towards the west and further 5 metres towards the

North He then turns towards east and walks 15 metres. What is the straight distance (in metres)

between his initial and final position?

(a) 0   (b) 5   (c) 10   (d) 11

9.   A, B, C and D are standing on the four corners of a square field as shown in the figure below:

A starts crossing the field diagonally. After walking half the distance, he turns right, walks some

distance and turns left. Which direction is A facing now?
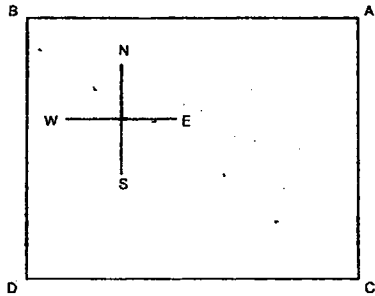
(a) North-East   (b) South-West   (c) South-East   (d) North-West

10.   Kunal walks 10 km towards north. From there, he walks 6 km towards South. Then he walks 3 km towards

east. How far and in which direction is he with reference to his starting point?

(a) 5 km, West   (b) 5 km, North-East   (c) 7 km, East   (d) 7 km, south-East

11.   Rohan walks a distance of 3 km towards north, then turns to his left and walks 2 km. He again turns

left and walks for 3 km. At this point he turns to his left and walks for 3 km. How many kilometres

is he from the starting point?

(a) 1 km.   (b) 2 km.   (c) 3 km.   (d) 4 km.

12.   One morning Udai and Vishal were talking to each other face to face at a crossing. If Vishal's

shadow was exactly to the left of Udai, which direction was Udai facing?

(a) East   (b) West   (c) North   (d) South

13. Rahul put his timepiece on the table in such a way that at 6 P.M. hour hand points to North. In which direction the

minute hand will point at 9.15 P.M. ?

(a) South-East   (b) South   (c) North   (d) West

14. Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P?

(a) North   (b) South   (c) South-East   (d) None of these

15. A direction pole was situated on the crossing. Due to an accident the pole turned in such a manner

that the pointer which was showing East, started showing South. One traveller went to wrong direction

thinking to be West. In what direction actually he was traveling?

(a) East   (b) South-West   (c) North   (d) South

16. If South-East becomes North, North-East becomes West and so on. What will West become?

(a) North-East   (b) North-West   (c) South-East   (d) South-West

17. A boy rode his bicycle Northward, then turned left and rode 1 km. and again turned left and rode 2 km.

He found himself 1 km. west of his starting point. How far did he ride northward initially?

(a) 1 km.   (b) 2 km.   (c) 3 km.   (d) 5 km.

18. A man walks 5 km toward south and then turns to the right. After walking 3 km he turns to the left and walks 5 km.

Now in which direction is he from the starting place

(a) West   (b) South   (c) North-East   (d) South-West

19. K is 40 metres South-West of L. If M is 40 metres South-East of L, then M is in which direction of K?

(a) East   (b) West   (c) North-East   (d) South

20. Rasik walked 20 m towards north. Then he turned right and walks 30 m. Then he turns right and walks

35 m. Then he turns left and walks 15 m. Finally he turns left and walks 15 m. In which direction and how

many metres is he from the starting position

(a) 15 m West   (b) 30 m East   (c) 30 m West   (d) 45 m East

21. One evening before sunset Rekha and Hema were talking to each other face to face. If Hema's shadow

was exactly to the right of Hema, which direction was Rekha facing?

(a) North   (b) South   (c) East   (d) Data is inadequate

22. Two cars start from the opposite places of a main road, 150 km apart. First car runs for 25 km and takes

a right turn and then runs 15 km. It then turns left and then runs for another 25 km and then takes the

direction back to reach the main road. In the mean time, due to minor break down the other car has run only

35 km along the main road. What would be the distance between two cars at this point?

(a) 65 km.   (b) 75 km.   (c) 80 km.   (d) 85 km.

23. Starting from the point X, Jayant walked 15 m towards west. He turned left and walked 20 m. He then

turned left and walked 15 m. After this he turned to his right and walked 12 m. How far and in which

directions is now Jayant from X?

(a) 32 m, South   (b) 47 m, East   (c) 42 m, North   (d) 27 m, South

24. A man walks 2 km towards North. Then he turns to East and walks 10 km. After this he turns to North

and walks 3 km. Again he turns towards East and walks 2 km. How far is he from the starting point?

(a) 10 km.   (b)13km.   (c) 15 km.   (d) None of these

25. Some boys are sitting in three rows all facing North such that A is in the middle row. P is just to the right

of A but in the same row. Q is just behind of P while R is in the North of A. In which direction of R is Q?

(a) South   (b) South-West   (c) North-East   (d) South-East

26. The length and breadth of a room are 8 m and 6 m respectively. A cat runs along all the four walls and finally

along a diagonal order to catch a rat. How much total distance is covered by the cat?

(a) 10   (b) 14   (c) 38   (d) 48

27. P started from his house towards west. After walking a distance of 25 m. He turned to the right and walked

10 m. He then again turned to the right and walked 15 m. After this he is to turn right at 135°and to cover 30 m. In

which direction should he go?

(a) West   (b) South   (c) South-West   (d) South-East

28. One morning after sunrise, Vimal started to walk. During this walking he met Stephen who was coming

from opposite direction. Vimal watch that the shadow of Stephen to the right of him (Vimal). To Which direction

Vimal was facing?

(a) East   (b) West   (c) South   (d) Data inadequate

29. X started to walk straight towards south. After walking 5 m he turned to the left and walked 3 m. After this he turned to the right and walked 5 m. Now to which direction X is facing?

(a) North-East   (b) South   (c) North   (d) South-West

30. If A x B means A is to the south of B; A + B means A is to the north of B; A % B means A is to the east of B; A - B means A is to the west of B; then in P % Q + R - S, S is in which direction with respect to Q?

(a) South-West   (b) South-East   (c) North-East   (d) North-West

31. One morning Sujata started to walk towards the Sun. After covering some distance she turned to right then again to the right and after covering some distance she again turns to the right. Now in which direction is she facing?

(a) North   (b) South   (c) North-East   (d) South-West

32. Golu started from his house towards North. After covering a distance of 8 km. he turned towards left and covered a distance of 6 km. What is the shortest distance now from his house?

(a) 10 km.   (b)16km.   (c) 14km.   (d) 2 km.

33. Hemant in order to go to University started from his house in the east and came to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the University?

(a) North   (b) South   (c) East   (d) West

34. Reena walked from A to B in the East 10 feet. Then she turned to the right and walked 3 feet. Again she turned to the right and walked 14 feet. How far is she from A?

(a) 4 feet   (b) 5 feet   (c) 24 feet   (d) 27 feet

35. After walking 6 km, I turned to the right and then walked 2 km. After then I turned to the left and walked

10 km. In the end, I was moving towards the North. From which direction did I start my journey?

(a) North   (b) South   (c) East   (d) West

36. One morning after sunrise, Suresh was standing facing a pole. The shadow of the pole fell exactly to his right

To which direction was he facing?

(a) East   (b) South   (c) West   (d) Data is inadequate

37. Ravi left home and cycled 10 km towards South, then turned right and cycled 5 km and then again turned right

and cycled 10 km. After this he turned left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

(a) 10 km.   (b)15km.   (c) 20 km.   (d) 25 km.

38. A child went 90 m in the East to look for his father, then he turned right and went 20 m. After this he turned

right and after going 30 m he reached to his uncle's house. His father was not there. From there he went

100 m to his north and met his father. How far did he meet his father from the starting point?

