Mock Test Paper - Series II: August 2024

Date of Paper: 22nd August 2024

Time of Paper: 10.30 A.M. to 12.30 P.M.

FOUNDATION COURSE

PAPER 3: QUANTITATIVE APTITUDE

Time: 2 Hours **Marks: 100**

1. A bag contains 23 number of coins in the form of 1 rupee, 2 rupee and 5 rupee coins. The total sum of the coins is ₹43. The ratio between 1 rupee and 2 rupees coins is 3 : 2, Then the number of 1 rupee coins.
   (a) 12
   (b) 8
   (c) 10
   (d) 16
2. On Simplification $\frac{1}{1+z^{a-b}+z^{a-c}} + \frac{1}{1+z^{b-c}+z^{b-a}} + \frac{1}{1+z^{c-a}+z^{c-b}}$ would reduces to
   (a) $\frac{1}{z^{2(a+b+c)}}$
   (b) $\frac{1}{z^{(a+b+c)}}$
   (c) 1
   (d) 0
3. $(18)^{3.5} \div (27)^{3.5} \times 6^{3.5} = 2^x$, then the value of x is:
   (a) 3.5
   (b) 4.5
   (c) 6
   (d) 7
4. The value of $\frac{(243)^{0.13} \times (243)^{0.07}}{(7)^{0.25} \times (49)^{0.075} \times (343)^{0.2}}$ is:
   (a) $\frac{3}{7}$
   (b) $\frac{7}{3}$
   (c) $1\frac{3}{7}$
   (d) $2\frac{2}{7}$

5. The number of prime factors in $\frac{6^{12}\times(35)^{28}\times(15)^{16}}{(14)^{12}\times(21)^{11}}$ is :

   (a) 56

   (b) 66

   (c) 112

   (d) none of these

6. $\log\frac{a^2}{bc}-\log\frac{ca}{b^2}+\log\frac{c^2}{ab}=$

   (a) 0

   (b) 1

   (c) log a

   (d) none of these.

7. $\frac{1}{\log_{xy}(xyz)}+\log_{xyz}yz+\frac{1}{\log_{xz}(xyz)}=?$

   (a) 1

   (b) 2

   (c) 3

   (d) None of these

8. 4 tables and 3 chairs, together, cost ₹2,250 and 3 tables and 4 chairs cost ₹ 1950. Find the cost of 2 chairs and I table.

   (a) ₹ 550

   (b) ₹ 1005

   (c) ₹ 750

   (d) None of these

9. If $n = m!$ where (' m' is a positive integer > 2) then the value of:

   $\frac{1}{\log_{2^n}}+\frac{1}{\log_3^n}+\frac{1}{\log_{4^n}}+\cdots\ldots..+\frac{1}{\log_m^n}$

   (a) 1

   (b) 0

   (c) -1

   (d) 2

10. Aman walks a certain distance with certain speed. If he walks 1/2 km an hour faster, he takes 1 hour less. But, if he walks 1 km an hour slower, he takes 3 more hours. Find the distance covered by the man and his original rate of walking.

    (a) 36 km, 4 km/hr

    (b) 40 km, 10 km/hr

(c) 50 km, 20 km/hr

(d) None of these

11. If α; β are the roots of the quadratic equation $3x^2$-4x+1= 0; the equation having roots $\frac{\alpha^2}{\beta};\frac{\beta^2}{\alpha}$

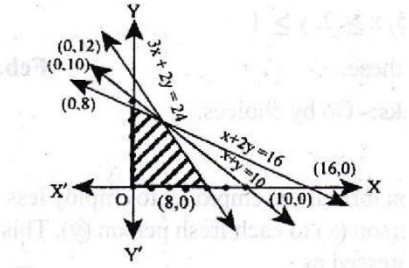
(a) $9x^2$ - 28x + 3 = 0;

(b) $9x^2$ - 28x + 1 = 0

(c) $9x^2$ - 28 x + 5 = 0;

(d) None of these.

12. The shaded region represents:



(a) 3x + 2y< 24,x + 2y> 16, x + y< 10x,x> 0,y>0

(b) 3x+2y<24, x+2y < 16, x+y > 10, x>0,y >0

(c) 3x + 2y < 24, x + 2y < 16, x + y < 10, x > 0, y > 0

(d) None of these.

