CA FOUNDATION

Test Code – JKN_QA_01

(Date :20/09/2020)

(100 Marks)

PART – A

MATHS

1. If (a + b) : (a – b) = 1 : 5, then $(a^2 – b^2) : (a^2 + b^2)$ equals :
   (a) 2 : 3 (b) 3 : 2 (c) 5 : 13 (d) 13 : 5

2. If $\frac{\sqrt{x+5}+\sqrt{x-16}}{\sqrt{x+5}-\sqrt{x-16}} = \frac{7}{3}$ then x equals
   (a) 10 (b) 20 (c) 30 (d) 40

3. If $2^x – 2^{x-1} = 4$, then the value of x^x is :
   (a) 2 (b) 1 (c) 64 (d) 27

4. If $a = xy^{m-1}$; $b = xy^{n-1}$; $c = xy^{p-1}$ then the value of $a^{n-p} \times b^{p-m} \times c^{m-n}$ reduces to
   (a) 1 (b) –1 (c) 0 (d) None

5. If $(log_{\sqrt{x}} 2)^2 = \log_x 2$ then x =
   (a) 16 (b) 32 (c) 8 (d) 4

6. If $\frac{xy}{x+y} = 1$ and $x \neq y$, what is x in terms of y ?
   (a) $\frac{y+1}{y-1}$ (b) $\frac{y+1}{y}$ (c) $\frac{y}{y-1}$ (d) $\frac{y}{y+1}$

7. Solving equation $\frac{6x+2}{4} + \frac{2x^2-1}{2x^2+2} = \frac{10x-1}{4x}$ we get roots as
   (a) ± 1 (b) +1 (c) -1 (d) 0

8. A motor boat traveling at 18 miles per hour traveled the length of a lake in one quarter of an hour less time than it took when traveling at 12 miles per hour. What was the length in miles of the lake ?
   (a) 6 (b) 9 (c) 12 (d) 15

9. Roots of quadratic eqns $x^2 – 4x + 4 = 0$ are
   (a) Real & unequal; (b) Real & equal
   (c) Complex numbers; (d) None of these

10. If α, β are roots of $x^2 + 7x + 11 = 0$ then the equation whose roots as $(\alpha + \beta)^2$ & $(\alpha – \beta)^2$ is _____
    (a) $x^2 – 54x + 245 = 0$ (b) $x^2 – 14x + 49 = 0$
    (c) $x^2 – 24x + 144 = 0$ (d) $x^2 – 50x + 49 = 0$

11. What is the smallest integer value of x that satisfies the inequality $4 – 3x < 11$?
    (a) -3 (b) -2 (c) -1 (d) 0

12. On solving the inequalities
    $6x + y \geq 18$, $x + 4y \geq 12$, $2x + y \geq 10$,
    We get the following situation :
    (a) (0, 18), (12, 0), (4, 2) & (7, 6) (b) (3, 0), (0,3), (4, 2) & (7, 6)
    (c) (5, 0), (0, 10), (4, 2) & (7, 6) (d) (0, 18), (12, 0), (4, 2) (0, 0) & (7, 6)

13. Solve for real 'x' if $5x – 2 \geq 2x + 1$ and $2x + 3 < 18 – 3x$
    (a) $1 < x < 3$ (b) $-1 > x > -3$ (c) $1 \leq x < 3$ (d) $x = 3$

14. Suppose your mom decides to gift you Rs. 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) 83042 (b) 90100 (c) 93042 (d) 10100

15. The partners A & B together lent Rs. 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 in the sum of Rs. 3903/- would have been

(a) Rs. 1875 (b) Rs. 2280 (c) Rs. 2028 (d) Rs. 2820

16. The bacteria in a culture grow by 10% in first hour, decreases by 8% in second hour, again increase by 7% in third hour. If at the end of the third hour the count of bacteria is 15170000 then find the number of bacteria at the initial hour.

(a) 13790909 (b) 14009456 (c) 16489130 (d) 14177570

17. An annuity consisting of equal payments at the beginning of each quarter for 3 years is to be purchased for Rs. 7000. If the interest rate is 8% compounded quarterly, how much is each payment ?

