MODEL TEST PAPER 3

FOUNDATION COURSE

PAPER 3: QUANTITATIVE APTITUDE

Time: 2 Hours **Marks: 100**

1. If 'GOAL' is coded as 'HPBM' and 'FROCK' is coded as 'GSPTL' then how will 'LOFAR' be coded?

   (a) MPGZO

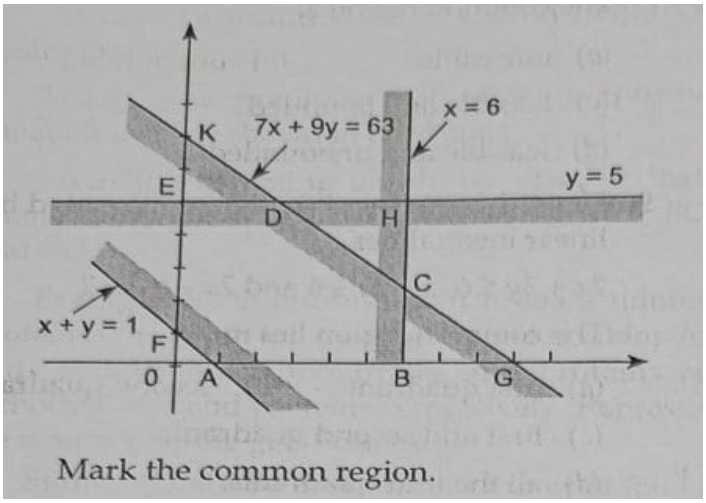
   (b) MNEBS

   (c) MPGBS

   (d) MPEBR

2. Graph of the following linear inequalities :

   $x+y\geq1$, $y\leq5$, $x\leq6$, $7x+9y\leq63$, $x\geq0$, $y\geq0$ is given below;



   (a) DCHAD

   (b) BCGB

   (c) ABCDEFA

   (d) EDKE

3. If mean and variance are 5 and 3 respectively then relation between p and q is :

   (a) P > q

   (b) p < q

   (c) p = q

   (d) p is symmetric

4. The expenditues and savings of a person are in the ratio 4:1. If his savings are increased by 25% of his income , then what is the new ratio of his expenditure and savings ?

   (a) 11:9

(b) 8:5

(c) 7:5

(d) 7:4

5. The sum of mean and SD of a series is a + b, if we add 2 to each observation of the series then the sum of mean and SD is :

(a) a + b + 2

(b) 6 – a + b

(c) 4 + a – b

(d) a + b + 4

6. What is the mean of X having the following density function?

$f(x) = \frac{1}{\sqrt[4]{2\pi}} e^{\frac{-(x-10)^2}{32}}$ for - ∞ < x < ∞

(a) 4

(b) 10

(c) 40

(d) None of these

7. In a Poisson distribution if P(x=4) = P(x= 5) then the parameter of Poisson distribution is:

(a) $\frac{4}{5}$

(b) $\frac{5}{4}$

(c) 4

(d) 5

8. Two events A and B are such that they do not occur simultaneously then they are called _____ events.

(a) Mutually exhaustive

(b) Mutually Exclusive

(c) Mutually Independent

(d) Equally Likely

9. Data are said to be _____ if the investigator himself is responsible for the collection of data.

(a) Primary Data

(b) Secondary Data

(c) Mixed of Primary and Secondary Data

(d) None

10. A suitable graph for representing the portioning of total into sub parts in statistics is:
    (a) A Pictograph
    (b) A Pie Chart
    (c) An Ogive
    (d) A Histogram
11. Ram is known to hit a target in 2 out of 3 shots whereas Shyam is known to hit the same target in 5 out of 11 shots. What is the probability that the target would be hit if they both try?
    (a) $\frac{9}{11}$
    (b) $\frac{6}{11}$
    (c) $\frac{10}{33}$
    (d) $\frac{3}{11}$
12. If from a population with 25 members, a random sample without replacement of 2 members is taken, the number of all such samples is
    (a) 300
    (b) 625
    (c) 50
    (d) 600
13. The sum of two numbers is 75 and their difference is 20. Find the difference of their squares.
    (a) 1500
    (b) 1600
    (c) 1550
    (d) None of these
14. A room has 10 doors. In how many ways can a man enter the room by one door and come out by a different door.
    (a) 90
    (b) 100
    (c) 50
    (d) None of these
15. The average of marks obtained by 120 students in a certain examination is 135. If the average marks of passed students is 39 and that of the failed students is 15; what is the number of students who passed in the examination?