(a) 80 m   (b) 100 m   (c) 140 m   (d) 260 m

39. Umesh directly went from P, to Q which is 9 feet distant. Then he turns to the right and walked 4 feet. After

this he turned to the right and walked a distance which is equal from P to Q. Finally he turned to the

right and walked 3 feet. How far is he now from P?

(a) 6 feet   (b) 5 feet   (c) 1 feet   (d) 0 feet

40. Amit started walking positioning his back towards the sun. After some time, he turned left, then turned

right and towards the left again. In which direction is he going now?

(a) North or South   (b) East or West   (c) North or West   (d) South or West

41. Four friends A, B, C and D live in a same locality. The house of B is in the east of A's house but in the north

of C's house. The house of C is in the west of D's house. D's house is in which direction of A's house?

(a) South-East   (b) North-East   (c) East   (d) Data is inadequate

42. Rohit walked 25 m towards south. Then he turned to his left and walked 20 m. He then turned to his left

and walked 25 m. He again turned to his right and walked 15 m. At what distance is he from the starting
point

and in which direction?

(a) 35 m East   (b) 35 m North   (c) 30 m West   (d) 45 m East

43. One morning after sunrise Nivedita and Niharika were talking to each other face to face at Dalphin

crossing. If Niharika's shadow was exactly to the right of Nivedita, Which direction Niharika was facing ?

(a) North   (b) South   (c) East   (d) Data is inadequate

44. Radha moves towards South-East a distance of 7 km, then she moves towards West and travels a distance
of

14 km. From here she moves towards North-West a distance of 7 km and finally she moves a

distance of 4 km towards east. How far is she now from the starting point?

(a) 3 km.   (b) 4 km.   (c) 10 km.   (d) 11 km.

45. From his house, Lokesh went 15 km. to the North. Then he turned west and covered 10 km. Then he turned

south and covered 5 krn. Finally turning to the east, he covered 10 km. In which direction is he from his house?

(a) East   (b) West   (c) North   (d) South

46. Sachin walks 20 km towards North. He turns left and walks 40 km. He again turns left and walks 20 km.

Finally he moves 20 km. after turning to the left. How far is he from his starting position.

(a) 20 km.   (b) 30 km.   (c) 50 km.   (d) 60 km.

47. Shyam walks 5 km towards East and then turns left and walks 6 km. Again he turns right and walks 9 km.

Finally he turns to his right and walks 6 km. How far is he from the starting point?

(a) 26 km.   (b) 21 km.   (c) 14 km.   (d) 9 km.

48. Sundar runs 20 m towards East and turns to right and runs 10 m. Then he turns to the right and runs 9 m.

Again he turns to right and runs 5 m. After this he turns to left and runs 12 m and finally he turns to right

and 6 m. Now to which direction is Sundar facing?

(a) East   (b) West   (c) North   (d) South

49. Village Q is to the North of the village P. The village R is in the East of Village Q. The village S is to the left of

the village P. In which direction is the village S with respect to village R?

(a) West   (b) South-West   (c) South   (d) North-West

ANSWERS

1	C	11	A	21	B	31	A	41	A
2	A	12	C	22	A	32	A	42	A
3	A	13	D	23	A	33	A	43	A
4	C	14	D	24	B	34	B	44	C
5	D	15	C	25	D	35	B	45	C
6	D	16	C	26	C	36	B	46	A
7	D	17	B	27	C	37	B	47	C
8	B	18	D	28	C	38	B	48	C
9	D	19	A	29	B	39	C	49	B
10	B	20	D	30	B	40	A		

CHAPTER 3

SEATING ARRANGEMENTS

ADDITIONAL QUESTION

"MORE REASONING YOU FIND, MORE EASY WILL BE THE

MYSTERY OF CA JOURNERY"

1. A. Eleven students, A, B, C, D, E, F, G, H, I, J and K, are sitting in the first row of the class facing the teacher.

    B. D who is to the immediate left of F is second to the right of C.

    C. A is the second to the right of E, who is at one of the ends.

    D. J is the immediate neighbour of A and B and third to the left of G.

    E. H is to the immediate left of D and third to the right of I. Who is sitting in the middle of the row?

    (a) A   (b) B   (c) H   (d) I

2. Siva, Satish, Amar and Praveen are playing cards. Amar is to the right is to the right of Satish who is to

    the right of Siva. Who is to the right of Amar?

    (a) Satish   (b) Amar   (c) Praveen   (d) Shiva

3. A, R, P, X, S and Z are sitting in a row Sand Z are in the Centre. A and P are at the ends. A is sitting to the left

    of A. Who is to the right of P?

    (a) A   (b) X   (c) S   (d) Z

4. A, B, C, D and E are sitting On a bench. A is sitting next to B, C is sitting next to D, D is not sitting with F

who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E

A and C are sitting together. In which position A is sitting?

(a) Between B and D   (b) Between B and C   (c) Between F and D   (d) Between C and F

Q.5-8

(a) P, Q, R, S, T, U, V and W are sitting round the circle and are facing the centre:

(b) P is second to the right of T who is the neighbour of R and V.

(c) S is not the neighbour of P.

(d) V is the neighbour of U.

(e) Q is not between S and W. W is not between U and S

5. Which two of the following are not neighbours ?

(a) RV   (b),UV   (c) RP   (d) QW

6. Which one is immediate right to the V ?

(a) P   (b) U   (c) R   (d) T

7. Which of the following is correct ?

(a) P is to the immediate right of Q   (b) R is between U and V

(c) Q is to the immediate left of W   (d) U is between W and S

8. What is the position of S ?

(a) Between U and V   (b) Second to the right of P

(c) To the immediate right of W   (d) Data inadequate.

Q. 9-12 Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu.

Mary is to the right of Rani. Reeta is between Rani and Mary.

9. Who is sitting immediate right to Reeta?

   (a) Bindu   (b) Rani   (c) Mary   (d) Seema

10. Who is in the middle of the photograph ?

    (a) Bindu   (b) Rani   (c) Reeta   (d) Seema

11. Who is second from the right ?

    (a) Mary   (b) Rani   (c) Reeta   (d) Bindu

12. Who is second from the left in photograph ?

    (a) Reeta   (b) Mary   (c) Bindu   (d) Seema

Q.13-16 Six friends are sitting in a circle and are facing the centre of the circle. Deepa is between Prakash and

Pankaj. Priti is between Mukesh and Lalit. Prakash and Mukesh are opposite to each other.

13. Who is sitting right to Prakash ?

    (a) Mukesh   (b) Deepa   (c) Pankaj   (d) Lalit

14. Who is just right to Pankaj ?

    (a) Deepa   (b) Lalit   (c) Prakash   (d) Priti

15. Who are the neighbours of Mukesh?

    (a) Prakash and Deepa (b) Deepa and Priti (c) Priti and Pankaj (d) Lalit and Priti

16. | Who is sitting opposite to Priti?

(a) Prakash   (b) Deepa   (c) Pankaj   (d) Lalit

Q.17-20 Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the

centre of the hexagonal. P is second to the left of U. Q is neighbour of R and S. T is second to the left of S.

17. | Which one is sitting opposite to P ?

(a) R   (b) Q   (c) T   (d) S

18. | Who is the fourth person to the left of Q?

(a) P   (b) U   (c) R   (d) Data inadequate

19. | Who are the neighbours of P?

(a) U andP   (b) T and R   (c) U and R   (d) Data inadequate

20. | Which one is sitting opposite to T?

