

**MODEL TEST PAPER 1**  
**FOUNDATION COURSE**  
**PAPER 3: QUANTITATIVE APTITUDE**

**Time: 2 Hours**

**Marks: 100**

1. The students in three classes are in the ratio 2 : 3 : 5. If 40 students are increased in each class the ratio changes to 4 : 5 : 7. Originally the total number of students was
  - (a) 180
  - (b) 400
  - (c) 100
  - (d) 200
2. A bag contains coins of denominations 1 rupee , 2 rupee and 5 rupees . Their numbers are in the ratio 4:3:2 .If bag has total of Rs. 1800 then find the number of 2 rupee coins ?
  - (a) 270
  - (b) 230
  - (c) 180
  - (d) 210
3. 4 tables and 3 chairs together cost ₹ 2,250 and 3 tables and 4 chairs cost ₹ 1950. Find the cost of 2 chairs and 1 table.
  - (a) ₹ 550
  - (b) ₹ 1005
  - (c) ₹ 750
  - (d) None of these
4. One root of the equation:  $x^2 - 2(5 + m) + 3(7 + m) = 0$  is reciprocal of the other. Find the value of m.
  - (a)  $-20/3$
  - (b) 7
  - (c)  $1/7$
  - (d) 117
5. A small manufacturing firm produces two types of gadgets A and B, which are first processed in the foundry then sent to the machine shop for finishing. The number of man-hours of labour required in each shop for the production of

each unit of A and B, and the number of man-hours the firm has available per week are as follows:

Gadget	Foundry	Machine-shop
A	10	5
B	6	4
Firm's capacity per week	1000	600

Let the firm manufactures  $x$  units of A and  $y$  units of B. The constraints are:

- (a)  $10x+6y \leq 1000$  ,  $5x+4y \geq 600$ ,  $x \geq 0, y \leq 0$
  - (b)  $10x+6y \leq 1000$  ,  $5x+4y \leq 600$ ,  $x \geq 0, y \geq 0$
  - (c)  $10x+6y \geq 1000$  ,  $5x+4y \leq 600$ ,  $x \leq 0, y \leq 0$
  - (d)  $10x+6y \leq 1000$  ,  $5x+4y \geq 600$ ,  $x \leq 0, y \leq 0$
6. Sangeeta leaves from her home. She first walk 30 metres in North-West 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?
- (a) North-West
  - (b) North-East
  - (c) South-East
  - (d) South-West
7. Rahim started from point X and walked straight 5 km. East, then turned left and walked straight 2 km. and 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
8. Find out the next number in the following series 7,11, 13, 17, 19, 23, 25, 29,?
- (a) 30
  - (b) 31
  - (c) 32
  - (d) 33
9. If MACHINE is coded as 19 - 7 - 9 - 14 - 15 - 20 - 11, how will you code DANGER?
- (a) 11-7-20-16-11-24
  - (b) 13-7-20-9-11-25
  - (c) 10-7-20-13-11-24
  - (d) 13-7-20-10-11-25

10. A, B, C, D, E and F are sitting around a round table. A is between E and F, E is opposite to D, and C is not in either of the neighbouring seats of E. Who is opposite to B ?
- C
  - D
  - F
  - None of these
11. Pointing to a photograph, a man said to a woman "His mother is the only daughter of your father " How is the woman related to that person
- Daughter
  - Sister
  - Mother
  - Wife
- (12-13) Read the following information and answer the given below it :
- A is the father of C, But C is not his son,
  - E is the daughter of C. F is the spouse of A .
  - B is the brother of C. D is the son of B.
  - G is the spouse of B. H is the father of G
12. Who is the grand mother of D?
- A
  - C
  - F
  - H
13. Who is son of F
- B
  - C
  - D
  - E
14. A is the father of C and D is the son of B. E is the brother of A . If C is the sister of D, how is B is related to E?
- Daughter
  - Brother-in-law
  - Husband
  - Sister-in-law