(a) 100

(b) 150

(c) 200

(d) None of these

16. If $\log \frac{a-b}{2} = \frac{1}{2}$ (log a + log b), the value of $a^2 + b^2$ is

(a) 6ab

(b) 8ab

(c) $6a^2 6^2$

(d) None of these

17. In an election, there are five candidates contesting for three vacancies; an elector can vote any number of candidates not exceeding the number of vacancies. In how many ways can one cast his votes?

(a) 12

(b) 14

(c) 25

(d) None of these

18. The number of ways that 12 prizes can be divided among 4 students so that each may have 3 prizes is:

(a) 15,400

(b) 15,000

(c) 14,400

(d) 369600

19. Five balls of different colours are to be placed in three boxes of different sizes. Each box can hold all the five balls. In how many different ways can we place the balls so that no box remains empty?

(a) 100

(b) 120

(c) 150

(d) None of these

20. Find the sum of the series. 243 + 324 + 432 + ……. to n terms

(a) $3^6\left(\frac{4^n}{3^n} - 1\right)$

(b) $3^4\left(\frac{4^n}{3^n} - 1\right)$

(c) $3^6\left(\frac{3^n}{4^n}-1\right)$

(d) None of these

21. The sum of the first eight terms of a G.P. is five times the sum of the first four terms; then the common ratio is –

(a) $\sqrt{2}$

(b) $-\sqrt{2}$

(c) $\pm\sqrt{2}$

(d) None of these

22. The sum of the following series 4 + 44 + 444 + …… to n term is:

(a) $\frac{4}{9}\left[\frac{10(10^n-1)}{9}-n\right]$

(b) $\frac{4}{9}\left[\frac{10(10^n-1)}{9}+n\right]$

(c) $\frac{10(10^n-1)}{9}+n$

(d) None of these

23. The Arithmetic Mean between two numbers is 15 and their G.M. is 9; then the numbers are –

(a) 27,3

(b) 9, 9

(c) 16, 9

(d) None of these

24. Find the gradient of curve $y = 3x^2-5x+4$ at the point (1, 2)

(a) 1

(b) 3

(c) 4

(d) 5

25. Evaluate: $\int_0^5 \frac{x^2}{x^2+(5-x)^2}dx$

(a) 0

(b) 1

(c) -1

(d) none of these

26. If $f'(x) = 3x^2 + 2$ & f(0) = 0 then find f(2).

(a) 8

(b) 10

(c) 12

(d) none of these

27. A box contains 7 red, 6 white and 4 blue balls. How many selections of three balls can be made so that none is red?

(a) 90

(b) 120

(c) 48

(d) None of these

28. The number of times a particular item occurs in a given data is called its

(a) Variation

(b) Frequency

(c) Cumulative frequency

(d) None of these

29. If the width of each of ten classes in a frequency distribution is 2.5 and the lower class boundary is 5.1, then the upper class boundary of the highest class is

(a) 30.1

(b) 31.1

(c) 30

(d) 27.6

30. Let L be the lower class boundary of a class in a frequency distribution and m be the mid point of the class. Which one of the following is the higher class boundary of the class?

(a) $m + \frac{m+2}{2}$

(b) $L + \frac{m+L}{2}$

(c) 2m–L

(d) m – 2L

31. The mean of the values of 1, 2, 3 ……, n with respective frequencies x, 2x, 3x, …… nx is

(a) $\frac{n+1}{2}$

(b) $\frac{n}{2}$

(c) $\frac{2n+1}{3}$

(d) $\frac{2n+1}{6}$

32. The correlation between two variables x and y is found to be 0.4. What is the correlation between 2x and (–y) ?

(a) 0.4

(b) –0.4

(c) 0.6

(d) None of these

33. Correlation Co-efficient is _____ of the units of measurements

(a) Dependent

(b) Independent

(c) both

(d) none of these

34. If for two variable x and y, the covariance, variance of x and variance of y are 40, 16 and 256 respectively, what is the value of the correlation coefficient?

(a) 0.01

(b) 0.625

(c) 0.4

(d) 0.5

35. The coefficient of rank correlation of marks obtained by 10 students in English and Economics was found to be 0.5, it was later discovered that the difference in ranks in the two subjects obtained by one student was wrongly taken as 3 instead of 7. Find correct coefficient of rank correlation.