(a) R   (b) Q   (c) Cannot be determined   (d) S

Q 21-25. Directions to Solve

a. A ,B, C, D and E are five men sitting in a line facing to south - while M, N, O, P and Q are five ladies

sitting in a second line parallel to the first line and are facing to North.

b. B who is just next to the left of D, is opposite to Q.

c. C and N are diagonally opposite to each other.

d. E is opposite to O who is just next right of M.

e. P who is just to the left of Q, is opposite to D.

f. M is at one end of the line.

21.   Who is sitting third to the right of O?

(a) Q   (b) N   (c) M   (d) Data inadequate

22.   If B shifts to the place of E, E shifts to the place of Q, and Q shifts to the place of B, then who will be the

second to the left of the person opposite to O ?

(a) Q   (b) P   (c) E   (d) D

23.   Which of the following pair is diagonally opposite to each other?

(a) EQ   (b) BO   (c) AN   (d) AM

24.   If O and P, A and E and B and Q interchange their positions, then who will be the second person to the

right of the person who is opposite to the person second of the right of P?

(a) D   (b) A   (c)E   (d)O

25.   In the original arrangement who is sitting just opposite to N?

(a) B   (b) A   (c) C   (d) D

Q 26-29. Directions to slove

a. A, B, C, D, E, F and G are sitting in a row facing North:

b. F is to the immediate right of E.

c. E is 4th to the right of G.

d. C is the neighbour of B and D.

e. Person who is third to the left of D is at one of ends.

26. Who are to the left of C?

(a) Only B   (b) G, B and D   (c) G and B   (d) D, E.F and A

27. Which of the following statement is not true?

(a) E is to the immediate left of D   (b) A is at one of the ends

(c) G is to the immediate left of B   (d) F is second to the right of D

28. Who are the neighbours of B?

(a) C and D   (b) C and G   (c) G and F   (d) C and E

29. What is the position of A?

(a) Between E and D   (b) Extreme left   (c) Centre   (d) Extreme right

Q.30-34: Each of these questions are based on the information given below:

1. 8 persons E, F, G, H, I, J, K and L are seated around a square table-two on each side.

2. There are 3 ladies who are not seated next to each other.

3. J is between L and F.

4. G is between I and F.

5. H, a lady member is second to the left of J.

6. F, a male member is seated opposite to E, a lady member.

7. There is a lady member between F and I.

30. Who among the following is to the immediate left of F?

(a) G   (b) I   (c) J   (d) H

31. What is true about J and K?

(a) J is male, K is female   (b) J is female, K is male

(c) Both are female   (d) Both are male

32. How many persons are seated between K and F?

(a) 1   (b)2   (c) 3   (d)4

33. Who among the following are three lady members?

(a) E, H and J   (b) E, F and G   (c) E, H and G   (d) C, H and J

34. Who among the following is seated between E and H?

(a) F   (b) l .   (c) K   (d) Cannot be determined

Q.35-38. Directions to slove

In a class there are seven students (including boys and girls) A, B, C, D, E, F and G. They sit on three benches

I, II and III. Such that at least two students on each bench and at least one girl on each bench. C who is a

girl student, does not sit with A, E and D. F the boy student sits with only B. A sits on the bench I with

his best friends. G sits on the bench III. E is the brother of C.

35.   How many girls are there out of these 7 students ?

(a) 3   (b) 3 or 4   (c) 4   (d) Data inadequate

36.   Which of the following is the group of girls ?

(a) BAC   (b)BFC   (c) BCD   (d) CDF

37.   Who sits with C ?

(a) B   (b) D   (c) G   (d)E

38.   On which bench there are three students ?

(a) Bench I   (b) Bench II   (c) Bench III   (d) Bench I or II

Q 39-42. Six girls are sitting in a circle facing to the centre of the circle. They are P, Q, R, S, T and V. T is not

between Q and S but some other one. P is next to the left of V. R is 4th to the right of P.

39.   Which of the following statement is not true?

(a) S is just next to the right to R   (b) T is just next to the right of V

(c) R is second to the left of T   (d) P is second to the right of R

40.   If P and R interchange their positions then which of the following pair will sit together?

(a) RT   (b) PV   (c) VT   (d) QV

41. What is the position of T?

(a) Just next to the right of Q   (b) Second to the left of P

(c) Between Q and R   (d) To the immediate right of V

42. Which one is sitting just right to the V?

(a) P   (b) T   (c) R   (d) S/Q

Q.43-47: Eight friends H, J, K, L, M, N, 0 and P are sitting around a circular table facing the centre but

not necessarily in the same order. There are five females in the group of friends. No two male persons are

immediate neighbours of each other. N sits third to the right of P, who sits second to the right of his wife.

J sits second to the right of her husband H, who is not an immediate neighbour of P's wife. K is not

an immediate neighbour of P, M sits second to the right of her husband. 0 is not an immediate neighbour

of J. L sits second to the right of N, who is not a male.

43. Who among the following sits exactly between two males?

(a)M   (b)0   (c)J   (d)N   (e) K

44. Who is wife of P?

(a) K   (b) 0   (c) L   (d) N   (e) None of these

45. In which of the following pairs is the second person second to the right of the first person?

| (a) M, O | (b) N,P | (c) K,J | (d) N,P | (e) None of these |

46. How many females are there exactly between J and N?

(a) 1   (b) 2   (c) 3   (d) None

47. Who among the following is third to the right of J?

(a) H   (b) O   (c) Wife of L   (d) Wife of P

Q.48-52: A, B, C, D, E, F and G are sitting in a straight line facing North. There is only one person between

F and C. E sits between A and D. There are only two persons between E and G. F sits on the immediate

left of A, who sits in the middle of the row

48. How many persons are there between E & F?

(a) 1   (b) 2   (c) 3   (d) 4

49. Who among the following sit at the extreme ends of the row?

(a) O, F   (b) C, C   (c) B, C   (d) None of these

50. Who among the following sits on the immediate right of D?

(a) G   (b) E   (c) F   (d) B

51. Who among the following sits third to the right of A ?

(a) C   (b) G   (c)B   (d)E

52. Which is true with regard to B?

(a) B is second to the right of A.   (b) B is fourth to the left of G.

(c) B sits at the extreme right.   (d) B sits at the extreme left.

Q.53-57: Instructions to Solve

(1) P, 0, R, S, T, U and V are sitting on a wall and all of them are facing West.

(2) s iè on the immediate left of P.

(3) T is at an extreme end and has Q as his neighbour.

(4) V is between Q and U.

(5) S is sitting third from the north end.

53. Who is sitting to the left of S ?

(a) Q   (b)U   (c)T   (d)R

54. Which of the following pairs of people are sitting at the extreme ends?

(a) QV   (b) PR   (c) TP   (d) ST   (e) VP

55. Name the person who should change places with IR such that he gets the fourth place from the South end?

(a)P   (b)S   (c) Q   (d) T   (e)U

56. Immediately between which of the following pairs of people S is sitting?

(a) UR   (b) PQ   (c) VP   (d) TU   (e)RV

57. Which of the conditions given above are not required to find out the place in which P is sitting?

(a) I   (b) II   (c) IV   (d) Ill   (e) All required

Q.58-62: K, P, T, C, N, 0, Land J are standing in a row facing north, but not necessarily in the same order.

Only N is between C and 0 whereas only L is between 0 and J. T and K are P's neighbours. Neither T

nor C is at the extreme end of the row. J is to the right of T but not necessarily on the immediate right.
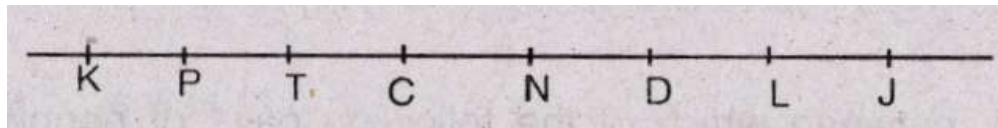
58. Who among the following are neighbour?