15. If 'P+Q' means 'P is the father of Q', 'P×Q' means 'P is the brother of Q', 'P-Q' means 'P is the mother of Q', then which of the following is definitely true about 'C-A+B'?
- B is the son of A
  - A is the son of C
  - B is the father of C
  - C is the mother of B
16. 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 will be:
- 2:15
  - 7:15
  - 15:7
  - 1:7
17. How much money is required to be invested every year as to accumulate Rs,6,00,000 at the end of 10 years, if interest is compounded annually at 10% rate of interest [ Given :  $(1.1)^{10}=259734$  ]
- ₹ 37,467
  - ₹ 37,476
  - ₹ 37,647
  - ₹ 37,674
18. The Scarap value of machine valued at Rs,10,00,000 after 15 yaers of depreciation is 10% per annum .
- ₹ 215891.13
  - ₹ 205891.13
  - ₹ 225891.13
  - None
19. The effective annual rate of interest corresponding to nominal rate 6% p.a. payable quaterly is:
- 6.14%
  - 6.07%
  - 6.08%
  - 6.09%
20. If the difference between the compound interest compounded annually and simple interest on a certain amount at 10% per annum for two years is ₹ 372, then the principal amount is.
- ₹ 37,000
  - ₹ 37,200

- (c) ₹ 37,500  
(d) None of the above
21. The future value of an annuity of ₹ 1500 made annually for 5 years at an interest rate of 10% compounded annually is [Given that  $(1.1)^5 = 1.61051$ ]  
(a) 9517.56  
(b) 9157.65  
(c) 9715.56  
(d) 9175.65
22. Find the present value of an annuity of ₹ 1,000 payable at the end of each year for 10 years. If rate of interest is 6% compounding per annum. (given  $(1.06)^{-10} = 0.5584$ ):  
(a) ₹ 7,360  
(b) ₹ 8,360  
(c) ₹ 12,000  
(d) None of these.
23. Mr. A borrows 5,00,000 to buy a house. If he pays equal instalments for 20 years and 10% interest on outstanding balance what will be the equal annual instalment?  
(a) ₹ 58239.84  
(b) ₹ 58729.84  
(c) ₹ 68729.84  
(d) None of these
24. Suppose your mom decides to gift you ₹ 10,000 every year starting from today for the next sixteen years. You deposit this amount in a bank as and when you receive and get 8.5% per annum interest rate compounded annually. What is the present value of this money: [Given that  $P(15, 0.085) = 8.304236$ ]  
(a) ₹ 83,042  
(b) ₹ 90,100  
(c) ₹ 93,042  
(d) ₹ 10,100
25. What will be the population after 3 years, when present population is 1,00,000 and the population increases at 3% in year 1st year, at 4% in second year and 5% in third year.  
(a) 1,12,476  
(b) 1,15,476  
(c) 1,20,576  
(d) 1,25,600

26. Find the present value of an annuity which pays 200 at the end of each 3 months for 10 years assuming money to be worth 5% converted quarterly?
- ₹ 3473.86
  - ₹ 3108.60
  - ₹ 6265.38
  - None of these
27. The value of furniture depreciates by 10% a year, if the present value of the furniture in an office is ₹ 21870, calculate the value of furniture 3 years ago:
- ₹ 30,000
  - ₹ 40,000
  - ₹ 35,000
  - ₹ 50,000
28. A sum of money, lent out at simple interest, doubles itself in 8 years. Find in how many years will the sum become triple (three times) of itself at the same rate per cent ?
- 16 years
  - 15 years
  - 20 years
  - None.
29.  $\int 2^{3x} \cdot 3^{2x} \cdot 5^{2x} dx$
- $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(720)} + C$
  - $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(360)} + C$
  - $\frac{2^{3x} \cdot 3^{2x} \cdot 5^{2x}}{\log(1800)} + C$
  - $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(90)} + C$
30.  $\int_1^4 (2x + 5) dx$  and the value is
- 10
  - 3
  - 30
  - none
31. The equation of the tangent to the curve,  $x^3 - 2x + 3$ , at the point (2, 7) is:
- $y = 2x - 13$
  - $y = 10x$
  - $y = 10x - 13$