(a) 0.514

(b) 0.364

(c) 0.15

(d) 0.260

36. If r = 0.5, $\sum xy$ = 120, σ_y = 8, $\sum x^2$ = 90, then value of n is equal to _____

(a) 5

(b) 10

(c) 15

(d) 20

37. For a (m×n) classification of bivariate data, the maximum number of conditional distributions is

(a) p

(b) p+q

(c) pq

(d) p

38. _____ is an extension of time reversal test.

(a) Factor reversal test

(b) Circular test

(c) Unit test

(d) None of these

39. Fisher's method for construction of Index Numbers uses_____

(a) Geometric Mean

(b) Harmonic Mean.

(c) Median

(d) HM

40. The consumer price index in 1990 increases by 80- per cent as compared to the base 1980. A person in 1980 getting ₹ 60,000 per annum should now get

(a) ₹ 1,08,000 per annum

(b) ₹ 82,000 per annum

(c) ₹ 64,000 per annum

(d) None of these

41. If 'INSURE' is coded as 951395, then how will 'PATRIOT' be coded?

(a) 7129962

(b) 7129962

(c) 7129962

(d) 7129962

42. If in a certain code '493' means 'Friendship difficult challenge', '961', means, 'Struggle difficult Exam., and '178' means 'Exam believable subject', then which digit is used for 'believable'?

(a) 7 or 8

(b) 7 or 9

(c) 8

(d) 8 or 1

43. In the following series, which number will replace the question mark:

23, 29, 31, 37, 41, 43, ?

(a) 45

(b) 53

(c) 47

(d) 49

44. In the following letter-series some letters are missing. The missing letters are given in the proper sequence as one of the alternatives. Find the correct alternative.

ab—abcab—abc—bca—c

(a) abac

(b) bcac

(c) ccab

(d) bbac

45. A and B both are children of C. If C is the mother of A, A is the son of C but B is not the daughter of C, then how are A and B mutually related?

(a) A is the brother of B

(b) A is the nephew of B

(c) A is the sister of B

(d) A is the cousin of B

46. A husband and wife had five married sons and each of these had four children. How many members are there in the family?

(a) 50

(b) 40

(c) 32

(d) 36

47. Pointing to the lady in the photograph , Seema said, "Her son's father is the son-in-law of my mother." How is Seema related to the lady?

(a) Sister

(b) Mother

(c) Cousin

(d) Aunt

(48-49).Each of these questions is based on the following information:

P % Q means P is the father of Q.

P @ Q means P is the sister of Q.

P $ Q means P is the brother of Q.

P * Q means P is the wife of Q.

48. In the expression F $ D % K @ H * R, how is D related to R?
    (a) Father
    (b) Mother
    (c) Sister
    (d) Father in law

49. In the expression A % B @ K * H % P, how is B related to P?
    (a) Aunt
    (b) Cousin
    (c) Uncle
    (d) Daughter

50. The length and breadth of a room are 8 m and 6 m respectively. A cat runs along all the four walls and finally along a diagonal order to catch a rat. How much total distance is covered by the cat?
    (a) 10 m
    (b) 14 m
    (c) 38 m
    (d) 48 m

51. If A x B means A is to the south of B; A + B means A is to the north of B; A % B means A is to the east of B; A - B means A is to the west of B; then in P % Q + R - S, S is in which direction with respect to Q?
    (a) South-West
    (b) South-East
    (c) North-East
    (d) North-West

52. P started from his house towards west. After walking a distance of 25 m. He turned to the right and walked 10 m. He then again turned to the right and walked 15 m. After this he is to turn right at 1350 and to cover 30 m. In which direction should he go?
    (a) West
    (b) South
    (c) South-West
    (d) South-East

53. A man is facing north. He turns 45 degree in the clockwise direction and then another 180 degree in the same direction and then 45 degree in the anticlockwise direction. Find which direction he is facing now ?
    (a) North

(b) East

(c) West

(d) South

54. A child is looking for his father. He went 90 meters in the east before turning to his right. He went 20 meters before turning to is right again to look for his father at his uncle's place 30 meters from this point. His father was not there. From there, he went 100 meters to his north before meeting his father in a street. How far did the son meet his father from starting point ?