(a) T,K   (b) T,C   (c) N,L   (d) K,J   (e) L, T

59. Which of the following is true?

(a) N is on the immediate right of D.   (b) K is not at either of the extreme end.

(c) P is between K and T.   (d) T is at one of the extreme end.   (e) None of these.

60. Which of the following defines the position of D ?

(a) D is second to the left of J.   (b) P is second to the right of L.

(c) D is at one of the extreme ends   (d) D is the neighbour of C.   (e) None of these.

61. Which ot the following pairs is the neighbour of N?

(a) D, L   (b) C,T   (c) T,L   (d) C,D   (e) None of these

62. Which of the following pairs is at the extreme ends of the row?

(a) ,J,P   (b) K, P   (c) K,J   (d) Can't be determined   (e) None of these

Q.63-67: Directions: Twelve girl students L, M, N, 0, P. Q, A, 5, T, U, V. and W are sitting in a row facing east.

0 is third to the right at M and T is sitting near L. Six girl students are sitting between Wand 0.

A is fourth to the right of 0 and S is fifth to the left of P. who is eight to the right of W L is sitting on sixth

place from the right end. U is not near to A and S. V is sitting on the fourth place to the left of L.

63. Who is the two girl students sitting at the two ends?

(a) W and N   (b) W and R   (c) V and 0   (d) 0 and Q

64. Find out the names of two girl students sitting near to Q?

(a) T and V   (b) N and S   (c) VandU   (d) SandT

65. Who is sitting at fifth to the left of U?

(a) Q   (b) S   (c) T   (d) R

66. Who is second to right of L?

(a)S   (b)P   (c) U   (d)V

67. Which of the following statements are true?

(a) More the one statements is true.

(b) There are six girl students sitting between N and 0.

(c) U is second to the right of 0.

(d) M is sitting at fourth place to the right of T.

Q.68-72: Directions: A, B, C, D, E, F and H are sitting in a straight line but not necessarily in the same order

Two of them are facing south. C sits second to the right of E. A sits second to the left of F, who sits third

to the left of H. H is facing south. B sits third to the right of C, who is third from left. 6 and face opposite directions.

68.

Who among the following sits between F and B?

(a)D   (b)E   (c)H   (d) C   (e) None of these

69.

Who among the following sits third to the right of F?

(a) E   (b) C   (c) B   (d) A   (e) None of these

70.

Which of the following pairs sits on the extreme ends of the row?

(a) F,D   (b) A,E   (c) H,B   (d) D,H   (e) None of these

71.

Four of the following five are alike in a certain way and so form a group. Which is the one that does not

belong to the group?

(a) AD   (b) B,D   (c) FED   (d) C,D   (e)H,E

72.

Who among the following sits second to the left of E?

(a) D   (b)C   (c)   (d).B   (e) None of these

Q.73-77: Directions: Seven friends I', 0, R, S. T, U and V are standing in a straight line facing north but not necessarily

in the same order.

• U stands second from the left end of the line.

• Only two persons stands between U and T.

• Only one person stands between P and P.

• V stands third to the left of R.

• Neither R nor U is an immediate neighbour of S.

73. Which of the following is TRUE regarding 0?

(a) P stands second to the left of 0.   (b) S is one of the immediate neighbour of 0.

(c) Only one person stands between Q and T.   (d) Q stands at one of the extreme ends of the line.

(e) V stands second to the right of 0.

74. Four of the following five form a group as per the given arrangement. Which of the following does not

belong to that group?

(a) RO   (b) IP   (c) VT   (d) UV   (e) PS

75. What is the position of V with respect to U?

(a) Immediate left   (b) Second to the right

(c) Third to the right   (d) Immediate right (e) Second to the left

76. Which of the following pairs stand at the extreme ends of the line (b) 0, P

(a) Q, S   (b) Q, P   (c) Q,T   (d) V, S   (e) V. P

77. Which of the following represents the position of R from the left end o the line ?

(a) Fifth   (b) First   (c) Sixth   (d) Fourth   (e) Second

Q.78-82: Direction:

I. A, B, C, D, E, F, G, and H are sitting in a row facing North.

II. A is fourth to the right of E.

III. H is fourth to the left of D.

IV. C and F, who are not at the ends are neighbours of B and E, respectively.

V. H is next to the left of A and A is the neighbour of B.

78. What is the position of F?

(a) Next to the right of E.   (b) Next to the right of G.

(c) Sixth to the right of D   (d) Between G and H,   (e) None of these.

79. Which of the following statements is not true?

(a) G is the neighbour of H and F.   (b) B is next to the right of A.

(c) E is at left end.   (d) D is next to the right of B.   (e) None of these.

80. Who is/are the neighbour/(s) of D?

(a) F alone.   (b) C alone.   (c) BandC.   (d) Cannot be determined.

(e) None of these.

81. Which of the following statements is not true?

(a) H is second to the right of F.   (b) E is fourth to the left of A.

(c) D is fourth to the right of H.   (d) None of these.   (e) Cannot be determined.

82. Who are sitting at the ends?

(a) EandC.   (b) F and D.   (c) G and D.   (d) None of these.   (e) Cannot be determined.

ANSWERS

1	D	11	C	21	B	31	D	41	D	51	B	61	D	71	E	81	D
2	C	12	D	22	A	32	C	42	B	52	C	62	C	72	A	82	D
3	B	13	D	23	D	33	C	43	B	53	B	63	B	73	C		
4	B	14	A	24	B	34	C	44	A	54	C	64	D	74	C		
5	A	15	C	25	B	35	B	45	A	55	E	65	A	75	A		
6	D	16	B	26	C	36	C	46	D	56	A	66	B	76	D		
7	C	17	D	27	A	37	C	47	C	57	E	67	C	77			
8	C	18	A	28	B	38	A	48	A	58	B	68	B	78	A		
9	C	19	B	29	D	39	C	49	C	59	A	69	C	79	D		
10	B	20	B	30	C	40	C	50	B	60	A	70	D	80	B		

CHAPTER 4
BLOOD RELATIONS

ADDITIONAL QUESTIONS

"MORE REASONING YOU FIND, MORE EASY WILL BE THE

MYSTERY OF CA JOURNERY"

1. Pointing to a lady in the photograph, Monika said, "Her son's father is the son-in-law of my mother"

   How is Monika related to the lady?

   (a) Aunt   (b) Sister   (c) Mother   (d) Cousin

2. Amit introduced Akash of the son of the only brother of his father's wife. How is Akash related to Amit?

   (a) Cousin   (b) Son   (c) Uncle   (d) Son-in-law

3. Pointing to a man in a photograph, Sania said, "His mother's only daughter is my mother", How is Sania

   related to that man ?

   (a) Nephew   (b) Sister   (c) Wife   (d) Niece

4. Poloting to a woman, Rajesh said, "She is the daughter of the only child of my grandmother":

   How is the woman related to Rajesh?

   (a) Sister   (b) Niece   (c) Cousin   (d) Brother

5. K and L are brothers. M and N are sisters K's son is N's brother. How isL related to M? -

   (a) Father   (b) Brother   (c) Grandfather   (d) Uncle

6. Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother'. How is Suresh

related to that boy?

