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CA Foundation Statistics

Revision Notes

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1

STATISTICAL DESCRIPTION OF DATA
(Introduction to Statistics)



Related MCQ's:

1. The word statistics refers either _____ information or to a method of dealing with _____ information.
 - a) absolute, actual
 - b) quantitative, qualitative
 - c) real, actual
 - d) none of the above

2. Statistics is considered with:
 - a) Qualitative information
 - b) Quantitative information
 - c) Both a) and b)
 - d) Either a) or b)

3. An attribute is:
 - a) A measurable characteristics
 - b) A quantitative characteristics
 - c) A qualitative characteristic
 - d) All of the above

4. Nationality of a student is:
 - a) A continuous variable
 - b) An attribute
 - c) A discrete variable
 - d) None of the above

5. The quickest method to collect primary data is:
 - a) Personal Interview
 - b) Indirect Interview
 - c) Mailed Questionnaire Method
 - d) Telephonic Interview

6. The data obtained by the internet are:
 - a) Primary data
 - b) Secondary data
 - c) Both a) and b)
 - d) Neither a) nor b)

7. _____ classification refers to the classification of data according to some characteristics that can be measured.
 - a) qualitative
 - b) subjective
 - c) quantitative
 - d) all of the above

8. Geographical classification means classifications of data according to:
- a) time
 - b) location
 - c) attributes
 - d) class intervals
9. The entire upper part of a table is known as :
- a) caption
 - b) stub
 - c) box head
 - d) body.
10. 'Stub' of a table is the
- a) right part of the table describing the columns.
 - b) left 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.
11. The most common form of diagrammatic representation of a grouped frequency distribution is :
- a) ogive
 - b) histogram
 - c) frequency polygon
 - d) none of the above
12. Mode is found graphically by :
- a) frequency polygon
 - b) ogive
 - c) histogram
 - d) none of the above
13. Median of a distribution can be obtained from
- a) histogram
 - b) frequency polygon
 - c) Ogives
 - d) none of the above
14. Which of the following is a two dimensional figure?
- a) Line Diagram
 - b) Pie Diagram
 - c) Squares
 - d) Both b & C
15. Arrange the dimensions of Bar Diagram, Cube Diagram, Pie Diagram in sequence.
- a) 1, 3, 2
 - b) 2, 1, 3
 - c) 2, 3, 1
 - d) 3, 2, 1

16. the mid-point of a class is obtained by:

- a) adding upper and lower limits
- b) by dividing the difference of upper and lower limits by 2
- c) by adding upper and lower limits and dividing it by 2
- d) by deducting upper limit from the lower limit

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) and b) above
- d) none of the above

18. When all classes have equal width, the heights of the rectangles in Histogram will be numerically equal to the

- a) class frequencies
- b) class boundaries
- c) both a) and b) above
- d) none of the above

2

MEASURES OF CENTRAL TENDENCY
(Averages of First Order)

- The average salary of a group of unskilled workers is ₹ 10,000 and that of a group of skilled workers is ₹ 15,000. If the combined salary is ₹ 12,000, then what is the percentage of skilled workers?
(a) 40% (b) 50% (c) 60% (d) none of these
- The interest paid on the same sum yielding 3%, 4%, and 5% compound interest for 3 consecutive year respectively. What is the average yield percent on the total sum invested.
(a) 3.83% (b) 4.83% (c) 2.83% (d) 3.99%
- 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.
- 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.
- If the AM and GM for two numbers are 6.50 and 6 respectively then the two numbers
(a) 6 and 7 (b) 9 and 4 (c) 10 and 3 (d) 8 and 5.
- 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) 37 (c) 40 (d) 35
- 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

8. If the Mean and Mode of a certain set of numbers be 60.4 and 50.2 respectively, find approximately the value of the Median.
- a) 55 b) 56 c) 57 d) 58
9. 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
10. For a moderately skewed distribution, which of the 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)
11. 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) $GM > AM > HM$
12. 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
13. ----- is equal to the value corresponding to cumulative frequency $k(N + 1)/10$ from simple frequency distribution
- (a) Median (b) k^{th} decile (c) k^{th} percentile (d) none
14. A lady travel at a speed of 20 km/h and returned at quicker speed. If her average speed of the whole journey is 24 km/hr, find the speed of return journey (in km/h)
- (a) 25 (b) 30 (c) 35 (d) 38
15. The median of following numbers, which are given in ascending order is 25. Find the value of X.
- 11, 13, 15, 19, (x + 2), (x + 4), 30, 35, 39, 46
- (a) 21 (b) 20 (c) 15 (d) 30