- (d)  $y = 10$
32. If  $x = c.t$ ,  $y = c/t$ , then  $dy/dx$  is equal to :
- (a)  $1/t$
  - (b)  $t.e^t$
  - (c)  $-1/t^2$
  - (d) None of these
33. 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
34. A garden having 6 tall trees in a row. In how many ways 5 children stand, one in a gap between the trees in order to pose for a photograph?
- (a) 24
  - (b) 120
  - (c) 720
  - (d) 30
35. Find the number of arrangements in which the letters of the word 'MONDAY' be arranged so that the words thus formed begin with 'M' and do not end with 'N'.
- (a) 720
  - (b) 120
  - (c) 96
  - (d) None
36. In how many ways can a party of 4 men and 4 women be seated at a circular table, so that no two women are adjacent ?
- (a) 164
  - (b) 174
  - (c) 144
  - (d) 154
37. A Supreme Court Bench consists of 5 judges. In how many ways, the bench can give a majority division ?
- (a) 10
  - (b) 5
  - (c) 15
  - (d) 16

38. If the  $p$ th term of an A.P. is 'q' and the  $q$ th term is 'p', then its  $r$ th term is:
- $p + q + r$
  - $p + q - r$
  - $p - q - r$
  - $p + q$
39. Find the numbers whose GM is 5 and AM is 7.5:
- 12 and 13
  - 13.09 and 1.91
  - 14 and 11
  - 17 and 19
40. If the sum of  $n$  terms of an A.P. be  $2n^2 + 5n$ , then its ' $n$ ' term is:
- $4n - 2$
  - $3n - 4$
  - $4n + 3$
  - $3n + 4$
41. The first, second and seventh term of an AP. are in G.P. and the common difference is 2, the 2nd term of A.P. is :
- $5/2$
  - 2
  - $3/2$
  - $1/2$
42. Find the sum of all natural numbers between 250 and 1,000 which are exactly divisible by 3 :
- 1,56,375
  - 1,56,357
  - 1,65,375
  - 1,65,357
43. On the set of lines, being perpendicular is a satisfies which property :
- Reflexive
  - Symmetric
  - Transitive
  - None of these
44. If  $A = (1, 2, 3, 4, 5)$ ,  $B = (2, 4)$  and  $C = (1, 3, 5)$  then  $(A - C) \times B$  is:
- $\{(2, 2)(2, 4)(4, 2)(4, 4)(5, 2) (5, 4)\}$
  - $\{(1, 2) (1, 4) (3, 2) (3, 4) (5, 2) (5, 4)\}$



- (c)  $\{(2, 2) (4, 2) (4, 4) (4, 5)\}$   
 (d)  $\{(2, 2) (2, 4) (4, 2) (4, 4)\}$
45. Out of total 150 students, 45 passed in Accounts, 30 in Economics and 50 in Maths, 30 in both Accounts and Maths, 32 in both Maths and Economics, 35 in both Accounts and Economics, 25 students passed in all the three subjects. Find the numbers who passed atleast in anyone of the subjects:
- (a) 63  
 (b) 53  
 (c) 73  
 (d) None.
46. Let  $R$  is the set of real numbers, such that the function  $f: R \rightarrow R$  and  $g: R \rightarrow R$  are defined by  $f(x) = x^2 + 3x + 1$  and  $g(x) = 2x - 3$ . Find  $(f \circ g)$  :
- (a)  $4x^2 + 6x + 1$   
 (b)  $x^2 + 6x + 1$   
 (c)  $4x^2 - 6x + 1$   
 (d)  $x^2 - 6x + 1$
47. The ages of two persons are in the ratio 5:7. Eighteen years ago their ages were in the ratio of 8:13, their present ages (in years) are :
- (a) 50,70  
 (b) 70,50  
 (c) 40,56  
 (d) None of these
48. A box contains ₹ 56 in the form of coins of one rupee, 50 paise and 25 paise. The number of 50 paise coin is double the number of 25 paise coins and four times the numbers of one rupee coins. The numbers of 50 paise coins in the box is
- (a) 64  
 (b) 32  
 (c) 16  
 (d) 14
49. A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹ 1,500 after 4 years of service and ₹ 1,800 after 10 years of service, what was his starting salary and what is the annual increment in rupees?
- (a) ₹ 1,300, ₹ 50  
 (b) ₹ 1,100, ₹ 50  
 (c) ₹ 1,500, ₹ 30