13. The solution of the inequality $\frac{(5-2x)}{3} \leq \frac{x}{6} - 5$ is

(a) x>8

(b) x≤ 8

(c) x=8

(d) none of these

14. The simple interest on a certain sum of **1** money is $\frac{1}{25}$ times of principal, the rate of interest when rate of interest and time are equal is

(a) 2%

(b) 3%

(c) 4%

(d) None

15. At what time a certain sum of money amounts to ₹ 400 at 10% p.a. S .1. and to ₹ 200 at 4% p.a. S.I.

(a) 10 Yrs.

(b) 30 Yrs.

(c) 50 Yrs.

(d) None

16. ₹ 6,400 amounts to ₹ 7840 in two years at simple interest. How much will a sum of ₹ 84 invested at the same rate of simple interest amount in four years?

(a) ₹11.20

(b) ₹112.20

(c) ₹ 120.80

(d) ₹ 121.80

17. A person gave a loan of ₹ 200 to Mr. X and recovered it at the rate of ₹ 35 for eight months, commencing from the end of first month. What is the effective rate of simple interest?

(a) 10%

(b) 20%

(c) 40%

(d) 60%

18. If the compound Interest on a certain sum of money for 2 years at 4% p.a. be ₹510, then its simple Interest (S.L) of same time at same rate of interest is

(a) ₹500

(b) ₹510

(c) ₹1000

(d) None

19. On what sum will the difference between the S.I. and C.I. for 3 years at 6% p.a. amount to ₹ 13.77?

(a) ₹1250

(b) ₹1150

(c) ₹1320

(d) None

20. Mr. X bought an electronic item for ₹1000. What would be the future value of the same item after two years, if the value is compounded semi-annually at the rate of 22% per annum ?

(a) ₹ 1488.40

(b) ₹ 1518.07

(c) ₹2008.07

(d) ₹2200.00

21. The Partners A & B together lent ₹3903 at 4% p.a interest compounded annually. After a span of 7 years, A gets the same amount as B gets after 9 years. The share of A is sum of ₹3903/- would have been

    (a) ₹ 875

    (b) ₹ 2280

    (c) ₹ 2028

    (d) ₹ 2820

22. If X = {a, b, c, d}; the elements of power set P (X) are

    (a) Φ, {a}, {b},({c}, {d} ,{a, b}, {a ,c}, {a ,d}, {b, c} ,{b,d>, {c,d}

    (b) {a, b, c}, {a, b, d}, {a, c, d}, {b, c, d}

    (c) {a, b, c, d}

    (d) None of the above

23. 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 these

24. 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) ₹ 4445.41

    (c) ₹ 68729.84

    (d) None of these

25. Invests ₹ 10,000 every year starting from today for next 10 years. Suppose interest rate is 8% per annum compounded annually calculate future value of the annuity Given that $(1 +0.08)^{10} = 2.15892500$

    (a) ₹ 156454.875

    (b) ₹ 156484.875

    (c) ₹144865.625

    (d) None of these

26. 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

    (a) ₹ 3473.86

    (b) ₹ 3108.60

    (c) ₹114180.44

(d) none of these

27. The value of the present value of a sequence of payments of ₹ 80 made at the end of each 6 months and continuity for ever, if money is worth 4% compounded semi-annually is....

(a) ₹ 4,000

(b) ₹ 5,000

(c) ₹ 3,000

(d) None of these

28. Mr. X Invests ₹ 10,000 every year starting from today for next 10 years suppose: interest rate is 8% per annum compounded annually. Calculate future value of the annuity: [Given that $(1 + 0.08)^{10} = 2.15892500$]

(a) ₹ 156454.88

(b) ₹ 144865.625

(c) ₹ 156554.88

(d) None of these

29. A company establishes a sinking fund to provide for the payment of ₹ 2,00,000 debt maturing in 20 years. Contributions to the fund are to be made at the end of every year. Find the amount of each annual deposit if interest is 5% per annum :

(a) ₹ 6,142

(b) ₹ 6,049

(c) ₹ 6,052

(d) ₹ 6,159

30. A candidate is required to answer 6 out of 10 questions, which are divided into two groups each containing 5 questions and he is not permitted to attempt more than 4 from each group. In how many ways can he make up his choice?

