Ca Foundation 300 important Questions pdf

TIME VALUE OF MONEY

1. In how many years, a sum will become double at 5% p.a. compound interest.
   (a) 14.0 years   (b) 15 years
   (c) 16 years   (d) 14.3 years

2. The time by which a sum of money is 8 times of itself if it doubles itself in 15 years interest compounded annually.
   (a) 42 years   (b) 43 years
   (c) 45 years   (d) 46 years

3. What is the rate of simple interest if a sum of money amounts to ₹ 2,784 in 4 years and ₹ 2,688 in 3 years?
   (a) 1% p.a.   (b) 4% p.a.
   (c) 5% p.a.   (d) 8% p.a.

4. The compound interest for a certain sum @ 5% p.a. for first year is ₹ 25. The S-I for the same money @ 5% p.a. for 2 years will be.
   (a) ₹ 40   (b) ₹ 50
   (c) ₹ 60   (d) ₹ 70

5. The cost of Machinery is ₹ 1,25,000/- If its useful life is estimated to be 20 years and the rate of depreciation of its cost is 10% p.a., then the scrap value of the Machinery is [given that $(0.9)^{20} = 0.1215$]
   (a) ₹ 15,187   (b) ₹ 15,400
   (c) ₹ 15,300   (d) ₹ 15,250

6. Mr. X invests 'P' amount at Simple Interest rate 10% and Mr. Y invests 'Q' amount at Compound Interest rate 5% compounded annually. At the end of two years both get the same amount of interest, then the relation between two amounts P and Q is given by:
   (a) $P = \frac{41Q}{80}$ (b) $P = \frac{41Q}{40}$
   (c) $P = \frac{41Q}{100}$ (d) $P = \frac{41Q}{200}$

7. If the difference of S.I and C.I is ₹ 72 at 12% for 2 years. Calculate the Principle.
   (a) ₹ 8,000   (b) ₹ 6,000
   (c) ₹ 5,000   (d) ₹ 7,750

8. If a simple interest on a sum of money at 6% p.a. for 7 years is equal to twice of simple interest on another sum for 9 years at 5% p.a.. The ratio of sum will be:
   (a) 2 : 15   (b) 7 : 15
   (c) 15 : 7   (d) 1 : 7

9. By mistake a clerk, calculated the simple interest on principal for 5 months at 6.5% p.a. instead of 6 months at 5.5% p.a. If the error in calculation was ₹ 25.40. The original sum of principal was_____.
   (a) ₹ 60,690   (b) ₹ 60,960
   (c) ₹ 90,660   (d) ₹ 90,690

10. The S.I. on a sum of money is $\frac{4}{9}$ of the principal and the no. of years is equal to the rate of interest per annum. Find the rate of interest per annum?
   (a) 5%   (b) 20/3%
   (c) 22/7%   (d) 6%

11. A sum of money compounded annually becomes ₹ 1,140 in two years and ₹ 1,710 in three years.
    Find the rate of interest per annum.
    (a) 30%   (b) 40%
    (c) 50%   (d) 60%

12. The partners A and B together lent ₹ 3,903 at 4% per annum interest compounded annually. After a span of 7 years, A gets the same amount as B gets after 9 years. The share of A in the sum of ₹ 3,903 would have been:
    (a) ₹ 1,875   (b) ₹ 2,280
    (c) ₹ 2,028   (d) ₹ 2,820

13. If a sum triples in 15 years at simple rate of interest, the rate of interest per annum will be:
    (a) 13.0%   (b) 13.3%
    (c) 13.5%   (d) 18.0%

14. How much amount is required to be invested every year as to accumulate ₹ 6,00,000 at the end of 10 years, if interest is compounded annually at 10% rate of interest
    [Given: $(1.1)^{10} = 2.59374$].
    (a) ₹ 37,467   (b) ₹ 37,476
    (c) ₹ 37,647   (d) ₹ 37,674

15. A sum of money invested of compound interest doubles itself in four years. It becomes 32 times of itself at the same rate of compound interest in
    (a) 12 years   (b) 16 years
    (c) 20 years   (d) 24 years

16. A certain sum of money was invested at simple rate of interest for three -years. If the same has been invested at a rate that was seven percent higher, the interest amount would have been ₹ 882 more. The amount of sum invested is:
    (a) ₹ 12,600   (b) ₹ 6,800
    (c) ₹ 4,200   (d) ₹ 2,800

17. A sum of ₹ 44,000 is divided into three parts such that the corresponding interest earned after 2 years, 3 years and 6 years may be equal. If the rates of simple interest are 6% p.a., 8% p.a. and 6% p.a. respectively, then the smallest part of the sum will be:
    (a) ₹ 4,000   (b) ₹ 8,000
    (c) ₹ 10,000   (d) ₹ 12,000

18. Mr. X bought an electronic item for ₹ 1,000. What would be the future value of the same item after 2 years, if the value is compounded semi-annually at 22% per annum?
    (a) ₹ 1,488.40   (b) ₹ 1,518.07
    (c) ₹ 2,008.07   (d) ₹ 2,200.00

19. If an amount is kept at simple interest, it earns an interest of ₹ 600 in first two years but when kept at compound interest it earns an interest of ₹ 660 for the same period, then the rate of interest and principal amount respectively are:
    (a) 20%, ₹ 1,200   (b) 10%, ₹ 1,200
    (c) 20%, ₹ 1,500   (d) 10%, ₹ 1,500

20. A person lends ₹ 6,000 for 4 years and ₹ 8,000 for 3 years at simple interest. If he gets ₹ 2,400 as total interest, the rate of interest is:
    (a) 5%   (b) 4%
    (c) 6%   (d) 7%

21. The difference between the Compound interest and Simple interest at 10% per annum for 4 years on ₹ 10,000 is ₹ _____.
   (a) 650 (b) 640
   (c) 641 (d) 600

22. The effective rate of interest equivalent to the nominal rate of 7% converted monthly:
   (a) 7.26% (b) 7.22%
   (c) 7.02% (d) 7.20%

23. Mr. X invest ₹ 10,000 every year starting from today for next: 10 years. suppose interest rate is 8% per annual compounded annually. Calculate future value of the annuity.
   (a) ₹ 1,56,454.88 (b) ₹ 1,56,554.88
   (c) ₹ 1,44,865.625 (d) None of these

24. If ₹ 1,000 be invested at interest rate of 5% and the interest be added to the principal every 10 years, then the number of years in which it will amount to ₹ 2,000 is:
   (a) $16\frac{2}{3}$ years (b) $6\frac{1}{4}$ years
   (c) 16 years (d) $6\frac{2}{3}$ years

25. A person borrows ₹ 5,000 for 2 years at 4% per annual simple interest. He immediately lends to another person at $6\frac{1}{4}$%. Per annual for 2 years find his gain in the transaction for year:
   (a) ₹ 112.50 (b) ₹ 225
   (c) ₹ 125 (d) ₹ 107.50

26. The future value of an annuity of ₹ 1,000. made annually for 5 years at the interest of 14% compounded annually is:
   Given $(1.14)^5 1.92541)$
   (a) ₹ 5,610 (b) ₹ 6,610
   (c) ₹ 6,160 (d) ₹ 5,160

27. If ₹ 10,000 is invested at 8% per year compounded quarterly, then the value of the investment after 2 years is:
   [given $(1 + 0.02)^8 = 1.171659$]
   (a) ₹ 11,716.59 (b) ₹ 10,716.59
   (c) ₹ 117.1659 (d) None of the above

28. A certain money doubles itself in 10 years when deposited on simple interest. It would triple itself in
   (a) 20 years (b) 15 years
   (c) 25 years (d) 30 years

29. If compound interest on a sum for 2 years at 4% per annum is ₹ 102, then the simple interest on the same sum for the same period at the same rate will be
   (a) ₹ 99 (b) ₹ 101
   (c) ₹ 100 (d) ₹ 95

30. A man invests an amount of ₹ 15,860 in the names of his three sons A, B and C in such a way that they get the same amount after 2,3 and 4 years respectively. If the rate of interest is 5%, then the ratio of amount invested in the name of A, B and C is:
   (a) 6 : 4 : 3 (b) 3 : 4 : 6
   (c) 30 : 12 : 5 (d) None of the above

31. What is the net present value of piece of property which would be valued at ₹ 2 lakh at the end of 2 years? (Annual rate of increase = 5%)
(a) ₹ 1.81 lakh
(b) ₹ 2.01 lakh
(c) ₹ 2.00 lakh
(d) None of the above

32. The value of furniture depreciates by 10% a year, it the present value of the furniture in an office is ₹ 21,870, calculate the value of furniture 3 years ago
(a) ₹ 30,000
(b) ₹ 35,000
(c) ₹ 40,000
(d) ₹ 50,000