(a) Brother   (b) Uncle   (c) Cousin   (d) Father

7. If A is the brother at B, B is the sister of C, and C is the lather of ID, how ID is related to A.

(a) Nephew   (b) Sister   (c) Nephew   (d) Can't say

8. If A + B means A is the brother of B, A - B means A is the sister of B, and A x B means A is the father of

B. Which of the following means that C is the son of M

(a) M-NXC+F   (b) F- C+NxM   (c) N+M-FxC   (d) MxN-C+F

9. Introducing a boy, a girl said, "He is the son of the dapghter of the lather of my uncle." How is the boy related to the girl?

(a) Brother   (b) Nephew   (c) Uncle   (d) Son-in-law

10. Pointing to a photograph Lata says, "He is the son of the only son of my grandfather". How is the man in the

photograph related to Lata ?

(a) Brother   (b) Uncle   (c) Cousin   (d) Data is inadequate

11. It A + B means A is the brother of B. Ax B means A is the son of B and A % B means B is the

daughter of A then which of the following means M is the maternal uncle of N?

(a) M+OxN   (b) M%QxN+P   (c) M+O%N   (d) None of these

12. If D is the brother of B how B is related to C. To answer this question which of the statements is/are necessary?

1. The son of V is the grandson of C.

2. B is the sister of ID.

(a) Only 1   (b) Only 2   (c) Either 1 or 2   (d) 1 and 2 both are required

13. If A + B means A is the father of B. A B means A is the brother B. A% B means A is the wife of B and Ax B

means A is the mother of B, which of the following shows that M is the maternal grandmother of T?

(a) MxN%S+T   (b) MxN-S%T   (c) MxS-N%T   (d) MxNxS%T

14. Pointing to a photograph. Bajpai said, "He is the son of the only daughter of the lather of my brother" How

Bajpai is related to the man in the photograph?

(a) Nephew   (b) Brother   (c) Father   (d) Maternal uncle

15. Deepak said to Nitin, "That boy playing with the football is the younger of the two brothers of the daughter

of my father's wife", How is the boy playing football related to Deepak?

(a) Son   (b) Brother   (c) Cousin   (d) Brother-in-law

16. Pointing a photograph X said to his friend Y, "she is the only daughter of the father of my mother",

How X is related to the person of photograph?

(a) Daughter   (b) Son -   (c) Nephew   (d) Cannot be decided

17. Veeha who is the sister-in-law of Ashok is the daughter-in-law of Kalyani. Dheeraj is the father of Sudeep

who is the only brother of Ashok. How Kalyani is related to Ashok?

(a) Mother-in-law   (b) Aunt   (c) Wife   (d) None of these

18. If A + B means A is the sister pf B, Ax B means A is the wife of B, A % B means A is the father of B and

A - B means A is the brother of B. Which of the following means T is the daughter of P?

(a) PxQ%R+S-T   (b) PxQ%R-T+S   (c) PxQ%R+T-S   (d) PxQ%R+S+T

19. Pointing to a woman, Abhijit said, "Her grand daughter is the only daughter of my brother", How is the

woman related to Abhijit?

(a) Sister   (b) Grandmother   (c) Mother-in-law   (d) Mother

20. Amit said "This girl is the wife of the grandson of my mother", How is Amit related to the girl?

(a) Brother   (b) Grandfather   (c) Husband   (d) Father-in-law

21. Pointing toward a man, a woman said "His mother is the only daughter of my mother". How is the

woman related to the man?

(a) Mother   (b) Grandmother   (c) Sister .   (d) Daughter

22. If P $ Q means P is the brother of 0. P # 0 means P is the mother of Q p * Q means P is the daughter

of Q in A # B $ C * D, who is the father?

(a) D   (b)C   (c) B   (d) Data is inadequate

23. Introducing Sonia, Aamir saysr"She is the wife of only nephew ot ui brother of my mother".

How Sonia is related to Aamir 2

(a) Wife   (b) Sister   (c) Sister-in-law   (d) Data is inadequate

24. If A + B means A is the brother of B. A % B means A is the father B and A x B means A is the sister of 8.

Which of the following means M the uncle of P?

(a) M%NXP   (b) NxP%M   (c) M+S%R%P   (d) M+K%TXP

25. Pointing of Vaman, Madhav said, "I am the only son of one of the sons of his father", How is Vaman related

to Madhav?

(a) Nephew　　　　(b) Uncle　　　　(c) Father or uncle　　　　(d) Father

26. Introducing a woman. Shashank said "she is the mother of the only daughter of my son"., How that woman is

related to Shashank?

(a) Daughter　　　　(b) Sister-in-law　　　　(c) Wife　　　　(d) Daughter-in-Law

27. If A + B means B is the brother of A. Ax B means B is the husband of A, A -B means A is the mother of B

and A % B means A is the father of B. Which of the following shows that 0 is the grand mother of T?

(a) Q-P-t-R%T　　　　(b) PxQ%R-T　　　　(c) PxO%R+T　　　　(d) P+Q%R-T

28. Pointing to a photograph. Anjali said, "He is the son of the only son of my grand father" How is the

man in photograph related to Anjali?

(a) Brother　　　　(b) Uncle　　　　(c) Son　　　　(d) Data is inadequate

29. Pointing to a person, Deepak said, "His only brother is the father of my daughter's father", How is the person

related to Deepak?

(a) Father　　　　(b) Grandfather　　　　(c) Uncle　　　　(d) Brother-in-law

30. P is the mother of K. K is the sister of D. D is the father of J. How is P related to J ?

(a) Mother　　　　(b) Grandmother　　　　(c) Aunt　　　　(d) Data is inadequate

31. If P $ Q means P is the father of Q. P #Q means P is the mother of Q and P * Q means of P is the sister of Q

then N # L $ P * Q shows which of the relation of Q to N?

(a) Grandson　　　　(b) Nephew　　　　(c) Grand daughter　　(d) Data is inadequate

32. If A $ B means A is the brother of B. A @ B means A is the wife of B, A # B means A is the daughter of B

and A * B means A is the father of B. Which of the following indicates that U is the father-in-law of P?

(a) P @ Q$T#U*W   (b) P @ W $ Q*T # U   (c) P @ Q$W*T#U   (d) P @ Q $ T # W*U

33. Introducing a man, a woman said "He is the only son of the mother of my mother?",, How is the woman

related to the man?

(a) Mother   (b) Sister   (c) Niece   (d) Maternal aunt

34. Pointing to Gopi, Naini says "I am the daughter ot the only son of his grandfather". How Naini is related
to Gopi?

(a) Niece   (b) Daughter   (c) Sister   (d) Cannot be determined

35. A's son B is married with C whose sister D is married to E the brother of B. How D is related to A?

(a) Sister   (b) Daughter-in-law   (c) Sister-in-jaw   (d) Cousin

36. Pointing to a lady a person said. "The son of her only brother js the brother of my wife". How is the lady

related to the person?

(a) Maternal aunt   (b) Grand mother   (c) Sister of Father-in-law   (d) None of
these

37. 1. B 5 D means 8 is the father of D.

2. B 9 D means-B is the sister of D.

3. B 4 D means B is the brother of D.

4. B 3 Dmeans B is the wife of D.

Which of the following means F is the mother of K?

(a) F 3 M 5 K   (b) F 5 M 3 K   (c) F 9 M 4 N 3 K   (d) F 3 M 5 N 3 K

38. A $ B means A is the father of B. A # B means A sis the sister of B, A * B means A is the daughter of B and A

@ B means A is the brother of B. Which of the following indicates that M is the wife of Q?

(a) Q $ R # T@M   (b) Q $ R @ T # M   (c) Q $ R * T # M   (d) Q $ A @ T * M

39. If A $ B means A is the brother of B, B * C means B is the son of C, C @ D means C is the wife of D and A # D means

A is the son of D, How related to A?