(a) Rs. 587.86 (b) Rs. 108.60 (c) Rs. 648.9 (d) none of these

18. Given annuity of Rs. 1000 amounts to Rs. 31371.2 at 4.5% per annum compound interest, what is the number of years ?

(a) 10 years (b) 20 years (c) 30 years (d) None of these

19. 5 Boys and 4 girls are to be seated in row. If the girls occupy even places then the no. of such arrangements

(a) 288 (b) 2808 (c) 2008 (d) 2880

20. Eighteen guests have to be seated, half on each opposite side of a long table. Four particular guest desire to it on one particulars side and three others on the other side. Determine the number of ways in which the seating arrangement can be made.

(a) $\frac{12!}{(3!)^4}$ (b) $\frac{9!}{5!2!2!}$ (c) $\frac{11!}{6!5!} \times 9!\,9!$ (d) None of these

21. How many different signals are possible if we wish to make signals by arranging 3 red, 2 yellow and 2 green flags in one post.

(a) 210 (b) 6,420 (c) 40,320 (d) 96

22. If $(n + 1)\,C_{r+1} : {}^{n}C_{r} : {}^{n-1}C_{r-1} = 8 : 3 : 1$ then find the value of n

(a) 14 (b) 15 (c) 16 (d) 17

23. In how many ways can 10 different prizes be given to 5 students if one particular boy must get 4 prizes and rest of the student get any no. of prizes ?

(a) 860160 (b) 240240 (c) 420620 (d) none of these

24. Between the two numbers whose sum is $\frac{13}{6}$, an even number of A.M. is inserted. If the sum of arithmetic mean exceeds their number by unity, then number of arithmetic means inserted are –

(a) 6 (b) 10 (c) 8 (d) 12

25. On 1st January every year a person buys National Saving Certificates of value exceeding that of his last year's purchase by Rs. 100. After 10 years, he finds that the total value of the certificates purchased by him is Rs. 54,500. Find the value of certificates purchased by' him in the first year :

(a) Rs. 6,000 (b) Rs. 4,000 (c) Rs. 5,000 (d) Rs. 5,500

26. Four numbers in G.P. such that the third term is greater than the first by 9 and the fourth term is smaller than the second by 18, then the numbers are …….

(a) 3, – 6, 12, – 24 (b) 3, 6, 12,24

(c) – 3, 6, – 12, 24 (d) both (a) & (c)

27. Find the sum to Infinity of the Following series : 1 – 1 + 1 – 1 + 1 – 1 ……∞
(a) 1 (b) ½ (c) 0 (d) Not defined

28. The sum of n terms of the series S = 0.3 + 0.03 + …… is
(a) $\frac{1}{9}\left(1-\frac{1}{10^{n+1}}\right)$ (b) $\frac{1}{3}\left(1-\frac{1}{10^{n-1}}\right)$ (c) $\frac{1}{3}\left(1-\frac{1}{10^{n}}\right)$ (d) None

29. If X = {a, b, c, d, e, f}, Y = {a, e, i, o, u} and Z = {m, n, o, p, q, r, s, t, u}, then X – Y is
(a) {b, c, d, f} (b) {a, e, i, o} (c) {m, n, p, q} (d) None

30. On a survey of 100 boys it was found that 50 used white shirt 40 red and 30 blue. 20 were habituated in using both white and red shirts 15 both red and blue shirts and 10 blue and white shirts. Find the number of boys using all the colours.
(a) 20 (b) 25 (c) 30 (d) None

31. If $f(x) = x^3 - x^2 + x + 1$ then the value of $[f(1) + f(-1)]/2$ will be
(a) 5 (b) 2 (c) 0 (d) -2

32. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$ then $f\left(\frac{2x}{1+x^2}\right)$ =
(a) f(x) (b) 2f(x) (c) 3f(x) (d) $-f(x)$

33. Obtain the inverse of the matrix $\begin{bmatrix}2 & 4 & 1\\ 3 & 1 & 2\\ 1 & 3 & -3\end{bmatrix}$ Hence solve the following system of equations.
2x + 4y – z = 9
3x + y + 2z = 7
X + 3y – 3z =4
(a) 2, 1, 1 (b) 2, 2, 2 (c) 1, 1, 1 (d) 1, 2, 1

34. A company is manufactured two types of autocycles for gents and ladies separately, which are assembled and finished in to workshops W_1 and W_2. Each type takes 15 hours and 10 hours for assembly and 5 hours and 2 hours for finishing in the respective shops. If total number of hours available are 400 and 120 in workshops W_1 and W_2 respectively, calculate the number of units of autocycles produced using matrix method.
(a) 20, 20 (b) 20, 10 (c) 10, 30 (d) 10, 20