3

MEASURES OF DISPERSION

(Average of Second Order)

1. 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
2. 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.
3. 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.
4. If the mean and SD of x are a and b respectively, then the SD of $\frac{(x-a)}{b}$ is
 (a) -1 (b) 1 (c) ab (d) a/b .
5. The standard deviation of 10, 16, 10, 16, 10, 10, 16, 16 is
 (a) 4 (b) 6 (c) 3 (d) 0.
6. 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
7. 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 of y is
 (a) 25 (b) 30 (c) 40 (d) 20
8. If two samples of sizes 30 and 20 have means as 55 and 60 and variances as 16 and 25 respectively, then what would be the SD of the combined sample of size 50?
 (a) 5.00 (b) 5.06 (c) 5.23 (d) 5.35

9. 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.
10. In 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
11. 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

4

**LINEAR CORRELATION &
LINEAR REGRESSION**

- The Cov (x, y) = 25; $v(x) = 36$, $v(y) = 25$, then the coefficient of correlation is
 a) 0.409 b) 0.416 c) 0.833 d) 0.277
- Find the coefficient of correlation from the following data:
 X: 1 2 3 4 5
 Y: 6 8 11 8 12
 a) + 0.775 b) - 0.775 c) + 0.895 d) + 0.956
- The coefficient of rank correlation between the marks in Statistics and Mathematics obtained by a certain group of students is $\frac{2}{3}$ and the sum of the squares of the differences in ranks is 55. How many students are there in the group?
 a) 10 b) 9 c) 12 d) more than 15
- From the following data calculate the value of coefficient of Rank correlation:
 X: 75 88 95 70 60 80 81 50
 Y: 120 134 150 115 110 140 142 100
 a) 0.93 b) - 0.85 c) 0.85 d) 0.63
- What is the coefficient of concurrent deviations for the following data:
 Supply: 68 43 38 78 66 83 38 23 83 53 48
 Demand: 65 60 55 61 35 75 45 40 85 80 85
 a) 0.82 b) 0.85 c) 0.89 d) - 0.81
- The coefficient of concurrent deviation for p pairs of observation was found to be $\frac{1}{\sqrt{3}}$. If the number of concurrent deviations was found to be 6, then the value of p
 a) 10 b) 9 c) 8 d) None of these
- If $u + 5x = 6$ and $3y - 7v = 20$ and the correlation coefficient between x and y is 0.58 then where would be the correlation coefficient between u and v?
 (a) 0.58 (b) -0.58 (c) -0.84 (d) 0.84

8. Find the probable error of r if $r = 0.05$ and $n = 25$.
- a) 0.1928 b) 0.1345 c) 0.0129 d) 0.0192
9. In Case of “insurance companies” profit and the number of claims They have pay there is _____ correlation.
- a) Positively b) Negative c) No of correlation d) None of these
10. The $\text{Cov}(x, y) = 15$, 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
11. Standard Error of “ r ” is given by:
- a) $\frac{1-r^2}{n}$ b) $\frac{1-r^2}{\sqrt{n}}$ c) $\frac{1+r^2}{\sqrt{n}}$ d) None of the above
12. From the following data, find the regression equation of X on Y :
- | | | | | | |
|-----|---|---|---|---|---|
| X | 1 | 2 | 3 | 4 | 5 |
| Y | 2 | 3 | 5 | 4 | 6 |
- a) $X = 0.9Y + 0.6$ b) $X = 0.9Y - 0.6$
c) $X = 0.9Y + 1.3$ d) $X = 0.9Y - 1.3$
13. Given the following data:
- | | | |
|-----------|-----|-----|
| Variable: | x | y |
| Mean: | 80 | 98 |
| Variance: | 4 | 9 |
- Coefficient of correlation = 0.6
- What is the most likely value of y when $x = 90$?
- (a) 90 (b) 103 (c) 104 (d) 107
14. With $b_{xy} = 0.5$, $r = 0.8$ and variance of $y = 16$, standard deviation of x equals to:
- a) 6.4 b) 2.5 c) 10.0 d) 26.5