(a) Maternal grandmother   (b) Aunt   (c) Maternal aunt   (d) Mother

40. Pointing to a girl Sandeep said, "she is the daughter of the only sister of my father." How is Sandeep related

to the girl?

(a) Uncle   (b) Cousin   (c) Father   (d) Grand father

41. Pointing to a boy in the photograph Reena said, "He is the only the only child of my grandfather".

How Reena related to that boy?

(a) Mother   (b) Sister   (c) Aunt   (d) Cannot be determined

42. 1. A * B means A is the sisterof B.

2. A $ B means B is the mother of A.

3. A + B means A is the brother of B

4. A = B means B is the fatherof A

Which of the following means M is the maternal uncle of N?

(a) M=P+Q*N   (b) N+P=Q*M   (c) N*P$Q*M   (d) None of these

43. If M x N means M is the daughter of N, M + N means M is the father of N. M % N means M is the mother of N

and M - N means M is the brother then P % Q + A - T x K indicates which relation of P to K?

(a) Daughter-in-law   (b) Sister-in-law   (c) Aunt   (d) None of these

44. If P + Q means P is the brother of Q, P x Q means P is the father of no P - Q means P is the sister of Q, which

of the following relations ws that I is the niece of K?

(a) K+Y+Z- l   (b) K + Y x I – Z   (c) Z- I x Y+K   (d) KxY+l-Z

45. Pointing towards a girl, Abhisek says "This girl is the daughter of only a child of my father". What is the

relation of Abhisek's wife to that girl?

(a) Daughter   (b) Mother   (c) Ant   (d) Sister-in-law

46. P & Q are brothers, Rand S are sister. P's son is S's brother. How is Q related to R?

(a) Uncle   (b) Brother   (c) Father   (d) Grand father

47. A is B's brother. C is A's mother. D is C's father. F is A's son How is B related to F's child?

(a) Aunt   (b) Cousin   (c) Nephew   (d) Grandfather

48. A and B are brothers. E is the daughter ofF. F is the wife of B. What is the relation of E to A?

(a) Sister   (b) Daughter   (c) Niece   (d) Daughter in law

49. A is B's wife's husband's brother. C and D are sisters of B. How A is related to C?

(a) Brother   (b) Sister-in-law   (c) Wife   (d) Sister

50. Vinod introduces Vishal as the son of the only brother of his father's wife. How is Vinod related to Vishal?

(a) Cousin   (b) Brother   (c) Son   (d) Uncle

51. Pointing out a man receiving th prize, menu said, "He is the brother of my uncle's daughter". Who is the

man to menu ?

(a) Son   (b) Brother-in-law   (c) Nephew   (d) Cousin

52. Pointing to a picture, Sumit said, she is the mother of my son's wife's. daughter. How is lady related to the Sumit

(a) Uncle   (b) Cousin   (c) Daughter-in-law   (d) None of these

53. Introducing a boy, a girl said, "He is the only son of my mother's mother". How is the girl related to that boy?

(a) Aunt   (b) Niece   (c) Sister   (d) Mother

54. There are two couples in a family.,K has two children. M is wife of 0 wi,o is brother of B. F is daughter of K: U

is sister of 5, who is son of 0. T is son of B, who is a male. How M is related to K?

(a) Sister   (b) Sister-in-law   (c) Brother   (d) None of these

55. There are two couple in a family. K has two children. M is. wife of 0, who is brother of B. F is daughter of K.

U is sister of 5, who is son of 0. T is son of B, who is a male. How is U related to T?

(a) Mother   (b) Brother   (c) Sister   (d) Cousin

Q.56-58: Directions: A is the father of P, who is a son-in-law of M and S is the mother of G. S is a sister of K, who is a

brother-in-law of P and H is the daughter ofT, who is a grand mother of G?

56. How is G related to P?

(a) Son   (b) Daughter   (c) Grandson   (d) Grand daughter   (e) Cannot be determined

57. If M is a female, then how is H related to 5?

(a) Sister   (b) Sister-in-law   (c) Niece   (d) Cannot be determined   (e) None of these

58. If K married to N, then how is N related to M?

(a) Son-in-law   (b) Daughter-in-law

(c) Mother-in-law   (d) Father-in-law   (e) None of these

59. Pointing a photograph, 'Sheela said, he- is the only son of my grandfather's only son. How is the boy in the photograph related to Sheela?

(a) Brother   (b) Cousin   (c) Son   (d) Cannot be determined   (e) None of these

60. Pointing a girl, Prasan said, she is the only granddaughter of my wife's grandfather's only child. How is the girl relate to Prasan?

(a) Sister   (b) Niece   (c) Daughter   (d) Cannot be determined   (e) None of these.

61. P is the sister of Q. R is the father of S, who is the brother of Q. R married to T. How is Q related to T?

(a) Son   (b) Daughter   (c) Either son or daughter

(d) Data inadequate   (e) None of these

62. G is the father ol K, who is the brother of B. K married to U. B is the daughter of C D is the father of U and M

is the only son of D. How is U related to C?

(a) Daughter   (b) Daughter-in-law

(c) Grand daughter   (d) Son-in-law   (e) None of these

63. K married to S. P is a brother of B. S is a mother of N, who is a brother of B. How is B related to K?

(a) Son   (b) Daughter   (c) Either son or daughter

(d) None of these   (e) Data inadequate

64. Pointing to a girl, Mala said, 'she is the grand daughter of my grandfather's only son'. How is the girl related to Mala?

(a) Niece   (b) Sister

(c) Daughter   (d) Cannot be determined   (e) None of these

65. Pointing a boy, Ram said, 'He is the only son of my grand father's son'. How is the boy related to Ram?

(a) Brother   (b) Son   (c) Cousin   (d) Data inadequate   (e) None of these

Q.66-67: Directions: There are seven members A, C, D, E, F, G and H in a family. There are two fathers,

one mother two sisters and four brothers. E is the sister-in-law of D. G is a daughter of C. F is the brother of E.

A is a grandfather of G. E is a mother of H?

66 How is H related to A?

(a) Grandson   (b) Grand daughter   (c) Son   (d) Cannot be determined   (e) None of these

67. How many male members in the family?

(a) 4   (b) 5   (c) 3   (d) Data inadequate   (e) None of these

Q.68-70: Directions; M is the grandson of G. D is the husband of G. K. is married to the son of S. T have two children

of different gender. E is the daughter of K's brother N is brother-in-law of the son of S. G has one only one child

D is the father of N.

68. How N is related to D?

(a) Son   (b) Son-in-law   (c) Grandson   (d) Brother   (e) Father

69. If Q is married to N, then how is Q related to M?

(a) Father   (b) Mother   (c) Sister   (d) Grand mother   (e) Cannot be determined

70. If U is the son of T, then how is U related to N ?

(a) Brother   (b) Uncle   (c) Cousin   (d) Brother-in-law   (e) Data inadequate

Q.71-73: Directions: A family consists of six members P, Q, R, X, Y and Z. Q is the son of R but R is not the mother of

Q, P and R are married couple.Y is the brother of A. X is the daughter of P and Z is the brother of P.

71. Who is the brother-in-law of A?

(a) P   (b) Z   (c) Y   (d) X   (e) Q

72. How many female members are there in the family?

(a) One   (b) Two   (c) Three   (d) Four   (e) Five

73. Which of these is a pair of brothers?

(a) P and X   (b) Pand Z   (c) Q and X   (d) A and Y   (e) None of these

Q.74-75: Directions: There are six children taking part in an eassy competition, namely A, B, C, D, E, and F. A and E

are brothers. F and D are the sister of E. C is the only son of A's uncle. B and D are the brother of father.