33. The certain sum of money became ₹ 692/ in 2 yrs and ₹ 800/ - in 5 yrs then the principle amount is _____
(a) ₹ 520
(b) ₹ 620
(c) ₹ 720
(d) ₹ 820

34. A sum of money amount to ₹ 6,200 in 2 years and ₹ 7,400 in 3 years as per S.I. then the principal is
(a) ₹ 3,000
(b) ₹ 3,500
(c) ₹ 3,800
(d) None

35. A sum was invested for 3 years as per C.I. and the rate of interest for first year is 9%, 2nd year is 6% and 3rd year is 3% p.a. respectively. Find the sum if the amount in three years is ₹ 550 ?
(a) ₹ 250
(b) ₹ 300
(c) ₹ 462.16
(d) ₹ 350

36. A person wants to lease out a machine costing ₹ 5,00,000 for a 10 year period. It has fixed a rental of ₹ 51,272 per annum payable annually starting from the end of first year. Suppose rate of interest is 10% per annum compounded annually on which money can be invested. To whom this agreement is favourable?
(a) Favour of Lessee
(b) Favour of Lessor
(c) Not for both
(d) Can't be determined

37. Let a person invest a fixed sum at the end of each month in an account paying interest 12% per year compounded monthly. If the future value of this annuity after the 12th payment is ₹ 55,000 then the amount invested every month is?
(a) ₹ 4,837
(b) ₹ 4,637
(c) ₹ 4,337
(d) ₹ 3,337

38. In simple interest if the principal is ₹ 2,000 and the rate and time are the roots of the equation $x^2 - 11x + 30 = 0$ then simple interest is
(a) ₹ 500
(b) ₹ 600
(c) ₹ 700
(d) ₹ 800

39. A man invests ₹ 12,000 at 10% p.a. and another sum of money at 20% p.a. for one year. The total investment earns at 14% p.a. simple interest the total investment is:
(a) ₹ 8,000
(b) ₹ 20,000
(c) ₹ 14,000
(d) ₹ 16,000

40. An amount P becomes ₹ 5,100.5 and ₹ 5,203 after second and fourth years respectively at R% of interest per annum compounded annually. Thus, values of P and R are:
(a) ₹ 4,000 and 1.5
(b) ₹ 5,000 and 1
(c) ₹ 6,000 and 2
(d) ₹ 5,500 and 3

41. A certain sum invested at 4% per annum compounded semi- annually amounts to ₹ 1,20,000 at the end of one year. Find the sum:
    (a) 1,15,340   (b) 1,10,120
    (c) 1,12,812   (d) 1,13,113

42. Find the present value of ₹ 1,00,000 to be required after 5 years if the interest rate be 9%. Given that $1.09^5 = 1.5386.$
    (a) 78,995.98   (b) 64,994.15
    (c) 88,992.43   (d) 93,902.12

43. The ratio of principal and the compound interest value for three years (compounded annually) is 216: 127. The rate of interest is:
    (a) 0.1777   (b) 0.1567
    (c) 0.1666   (d) 0.1587

44. A stock pays annually an amount of ₹ 10 from 6th year onwards. What is the present value of the perpetuity, if the rate of return is 20% ?
    (a) 20.1   (b) 19.1
    (c) 21.1   (d) 22.1

45. A certain sum amounted to ₹ 575 at 5% in a time in which ₹ 750 amounted to ₹ 840 at 4%. If the rate of interest is simple, find the sum-
    (a) 525   (b) 550
    (c) 515   (d) 500

46. Two equal amounts of money an deposited in two banks each at 15% p.a. fix 3.5 year in the bank and fix 5 years in the either. The difference between the interest amount from the bank in ₹ 144. Find the sum
    (a) ₹ 620   (b) ₹ 640
    (c) ₹ 820   (d) ₹ 840

47. Assuming that the discount rate is 7% p.a. how much would pay to receive ₹ 200 growing at 5% annually for ever?
    (a) ₹ 2,500   (b) ₹ 5,000
    (c) ₹ 7,500   (d) ₹ 10,000

48. A man invested one-third of his capital at 7% one fourth at 8% and the remainder at 10%. If the annual income is ₹ 561. The capital is -
    (a) ₹ 4,400   (b) ₹ 5,500
    (c) ₹ 6,600   (d) ₹ 5,800

49. What is the compound interest (in ₹) on a sum of ₹ 12,600 for $1\frac{1}{2}$ years at 20% per annum if the interest is compounded half yearly? (Nearest to a rupee).
    (a) 4,271   (b) 4,171
    (c) 4,711   (d) 4,117

50. If the nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year then the projected real GDP after 6 years is:
    (a) 1.587P   (b) 1.921P
    (c) 1.403P   (d) 2.51P

51. Let the operating profit of a manufacturer for five years is given as:

Years	1	2	3	4	5	6
Operating profit (in lakh ₹)	90	100	106.4	107.14	120.24	157.34

Then the operating profit of Compound Annual Growth Rate (CAGR) for year 6 with respect to year 2 is given that:
(a) 9%
(b) 12%
(c) 11%
(d) 13%

52. What is the difference (in ₹) between the simple interest and the compound interest on a sum of ₹ 8,000 for $2\frac{2}{5}$ years at the rate of 10% p.a. when the interest is compounded yearly?
(a) 136.12
(b) 129.50
(c) 151.75
(d) 147.20

53. Anshika took a loan of ₹ 1,00,000@8% for 5 years. What amount will she pay if she wants to pay the whole amount in five equal installments?
(a) ₹ 25,045.63
(b) ₹ 26,045.68
(c) ₹ 28,045.50
(d) None

54. A machine worth ₹ 4,90,740 is depreciated at 15% on its opening value each year. When its value would reduce to ₹ 2,00,750 ?
(a) 5 years 5 months
(b) 5 years 6 months
(c) 5 years 7 months
(d) 5 years 8 months

55. 10 years ago, the earning per share (EPS) of ABC Ltd. was ₹ 5 share. Its EPS for this year is ₹ 22. Compute at what rate, EPS of the company grow annually?
(a) 15.97%
(b) 16.77%
(c) 18.64%
(d) 14.79%

56. Mr. Prakash invested money in two schemes 'A' and 'B' offering compound interest at the rate of 8% and 9% per annum respectively. If the total amount of interest accrued through these two schemes together in two years was ₹ 4,818.30 and total amount invested was ₹ 27,000. What was the amount invested in schemes 'A'?
(a) ₹ 12,000
(b) ₹ 12,500
(c) ₹ 13,000
(d) ₹ 13,500

57. A five year annuity due has periodic cash flow of ₹ 100 each year. If the interest rate is 8% the future value of this annuity is given by:

(a) (₹ 100) × (future value at rate 8% for 5 years) × (0.08)

(b) (₹ 100) × (future value at rate 8% for 5 years) × (1 − .08)

(c) (₹ 100) × (future value at rate 8% for 5 years) × (1 + 0.08)

(d) (₹ 100) × (future value at rate 8% for 5 years) × (1/0.08)

58. The present value of an Annuity immediate is the same as

(a) Annuity regular for $(n − 1)$ year plus the initial receipt in the beginning of the period.

(b) Annuity regular for $(n − 1)$ years

(c) Annuity regular for $(n + 1)$ years

(d) Annuity regular for $(n + 1)$ years plus the initial receipt in the beginning of the period

PERMUTATION & COMBINATION

59. If _____ $^{18}C_r = {}^{18}C_{r+2}$ find the value of $^rC_5$.
    (a) 55   (b) 50
    (c) 56   (d) None of these

60. 7 books are to be arranged in such a way so that two particular books are always at first and last place. Final the number of arrangements.
    (a) 60   (b) 120
    (c) 240   (d) 480

61. Six points are on a circle. The number of quadrilaterals that can be formed are:
    (a) 30   (b) 360
    (c) 15   (d) None of the above

62. The number of ways of arranging 6 boys and 4 girls in a row so that all 4 girls are together is:
    (a) $6! . 4 !$ (b) $2 (7! 4 !)$
    (c) $7! . 4 !$ (d) $2. (6!. 4!)$

63. How many ways a team of 11 players can be made out of 15 players if one particular player is not to be selected in the team.
    (a) 364   (b) 728
    (c) 1,001   (d) 1,234

64. 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) $2. \ {}^{15}C_7 6! \ 7 !$

65. The letters of the word "VIOLENT" are arranged so that the vowels occupy even place only. The number of permutations is _____.
    (a) 144   (b) 120
    (c) 24   (d) 72

66. If $^{13}C_6 + 2 \ {}^{13}C_5 + {}^{13}C_4 = {}^{15}C_x$ then, x = _____.
    (a) 6   (b) 7
    (c) 8   (d) 9

67. Number of ways of shaking hands in a group of 10 persons shaking hands to each other are:
    (a) 45   (b) 54
    (c) 90   (d) 10