15. If the regression coefficient of y on x , the coefficient of correlation between x and y and variance of y are $-3/4$, $-\frac{\sqrt{3}}{2}$ and 4 respectively, what is the variance of x
- (a) $2/\sqrt{3/2}$ (b) $16/3$ (c) $4/3$ (d) 4
16. Given $b_{xy} = 0.756$, $b_{yx} = 0.659$, then the value of coefficient of non-determination is given by:
- a) 0.402 b) 0.502 c) 0.602 d) 0.702
17. If $u = 2x + 5$, $v = -3y + 1$, and the regression coefficient of y on x is -1.2 , the regression coefficient of v on u is:
- a) 1.8 b) -1.8 c) 3.26 d) 0.8
18. The two regression lines are $7x - 3y - 18 = 0$ and $4x - y - 11 = 0$. Find the value of b_{yx} and b_{xy}
- a) $\frac{7}{3}, \frac{1}{4}$ b) $-\frac{7}{3}, -\frac{1}{4}$ c) $-\frac{3}{7}, -\frac{1}{4}$ d) none of these
19. The two lines of regression are given by $8x + 10y = 25$ and $16x + 5y = 12$ respectively. If the variance of x is 25, what is the standard deviation of y ?
- (a) 16 (b) 8 (c) 64 (d) 4
20. The two types of variables in regression analysis are:
- a) Direct & Indirect b) Dependent & Independent
c) Discrete & Continuous d) None of the above
21. The regression line of x on y is derived by:
- a) The minimization of vertical distance in the scatter diagram.
b) The minimization of horizontal distance in the scatter diagram.
c) Either a) or b) above.
d) Both a) and b) above.

22. The sign analogy of correlation coefficient and two regression coefficients is:

a) -, +, +

b) -, -, -

c) +, +, +

d) Both b) and c) above

23. If the regression coefficient of y on x is $\frac{4}{3}$, then the regression coefficient of x on y is:

a) More than 1

b) Less than 1

c) Less than zero

d) None of the above

5

INDEX NUMBERS

1. 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) 148.25 (c) 140.75 (d) None of these.

2. 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

Refer to the follow data and answer the questions:

Commodity	1979		1980	
	Price in ₹	Quantity (kg)	Price in ₹	Quantity(kg)
A	20	8	40	6
B	50	10	60	5
C	40	15	50	10
D	20	20	20	15

3. Which of the following represents Paasche's Price Index Number:
 a) 125.23 b) 124.70 c) 124.96 d) 125.95
4. Which of the following represents Laspeyer's Price Index Number:
 a) 125.23 b) 124.70 c) 124.96 d) 125.95

5. Given The following Data:

Items	Current Year		Base Year	
	Price (₹)	Value (₹)	Value (₹)	Quantity (kg)
A	20	200	360	12
B	4	36	64	16
C	14	238	575	23

The quantity index using Bowley's formula is:

- a) 65.95 b) 75.95 c) 85.95 d) 95.95

6. 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, 121.13, 130.82
 (c) 107, 100.25, 104, 118.72
 (d) None of these.

7. The price relative for the year 2000 with base 1995 = 100 is 135. The price relative for the year 1995 with base 1990 = 100 is 120. Find the price relative for 2000 with base 1990 = 100.

- (a) 100 (b) 83.33 (c) 162 (d) 135

Read the following data and answer the questions that follow:

Year	Price Index A [Base Year: 2000]	Price Index B [Base Year: 2003]
2000	100	
2001	110	
2002	115	
2003	120	100
2004		125
2005		135