(a) 315

(b) 250

(c) 450

(d) 150

31. If $\frac{1}{9!} + \frac{1}{10!} = \frac{x}{11!}$ The value of x is

(a) 211

(b) 122

(c) 1331

(d) none of these

32. The value of ${}^{n-1}p_r + r.{}^{n-1}p_{r-1}$ is

(a) ${}^{n}p_{r}$

(b) $\frac{n!}{(n-r)!}$

(c) both

(d) None of these

33. If ${}^{n}C_7 = {}^{n}C_5$, the value of 'n.' is

(a) 10

(b) 14

(c) 12

(d) none of these

34. If ${}^{2n}C_3 : {}^{n}C_3 = 11:1$, the value of 'n.'is

(a) 6

(b) 7

(c) 5

(d) none of these

35. The nth term of the series whose sum to n terms is $3n^2 + 2n$ is:

(a) 3n - 1

(b) 8n - 2

(c) 11 n – 3

(d) 6n-1

36. What is the value of $\lim_{y\to 2}\frac{y^2-4}{y-2}$

(a) 2

(b) 4

(c) 1

(d) 0

37. Given x = 2t + 5; y = t^2-2, then $\frac{dy}{dx}$ is calculated as:

(a) t

(b) 1/t

(c) -1/t

(d) None

38. If f'(x) = x - 1, the equation of the curve y = f(x) passing through the point (1,0) is given by

(a) $y=x^2 - 2x + 1$

(b) $y= x^2/2 - x + 1/2$

(c) $y= x^2/2 - x + 1$

(d) none of these

39. $\int x^2 e^{3x} dx$ is:

(a) $x^2.e^{3x}-2xe^{3x}+2e^{3x}+C$

(b) $\frac{e^{3x}}{3} - \frac{x.e^{3x}}{9} + 2e^{3x} + C$

(c) $\frac{x^2.e^{3x}}{3} - \frac{2x.e^{3x}}{9} + \frac{2}{27}e^{3x} + C$

(d) None of these

40. $\int_1^2 \frac{2x}{1+x^2} dx$:

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

(b) $\log_e 5 - \log_e 2+1$

(c) $\log_e \frac{2}{5}$

(d) None of these

41. If A = 26, SUN = 27, then CAT = ?

(a) 24

(b) 27

(c) 57

(d) 58

42. In a certain code language PREMONITION is written as 68530492904, how will the word MONITOR be written that code language?

(a) 12345567

(b) 3029408

(c) 3049208

(d) 3049258

43. In a certain code language, '123' means 'bright little boy', '145' means 'tall big boy' and '637' means 'beautiful little flower'. Which digit in that language means 'bright' ?

(a) 1

(b) 2

(c) 3

(d) 4

44. Find next term of the series 1, 3, 4, 8, 15, 27, ?

(a) 37

(b) 44

(c) 50

(d) 55

45. Find next term of the series 1, 5, 14, 30,55, 91 , ?

(a) 130

(b) 140

(c) 150

(d) 160

46. Q's mother is sister of P and daughter of M. S is daughter of P and sister of T. How is M related to T?

(a) Father

(b) Grandmother

(c) Grandfather or Grandmother

(d) Grandfather

47. E is the son of A. D is the son of B. E is married to C. C is B's daughter. How is D related to E ?

(a) Brother

(b) Uncle

(c) Father-in-Law

(d) Brother-in-law

(48-50) There are six persons A, B, C, D, E and F. C is the sister of F. B is the brother of E's husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group.

48. Which of the following is a group of brothers?

(a) ABF

(b) BFC

(c) BDF

(d) ABD

49. How many male members are there in the group?

(a) One

(b) Two

(c) Three

(d) Four

50. How F is related to E

(a) Uncle

(b) Husband

(c) Son

(d) Daughter

(51-53) Read the information given below to answer these questions A, B, C, D, E, F, G H and J are nine houses C is 2 km east of B. A is 1 km north of B and H is 2 km south of A, G is 1 km west of H while D is 3 km east of G and F is 2 km north of G. I is situated just in the middle of B and C while E just in middle of H and D.

51. Distance between E and I is _____.

(a) 4 km

(b) 2 km

(c) 1 km

(d) 3 km

52. Distance between E and G is _____.

(a) 1 km

(b) 1.5 km

(c) 2 km

(d) 5 km

53. Distance between A and F is_____

(a) 1 km

(b) 1.41 km

(c) 2 km

(d) 3 km

54. Seven villages A, B, C, D E, F and G are situated as follows:

E is 2 km to the west of B

F is 2 km to the north of A

C is 1 km to the west of A

D is 2 km to the south of G

G is 2 km to the east of C

D is exactly in the middle of B and E.

Which two villages are the farthest from one another?