68. There are 5 books on English, 4 Books on Tamil and 3 books on Hindi. In how many ways can these books be placed on a shelf if the books on the same subjects are to be together?
    (a) 1,36,800   (b) 1,83,600
    (c) 1,03,680   (d) 1,63,800

69. 5 Men and 4 Women to sit in a row in such a manner that the women always occupy the even places. The number of such arrangement will be:
    (a) 126   (b) 1056
    (c) 2080   (d) 2880

70. A person has ten friends of whom six are relatives. If he invites five guests such that three of them are his relatives, then the total number of ways in which he can invite them are:
(a) 30
(b) 60
(c) 120
(d) 75

71. An examination paper with 10 questions consists of 6 questions in mathematics and 4 questions in statistic part. At least one question from each part is to be attempted in how many ways can this be done?
(a) 1024
(b) 945
(c) 1005
(d) 1022

72. There are 6 men and 4 women in a group, then the number of ways in which a committee of 5 persons can be formed of them, if the committee is to include at least 2 women are:
(a) 180
(b) 186
(c) 120
(d) 105

73. In how many ways can a selection of 6 out of 4 teachers and 8 students be done so as to include at least two teachers?
(a) 220
(b) 672
(c) 596
(d) 968

74. The maximum number of points of inter section of 10 circles will be:
(a) 2
(b) 20
(c) 90
(d) 180

75. If $^{n+1}C_{r+1}: {}^{n}C_r: {}^{n-1}C_{r-1} = 8: 3: 1$, then n is equal to:
(a) 20
(b) 16
(c) 10
(d) 15

76. If 3 books on computer, 3 books on commerce, and 5 books on economics are arranged in such away that the books of same subject are kept together, then the number of ways in which this can be done are:
(a) 4320
(b) 35820
(c) 35920
(d) 25920

77. The number of triangles that can be formed by choosing the vertices from a set of 12 points, seven of which lie on the same straight line, is:
(a) 185
(b) 175
(c) 115
(d) 105

78. Which of the following is a correct statement?
(a) $^{n}p_n = {}^{n}p_{n-1}$
(b) $^{n}p_n = {}^{2n}p_{n-2}$
(c) $^{n}p_n = {}^{3n}p_{n-3}$
(d) $^{n}p_n = {}^{n \cdot (n-1)}p_{n-1}$

79. How many numbers can be formed with the help of 2,3,4,5,6,1 which are not divisible by 5, given that it is a five-digit no. and digits are not repeating?
(a) 600
(b) 400
(c) 1200
(d) 1400

80. A fruity basket contains 7 apples, 6 bananas, and 4 mangoes. How many selections of 3 fruits can be made so that all 3 are apples?
(a) 35 ways
(b) 120 ways
(c) 165 ways
(d) 70 ways

81. 'n' locks and 'n' corresponding keys are available but the actual combination is not known. The maximum number of trials that are needed to assigns the keys to the corresponding locks is:

(a) $(n-1)C_2$
(b) $(n+1)C_2$
(c) $\sum_{k=2}^{n}(k-1)$
(d) $\sum_{k=2}^{n}k$

82. $^nC_p + 2\,{}^nC_{p-1} + {}^nC_{p-2} = ?$

(a) $^{n+}C_p$
(b) $^{n+2}C_p$
(c) $^{n+1}C_{p+1}$
(d) $^{n+2}C_{p-1}$

83. If four letter words are taken with or without meaning from the word 'Logarithm' without repetition, how many words will be formed?

(a) 5040
(b) 2520
(c) 3024
(d) 40320

84. The number of ways 4 boys and 3 girls can be seated in a row so that they are alternate is:

(a) 12
(b) 288
(c) 144
(d) 256

85. How many 3 digit odd numbers can be formed using the digits 5,6,7,8,9, if the digits can be repeated?

(a) 55
(b) 75
(c) 65
(d) 85

SEQUENCE & SERIES

86. If in an A.P., Tn represents nth term.
    If $t_7 : t_{10} = 5 : 7$ then $t_8 : t_{11} =$ _____
    (a) 13 : 16   (b) 17 : 23
    (c) 14 : 17   (d) 15 : 19

87. Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be:
    (a) 48   (b) 36
    (c) 13   (d) 32

88. If Sum (S_n) of 'n'- terms of an Arithmetic Progression is $(2n^2 + n)$. What is the difference of its 10th and 1st term?
    (a) 207   (b) 36
    (c) 90   (d) 63

89. Geometric Mean of $P, P^2, P^3 \dots \dots \dots, P^n$ will be:
    (a) p^{n+1} (b) $P^{\frac{1+n}{2}}$
    (c) $P^{\frac{n(n+1)}{2}}$ (d) None of the above.

90. If sum of 3 arithmetic means between "a" and 22 is 42, then "a" = _____.
    (a) 14   (b) 11
    (c) 10   (d) 6

91. The sum of all two Digit odd numbers is
    (a) 2475   (b) 2575
    (c) 4950   (d) 5049

92. If 5th term of a G.P. is $\sqrt[3]{3}$, then the product of first nine terms is
    (a) 8   (b) 27
    (c) 243   (d) 9

93. If the sum of n terms of an A.P be $2n^2 + 5n$, then its 'n'th' term is:
    (a) $4n - 2$ (b) $3n - 4$
    (c) $4n + 3$ (d) $3n + 4$

94. If the sum of n terms of an A.P be $3n^2 - n$ and its common difference is 6, then its first term is:
    (a) 2   (b) 3
    (c) 4   (d) 5

95. If the sum of the 4th term and the 12th term of an A.P. is 8, what is the sum of the first 15 terms of the progression?
    (a) 60   (b) 120
    (c) 110   (d) 150

96. If Geometric mean (G.M.) of a, b, c, d is 3, then G.M. of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ will be:
    (a) 1/3   (b) 3
   (c) 81   (d) 1/81

97. The sum to m terms of the series $1 + 11 + 111 + \cdots$. upto m terms, is equal to:

(a) $\frac{1}{81}(10^{m+1} - 9m - 10)$ (b) $\frac{1}{27}(10^{m+1} - 9m - 10)$

(c) $10^{m+1} - 9m - 10$ (d) None of these

98. The sum of the infinite G.P. $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots \ldots$ is equal to:

(a) 1.95   (b) 1.5

(c) 1.75   (d) None of these

99. If x, y, z are the terms in G.P. then the terms $x^2 + y^2, xy + yz, y^2 + z^2$ are in:

(a) A.P.   (b) G.P.

(c) H.P.   (d) None of these.

100. If $S_n = n^2 p$ and $S_m = m^2 p (m \neq n)$ is the sum of an A.P., then $S_p = $ _____

(a) p^2 (b) p^3

(c) $2p^3$ (d) p^4

101. If the sum of first 'n' terms of an A.P. is $6n^2 + 6n$, then the fourth term of the series:

(a) 120   (b) 72

(c) 48   (d) 24

102. The sum of n terms of the series $\log x + \log \frac{x^2}{y} + \log \frac{x^3}{y^2} + \ldots\ldots\ldots\ldots$ is

(a) $\frac{n}{2}\left[2n\log\left(\frac{x}{y}\right) + \log xy\right]$ (b) $\frac{n}{2}\left[n\log xy + \log\left(\frac{x}{y}\right)\right]$

(c) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right) - \log xy\right]$ (d) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right) + \log xy\right]$

103. If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in arithmetic progression then a^2, b^2, c^2, are in

(a) Arithmetic Progression   (b) Geometric Progression

(c) Both in arithmetic and geometric Progression   (d) None of these

104. The sum of all numbers between 100 and 1000 which are divisible by 11 will be:

(a) 44550   (b) 66770

(c) 55440   (d) 33440

105. If the Pth term of an A.P. is 'q' and the qth term is 'p', then its rth term is

(a) $p + q - r$ (b) $p + q + r$

(c) $p - q - r$ (d) $p - q$

106. If the ratio of sum of n terms of two APs is $(n + 1):(n - 1)$, then the ratio of their m^{th} terms is:

(a) $(m + 1):2m$ (b) $(m + 1):(m - 1)$

(c) $(2m - 1):(m + 1)$ (d) $m:(m - 1)$

107. If $2 + 6 + 10 + 14 + 18 + \cdots\ldots +x = 882$ then the value of x

(a) 78   (b) 80

(c) 82   (d) 86

108. Sum upto infinity of series.

$\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{2^5} + \cdots\ldots\ldots\ldots$

(a) 19/24   (b) 24/19

(c) 5/24   (d) None

109. Find the no. of terms of the series 25, 5, 1 .... $\frac{1}{3125}$

(a) 6   (b) 7

(c) 8   (d) 9

110. The 20th term of arithmetic progression whose 6th term is 38 and 10th term is 66 is:

(a) 118   (b) 136

(c) 178   (d) 210

111. If the sum of 'n' terms of an AP (Arithmetic Progression) is $2n^2$, the fifth term is _____.

(a) 20   (b) 50

(c) 18   (d) 25

112. The nth term of the series 9,7,5, ... and 15,12,9, ... are same. Find the nth term?

(a) 7   (b) 8

(c) 9   (d) 10

113. If p^{th} term of an AP is q and its qth term is p, then what will be the value of $(p + q)^{th}$ term?

(a) 0   (b) 1

(c) $p + q - 1$ (d) $2(p + q - 1)$
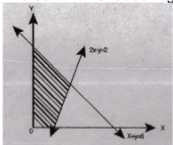
LINEAR INEQUALITIES

114. The solution of the inequality $\frac{(5-2x)}{3} \leq \frac{x}{6} - 5$ is
(a) $x \geq 8$ (b) $x \leq 8$
(c) $x = 8$ (d) None of these.