8. When PI B is spliced with PI A, the spliced index for the year 2004 is:
a) 100 b) 125
c) 135 d) 150
9. Net Monthly income of an employee was ₹ 800 in 1980. The consumer price Index number was 160 in 1980. It rises to 200 in 1984. If he has to be rightly compensated. The additional dearness allowance to be paid to the employee is :
(a) ₹ 240 (b) ₹ 275
(c) ₹ 250 (d) 200
10. The total value of retained imports into India in 1960 was ₹ 71.5 million per month. The corresponding total for 1967 was ₹ 87.6 million per month. The index of volume of retained imports in 1967 compared with 1960 (= 100) was 62.0. The price index for retained imports for 1967 with 1960 as base is
(a) 198.61 (b) 197.61 (c) 198.25 (d) None of these.
11. _____ is an extension of time reversal test
a) Factor Reversal test b) Circular test
c) both d) none
12. Chain index is equal to
(a) $\frac{\text{link relative of current year} \times \text{chain index of the current year}}{100}$
(b) $\frac{\text{link relative of previous year} \times \text{chain index of the current year}}{100}$
(c) $\frac{\text{link relative of current year} \times \text{chain index of the previous year}}{100}$
(d) $\frac{\text{link relative of previous year} \times \text{chain index of the previous year}}{100}$
13. 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

14. 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.

15. 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.

16. Time Reversal Test is represented by symbolically is :

- (a) $P_{01} \times Q_{01} = 1$ (b) $I_{01} \times I_{10} = 1$
(b) $I_{01} \times I_{12} \times I_{23} \times \dots \times I_{(n-1)n} \times I_{n0} = 1$ (d) None of these.

6

PROBABILITY



Tossing of Coins

Three coins are tossed simultaneously. Find the probability of getting:

1. More than two tails

a) $2/8$

b) $6/8$

c) $1/8$

d) $4/8$



Pack of Cards – Withdrawn of a card

A card is drawn from a well-shuffled pack of 52 cards. Find the probability that:-

2. A spade or an Ace not of spade.

a) $2/13$

b) $4/13$

c) $1/13$

d) $7/13$



Rolling of Dice

Two dices are rolled. Find the probability that,

3. It is either 7 or 11.

a) $3/9$

b) $5/9$

c) $2/9$

d) None of these

4. Sum is a multiple of 3 or 4.

a) $5/9$

b) $3/9$

c) $7/9$

d) None of these



Leap Year

Find the probability that a leap year selected at random will contain;

5. 53 Thursdays or 53 Fridays.

a) $1/7$

b) $3/7$

c) $2/7$

d) $4/7$



Addition Theorem

A number is selected at random from a set of first 120 natural numbers. What is the probability that it is divisible by:

6. 7 or 9
a) $31/120$ b) $30/120$ c) $29/120$ d) None of the above



Formula

If $P(A) = 1/4$, $P(B) = 2/5$, $P(A \cup B) = 1/2$. Find:

7. $P(A^c \cap B^c)$
a) $3/20$ b) $1/10$ c) $1/4$ d) $1/2$
8. $P(B/A)$
a) $2/5$ b) $3/5$ c) $1/5$ d) None of the above
9. If for two independent events A and B, $P(A \cup B) = 2/3$ and $P(A) = 2/5$, what is $P(B)$?
a) $4/15$ b) $4/9$ c) $5/9$ d) $7/15$
10. The odds against a certain event are 5:2 and odds in favour of another event, independent of the former, are 6:5. Find the chance that at least one of the events will happen.
a) $25/77$ b) $35/77$ c) $52/77$ d) $65/87$
11. 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 the second 3 red balls is
(a) $5/223$ (b) $6/257$ (c) $7/429$ (d) $3/548$
12. There are three persons aged 60, 65 and 70 years old. The survival probabilities for these three persons for another 5 years are 0.7, 0.4 and 0.2 respectively. What is the probability that at least two of them would survive another five years?
(a) 0.425 (b) 0.456
(c) 0.392 (d) 0.388