- (d) None
50. Find the positive value of  $k$  for which the equations:  $x^2 + kx + 64 = 0$  and  $x^2 - 8x + k = 0$  will have real roots:
- (a) 12  
(b) 16  
(c) 18  
(d) 22
51. Praveen is facing west. He turns  $45^\circ$  in the clockwise direction and then again another turns with  $180^\circ$  in the same direction i.e. clockwise direction, after that he turns  $270^\circ$  in the anti-clockwise direction. Which direction is he facing now ?
- (a) North-West  
(b) West  
(c) South-West  
(d) South
52. Shweta moved a distance of 75 metres towards the north. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of  $45^\circ$ . In which direction was she moving finally?
- (a) South  
(b) South-West  
(c) North-East  
(d) North-West
53. In a straight line there are six persons sitting in a row. B is between F and D. E is between A and C. A does not stand next to F or D, C does not stand next to D. F is between which of the following persons?
- (a) B and E  
(b) B and C  
(c) B and D  
(d) B and A
54. Rashmi walked 2 km west of her house and then turned south covering 4 km. Finally, she moved 3 km towards east and then again 1 km west. How far is she from her initial position?
- (a) 7 km  
(b) 3 km  
(c) 4 km  
(d) 12 km

55. Five boys A, B, C, D and E are sitting in a row. A is to the right of B, and E is to the left of B but to the right of C. A is to the left of D. Who is second from the left end ?
- D
  - A
  - E
  - B
56. Eight leaders P, Q, R, S, T, U, V and W are sitting on a bench facing towards North.
- T is fourth to the left of P
  - S is fourth to the right of W
  - U and R are not sitting at the ends, but they are neighbours of T and Q respectively.
  - P is next to the right of W and but left of Q.
- Who are sitting at the extreme ends ?
- T and S
  - P and Q
  - U and R
  - None
57. If  $\log_4(x^2 + x) - \log_4(x + 1) = 2$  then the value of x is
- 2
  - 3
  - 16
  - 8
58. If HEALTH is written as GSKZDG, then how will NORTH be written in that code?
- OPSUI
  - GSQNM
  - FRPML
  - IUSPO
59. In a certain code, TEACHER is written as VGCEJGT. How is CHILDREN written in that code ?
- EJKNEGTP
  - EGKNEITP
  - EJKNFGTO
  - EJKNFTGP

60. Find odd man out of the following:
- (a) 15
  - (b) 25
  - (c) 37
  - (d) 49
61. Which of the following statement is true?
- (a) Statistics is derived from the French word 'Statistik'
  - (b) Statistics is derived from the Italian word 'Statista'
  - (c) Statistics is derived from the Latin word 'Statistique'.
  - (d) None of these
62. In tabulation, source of data, if any is shown in the :
- (a) Stub
  - (b) Body
  - (c) Caption
  - (d) Footnote
63. From the following data 73, 72, 65, 41, 54, 80, 50, 46, 49, 53, find the number of class intervals if class length is given as 5,
- (a) 6
  - (b) 5
  - (c) 7
  - (d) 8
64. The number of observations between 150 and 200 based on the following data is:
- | Value               | More than<br>100 | More than<br>150 | More than<br>200 | More than<br>250 |
|---------------------|------------------|------------------|------------------|------------------|
| No. of Observations | 70               | 63               | 28               | 05               |
- (a) 46
  - (b) 35
  - (c) 28
  - (d) 23
65. Data collected on religion from the census reports are:
- (a) Primary data
  - (b) Secondary data
  - (c) Sample data
  - (d) (a) or (b)