115. Solution space of the inequalities $2x + y \leq 10$ and $x - y \leq 5$:
(i) includes the origin.
(ii) includes the point (4, 3)
which one is correct ?
(a) Only (i)   (b) Only (ii)
(c) Both (i) and (ii)   (d) None of the above.

116. The union forbids employer to employ less than two experienced person (x) to each fresh person (y). This situation can be expressed as:
(a) $x \leq y/2$ (b) $y \leq x/2$
(c) $y \geq x/2$ (d) None of these

117. The graph of linear inequalities $7x + 9y \leq 63, x + y \geq 1, 0 \leq x \leq 6$ and
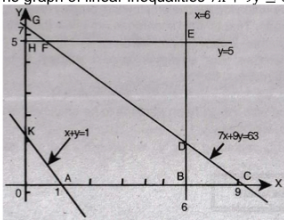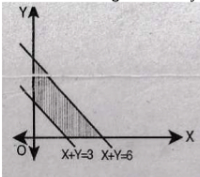

Common region of the inequalities is:
(a) BCDB and DEFD   (b) Unbounded
(c) HFGH   (d) ABDFHKA

118. The common shaded region in the graph represents the linear inequalities as:
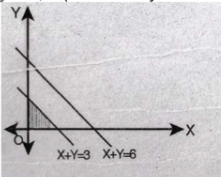

(a) $x + y \geq 6$
    $2x - y - 2 \geq 0$
    $x, y \geq 0$

(b) $x + y \geq 6$
    $2x - y - 2 \leq 0$
    $x, y \geq 0$

(c) $x + y \leq 6$
    $2x - y - 2 \leq 0$
    $x, y \geq 0$

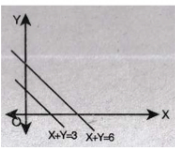(d) $x + y \leq 6$
    $2x - y - 2 \geq 0$
    $x, y \geq 0$

119. The common region of $x + y \leq 6; x + y \geq 3; x \geq 0; y \geq 0$, is (as shown by shaded region):

(a)

(b)

(c)

(d) None the these.

120. On Solving the Inequalities $5x + y \leq 100, x + y \leq 60, x \geq 0, y \geq 0$, we get the following solution:
(a) $(0,0), (20,0), (10,50)$ & $(0,60)$
(b) $(0,0), (60,0), (10,50)$ & $(0,60)$
(c) $(0,0), (20,0), (0,100)$ & $(10,50)$
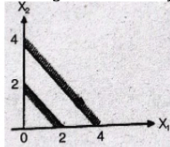(d) None of these

121. Solve for x of the Inequalities
$$2 \leq \frac{3x - 2}{5} \leq 4 \text{ where } x - N$$
(a) $\{5,6,7\}$
(b) $\{3,4,5,6\}$
(c) $\{4,5,6\}$
(d) None

122. The common region in the graph of the inequalities $x + y \leq 4, x - y \leq 4, x \geq 2$ is
(a) Equilateral triangle
(b) Isosceles triangle
(c) Quadrilateral
(d) Square

123. The region indicated by the shading in the graph is expressed by the inequalities

(a) $x_1 + x_2 \leq 2$
$x_1 + x_2 \geq 4$
$x_1 \geq 0, x_2 \geq 0$

(b) $x_1 + x_2 \leq 2$
$x_2 x_1 + x_2 \leq 4$
$x_1 \geq 0, x_2 \geq 0$

(c) $x_1 + x_2 \geq 2$
$x_1 + x_2 \geq 4$
$x_1 \geq 0, x_2 \geq 0$

(d) $x_1 + x_2 \geq 2$
$x_1 + x_2 \leq 4$
$x_1 \geq 0, x_2 \geq 0$

124. If $2x + 5 > 3x + 2$ and $2x - 3 <= 4x - 5$, then 'x' can take which of the following value?
(a) 4
(b) -4
(c) 2
(d) -2

EQUATIONS

125. Roots of the equation $3x^2 - 14x + k = 0$ will be reciprocal of each ather if:
(a) k = -3
(b) k = 0
(c) k = 3
(d) k = 14.

126. Positive value of 'k' for which the roots of equation $12x^2 + kx + 5 = 0$ are in ratio 3 : 2, is:
(a) 5/12
(b) 12/5
(c) $\frac{5\sqrt{10}}{2}$
(d) $5\sqrt{10}$

127. If p & q are the roots of the Equation $x^2 - bx + C = 0$, then what is the Equation whose roots are $(pq + p + q)$ and $(pq - p - q)$?
(a) $x^2 - 2cx + c^2 - b^2 = 0$
(b) $x^2 - 2bx + c^2 + b^2 = 0$
(c) $8cx^2 - 2(b + c)x + c^2 = 0$
(d) $x^2 + 2bx - (c^2 - b^2) = 0$

128. If one of the roots of the equation $x^2 + px + a$ is $\sqrt{3} + 2$, then the value of 'p' and '_' is:
(a) $-4, -1$
(b) $4, -1$
(c) $-4, 1$
(d) $4, 1$

129. If $|x - 2| + |x - 3| = 7$ then, 'x' will be equal to
(a) 6
(b) -1
(c) 6 and-1
(d) None of the above

130. Roots of equation $2x^2 + 3x + 7 = 0$ are α and β. The value of $\alpha\beta^{-1} + \beta\alpha^{-1}$ is
(a) 2
(b) 3/7
(c) 7/2
(d) -19/14

131. If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be:
(a) $x^2 - 14x + 49 = 0$
(b) $x^2 - 24x + 144 = 0$
(c) $x^2 - 50x + 49 = 0$
(d) $x^2 - 19x + 144 = 0$

132. The roots of the equation $y^3 + y^2 - y - 1 = 0$ are:
(a) (1,1, −1)
(b) (−1, −1,1)
(c) (1,1,1)
(d) None of these

133. The number of students in each section of a school is 36. After admitting 12 new students, four new sections were started. If total number of students in each section now is 30, than the number of sections initially were.
(a) 6
(b) 10
(c) 14
(d) 18

134. If roots of equation $x^2 + x + r = 0$ are ' α' and ' β' and $\alpha^3 + \beta^3 = -6$. Find the value 'r'?
(a) $\frac{-5}{3}$
(b) $\frac{7}{3}$
(c) $\frac{-4}{3}$
(d) 1

135. If difference between the roots of the equation $x^2 - kx + 8 = 0$ is 4, then the value of k is:
(a) 0
(b) ± 4
(c) $\pm 8\sqrt{3}$
(d) $\pm 4\sqrt{3}$

136. If the sides of an equilateral triangle are shortened by 3 units, 4 units and 5 units respectively and a right triangle is formed, then the side of an equilateral triangle is:
(a) 6 units
(b) 7 units
(c) 8 units
(d) 10 units.

137. If $u^{5x} = v^{5y} = w^{5z}$ and $u^2 = vw$, then the value of $xy + xz - 2yz$ will be:
(a) 5
(b) 2
(c) 1
(d) 0

138. Let α and β be the roots of $x^2 + 7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$ will be:
(a) $\frac{7}{12} + \frac{12}{7}$
(b) $\frac{49}{144} + \frac{144}{49}$
(c) $-\frac{91}{12}$
(d) None of the above.