13. A packet of 10 electronic components is known to include 2 defectives. If a sample of 4 components is selected at random from the packet, what is the probability that the sample does not contain more than 1 defective?
(a) $1/3$ (b) $2/3$ (c) $13/15$ (d) $3/15$
14. Four digits 1, 2, 4 and 6 are selected at random to form a four digit number. What is the probability that the number so formed, would be divisible by 4?
(a) $1/2$ (b) $1/5$ (c) $1/4$ (d) $1/3$
15. 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
16. $P(A/B')$ 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.
17. A bag contains 3 red & 5 white balls and the 2nd bag contains 4 red and 6 white balls. One ball is drawn at random from the first bag and put into 2nd bag. If now, a ball is drawn from the 2nd bag, find the probability that it is red.
a) $35/88$ b) $53/88$ c) $16/89$ d) None of the above
18. 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) 0.92 c) 0.44 d) 0.54
19. 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) 0.20 b) 0.30 c) 0.35 d) 0.70
20. If two letters are taken at random from the word "HOME", what is the probability that none of the letters would be vowels?
a) $1/2$ b) $1/6$ c) $1/3$ d) $1/4$
21. If $P(A) = 2/3$, $P(B) = 3/5$, $P(A \cup B) = 5/6$, find $P(A/B')$
a) $5/12$ b) $7/12$ c) $1/4$ d) $3/4$

7

RANDOM VARIABLE

Theory of Expectation - THEORY

1. If a random variable x assumes the values x_1, x_2, x_3, x_4 with corresponding probabilities p_1, p_2, p_3, p_4 , then the expected value of x is:

- a) $p_1 + p_2 + p_3 + p_4$ b) $x_1p_1 + x_2p_2 + x_3p_3 + x_4p_4$
c) $x_1 + x_2 + x_3 + x_4$ d) None of the above

A random variable x has the following probability distribution:

X	:	4	5	6	8
Probability	:	0.1	0.3	0.4	0.2

2. What is the standard deviation of the random variable x .

- a) 5.99 b) 1.01 c) 2.25 d) 1.22

3. Let X be a random variable assuming values $-3, 6$ and 9 with probabilities $1/6, 1/2$ and $1/3$ respectively. Then find the value of $E(X), E(X^2)$ and $E(2X+1)^2$

- a) 5.5, 46.5, 209 b) 6.5, 45.5, 207 c) 6, 40, 200 d) None of these

4. If it rains a taxi driver can earn Rs. 100 per day if it is fair, he can lose Rs. 10 per day. If the probability of rain is 0.4 what is his expected gain?

- a) 60 b) 34 c) - 6 d) - 40

5. A man draws 2 balls from a bag containing 3 white and 6 black balls. If he is to receive Rs. 14 for every white ball and Rs. 7 for every black ball; what is his expectation?

- a) 18.67 b) 19.25 c) 20.25 d) 25.19

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

6. What is the value of $P(x < 6)$?

- a) 0.19 b) 0.80 c) 0.81 d) 0.91

7. Daily demand for a product X 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) 2.19 b) 2.22 c) 2.33 d) 2.54

8. A random variable X has the following probability distribution:

X	-2	3	1
P(X=x)	1/3	1/2	1/6

Find $E(X^2)$ and $E(2X + 5)$

- a) 5 and 7 respectively b) 6 and 7 respectively
c) 7 and 7 respectively d) 7 and 6 respectively

9. A player tosses 3 fair coins. He wins Rs. 5 if 3 heads appear, Rs. 3 if two head appears, Re. 1 if one head occurs. On the other hand, he losses Rs. 15 if three tail occur. Find the expected gain of the player.

- a) 0.15 b) 0.25 c) 0.35 d) 0.55

8

THEORETICAL DISTRIBUTION

- An unbiased dice is tossed 500 times. The standard deviation of the number of 'sixes' in these 500 tosses are:
a) $50/6$ b) $51/6$ c) $15/6$ d) None of these
- What is the probability of getting 3 heads if 6 unbiased coins are tossed simultaneously?
a) 0.50 b) 0.20 c) 0.3125 d) 0.6875
- The binomial distribution with mean = 20 and sd = 4 is:
a) $(1/4 + 4/5)^{100}$ b) $(4/5 + 1/5)^{100}$
c) $(4/5 + 1/5)^{50}$ d) None of the above
- Assuming that one-third of the population is tea drinkers and each of 1000 enumerators takes a sample of 8 individuals to find out whether they are tea drinkers or not, how many enumerators are expected to report that five or more people are tea drinkers?
a) 100 b) 95 c) 88 d) 90
- X is binomial variable such that $2P(x=2) = P(x=3)$ and mean of X is known to be $10/3$. What would be the probability that X assumes at most the value 2?
a) $16/81$ b) $17/81$ c) $47/273$ d) $26/243$
- The important characteristic(s) of Bernoulli trials is:
a) Trials are independent
b) Each trial is associated with just two possible outcomes.
c) Trials are infinite
d) Both a) and b) above