(a) F and E

(b) D and C

(c) F and B

(d) G and E

55. If 'South-east' is called 'East', 'North-west' is called 'West', 'South-west' is called 'South' and so on, what will 'North' be called?

(a) East

(b) North-east

(c) North-west

(d) South

(56-58) A, B, C, D, E, F and G are sitting in a row facing North.

(i) F is to the immediate left of G

(ii) E is 4th to the right of G

(iii) C is the neighbour of B and D

(iv) Person who is third to the left of D is at one of the ends.

56. Who are the neighbours of B ?

(a) C and D

(b) C and G

(c) G and F

(d) C and E

57. What is the position of A ?

(a) Between E and D

(b) Extreme left

(c) centre

(d) Extreme right

58. who are the left of C

(a) only B

(b) G, B and D

(c) G and B

(d) D, E, F and A

(59-60) 8 persons E, F, G, H, I, J, K and L are seated around a square table two on each side. There are 3 ladies who are not seated next to each other.

1. J is between L and F and G is between I and F.
2. H, a lady member is second to the left of J.
3. F, a male member is seated opposite to E, a lady member.
4. There is a lady member between F and I.

59. Who among the following is to the immediate left of F ?

(a) G

(b) I

(c) J

(d) H

60. How many persons are seated between K and F

(a) 1

(b) 2

(c) 3

(d) 4

61. For a moderately skewed distribution, quartile deviation and the standard deviation are related by:

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

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

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

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

62. Data are said to be _____if the investigator if the investigator himself responsible for collection of data

(a) Primary data

(b) Secondary data

(c) Mixed primary and Secondary data

(d) none of these

63. Which of the following is suitable for cumulative frequency distribution?

(a) Ogive

(b) Histogram

(c) GM

(d) AM

64. The left part of the table providing the description of row is called.

(a) Caption

(b) Box-head

(c) Stub

(d) Body

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

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

How many students got marks more than 30 ?

(a) 65

(b) 50

(c) 35

(d) 43

66. The probability of a blue-chip company is showed by __

(a) Bell Shape Curve

(b) U shape Curve

(c) J shape Curve

(d) Mixed curve

67. if all the observations are increased by 6, then the variance of the series will be

(a) Increased

(b) Decreased

(c) Unchanged

(d) None of these

68. if the mode of the data is 18 and mean is 24, then median is ,

(a) 18

(b) 24

(c) 22

(d) 21

69. 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

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

(a) Range

(b) Mean deviation

(c) Standard deviation

(d) Quartile deviation

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

(a) 36

(b) 6

(c) 1

(d) 9

72. If x and y are related by y = 2x+ 5 and the SD and AM of x are known to be 5 and 10 respectively, then the coefficient of variation is:

(a) 25

(b) 30

(c) 40

(d) 20.

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

(a) 17

(b) –17

(c) –27

(d) 27.

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

(a) 20

(b) 13

(c) 3

(d) 23.

75. There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is

(a) 115/227

(b) 83/250

(c) 137/220

(d) 127/250

76. A box contains 5 white and 7 black balls. Two successive drawn of 3 balls are made (i) with replacement (ii) without replacement. The probability that the first draw would produce white balls and the second draw would produce black balls are respectively.

(a) 6/321 and 3/926

(b) 1/20 and 1/30

(c) 35/144 and 35/108

(d) 7/968 and 5/264

77. If P (A) = 1/2, P(B) = 1/3 and P(A∩B) = 1/4, , what is P $\left(\frac{A'}{B'}\right)$?

(a) 1/2

(b) 7/8

(c) 5/8

(d) 2/3

78. X and y are stand in a line with 6 people. What is the probability that there are three persons between them ?

(a) 1/5

(b) 1/6

(c) 1/7

(d) 1/3

79. For two events A and B, P(A ∪ B) = P(A) + P(B) only when

(a) A and B are equally likely events

(b) A and B are exhaustive events

(c) A and B are mutually independent

(d) A and B are mutually exclusive.

80. If x is a binomial variable with parameters n and p, then x can assume

(a) any value between 0 and n.

(b) any value between 0 and n, both inclusive.

(c) any whole number between 0 and n, both inclusive.

(d) any number between 0 and infinity.

81. The probability density function of a normal variable x is given by

(a) $f(x) = \frac{1}{\sqrt{2\pi}}.e^{\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$ for $-\mu < x < \mu$.

(b) $f(x) = \frac{1}{\sigma\sqrt{2\pi}}.e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ for $0 < x < \mu$.