(a) 80 m

(b) 90 m

(c) 100 m

(d) 110 m

(55-56) A, B, C, D, E, F and G arc sitting in a straight line facing north, but not necessarily in the same order. There is only one person between F and C. E sits between A and D. There are only two persons between E and G. F sits on the immediate left of A, who sits in the middle of the row.

55. How many persons are there between E and F

(a) 1

(b) 2

(c) 3

(d) 4

56. Who among the following sit at the extreme ends on the row ?

(a) D, F

(b) G,C

(c) B, C

(d) None of these

57. Who among the following sits to the immediate right of D

(a) G

(b) E

(c) F

(d) B

58. In a line, P is sitting 13th from left. Q is sitting 24th from the right and 3rd left from P. How many people are sitting in the line?

(a) 34

(b) 31

(c) 32

(d) 33

59. Four ladies A, B, C and D and four gentlemen E, F, G and H are sitting in a circle round a table facing each other.

Directions:

(1) No two ladies or two gentlemen are sitting side by side.

(2) C, who is sitting between G and E is facing D.

(3) F is between D and A and is facing G.

(4) H is to the right of B.

Who are immediate neighbours of B?

(a) G and H

(b) F and H

(c) E and F

(d) E and H

60. If the mean deviation of a normal variable is 16, what is its quartile deviation?

(a) 10

(b) 13.50

(c) 15

(d) 12.50

61. An Ogive can be prepared in _____ different ways.

(a) 2

(b) 3

(c) 4

(d) 5

62. _____ is an absolute measure of dispersion.

(a) Range

(b) Mean Deviation

(c) Stnadrd Deviation

(d) All the above

63. The wages of 8 workers expressed in rupees are 42, 45,49,38,56,54,55,47. Find median wage?

(a) 47

(b) 48

(c) 49

(d) 50

64. If the Standard Deviation of 10 observations is 4 and if each item is divided by – 2 then Standard Deviation of new series is

(a) 2

(b) –2

(c) 4

(d) None of these

65. If the relationship between x and y is given by 4x– 6y =13 and if the median of x is 16. Find median of y.

(a) 7.50

(b) 8

(c) 8.50

(d) none of these

66. Two variables x and y are related by 5x+ 2y+ 5 = 0 and $\bar{x} = 5$, then $\bar{y}$ is

(a) 10

(b) -10

(c) 15

(d) -15

67. Find Q_1 for the following observations: 7,9,5,4,10,15,14,18,6,20

(a) 4.75

(b) 5.25

(c) 5.75

(d) 6.25

68. _____ is the entire upper part of the table which includes columns and sub–column numbers, unit(s) measurement.

(a) Sub

(b) Box-head

(c) Body

(d) Caption

69. If P(A) = $\frac{1}{2}$; P(B) = $\frac{1}{3}$ and P($A \cap B$) = $\frac{1}{4}$ then the value of $P(\bar{A} \cap \bar{B})$ is

(a) $\frac{5}{12}$

(b) $\frac{7}{12}$

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

(d) None of these

70. From the following probability distribution table, find E(x).

x:	1	2	3
f(x):	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{6}$

(a) 1

(b) 1.50

(c) 1.67

(d) None of these

71. In a box carrying one dozen of oranges, one third has become bad. If 3 oranges are taken out from the box at random, what is the probability that at least one orange out of the three oranges picked up is good?

(a) $\frac{54}{55}$

(b) $\frac{1}{55}$

(c) $\frac{45}{50}$

(d) None of these

72. Find the effective rate of interest at 10% p.a. when interest is payable quarterly.

(a) 10.38%

(b) 5%

(c) 5.04%

(d) 4%

73. Arslan invested ₹ 10,000 at 8% per annum compound quarterly, then the value of the investment after 2 years is [given $(1.02)^8 = 1.171659$]

(a) ₹ 11,716.59

(b) ₹ 10,716.59

(c) ₹ 117.1659

(d) None of the above

74. The future value of an annuity of ₹ 1,000 made annually for 5 years at the interest of 14% compounded annually is:

(a) ₹ 5,610

(b) ₹ 6,610

(c) ₹ 6,160

(d) ₹ 5,160

75. 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 interest 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

76. What annual payment will discharge a debt of ₹ 770 due in years, the rate of interest being 5% per annum?

(a) ₹ 150

(b) ₹ 140

(c) ₹ 130

(d) None of these

77. In _____ receipts / payments takes place forever.

(a) Annuity

(b) Perpetuity

(c) Annuity regular

(d) Annuity due

78. Present value of a scooter is ₹ 7,290 if its value decreases every year by 10% then its value before 3 years is equal to:

(a) 10,000

(b) 10,500

(c) 20,000

(d) 20,5000

79. How much amount is required to be invested every year so as to accumulate ₹ 3,00,000 at the end of 10 years, if interest is compounded annually at 10%?