7. An example of a bi-parametric discrete probability distribution is
- binomial distribution
 - Poisson distribution
 - normal distribution
 - both (a) and (b)
8. In a Binomial distribution if n is infinitely large, the probability p of occurrence of event is close to ____ and q is close to ____ then binomial distribution follows to Poisson distribution.
- 0, 1
 - 1, 1
 - 1, 0
 - None of the above
9. The variance of binomial distribution with parameters n and p is
- $n(1-p)$
 - $np(1-p)$
 - $np\sqrt{(1-p)}$ [®]
 - $\sqrt{np(1-p)}$
10. In a Poisson Distribution $P(X = 0) = P(X = 1) = k$, the value of “ k ” is:
- 1
 - $\frac{1}{e}$
 - e^2
 - $\frac{1}{\sqrt{e}}$
11. If x is Poisson variety with a parameter 4 find the Mode of the Distribution?
- 4, 2
 - 4, 3
 - 4, 4
 - None
- It is found that the number of accidents occurring in a factory follows Poisson distribution with a mean of 2 accidents per week. (Given $e^{-2} = 0.1353$)
12. Find the probability that the number of accident in a week exceeds 2.
- 0.3235
 - 0.523
 - 0.352
 - None of the above
13. In a company manufacturing toys, it is found that 1 in 500 is defective. Find the probability that there will be at the most two defectives in a sample of 2000 units. [Given $e^{-4} = 0.0183$]
- 0.2597
 - 0.3549
 - 0.2549
 - 0.2379
14. $P(x \leq 2 / x \geq 1)$ given $E(x) = 2.2$ & $e^{-2.2} = .1108$
- 0.58
 - 0.68
 - 0.70
 - None of the above

15. Poisson distribution may be

- a) Bimodal
- b) Uni modal
- c) Multi Modal
- d) Either a) or b) above and not c)

16. For a Poisson distribution

- a) Standard Deviation and Variance are equal.
- b) Mean and Variance are equal.
- c) Mean and Standard Deviation are equal.
- d) Both a) and b) above

17. 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) 10
- b) 12
- c) 15
- d) 20

18. For normal distribution with mean =150 and S.D = 45; find Q_1 and Q_3

- a) 119.35 and 190.65
- b) 119.625 and 180.375
- c) 180.35 and 119.65
- d) 123.45 and 183.65

19. What is the first quartile of x having the following probability density function?

$$f(x) = \frac{1}{\sqrt{72}\pi} e^{-\frac{(x-10)^2}{72}} \text{ for } -\infty < x < \infty$$

- a) 4
- b) 5
- c) 5.95
- d) 6.75

20. If x and y are 2 independent normal variable with mean 10 and 12 and SD 3 and 4 respectively, then (x + y) is also a normal distribution with mean ____ and SD ____.

- a) 22, 7
- b) 22, 25
- c) 22, 5
- d) 22, 49

21. In a sample of 800 students, the mean weight and standard deviation of weight are found to be 50 kg and 20 kg respectively. On the assumption of normality, what is the number of students weighting between 46kg and 62kg? Given area of the standard normal curve between $z = 0$ to $z = 0.2 = 0.0793$ and area between $z = 0$ to $z = 0.60 = 0.2257$.

- a) 250
- b) 244
- c) 240
- d) 260

22. The I.Q. 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 IQ. Find that lowest score acceptable for the advanced training? [$\phi(0.84) = 0.80$]
- a) 118.4 b) 116.4 c) 108.4 d) 101.6
23. The interval $(\mu - 3\sigma, \mu + 3\sigma)$ covers
- a) 96% area of a normal distribution.
b) 95% area of a normal distribution.
c) 99% area of a normal distribution.
d) All but 0.27% area of a normal distribution
24. An approximate relation between Quartile deviation (QD) and Standard Deviation (SD) of normal distribution is:
- a) 5 QD = 4 SD b) 4 QD = 5 SD
c) 2 QD = 35 SD d) 3 QD = 2 SD