(c) $f(x) = \frac{1}{\sqrt{2\pi}}.e^{-\frac{(x-\mu)^2}{2\sigma^2}}$ for $-\mu < x < \mu$.

(d) none of these.

82. What is the first quartile of X having the following probability density function?

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

(a) 4

(b) 5

(c) 5.95

(d) 6.75

83. The average weekly food expenditure of a group of families has a normal distribution with mean ₹ 1,800 and standard deviation ₹ 300. What is the probability that out of 5 families belonging to this group, at least one family has weekly food expenditure in excess of ₹ 2,100? Given f (1) = 0.84.

(a) 0.418

(b) 0.582

(c) 0.386

(d) 0.614

84. X is a binomial variable such that 2 P(X = 2) = P(X = 3) and mean of X is known to be 10/3. What would be the probability that X assumes at most the value 2?

(a) 16/81

(b) 17/81

(c) 47/243

(d) 46/243

85. For a standard normal distribution, the points of inflexion are given by

(a) m – s and m + s.

(b) – s and s.

(c) –1 and 1.

(d) 0 and 1.

86. If two random variables x and y are related by y = 2 – 3x, then the SD of y is given by

(a) –3 x SD of x

(b) 3 x SD of x.

(c) 9 x SD of x

(d) 2 x SD of x.

87. Probability of getting a head when two unbiased coins are tossed simultaneously is

(a) 0.25

(b) 0.50

(c) 0.20

(d) 0.75

88. If x and y are random variables having expected values as 4.5 and 2.5 respectively, then the expected value of (x–y) is

(a) 2

(b) 7

(c) 6

(d) 0

89. The interval (m - 3s, m + 3s) covers

(a) 95% area of a normal distribution.

(b) 96% area of a normal distribution.

(c) 99% area of a normal distribution.

(d) all but 0.27% area of a normal distribution

90. What is spurious correlation?

(a) It is a bad relation between two variables.

(b) It is very low correlation between two variables.

(c) It is the correlation between two variables having no causal relation.

(d) It is a negative correlation.

91. The two lines of regression become identical when

(a) r = 1

(b) r = –1

(c) r = 0

(d) (a) or (b).

92. The two lines of regression are given by 8x + 10y = 25 and 16x + 5y = 12 respectively. If the variance of x is 25, what is the standard deviation of y?

(a) 16

(b) 8

(c) 64

(d) 4

93. If the regression line of y on x and of x on y are given by $2x + 3y = -1$ and $5x + 6y = -1$ then the arithmetic means of x and y are given by

(a) (1, –1)

(b) (–1, 1)

(c) (–1, –1)

(d) (2, 3)

94. If $y = 3x + 4$ is the regression line of y on x and the arithmetic mean of x is –1, what is the arithmetic mean of y?

(a) 1

(b) –1

(c) 7

(d) none of these

95. When the product of price index and the quantity index is equal to the corresponding value index then the test that holds is

(a) Unit Test

(b) Time Reversal Test

(c) Factor Reversal Test

(d) none holds

96. The formula for conversion to current value

(a) $\text{Deflated value} = \frac{\text{Price Index of the current year}}{\text{previous value}}$

(b) $\text{Deflated value} = \frac{\text{Current Value}}{\text{Price Index of the current year}}$

(c) $\text{Deflated value} = \frac{\text{Price Index of the previous year}}{\text{previous value}}$

(d) $\text{Deflated value} = \frac{\text{Price Index of the previous year}}{\text{previous value}}$

97. If the index number of prices at a place in 2018 is 280 with 2008 as base year, then the prices have increased on average by

(a) 280%

(b) 180%

(c) 380%

(d) None of these.

98. In 1980, the net monthly income of the employee was ₹ 800/- p. m. The consumer price index number was 160 in 1980. It rises to 200 in 1984. If he has to be rightly compensated. The additional D. A. to be paid to the employee is

(a) ₹ 175/-

(b) ₹ 185/-

(c) ₹ 200/-

(d) ₹ 125.

99. Consumer price index number goes up from 110 to 200 and the Salary of a worker is also raised from ₹ 325 to ₹ 500. Therefore, in real terms, to maintain his previous standard of living he should get an additional amount of :

(a) ₹ 85

(b) ₹ 90.91

(c) ₹ 98.25

(d) None of these.

100. The prices of a commodity in the year 1975 and 1980 were 25 and 30 respectively taking 1980 as base year the price relative is :

(a) 109.78

(b) 110.25

(c) 113.25

(d) 83.33