66. The number of test of Adequacy in Index numbers:
- (a) 2
  - (b) 3
  - (c) 4
  - (d) 5
67. Circular Test is satisfied by:
- (a) Paasche's Index Number
  - (b) The simple geometric mean of price relatives and the weighted aggregative with fixed weights
  - (c) Laspeyre's Index Number
  - (d) None of these
68. In the data group Bowley's and Laspeyre's index number is as follows. Bowley's index number = 150, Laspeyre's index number = 180 then Paasche's index number is:
- (a) 120
  - (b) 30
  - (c) 165
  - (d) None of these
69. If Fisher's index = 150 and Paasche's Index = 144, then Laspeyre's index is \_\_\_\_\_
- (a) 147
  - (b) 156.25
  - (c) 104.17
  - (d) 138
70. Monthly salary of an employee was ₹ 10,000 in the year 2010 and it was increased to ₹ 20,000 in the year 2023 while the consumer price index number is 240 in year 2023 with the base year 2010, what should be his salary in comparison of consumer price index in the year 2023 ?
- (a) 2,000
  - (b) 16,000
  - (c) 24,000
  - (d) None of these
71. Parameter is a characteristic of:
- (a) Population
  - (b) Sample
  - (c) Probability distribution
  - (d) Both (a) & (b)

72. The Interval  $(\mu - 3\sigma, \mu + 3\sigma)$  covers
- (a) 95% area of normal distribution
  - (b) 96% area of normal distribution
  - (c) 99% area of normal distribution
  - (d) All but not 0.27% area of a normal distribution
73. The overall percentage of failure in a certain examination is 0.30. What is the probability that out of a group of 6 candidates at least 4 passed the examination?
- (a) 0.74
  - (b) 0.71
  - (c) 0.59
  - (d) 0.67
74. In a certain manufacturing process, 5% of the tools produced turn out to be defective. Find the probability that in a sample of 40 tools, at most 2 will be defective: [Given:  $e^{-2} = 0.135$ ]
- (a) 0.555
  - (b) 0.932
  - (c) 0.785
  - (d) 0.675
75. For binomial distribution  $E(x) = 2$ ,  $V(x) = 4/3$ . Find the value of  $n$ .
- (a) 3
  - (b) 4
  - (c) 5
  - (d) 6
76. If standard deviation of a poisson distribution is 2 , then its Mode
- (a) 2
  - (b) 4
  - (c) 3 and 4
  - (d) 5
77. Consumer price index is commonly known as
- (a) Chain Based index
  - (b) Ideal index
  - (c) Wholesale price index
  - (d) Cost of living index.

78. 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.
- 0.82
  - 0.28
  - 0.01
  - 0.09
79. If  $r$  is the Karl Pearson's coefficient of correlation in a bivariate distribution the two regression lines are at right angles when \_\_\_\_\_
- $r = \pm 1$
  - $r = 0$
  - $r = \pm \infty$
  - None
80. If  $r = 0.6$  then the coefficient of non-determination is \_\_\_\_\_
- 0.4
  - 0.6
  - 0.36
  - 0.64
81. The correlation coefficient between  $x$  and  $y$  is  $-1/2$ . The value of  $b_{xy} = -1/8$ . Find  $b_{yx}$ .
- 2
  - 4
  - 0
  - 2
82. Out of the following which one affects the regression co-efficient:
- Change of origin only
  - Change of scale only
  - Change of scale & origin both
  - Neither change of origin nor change of scale
83. If Y is dependent variable and X is Independent variable and the S.D of X and Y are 5 and 8 respectively and Co-efficient of co-relation between X and Y is 0.8. Find the Regression co-efficient of Y on X.
- 0.78
  - 1.28
  - 6.8
  - 0.32