35. Find the inverse of the matrix $\begin{bmatrix}2 & -3\\ 4 & -11\end{bmatrix}$ hence, solve the system of equations
2x – 3y = 3
4x – 11y = 11
(a) 0, – 2 (b) – 3, 1 (c) 0, – 1 (d) –1, 1

36. $\frac{d}{dx}e^{2\log x}$ is equal to
(a) 2 (b) 2x (c) x^2 (d) 0

37. If $y = (1 + x)^{2x}$ then the value of $\frac{1}{y} \times \frac{dy}{dx}$ is
(a) $2[x(x + 1)^{-1} + \log(x + 1)]$ (b) $x(x + 1)^{-1} + \log(x + 1)$
(c) $2[x(x + 1)^{-1} - \log(x + 1)]$ (d) None

38. If $x^3 - 2x^2y^2 + 5x + y = 5$, then $\frac{dy}{dx}$ at x = 1 and y = 1 is :
(a) 4/3 (b) – 5/4 (c) 4/5 (d) –4/3

39. $\int \frac{6x+4}{(x-2)(x-3)} dx$ is equal to

(a) 22 log (x – 3) – 16(x – 2) (b) 11 log (x – 3) – 8(x – 2)

(c) 22 log (x – 3) – 16log (x – 2) (d) 232log (x – 3) + 16 log (x – 2)

40. The value of $\int_1^e \frac{(1+\log x)}{x} dx$ is : [Given Log e = 1]

(a) ½ (b) 3/2 (c) 1 (d) 5/2

PART – B

LOGICAL REASONING

41. Find the Missing Term : 4832, 5840, 6848, 7856, ?

(a) 8864 (b) 8815 (c) 8846 (d) 8887

42. Find the Missing Term : 1, 1, 4, 8 , 9, ? , 16, 64

(a) 27 (b) 28 (c) 32 (d) 40

43. A man starts from a point, walks 4 miles towards north and turns left and walks 6 miles, turns right and walks for 3 miles and again turns right and walks 4 miles and takes rest for 30 minutes. He gets up and walks straight 2 miles in the same direction and turns right and walks one mile. What is the direction he is facing?

(a) North (b) South (c) South-east (d) West

44. One evening, Raja started to walk toward the Sun. After walking a while, he turned to his right and again to his right. After walking a while, he again turned right. In which direction is he facing?

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

45. Six children A, B, C, D, E and F are standing in a row. B is middle of F and D. E is middle of A and C. A does not stand next to either F or D. C does not stand next to D. F is between which of the following pairs of children?

(a) B and E (b) B and C (c) B and D (d) B and A

46. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle?

(a) A (b) B (c) C (d) D

47. Seema is the daughter-in-law of Sudhir and sister-in-law of Ramesh. Mohan is the son of Sudhir and only brother of Ramesh. Find the relation between Seema and Mohan.

(a) Sister-in-law (b) Aunt (c) Cousin (d) Wife

48. There are 2 film stars. One is the father of the other's son. What is the relationship of the two with each other?

(a) Grandfather and Grandson (b) Grandfather and son

(c) Husband and wife (d) Father and Son

Directions (Qs. 49 - 52): Each of the following questions contains two statements followed by two conclusions numbered I and II. You have to consider the two statements to be true, even if they seen to be at variance at the commonly known facts. You have to decide which of the given conclusions definitely follows from the given statements.

Give answer (a) if only I follows; (b) if only conclusion II follows; (c) both I and II follows (d) if neither I nor II follows

49. **Statement:** Some cats are kittens.
All Rats are kittens.

Conclusions: I. Some cats are Rats.
II. Some Rats are cats.

50. **Statement:** All tigers are birds.
Some birds are cows.
Conclusions: I. Some cows are birds.
II. Some tigers are cows.

51. **Statement:** Many actors are directors.
All Directors are dancers.
Conclusions: I. Some actors are dancers.
II. No director is an actor.

52. **Statement:** Some girls are flowers.
Some flowers are books.
Conclusions: I. Some girls are books.
II. No books are girls.