139. Find the condition that one roots is double the other of $ax^2 + bx + c = 0$
(a) $2b^2 = 3ac$
(b) $b^2 = 3ac$
(c) $2b^2 = 9ac$
(d) $2b^2 > 9ac$

140. Find value of $x^2 - 10x + 1$ if $x = \frac{1}{5 - 2\sqrt{6}}$
(a) 25
(b) 1
(c) 0
(d) 49

141. The rational root of the equation
$0 = 2p^3 - p^2 - 4P + 2$ is:
(a) 2
(b) -2
(c) ½
(d) -1/2

142. The harmonic mean of the roots of the equation $(5 + \sqrt{2}) \times 2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$ is
(a) 2
(b) 4
(c) 6
(d) 8

143. The sum of square of any real positive quantity and its reciprocal is never less than:
(a) 1
(b) 2
(c) 3
(d) 4

144. If the roots of the equation $x^2 - px + q = 0$ are in the ratio 2 : 3, then:
(a) $p^2 = 25q$
(b) $P^2 = 6q$
(c) $6p^3 = 5q$
(d) $6p^2 = 25q$

145. What will be the value of k, if the roots of the equation $(k - 4)x^2 - 2kx + (k + 5) = 0$ are equal?
(a) 18
(b) 20
(c) 19
(d) 21

RELATIONS & FUNCTION

146. $X = \{x, y, w, z\}, y = \{1,2,3,4\}$
   $H = \{(x, 1), (y, 2), (y, 3), (z, 4), (x, 4)\}$
   (a) H is a function from X to Y
   (b) H is not a function from X to Y
   (c) H is a relation from Y to X
   (d) None of the above

147. If $A = \{x: x^2 - 3x + 2 = 0\}$,
   $B = \{x: x^2 + 4x - 12 = 0\}$, then
   $B - A$ is Equal to
   (a) $\{-6\}$ (b) $\{1\}$
   (c) $\{1,2\}$ (d) $\{2, -6\}$

148. If $F: A \rightarrow R$ is a real valued function defined by $f(x) = \frac{1}{x}$, then $A = $ _____.
   (a) R (b) $R - \{1\}$
   (c) $R - \{0\}$ (d) $R - N$

149. If $f: R \rightarrow R, f(x) = x + 1$,
   $g: \bar{R} \rightarrow \bar{R} g(x^{'}) = x^2 + 1$
   then fog(-2) equals to
   (a) 6   (b) 5
   (c) -2 (d) None

150. If $A = \{\pm 2, \pm 3\}, B = \{1,4,9\}$ and
   $F = \{(2,4), (-2,4), (3,9), (-3,4)\}$ then 'F' is defined as :
   (a) One to one function from A into B.
   (b) One to one function from A onto B.
   (c) Many to one function from A onto B.
   (d) Many to one function from A into B.

151. The number of proper sub set of the set {3,4,5,6,7} is
   (a) 32   (b) 31
   (c) 30   (d) 25

152. If $f: R \rightarrow R$ is a function, defined by $f(x) = 10x - 7$, if $g(x) = f^{-1}(x)$, then $g(x)$ is equal to
   (a) $\frac{1}{10x-7}$ (b) $\frac{1}{10x+7}$
   (c) $\frac{x+7}{10}$ (d) $\frac{x-7}{10}$

153. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then $f\left(\frac{2x}{1+x^2}\right)$ is equal to:
   (a) $f(x)$ (b) $2f(x)$
   (c) $3f(x)$ (d) $-f(x)$

154. If R is the set of all real numbers, then the function f: R → R defined by $f(x) = 2^x$
(a) one-one onto
(b) one-one into
(c) many-one into
(d) many-one onto

155. The number of subsets of the set formed by the word Allahabad is:
(a) 128
(b) 16
(c) 32
(d) 64

156. In a group of students 80 can speak Hindi, 60 can speak English and 40 can speak English and Hindi both, then number of students is:
(a) 100
(b) 140
(c) 180
(d) 60

157. A is {1,2,3,4} and B is {1,4,9,16,25} if a function f is defined from set A to B where $f(x) = x^2$ then the range of f is:
(a) {1,2,3,4}
(b) {1,4,9,16}
(c) {1,4,9,16,25}
(d) None of these

158. Let F: R ⇒ R be defined by
$$f(x) = \begin{cases} 2x \text{ for } x > 3 \\ x^2 \text{ for } 1 < x \le 3 \\ 3x \text{ for } x \le 1 \end{cases}$$
The value of $f(-1) + f(2) + f(4)$ is
(a) 9
(b) 14
(c) 5
(d) 6

159. The number of integers from 1 to 100 which are neither divisible by 3 nor by 5 nor by 7 is.
(a) 67
(b) 55
(c) 45
(d) 33

160. The range of the function F defined by $f(x) = \sqrt{16 - x^2}$ is
(a) $[-4,0]$
(b) $[-4,4]$
(c) $[0,4]$
(d) $[+4,4]$

161. $f(x) = \{(2,2); (3,3); (4,4); (5,5); (6,6)\}$ be a relation of set $A = \{2,3,4,5,6\}$ It is a:
(a) Reflexive and Transitive (b) Reflexive and Symmetric
(c) Reflexive only (d) An equivalence relation
Given $A = \{2,3\}, B = \{4,5\}, C = \{5,6\}$ then $A \times (B \cap C)$ is:
(a) $\{(2,5), (3,5)\}$
(b) $\{(5,2), (5,3)\}$
(c) $\{(2,3), (5,5)\}$
(d) None of these

162. A survey shows that 74% of the Indian like grapes, whereas 68% like bananas. What percentage of the Indian like both grapes and bananas if everybody likes either fruit?
(a) 42%
(b) 26%
(c) 58%
(d) 62%

MEASURE OF CENRAL TENDENCY & DISPERSION

1. 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

2. The average salary of 50 men was ₹ 80 but it was found that salary of 2 of them were ₹ 46 and ₹ 28 which was wrongly taken as ₹ 64 and ₹ 82. The revised average salary is :
   (a) ₹ 80   (b) ₹ 78.56
   (c) ₹ 85.26   (d) ₹ 82.92

3. Inter Quartile Range is _____ of Quartile Deviation.
   (a) Half   (b) Double
   (c) Triple   (d) Equal

4. 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

5. 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

6. If variance of x is 5, then find the variance of $(2 - 3x)$
   (a) 10   (b) 45
   (c) 5   (d) -13

7. 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)

8. 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

9. 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/h, find the speed of return journey (in km/h)
   (a) 25   (b) 30
   (c) 35   (d) 38

10. 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

11. 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

12. If standard deviation of first 'n' natural numbers is 2 then value of 'n' is
    (a) 10   (b) 7
    (c) 6   (d) 5

13. Geometric Mean of three observations 40,50 and X is 10. The value of X is
    (a) 2   (b) 4
    (c) 1/2   (d) None of the above.

14. The mean salary of a group of 50 persons is ₹ 5,850. Later on it is discovered that the salary of one employee has been wrongly taken as ₹ 8,000 instead of ₹ 7,800. The corrected mean salary is
    (a) ₹ 5,854   (b) ₹ 5,846
    (c) ₹ 5,650   (d) None of the above

15. 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

16. Find at the variance given that the Arithmetic Mean = $(8 + 4)/2$
    (a) 2   (b) 6
    (c) 1   (d) 4

17. 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

18. 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

19. 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

20. 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)

21. 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%

22. A company's past 10 years average earning is ₹ 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) ₹ 40 crores   (b) ₹ $\frac{40 \times 10}{11}$ crores
    (c) More than ₹ 40 crores   (d) None of the above.

23. For 899, 999, 391, 384, 390, 480, 485, 760, 111, 240 Rank of median is
   (a) 2.75   (b) 5.5
   (c) 8.25   (d) none

24. If total frequencies of three series are 50, 60 and 90 and their means are 12, 15 and 20 respectively, then the mean of their composite series is
   (a) 16   (b) 15.5
   (c) 16.5   (d) 14.5

25. If $\sigma^2 = 100$ and coefficient of variation = 20% then $\bar{x} =$
   (a) 60   (b) 70
   (c) 80   (d) 50

26. For the distribution

X	1	2	3	4	5	6
F	6	9	10	14	12	8

The value of median is
   (a) 3.5   (b) 3
   (c) 4   (d) 5

27. The approximate ratio of SD, MD, QD is:
   (a) 3: 4: 5   (b) 2: 3: 4
   (c) 15: 12 : 10   (d) 5 : 6 : 7

28. Find SD of the following
   1,2,3,4,5,6,7,8,9.
   (a) 2.58   (b) 60/9
   (c) 60/3   (d) 3.20

29. Find the mode of the following:

$0-10$	$10-20$	$20-30$	$30-40$	$40-50$	$50-60$
7	14	22	34	20	19

   (a) 32   (b) 34.61
   (c) 25.42   (d) 35

30. Given the weights for the numbers 1,2,3 ..... n are respectively $1^2, 2^2\ 3^2$ ..... n^2 then weighted HM is _____.
   (a) $\frac{2n+1}{4}$ (b) $\frac{2n+1}{6}$
   (c) $\frac{2n+1}{3}$ (d) $\frac{2n+1}{2}$

31. The mean of 'n' observation is 'x'. If k is added to each observation, then the new mean is.
   (a) k   (b) xk
   (c) x-k   (d) x+k

32. The probable value of mean deviation when $Q_3 = 40$ and $Q_1 = 15$ is:
   (a) 15   (b) 18.75
   (c) 17.50   (d) 0

33. The marks secured by 5 students in a subject are $82,73,69,84,66$. What is the coefficient of Range
   (a) 0.12   (b) 12
   (c) 120   (d) 0.012

CORRELATION & REGRESSION

34. The correlation coefficient between x and y is -1/2. The value of $b_{xy} - 1/8$. Find b_{yx}.
(a) -2   (b) -4
(c) 0   (d) 2

35. 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

36. If 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

37. 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, ¼   (b) -7/3, -1/4
(c) -3/7, -1/4   (d) None of these.