84. The theory of compound probability states that for any two events A and B:
- (a)  $P(A \cap B) = P(A) \times P(B)$
  - (b)  $P(A \cap B) = P(A) \times P(B/A)$
  - (c)  $P(A \cup B) = P(A) \times P(B/A)$
  - (d)  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
85. Three identical dice are rolled. The probability that the same number will appear on each of them is:
- (a)  $1/6$
  - (b)  $1/12$
  - (c)  $1/36$
  - (d)  $1$
86. If 10 men, among whom are A and B, stand in a row, what is the probability that there will be exactly 3 men between A and B ?
- (a)  $11/15$
  - (b)  $4/15$
  - (c)  $1/15$
  - (d)  $2/15$
87.  $P(A) = 2/3$ ;  $P(B) = 3/5$ ;  $P(A \cup B) = 5/6$ . Find  $P(B/A)$
- (a)  $11/20$
  - (b)  $13/20$
  - (c)  $13/18$
  - (d)  $15/20$
88. 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)  $119/180$
89. A bag contains 15 one rupee coins, 25 two rupee coins and 10 five rupee coins. If a coin is selected at random from the bag, then the probability of not selecting a one rupee coin is:
- (a) 0.30
  - (b) 0.70
  - (c) 0.25
  - (d) 0.20



90. If two variables  $x$  and  $y$  are related by  $2X + 3Y - 7 = 0$  and the mean and mean deviation about mean of  $X$  are 1 and 0.3 respectively, then the co-efficient of mean deviation of  $Y$  about mean is .
- 5
  - 4
  - 12
  - 50
91. 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 :
- 14
  - 15
  - 16
  - 9
92. Suppose a population  $A$  has 100 observations 101,102,103,200 and another population  $B$  has 100 observations 151, 152, 153, ..... 250. If  $V_A$  and  $V_B$  represents the variance of the two populations respectively, then  $V_A / V_B = :$
- 
- $9/4$
  - 1
  - $4/9$
  - $2/3$
93. The rate of returns from three different shares are 100%, 200% and 300% respectively. The average rate of return will be.
- 350%
  - 233.33%
  - 200%
  - 300%
94. If variance of  $x$  is 5, then find the variance of  $(2 - 3x)$
- 10
  - 45
  - 5
  - 13
95. The sum of the squares of deviations of a set of observations has the smallest value, when the deviations are taken from their
- A. M.
  - H. M.
  - G. M.

- (d) None
96. For a moderately skewed distribution, which of the following relationship holds?
- (a)  $\text{Mean} - \text{Median} = 3 (\text{Median} - \text{Mode})$
  - (b)  $\text{Median} - \text{Mode} = 3 (\text{Mean} - \text{Median})$
  - (c)  $\text{Mean} - \text{Mode} = 3 (\text{Mean} - \text{Median})$
  - (d)  $\text{Mean} - \text{Median} = 3 (\text{Mean} - \text{Mode})$
97. The mean salary for a group of 40 female workers is ₹ 5200 per month and that for a group of 60 male workers is ₹ 6800 per month. What is the combined salary ?
- (a) ₹ 6160
  - (b) ₹ 6280
  - (c) ₹ 6890
  - (d) ₹ 6920
98. The mean weight of 15 students is 110 kg. The mean weight of 5 of them is 100 kg. and that 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
99. If the difference between mean and mode is 69, then the difference between Mean and Median will be \_\_\_\_\_
- (a) 63
  - (b) 31.5
  - (c) 23
  - (d) None of the above
100. The average age of 15 students is 15 years. Out of these the average age of 5 students is 14 years and that of other 9 students is 16 years, then the age of 15<sup>th</sup> student is \_\_\_\_\_
- (a) 11 years
  - (b) 14 years
  - (c) 15 years
  - (d) None of these