53. If BROTHER is coded 2456784, SISTER coded as 919684, what is coded for BORBERS?
(a) 2542849 (b) 2542898 (c) 2454889 (d) 2524889

Find odd man out of the following

54. 835, 734, 642, 751, 853, 981, 532
(a) 751 (b) 853 (c) 981 (d) 532

55. If a man on a moped starts from a point and rides 4 km South then turns left and rides 2 km and turn again to the right to ride to go more towards which direction is he moving?
(a) North (b) West (c) East (d) South

56. Raju is standing facing north. He goes 30 metres ahead and turns left and goes for 15 metres. Now he turns right and goes for 50 metres and finally turns to his right and walks. In which direction is he heading?
(a) North (b) East (c) South (d) West

Directions (Q. No. 57- 58): Study the following information carefully to answer the given questions.

Eight persons P to W are sitting in front of one another in two rows. Each row has four persons. P is between U and V and facing North. Q, who is to the immediate left of S is facing W. R is between T and S and W is to the immediate right of V.

57. Who is sitting in front of R?
(a) U (b) Q (c) V (d) P

58. Who is to the immediate right of R?
(a) M (b) U (c) S or P (d) None of these

59. Suresh's sister is the wife of Ram. Ram is Rani's brother. Ram's father is Madhur. Sheetal is Ram's grandmother. Rema is Sheetal is daughter-in-law. Rohit is Rani's brother's son. Who is Rohit to Suresh?
(a) Brother-in-law (b) Son (c) Brother (d) Nephew

60. Introducing a man, a woman said, "His wife is the only daughter of my mother." How is the woman related with the man?
(a) Sister-in-law (b) Wife (c) Aunt (d) Mother-in-law

PART C

STATISTICS

61. The primary rules that should be observed in classification
    (i) As far as possible, the class should be of equal width
    (ii) The classes should be exhaustive
    (iii) The classes should be unambiguously defined.
    Then which of the following is correct
    (a) only (i) and (ii) (b) only (ii) and (iii)
    (c) only (i) and (iii) (d) all (i), (ii) and (iii)

62. If the width of each of ten classes in a frequency distribution is 2.5 and the lower class boundary of the lowest class is 5.1, then the upper class boundary of the highest class is
    (a) 30.1 (b) 30 (c) 31.1 (d) 27.6

63. In 2000, out of total of 1,750 workers of a factory, 1,200 were members of a trade union. The number of women employed was 200 of which 175 did not belong to a trade union. In 2004, there were 1,800 employees who belong to a trade union and 50 who did not belong to trade union. Of all the employees in 2004, 300 were women of whom only 8 did not belong to the trade union. On the basis of this information, the ratio of female members of the trade union in 2000 and 2004 is :
    (a) 292 : 25 (b) 8 : 175 (c) 175 : 8 (d) 25 : 292

64. 100 persons are divided into number of male/female and employed/unemployed it refers to
    (a) Cardinal Data (b) Ordinal Data (c) Spatial Data (d) Temporal Data

65. Which of the following graph is suitable for cumulative frequency distribution ?
    (a) 'O'give (b) Histogram (c) G.M. (d) A.M.

66. The A.M. of values 1, 2, 3, 4, 5 having corresponding frequencies as 1, 2, 3,4, 5 respectively is ?
    (a) $\frac{13}{4}$ (b) $\frac{11}{3}$ (c) $\frac{17}{4}$ (d) None

67. If there are two groups with 75 and 65 as harmonic means and containing 15 and 13 observations, then the combined H.M. is given by.
    (a) 65 (b) 70.36 (c) 70 (d) 71

68. If the A.M. and G.M. for two numbers are 34 and 16 respectively, then the two numbers are :
    (a) 16 and 70 (b) 4 and 64 (c) 100 and 3 (d) None

69. The median of a set of 9 distinct observations is 20.5 If each of the largest 4 observations of the set is increased by 2, then the median of the new set –
    (a) Is decreased by 2 (b) Is two times the original median
    (c) Remains the same as that of the original set (d) Is increased by 2

70. For the following observations, find the coefficient of quartile deviation.
    20, 23, 24, 32, 27, 35, 40, 29, 31, 39
    (a) 20.5 (b) 39 (c) 46 (d) 21

71. If the relationship between x and y is given by 7/2x + 1/3y = 10 and the range of x is Rs. 1.2, what would be the range of y ?
    (a) 9 (b) 12.6 (c) 12 (d) 1.35

72. If the relation between x and y is 5y – 3x = 10 and the mean deviation about mean for x is 12, then the Mean deviation of y about mean is
    (a) 7.20 (b) 6.80 (c) 20 (d) 18.80