74. How is D related to A?

(a) Uncle   (b) Sister   (c) Niece   (d) Cousin   (e) None of these

75. How many male competitors are there?

(a)6   (b)5   (c)4   (d)3   (e) 2

Q.76-78: Directions: PXQ means P is brother of Q.

P ÷ Q means Q is mother of P.

P - Q means P is father of Q.

P + Q means Q is sister of P.

76. Which of the following means M is the daughter of T?

(a) M + N ÷ J - T   (b) T- J x R + M   (c) M – J x T ÷ K   (d) M + W x R ÷ T   (e) None of these

77. How is K related to R in the expression R ÷ T + K?

(a) Daughter   (b) Sister   (c) Niece   (d) Cannot be dejermined

78. Which of the following means D us grandfather of W?

(a) D – K x T - W   (b) D ÷ K x T ÷ W

(c) D – K x T ÷ W   (D) D ÷ K x T – W   (e) None of these

79. How is F related to H?

(a) Son-in-law   (b) Daughter-in-law

(c) Father-in-law   (d) Grand daughter   (e) Niece

80 How is C related toE?

(a) Father   (b) Son   (c) Mother   (d) Cousin   (e) Grand father

ANSWERS

1	B	11	D	21	A	31	D	41	B	51	D	61	C	71	
2	A	12	D	22	A	32	A	42	D	52	C	62	B	72	B
3	D	13	A	23	A	33	C	43	A	53	B	63	C	73	D
4	A	14	D	24	D	34	C	44	B	54	B	64	C	74	B
5	D	15	B	25	C	35	B	45	D	55	D	65	A	75	D
6	D	16	B	26	D	36	C	46	A	56	E	66	A	76	B
7	C	17	D	27	A	37	A	47	D	57	B	67	B	77	D
8	D	18	B	28	A	38	D	48	C	58	B	68	A	78	A
9	A	19	D	29	C	39	D	49	A	59	A	69	B	79	B
10	A	20	D	30	B	40	B	50	A	60	C	70	D	80	A

CHAPTER 5

SYLLOGISM

ADDITIONAL QUESTIONS

"MORE REASONING YOU FIND, MORE EASY WILL BE THE

MYSTERY OF CA JOURNERY"

Direction to Solve

A. If only (1) Conclusion foNows.

B. If only (2) Conclusion follows.

C. It either (1) or (2) follows.

D. It neither (1) nor (2) follows.

E. It both (1) and (2) follows

1.	**Statements:** Some actors are Singers. All the Singers are dancers
	Conclusion: (1) Some actors are dancers. (2) No Singer is actor
2	**Statements:** All the harmoniums are instruments. All the instruments are flutes.
	Conclusions: (1) All flutes are instruments (2) All the harmoniums are flutes
3.	**Statements:** Some mangoes are yellow. Some lemons are mangoes.

Conclusions: (1) Some Mangoes are green
  (2) Lemon is a yellow.

4. **Statements:** Some antsare parrots. All the parrotsare apples.

  Conclusions: (1) All the apples are parrots.
  (2) Some ants are apples.

5. **Statements:** Some papers are pen. All the pencils are pens.

  Conclusions: (1) Some pens are pencils.
  (2) Some pens are papers.

6. **Statements:** All the actors are girls. All the girls are beautiful.

  Conclusions: (1) All the actors are beautifuL
  (2) Some girls are actors.

7. **Statements:** All the windows are doors. No door is a wail.

  Conclusions: (1) Some windows are walls.
  (2) No wall is a door.

8. **Statements:** All cups are books. All books are shirts.

  Conclusions: (1) Some cups are' not shirts.
  (2) Some shirts are cups.

9. **Statements:** Some Cows are Crows. Some Crows are elephants.

  Conclusions: (1) Some Cows are elephants.
  (2) All Crows are elephants.

10. **Statements:** All the Pencils are Pens. All the pens are inks.

  Conclusions (1) All the pencils are inks.
  (2) Some inks are pencils

11. **Statements:** Some dogs are bats. Some bats are cats.

  Conclusions: (1) Some dogs are Cats.
  (2) Some Cats are dogs.

12. **Statements:** All the trucks are flies. Some Scooters are flies.

Conclusions: (1) All the trucks are Scooters.
      (2) Some Scooters are trucks.

13. **Statements:** All buildings are Chalks. No chalk. is toffee.

Conclusions: (1) No building is toffee
      (2) All chalks are buildings.

14. **Statements:** All cars are cats. All fans are cats.

Conclusions: (1) All cars are tans.
      (2) Some fans are cars.

15. **Statements:** All lions are dogs. All dogs are rat. No lions are tiger.

Conclusions: (1) No rat is a tiger
     (2) Some dogs being tiger is a possibiity.

16. **Statements:** Some red are blue. Ally yellow are blue. No blue are orange.

Conclusions: (1) All blue being red is a possibility. -
     (2) Some yellow are yellow is a possibility.

17. **Statements:** All orange are green. No blue is green. All green are red.

Conclusions: (1) No blue is orange
      (2) All red being orange is a possibility.

18. **Statements:** All Monkey are rat. Some rat are lion. No lion is a dog.

Conclusions: (1) All Monkey being lion is a possibility.
      (2) No dog is a Rat

19. **Statements:** No dollar is yen. Some yen are franc. All rupee are dollar.

Conclusions: (1) No dollar is franc.
     (2) No yen is rupee.

20. **Statements:** All pen are eraser. All eraser are pencil. Some eraser are scale.

Conclusions: (1) All scale being pencil is a possibility.

(2) No eraser is a scale

21. **Statements:** No table is bench. All bench are chair. Some chair are huts.

Conclusions: (1) No table is chair.
              (2) Some bench are huts.

22. **Statements:** Some image are picture. Some picture are photo. Some photo are clip.

Conclusions: (1) All image are clip
              (2) Some clip are picture.

23. **Statements:** All apple are grapes. Some apple are Mango. No mango is banana.

Conclusions: (1) All banana being apple is a possibility.
              (2) All grapes being oanana is a possibility.

24. **Statements:** All Png are bmp. Some bmp are jpg. All gif are jpg.

Conclusions: (1) Some bmp are gif
              (2) Some jpg are png.

25. **Statements:** Some chairs are bags. All trees are chairs.

Conclusions: (1) Some trees are bags.
             (2) Some bags are trees.

26. **Statements:** No man is a lion. Ram is a man.

Conclusions: (1) Ram is not a lion.
              (2) All men are not ram.

27. **Statements:** No tiger is a lion. Shiva is a tiger.

Conclusions: (1) Shiva is not a lion.
              (2) All tigers are not Shiva.

28. **Statements:** All glasses are mirrors. Some mirrors are black.

Conclusions: I: All mirrors are glasses
              II: Some glasses are black.

29. | **Statement:** Some dogs are monkeys. No monkey is black.

Conclusions: I: Some dogs are black 1 .
                 II: Some monkeys are dogs --

30. | **Statement:** Many actors are directors. All directors are dancers.

Conclusions: I : Some actors are dancers
                 II: No director is an actor.

31. | **Statement:** All roads are poles. No poles are Bungalows.

Conclusion: Some roads are Bunoalows
               Some Bungalows are poles.

32. | **Statement:** Only dogs are animals. No historian is an animals

Conclusion: I: Some dogs are not historian.
               II: Some historians are not dogs.