(a) ₹ 18,823.65

(b) ₹ 18,000

(c) ₹ 18,728.65

(d) ₹ 18,882.65

80. The relation between two variables is $2x–3y+12=0$. If mean deviation of y is 6 then mean deviation of x is

(a) 9

(b) 6

(c) 3

(d) None of these

81. A company may obtain a machine either by leasing it for 5 years (useful life) at an annual rent of Rs. 2,000 or by purchasing the machine for Rs. 8,100. If the company can borrow money at 18% per annum, which alternative is preferable?

(a) Leasing

(b) Purchasing

(c) Can't say

(d) None of these

82. The time by which a sum of money is 8 times of itself if it doubles itself in 15 years.

(a) 42 years

(b) 43 years

(c) 45 years

(d) 46 years

83. 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) $\mathrm{P} = \frac{41\mathrm{Q}}{80}$

(b) $\mathrm{P} = \frac{41\mathrm{Q}}{40}$

(c) $\mathrm{P} = \frac{41\mathrm{Q}}{100}$

(d) $P = \frac{41Q}{200}$

84. In what time will a sum of money double its y at 6.25% p.a. simple interest?

(a) 5 years

(b) 8 years

(c) 12 years

(d) 16 years

85. If two variables x and y are related by 2x and 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:

(a) -5

(b) 4

(c) 12

(d) 50

86. Which of the following result hold for a set of distinct positive observations?

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

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

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

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

87. For a set of 100 observations, taking assumed mean as 4, the sum of the deviations is -11 cm, and the sum of the squares of these deviations is 257 cm2. The coefficient of variation is:

(a) 41.13%

(b) 42.13%

(c) 40.13%

(d) None

88. ____ & ____ are called ratio averages:

(a) H.M & G.M

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

(c) A.M. & G.M.

(d) None

89. If X and Y are two random variables then v(x+y) is:

(a) v (x) + v(y)

(b) v(x) + v(y) – 2 v (x,y)

(c) v(x) + v(y) + 2 v (x,y)

(d) v (x) – v (y)

90. Mean and S.D. of x is so and 5 respectively, Find mean and S.D. of $\frac{x-50}{5}$

(a) (1,0)

(b) (0,1)

(c) (1,-1)

(d) (0, - 1)

91. A letter is taken out at random from the word RANGE and another is taken out from the word PAGE. The probability that they are the same letters is :

(a) 1/20

(b) 3/20

(c) 3/5

(d) ¾

92. 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 ball and second 3 red balls is :

(a) 6/255

(b) 5/548

(c) 7/429

(d) 3/233

93. Daily demand for calculators is having the following probability distribution:

Demand	1	2	3	4	5	6
Probability:	0.10	0.15	0.20	0.25	0.18	0.12

Determine the variance of the demand.

(a) 2.54

(b) 2.93

(c) 2.22

(d) 2.19

94. One Card is drawn from pack of 52, what is the probability that it is a king or a queen?

(a) 11/13

(b) 2/13

(c) 1/13

(d) None of these

95. Let R is the set of real numbers such that the function f : R $\rightarrow$ R and g : R $\rightarrow$ R are defined by by $f(x) = x^2+3x+1$ and $g(x) = 2x-3$. Find (fog):

(a) $4x^2+6x+1$

(b) x^2+6x+1

(c) $4x^2-6x+1$

(d) $x^2- 6x+1$.

96. 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 all the three newspaper, then the number of families which buy A only is:

(a) 6600

(b) 6300

(c) 5600

(d) 600.

97. Given the function f(x) = (2x +3), then the value of f(2x)-2f(x) + 3 will be:

(a) 3

(b) 2

(c) 1

(d) 0

98. if (x+1), 3x (4x+2) are in A.P. Find the value of x

(a) 2

(b) 3

(c) 4

(d) 5

99. 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

100. Find the variance of binomial distribution with n = 10, p = 0.3

(a) 2.1

(b) 3

(c) 7

(d) None of these