38. 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.

39. 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

40. 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

41. 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

42. 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.

43. 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

44. 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 Squares of Deviations from Mean	136	138

Sum of products of Deviations of x and y series from Mean = 122

    (a) -0.89   (b) 0.89

    (c) 0.69   (d) -0.69

45. If $r = 0.6$, then the coefficient of determination is.

    (a) 0.4   (b) -0.6

    (c) 0.36   (d) 0.64

46. If the two regression lines are $3X = Y$ and $8Y = 6X$, then the value of correlation coefficient is

    (a) 0.5   (b) -0.5

    (c) 0.75   (d) -0.80

47. Find the probable error if $r = \frac{2}{\sqrt{10}}$ and $n = 36$

    (a) 0.6745   (b) 0.067

    (c) 0.5287   (d) None

48. Given that

X	-3	-3/2	0	3/2	3
Y	9	9/4	0	9/4	9

Then Karl pearson's coefficient of correlation is

    (a) Positive   (b) Zero

    (c) Negative   (d) None

49. If the regression line of y on x is given by $y = x + 2$ and Karl Pearson's coefficient of correlation is 0.5 then $\frac{\sigma y^2}{\sigma x^2} =$ _____.

    (a) 3   (b) 2

    (c) 4   (d) None

50. The coefficient of correlation between x and y is 0.5 the covariance, is 16, and the standard deviation of y is

    (a) 4   (b) 8

    (c) 16   (d) 64

51. If $y = 9x$ and $x = 0.01y$ then r is equal to:

    (a) -0.1   (b) 0.1

    (c) +0.3   (d) -0.3

52. If $b_{yx} = 0.5$, $b_{xy} = 0.46$ then the value of correlation coefficient r is:

    (a) 0.23   (b) 0.25

    (c) 0.39   (d) 0.48

PROBABILITY

53. 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

54. 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

55. 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) 1/4
    (c) 1/2   (d) None of these

56. 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

57. 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

58. 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.

59. 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

60. Let A and B two events in a sample space S such that $P(A) = \frac{1}{2}; P(B) = \frac{5}{8}, P(A \cup B) = \frac{3}{4};$ Find $P(A \cap B)$
    (a) 3/4   (b) 1/4
    (c) 3/16   (d) None of these.

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. Two dice are thrown together. Find the probability of getting a multiple of 2 on one 1st dice and multiple of 3 on the other dice.
(a) 2/3
(b) 1/6
(c) 1/3
(d) None of the above.

63. The probability of a cricket team winning match at Kanpur is 2/5 and hosing losing 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

64. 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

65. 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) $\frac{13}{72}$

66. What is the probability of having at least one 'SIX' from 3 throws of an unbaised die?
(a) $\frac{5}{6}$
(b) $\left(\frac{5}{6}\right)^3$
(c) $1 - \left(\frac{1}{6}\right)^3$
(d) $1 - \left(\frac{5}{6}\right)^3$

67. What is the probability of having at least one' six' in 3 throws of a project die?
(a) 5/6
(b) $(5/6)^3$
(c) $1 - (1/6)^3$
(d) $1 - (5/6)^3$

68. If a speaks 75% of truth and B speaks 60% of truth. In what percentage both of them likely contradict with each other in narrating the same questions?
(a) 0.60
(b) 0.45
(c) 0.65
(d) 0.35

69. If there are 48 marbles market with numbers 1 to 48, then the probability of selecting a marble having the number divisible by- 4 is:
(a) ½
(b) 2/3
(c) 1/3
(d) ¼

70. If there are 16 phones, 10 of them are Android and 6 of them are of Apple, then the probability of 4 randomly selected phones to include 2 Android and 2 Apple phone is:
(a) 0.47
(b) 0.51
(c) 0.37
(d) 0.27

71. 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?
(a) 0.40
(b) 0.60
(c) 0.45
(d) 0.55

72. If in a bag of 30 balls numbered from 1 to 30. Two balls are drawn find probability of getting a ball being multiple of 2 or 5

(a) $\frac{108}{465}$

(b) $\frac{117}{435}$

(c) $\frac{117}{300}$

(d) $\frac{116}{485}$

73. A machine is made of two parts A and B. The manufacturing process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect?

(a) 0.934   (b) 0.864

(c) 0.85   (d) 0.874

74. If a number is selected at random from the first 50 natural numbers, what will be the probability that the selected number is a multiple of 3 and 4 ?

(a) 5/50   (b) 2/25

(c) 3/30   (d) 4/25

THEORATICAL DISTRIBUTION

75. For a Poisson distribution $P(x = 3) = 5P(x = 5)$, then S.D. is
(a) 4
(b) 2
(c) 16
(d) $\sqrt{2}$

76. 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) ¼

77. If the inflexion points of a Normal Distribution are 6 and 14. Find its Standard Deviation ?
(a) 4
(b) 6
(c) 10
(d) 12.

78. 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) $\frac{1}{1-p}$

79. 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
(b) Mean = 0 and S.D. = $\sigma_1{}^2 + \sigma_2{}^2$
(c) Mean = $\mu_1 + \mu_2$ and S.D. = $\sqrt{\sigma_1^2 + \sigma_2^2}$
(d) None of these.

80. What is the mean of X having the following density function?
$$f(x) = \frac{1}{4\sqrt{2\pi}} \cdot e^{\frac{-(x-10)^2}{32}} \text{ for } -\infty < x < \infty$$
(a) 10
(b) 4
(c) 40
(d) None of the above

81. The quartile deviation of a normal distribution with mean 10 and standard deviation 4 is _____.
(a) 54.24
(b) 23.20
(c) 0.275
(d) 2.70

82. If Standard Deviation is 1.732 then what is the value of poisson distribution. The $P[-2.48 < x < 3.54]$ is
(a) 0.73
(b) 0.65
(c) 0.86
(d) 0.81

83. For a binomial distribution, there may be -
(a) One mode
(b) Two mode
(c) Multi mode
(d) No mode

84. Skewness of Normal Distribution is:
(a) Negative
(b) Positive
(c) Zero
(d) Undefined

INDEX NUMBER

85. In the data group Bowley's and Laspeyre's index number is as follows. Bowley's index number $= 150$, Lspeyre's index number $= 180$ then Paesche's index number is
(a) 120
(b) 30
(c) 165
(d) None of these

86. 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

87. If $\Sigma P_0 Q_0 = 116$, $\Sigma P_0 Q_1 = 140$
$\Sigma P_1 Q_0 = 97$, $\Sigma P_1 Q_1 = 117$
then Fisher's ideal index number is _____.
(a) 184
(b) 83.59
(c) 119.66
(d) 120

88. Consumer price index number for the year 1977, was 313, with 1960 as the base year, and was 100 for the year 1960. The average monthly wages in 1977 of the workers into factory be ₹ 160, their real wages is:
(a) ₹ 48.40
(b) ₹ 51.12
(c) ₹ 40.30
(d) None of the above

89. 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.

90. In the year 2010 the monthly salary of a clerk was ₹ 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 should be paid to him?
(a) ₹ 14,400
(b) ₹ 38,400
(c) ₹ 7,200
(d) None of these

91. P_{01} is the index for time
(a) 1 on 0
(b) 0 on 1
(c) 1 on 1
(d) 0 on 0

92. The cost of living index numbers in years 2015 and 2018 were 97.5 and 115 respectively. The salary of a worker in 2015 was ₹ 19500. How much additional salary was required for him in 2018 to maintain the some standard of living as in 2015 ?
(a) 3000
(b) 4000
(c) 3500
(d) 4500

93. Fisher's Index number is called as ideal index number because it is satisfying.
(a) Factor reversal test
(b) Time reversal test
(c) Both factor and time reversal test (d) Circular test

94. In price index, when a new commodity is required to be added, which of the following index is used?
(a) Shifted price index
(b) Splicing price index
(c) Deflating price index
(d) Value price index

DIRECTION TEST

1. Laxman went 15 km to North then he turned West and covered 10 kms. Then he turned South and covered 5 km. Finally turning to East he covered 10 km. In which direction he is from his house.
   (a) East   (b) West
   (c) North   (d) South

2. A man is facing East, then he turns left and goes 10 meter then turns right and goes 5 meter then goes 5 meter to the South and from there, 5 meter to West. In which direction is he from his original place?
   (a) East   (b) West
   (c) North   (d) South