33. | **Statement:** Some chairs are caps. No cap is red.

Conclusion: I: Some caps are chairs
               II: No chair is red.

34. | **Statement:** Some cups are belt. No belt is black.

Conclusion: I: Some cups are blacks.

               II: Some cups are not black

35. | **Statement:** Some girls are flowers. Some flowers are books.

Conclusions: I: Some girls are books
                 II: No books are girls

36. | **Statement:** Some tiles are rats. All animals are rats.

Conclusion: I: All files are rats.
               II: Some rats are animals.

37. | **Statements:** All Men are women. All women are children is young.

Conclusion: I: Some children are men.

II: No men is young.

38.

Statement: Some Pots are Mats . All Mats are cats. No cat is Rat.

Conclusion: I: No rat is pot
        II: Some rats are not mats.

39. **Statement:** Some pens are slots. Some slats are not pencils. All pencils are Erasers.

Conclusion: I: Some pencil are not slats
        II: Some erasers are pens.

40. **Statement:** Some Bottles are lids. Some lids are flat. Some flat are round.

Conclusion: I Some flat are lid.
        II: Some round are not bottles

41. **Statement;** All letters are vowels. Some vowels are words. No word is consonant.

Conclusion: I: All consonant being vowels is a possibility.
        Il No letter is consonants

42.

Statement: All the bags are handles. All the handles are dips. All the clips are gaps.

Conclusion; I: All the clips are bags.
        II: All the handles are gaps.

43. **Statements;** All trucks are aeroplanes. Some scooters are aeroplanes.

Conclusions: (1) All trucks are Scooters.
        (2) Some aeroplanes are trucks.

44.

Statements: All baskets are marbles. Some marbles are sticks. No stick is garden

Conclusions: (I) Some Gardens are basket.
        (II) No Garden is basket.

45.

Statements: All keys are staplers. All staplers are blades. Some blades are eraser. Erasers are Sharpeners.

Conclusions: (i) Some sharpeners are keys.
        (ii) Al keys are blades.

46. **Statements:** Some cats are dogs. All rats are dogs.

Conclusion: (1) Some cats are Rats
                    (2) Some rats are Cats.

47.   **Statement:** Some chairs are hats. No hat is red.

Conclusions: (1) Some hats are chairs.
                    (2) No chair is red.

48.   **Statement:** Some cups are laptop. No laptop is black.

Conclusions: (1) Some cups are black.
                    (2) Some cups are not black.

49.   **Statements:** Some dogs are cows. No cow is black.

Conclusions: (1) Some dogs are black.
                    (2) Some cows are dogs

50.   **Statements:** All papers are copies. All copies are erasers.

Conclusions: (i) Some erasers are papers.
                    (ii) Some copies are no papers.

51.   **Statement:** Some ships are Monkeys. Some boats are ships.

Conclusions: (1) Some monkeys are boats.
                    (2) Some ships are neither boat nor monkey.

52.   **Statements:** All sportsman are hardworking. No sportsman are superstitiors

Conclusions: (1) No sportsman are superstitions
                    (2) All superstitions are not sportsman

53.   **Statement:** All cricketer are hardworking. No cricketer are superstitions.

Conclusions: (1) No cricketer are superstitions.
                    (2) All superstitions are not cricketer.

54.   **Statement:** Some mirrors are glasses. All trees are mirrors.

Conclusions: (1) Some trees are glasses
                    (2) Some glasses are trees.

55. **Statement:** All player are hardworking. No player are superstitions. Conclusion:

Conclusions: (1) No players are superstitions.
(2) All superstitions are not players

56. **Statements:** All roads are villages. No villages are Bungalows

Conclusions: (1) Some roads are Bungalows.

(2) Some Bungalows are villages

57. **Statements:** Many actors are producers. All producers are dancers.

Conclusions: (1) Some actors are dancers.
(2) No producer is an actor. Full download

58. **Statements:** Many actors are Comedians. All comedians are dancers.

Conclusions: (1) Some actors are dancers
(2) No comedian is an actor

59. **Statement:** All cricketers are tall. Rajeshwar is falls.

Conclusions: (1) Rajeshwar is a cricketer
(2) Rajeshwar is not cricketer

60. **Statement:** All players are fall. Sachin is fall

Conclusions: (i) Sachin is a player
(ii) Sachin is not player.

61. **Statement:** No man is a zebra. Ram is a man.

Conclusions: (1) Ram is not a zebra
(2) All men are not Ram

62. **Statement:** All Sportsman are strong. Rajesh is strong.

Conclusions: (i) Rajesh is a sportsman

(ii) Rajesh is not sportsman

63. **Statements:** Some leaders are singers. All the singers are dar

Conclusions: (1) Some leaders are dancers
          (2) No singer is leader.

64. **Statement:** Some actors are musician. All the Musicians are dance

Conclusions: (1) Some actors are dancers.
          (2) No Musician is actor.

65. **Statement:** All the harmoniums are Desktop. All the Desktops are flutes.

Conclusion; (1) All the flutes are Desktop.

          (2) All the harmoniums are flutes

66. **Statement;** All the guitars are instruments. All the instruments are flutes.

Conclusions: (1) All the flutes are instruments
          (2) All the guitars are flutes.

67. **Statement:** Some Bananas are yeflow. Some tixo are Bananas.

Conclusions: (1) Some Bananas are green
          (2) Tixo is a yellow

68. **Statements;** Some ants are elephants. All the elephants are apples.

Conclusions: (1) All the apples are elephants
          (2) Some ants are apples.

69. **Statement:** Some papers are pens. All sharpeners are pen.

Conclusion: (1) Some pens are sharpeners.
          (2) Some pens are papers.

70. **Statement:** Some papers are books. All the pencils are books.

Conclusions: (1) Some books are pencils.
          (2) Some books are papers.

71. **Statement:** All the actors are girls. All the girls are intelligent.

Conclusion: (1) All the actors are intelligent.
          (2) Some girls are actors.

72. **Statement:** All the windows are woods. No wood is a wall. walls.

Conclusion: (1) Some windows are
            (2) No wall is a wood

73. **Statement:** All cups are bats. All bats are shirts.

Conclusion: (1) Some cups are not shirts.
            (2) Some shirts are cups.

74. **Statement:** Some cows are silvers. Some silvers are elephants.

Conclusion: (1) Some cows are elephants
            (2) All silvers are elephants

75. **Statements:** All the pencils are boxes. All the boxes are inks

Conclusions: (1) All the pencils are inks.
             (2) Some inks are pencils.

76. **Statements:** Some dogs are rats. Some rats are cats.

Conclusions: (1) Some dogs are cats.
             (2) Some cats are dogs

77. **Statements:** Some tigers are bats. Some bats are oats.

Conclusions: (1) Some tigers are cats.
             (2) Some cats are tigers.

ANSWERS

1	A	11	D	21	D	31	D	41	A	51	D	61	A	71	E
2	B	12	D	22	D	32	A	42	B	52	E	62	C	72	B
3	D	13	A	23	A	33	A	43	B	53	E	63	A	73	B
4	B	14	D	24	D	34	B	44	B	54	D	64	A	74	D
5	E	15	B	25	D	35	C	45	B	55	E	65	B	75	C
6	E	16	A	26	A	36	B	46	D	56	D	66	B	76	D
7	B	17	E	27	A	37	E	47	A	57	A	67	D	77	D

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8	B	18	A	28	D	38	B	48	B	58	A	68	B		
9	D	19	B	29	B	39	D	49	B	59	C	69	E		
10	E	20	A	30	A	40	A	50	A	60	C	70	E		