3. Anoop Starts walking towards South. After walking 15 metres, he turns towards North. After walking 20 metres, he turns towards East and walks 10 metres. He then turns towards south and walks 5 metres. In which direction is he from the original position.
   (a) North   (b) South
   (c) East   (d) West

4. Rahim started from point X and walked straight 5 km west, then turned left and walked straight 2 km, then again turned left and walked straight 7 km. In which direction is he from the point X?
   (a) North-East   (b) South-West
   (c) South-East   (d) North-West

5. Manu wants to go to the market. He starts from his house towards North and reaches a crossing after 30m. He turns towards East, goes 10m till the second crossing and turns again, moves towards South straight for 30m where marketing complex exits. In which direction is the market from his house?
   (a) North   (b) South
   (c) East   (d) West

6. Sangeeta leaves from her home. She first walks 30 meters in northwest direction and then 30m in south west direction, next she walks 30 metres in south-east direction. Finally she turns towards her house. In which direction is she moving now?
   (a) North – West   **(b) North - East**
   (c) South – East   (d) South – West

7. Madhuri moved a distance of 75 meters toward north. She then turned to her left and walked for about 25m, turned left again and walked 80m. Finally, she turned to her right at an angle of 45°. In which direction was she moving now?
   (a) South – East   **(b) South - West**
   (c) North – West   (d) North – East

8. A man is facing west he turns 45 degrees in the clockwise direction and then another 180 degrees in the same direction and then 270 degrees in the anticlockwise direction. Which direction is he facing now?
   (a) South-west   (b) North-west
   (c) West   (d) South

9. A man can walk by having long, medium and short steps. He can cover 60 meters by 100 long steps, 100 meters by 200 medium steps and 80 meters by 200 short steps, he walks taking 5000 long steps, then he turns left and walk by taking 6000 medium steps. He then turns right and walk by taking 2500 short steps. How far (in meters) is he away from his starting point?

(a) **5000 m**   (b) 4000 m
(c) 6000 m   (d) 7000 m

10. One morning after Sunrise, Vikram and Shailesh were standing in a down with their back towards each other. Vikram's shadow feli exactly towards left hand side. Which direction was Shailesh facing?

(a) South-West   (b) West
(c) **South**   (d) East-South

11. R's office is 4 km. in East direction from his home and club is 4km. in North direction from his home. On midway from office to club, R starts moving towards his home. In which direction is he facing his back?

(a) South-East   (b) North-West
(c) **North-East**   (d) South-West

12. A sign board pointing direction towards north due to heavy wind. The points of sign word shows west instead of North. If a person moves to same direction of pointer. He moves 100 meter than turn left, and moves 100 meter than again turn left and move 100 meter than he turn right & moves 100 meter. In which direction he is now?

(a) West   (b) East
(c) North   (d) **South**

13. One morning a boy starts walking in a particular direction for 5 Km and then takes a left turn and walks another 5 Km. thereafter he again takes left turn and walks another 5 Km and at last he takes right turn and walks 5 Km. Now he sees his shadow in front of him. What direction he did start initially?

(a) South   (b) **North**
(c) West   (d) East

SEATING ARRANGEMENTS

14. Four girls are seated for a photograph. Shikha is to the left of Reena. Manju is to the right of Reena. Reeta is between Reena and Manju. Who is the second left in photograph?
    (a) Reena   (b) Manju
    (c) Reeta   (d) Shikha

15. Five girls G, H, I, J, K are sitting in a row facing South not necessarily in the same order H is sitting between G and K, I is immediate right to K, J is immediate left to G. Which of the following is true?
    (a) J is third to the left of K.   (b) G is second to the left of I
    (c) H is to the right of K   (d) H is to the left of G

16. Four Indian, A, B, C and D and four Chinese E, F, G and H are sitting in a circle around a table facing the each other in a conference. No two Indians or Chinese are sitting side by side, C who is sitting between G and E is facing D, F is between D and A and facing G, H is to the left of B. Who is sitting left of A?
    (a) E   (b) F
    (c) G   (d) H

17. If six person are sitting in a hexagonal table are P, Q, R, S, T, U each facing the centre. P is seated to opposite to Q who is b/w R & S. P is b/w T and U. T is the left of S. Which of them is facing R?
    (a) P   (b) Q
    (c) U   **(d) T**

BLOOD RELATION

18. Ram and Mohan are brothers, Shankar is Mohan's father. Chhaya is Shankar's sister. Priya is Shankar's niece. Shubhra is Chhaya's grand daughter. How is Ram related to Shubhra?
(a) Brother   **(b) Uncle**
(c) Cousine   (d) Nephew

19. D is daughter of E. A is son of D. C is a brother of A and B is the sister of A. F is the brother of D. How F is related to B?
(a) Father-in-law   **(b) Uncle**
(c) Brother   (d) Mother-in-law

20. Introducing a boy a girl said, "He is the son of the daughter of the father of my uncle". Who is the boy to the girl?
(a) Brother   (b) Nephew
(c) Uncle   (d) Son-in-law

21. It is given that " A is the mother of B; B is the sister of C; C is the father of D". How is A related to D?
(a) Mother   **(b) Grandmother**
(c) Aunt   (d) Sister

22. 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

23. Annanya is mother of Satya and Shyam is the son of Bhima. Shiva is brother of Annanya. If Satya is sister of Shyam. How Bhima is related to Shiva?
(a) Son   (b) Cousin
(c) Brother-in-law   (d) Son-in-law

24. Suman is daughter-in-law of Rakesh and sister-in-law of Rajesh. Ramesh is the son of Rakesh and only brother of Rajesh. Find the relation of Suman with Ramesh?
(a) Sister-in-law   (b) Cousin
(c) Aunt   **(d) Wife**

25. 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 is related to the man?
(a) Brother-in-law   **(b) Son**
(c) Brother   (d) Nephew

26. Pointing to a man in a photograph, a woman said, "the father of his brother is the only son of my grandfather", how is the woman related to the man in the photograph?
(a) Mother   (b) Aunty
(c) Daughter   **(d) Sister**

27. Point out a Lady Sohil said she is the daughter of woman. Who is the mother of the husband of my mother Who is the lady to Sohil?
    (a) Sister   **(b) Aunt**
    (c) Daughter   (d) Sister-in-Law

28. Pointing towards a person, A man said to woman, "His mother is the only daughter of your father". How is the woman related to that person?
    (a) Mother   (b) Daughter
    (c) Sister   (d) Wife

29. Vicky introduces John as the son of the only brother of his father's wife. How is Vicky related to John?
    (a) Son   **(b) Cousin**
    (c) Uncle   (d) Brother

30. A Man said to a lady "your mother's husband's sister is my Aunt. "How is the man related to the lady?
    (a) Father   (b) Grandfather
    (c) Son   **(d) Brother**

31. Pointing to a lady, A said, "that women is my nephew's maternal grandmother". How is that women related to A's sister who has no ' sister?
    (a) Cousin   (b) Son-in-law
    (c) Mother   (d) Mother-in-law

32. Pointing out to a lady, Sahil said, "she is the daughter of the woman who is the mother of the husband of my mother". Who is the lady to Sahil?
    (a) Aunt   (b) Sister
    (c) Daughter   (d) Sister-in-law

Type-3

33. If P + Q means P is the mother of Q; P ÷ Q means P is the father of Q; P - Q means P is the sister of Q; then which of the following relationship shows that M is the daughter of R?
    (a) R ÷ M + N   (b) R + N ÷ M
    (c) R - M ÷ N   (d) None of the above

Ratio Proportion

1. X, Y, Z together starts a business. If X invests 3 times as much as Y invests and Y invests two third of what Z invests, then the ratio of capitals of X, Y, Z is:
   (a) 3 : 9 : 2
   (b) 6 : 3 : 2
   (c) 3 : 6 : 2
   (d) 6 : 2 : 3

2. There are total 23 coins of ₹ 1, ₹ 2 and ₹ 5 in a bag. If their value is ₹43 and the ratio of coins of ₹1 and ₹2 is 3 : 2. Then the number of coins of ₹1 is:
   (a) 12
   (b) 5
   (c) 10
   (d) 14

3. $\frac{3x-2}{5x+6}$ is the duplicate ratio of $\frac{2}{3}$ then find the value of x
   (a) 2
   (b) 6
   (c) 5
   (d) 9

4. The salaries of A, B, and C are in the ratio 2 : 3 : 5. If increments of 15%, 10% and 20% are allowed respectively to their salary, then what will be the new ratio of their salaries?
   (a) 23 : 33 : 60
   (b) 33 : 23 : 60
   (c) 23 : 60 : 33
   (d) 33 : 60 : 23

5. A vessel contained a solution of acid and water in which water was 64%. Four litres of the solution were taken out of the vessel and the same quantity of water was added. If the resulting solution contains 30% acid, the quantity (in litres) of the solution, in the beginning in the vessel, was
   (a) 12
   (b) 36
   (c) 24
   (d) 2

6. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets ₹1,000 more than D, what is B 's share?
   (a) ₹ 2,000
   (b) ₹1,500
   (c) ₹2,500
   (d) ₹ 1,000

INDICES

7. If $p^x = q$, $q^y = r$ and $r^z = p^6$, then the value of xyz will be:
   (a) 0
   (b) 1
   (c) 3
   (d) 6

8. $\left[\frac{x^2-(y-z)^2}{(x+z)^2-y^2} + \frac{y^2-(x-z)^2}{(x+y)^2-z^2} + \frac{z^2-(x-y)^2}{(y+z)^2-x^2}\right]$ the Value of Equation is
   (a) 0
   (b) 1
   (c) -1
   (d) ∞

9. If $3^x = 5^y = 75^z$, then
   (a) x + y − z = 0
   (b) $\frac{2}{x} + \frac{1}{y} = \frac{1}{z}$
   (c) $\frac{1}{x} + \frac{2}{y} = \frac{1}{z}$
   (d) $\frac{2}{x} + \frac{1}{z} = \frac{1}{y}$

10. If $abc = 2$, then the value of $\frac{1}{1+a+2b^{-1}} + \frac{1}{1+\frac{1}{2}b+c^{-1}} + \frac{1}{1+c+a^{-1}}$

(a) 1

(b) 2

(c) 3

(d) $\frac{1}{2}$

11. If $P = x^{1/3} + x^{-1/3}$ then $P^3 - 3P =$

(a) 3

(b) $\frac{1}{2}\left(x + \frac{1}{x}\right)$

(c) $\left(x + \frac{1}{x}\right)$

(d) $2\left(x + \frac{1}{x}\right)$

12. If $xy + yz + zx = -1$ then the value of $\left(\frac{x+y}{1+xy} + \frac{z+y}{1+zy} + \frac{x+z}{1+zx}\right)$ is:

(a) xyz

(b) $\frac{-1}{yz}$

(c) $\frac{1}{xyz}$

(d) $\frac{1}{x+y+z}$

13. Let $a = \frac{(\sqrt{5}+\sqrt{3})}{(\sqrt{5}-\sqrt{3})}$ and $b = \frac{\sqrt{5}-\sqrt{3}}{(\sqrt{5}+\sqrt{3})}$ What is the value of $a^2 + b^2$?

(a) 64

(b) 62

(c) 60

(d) 254

14. A group of 400 soldiers posted at border area had a provision for 31 days. After 28 days 280 soldiers from this group were called back. Find the number of days for which the remaining ration will be sufficient?

(a) 3

(b) 6

(c) 8

(d) 10

15. If $2^x = 4^y = 8^z$ and $\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z} = \frac{24}{7}$, then the value of z is:

(a) $\frac{7}{16}$

(b) $\frac{7}{32}$

(c) $\frac{7}{48}$

(d) $\frac{7}{64}$

LOGARITHM

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16. If $\log_4(x^2 + x) - \log_4(x + 1) = 2$, then the value of x is:

(a) 2

(b) 3

(c) 16

(d) 8

17. The value of $\log (1^3 + 2^3 + 3^3 + \ldots \ldots n^3)$ is equal to:

(a) $3 \log 1 + 3 \log 2 + \ldots + 3 \log n$

(b) $2 \log n + 2 \log (n+1) - 2 \log 2$

(c) $\log n + \log (n+1) + \log (2n+1) - \log 6$

(d) 1

18. If $\log\left(\frac{x-y}{2}\right) = \frac{1}{2}(\log x + \log y)$, then the value of $x^2 + y^2 =$

(a) $2xy$

(b) $4xy$

(c) $2x^2y^2$

(d) $6xy$

19. The value of $\log_5\left(1 + \frac{1}{5}\right) + \log_5\left(1 + \frac{1}{6}\right) + -- + \log_5\left(1 + \frac{1}{624}\right)$

(a) 2

(b) 3

(c) 5

(d) 0

20. $\log_{2\sqrt{2}}(512) : \log_{3\sqrt{2}} 324 =$

    (a) 128: 81   (b) 2: 3

    (c) 3: 2   (d) None

21. If $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = \frac{25}{6}$ then the value of x is

    (a) 64   (b) 4

    (c) 16   (d) 2

22. If $x = y^a, y = z^b, z = x^c$ then the value of abc is

    (a) 1   (b) 2

    (c) 3   (d) 4

151. The value of $\int_0^2 x \cdot e^{x^2} dx$ is

(a) 1

(b) $e - 1$

(c) $(e/2) - 1$

(d) $\frac{1}{2}(e^4 - 1)$

152. The value of $\int_1^2 \frac{x}{x^2+1} dx$ is equal to:

(a) $\log_e \left(\frac{5}{2}\right)$

(b) $\frac{1}{2}\log_e \left(\frac{5}{2}\right)$

(c) $\log_e (5) - \log_e 2 + c$

(d) None of these

153. The value of $\int_0^2 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{2-x}} dx$ is:

(a) 0

(b) 3

(c) 2

(d) 1

154. Find the area under the curve $f(x) = x^2 + 5x + 2$ with the limits 0 to 1?

(a) 3.833

(b) 4.388

(c) 4.833

(d) 3.338

155. Evaluate the integral $\int \frac{1}{(x-1)(y-2)} dx$:

(a) $\log \frac{(x-2)}{(x-1)} + c$

(b) $\log [(x-2)(x-1) + c$

(c) $\log \frac{(x-1)}{(x-2)} + c$

(d) $\log [(x-2)(x+1)] + c$

145. If $e^{xy} - 4xy = 4$ then $\frac{dy}{dx} = $ _____

(a) $\frac{y}{x}$ (b) $\frac{-y}{x}$

(c) $\frac{x}{y}$ (d) $\frac{-x}{y}$

146. If $u = 3t^4 + 5t^3 + 2t^2 + t + 4$, then the value of $\frac{du}{dt}$ at $t = -1$ is:

(a) 0   (b) 1

(c) 2   (d) 5

147. If $y = 1 + \frac{x}{\lfloor 1} + \frac{x^2}{\lfloor 2} + \frac{x^3}{\lfloor 3} + \ldots \ldots \infty$, then the value of $\frac{dy}{dx}$ is equal to:

(a) x   (b) y

(c) 1   (d) 0

148. The maxima and minima of the function $y = 2x^3 - 15x^2 + 36x + 10$ occurs respectively at:

(a) $x = 2$ and $x = 3$ (b) $x = 1$ and $x = 3$

(c) $x = 3$ and $x = 2$ (d) $x = 3$ and $x = 1$

149. The speed of a train at a distance x (from the starting point) is given by $3x^2 - 5x + 4$. What is the rate of change (of distance) at $x = 1$?

(a) -1   (b) 0

(c) 1   (d) 2

150. The cost function of production is given by $C(x) = \frac{x^3}{2} - 15x^2 + 36x$ where x, Denotes the number of items produced. The level of output for which marginal cost is minimum and the level of output for which the average cost is minimum are given by, respectively.

(a) 10 and 15   (b) 10 and 12

(c) 12 and 15   (d) 15 and 10

134. The number of subsets of the set formed by the word Allahabad is:

    (a) 128   (b) 16

    (c) 32   (d) 64

135. In a town of 20,000 families, it was found that 40% families buy newspaper. A, 20% families buy newspaper B and 10% families buy newspaper C, 5% families buy A and B, 3% buy B and C and 4% buy A and C if 2% families buy ail the three newspapers, then the number of families which buy A only is:

    (a) 6600   (b) 6300

    (c) 5600   (d) 600

136. If $A = \{1, 2\}$, $B = \{3, 4\}$, $C = \{5, 6\}$ then the value of $A \times (B \cup C)$

    (a) $\{(1, 2), (3, 4), (5, 6)\}$

    (b) $\{(1, 3), (2, 3), (1, 4), (2, 4), (2, 5), (1, 5), (1, 6), (2, 6)\}$

    (c) $\{(1, 3), (2, 3), (1, 4), (2, 4), (2, 5), (1, 5)\}$

    (d) $\{(3, 1), (2, 3), (4, 1), (2, 4), (2, 5), (1, 5), (1, 6), (2, 6)\}$

137. If $B = \{1, 2, 3, 4, 5\}$ then the number of proper subsets of B is

    (a) 120   (b) 30

    (c) 31   (d) 32

138. Two finite sets have x and y number of elements. The total number of subsets of first is 56 more than the total number of subsets of second. The value of x and y is:

    (a) 6 and 3   (b) 4 and 2

    (c) 2 and 4   (d) 3 and 4