73. The standard deviation of first n natural numbers is –
(a) [n (n + 1) (2n + 1)]/6 (b) $(n^2 - 1)/12$
(c) $\sqrt{\frac{n^2-1}{12}}$ (d) n/2

74. If x and y are related by y = 2x + 5 and the S.D. and A.M. of x are known to be 5 and 10 respectively, then the coefficient of variation of y is :
(a) 40 (b) 27 (c) 34 (d) 20

75. What will be the probable value of mean deviation ?
When Q_3= 40 and Q_1= 15
(a) 17.50 (b) 18.75 (c) 15.00 (d) None of the above

76. Determine spearman's rank correlation coefficient from the given data
$\sum d^2$ = 30, n = 10 :
(a) r = 0.82 (b) r = 0.32 (c) r = 0.40 (d) None of above

77. The more scattered the points are around a straight line in a scattered diagram, the _____ is the correlation coefficient.
(a) Zero (b) More (c) Less (d) None

78. If r = 0.28, Cov (x, y) = 7.6, V(x) = 9, then σ_y =
(a) 8.75 (b) 9.04 (c) 6.25 (d) None

79. If the regression line of Y on X is given by Y = X + 2 and Karl Pearson's coefficient of correlation is 0.5 the $\frac{\sigma y^2}{\sigma x^2}$ = _____.
(a) 3 (b) 2 (c) 4 (d) None

80. The two regression lines are : 16x – 20y + 132 = 0 and 80x – 30y – 428 = 0, the value of correlation coefficient is
(a) 0.6 (b) – 0.6 (c) 0.173 (d) 0.45

81. Expected value of a random variable
(a) is always positive (b) may be positive or negative
(c) may be positive or negative or zero (d) can never be zero

82. For two events A and B, P (B) = 0.3, P(A but not B) = 0.4 and P (not A) = 0.6. The events A and B are
(a) Exhaustive (b) Independent
(c) Equally likely (d) Mutually exclusive

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

84. There are three persons A, B and C having different ages. The probability that A survives for another 5 years is 0.80, B survives for another 5 years is 0.60 and C survives for another 5 years is 0.50. The probabilities that A and B survive for another 5 years is 0.46, B and C survive for another 5 years is 0.32, A and C survive for another 5 years is 0.48 and probability that all will survive is 0.26. Find the probability that at least one of them survives for another 5 years.
(a) 0.80 (b) 0.90 (c) 0.78 (d) 0.64

85. A random variable X takes values. 0, 1, 2, 3, and its mean is 1.3. If P (X = 3) = 3P (x = 1), and P(x = 2) = 0.3, then P (X = 0) is
(a) 0.1 (b) 0.42 (c) 0.3 (d) 0.4

86. 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

87. The method usually applied for fitting a binomial distribution is known as
(a) method of least square (b) method of moments
(c) method of probability distribution (d) method of deviations

88. In Binomial Distribution $\mu = 4$, $\sigma^2 = 3$, then mode =
(a) 4 (b) 4.25 (c) 4.5 (d) 4.1

89. If a variate X has, mean > variance, the its distribution will be _____.
(a) Binomial distribution (b) Poisson distribution
(c) Normal distribution (d) T – distribution

90. A discrete random variable x follows Poisson distribution. Find the value of $P(X \leq 2 / X \geq 1)$. You are given that E(x) = 2.20 and $e^{-2.20} = 0.1108$.
(a) 0.58 (b) 0.64 (c) 0.89 (d) 0.76

91. In a Normal Distribution the relation between QD and SD is –
(a) 3 QD = 2SD (b) 3 SD = 2 QD
(c) 4 QD = 3 SD (d) None of these

92. The mean of normal distribution is 500 and 16 percent of the values are greater than 600. What is the standard deviation of distribution ?
(a) 75 (b) 100 (c) 50 (d) 60

93. In semi average method, if the number of values is odd then we drop :
(a) First value (b) Last value (c) Middle value (d) Middle two value

94. Cyclical Variations are Caused by .....
(a) Festivals (b) Trade or business cycles
(c) Earthquakes (d) all of the above

95. 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

96. Time reversal & factor reversal are :
(a) Quantity Index (b) Ideal Index (c) price Index (d) Test of Consistency

97. From the data given below

Commodity	Price Relative	Weight
A	125	5
B	67	2
C	250	3

Then the suitable index number is
(a) 150.9 (b) 155.8 (c) 145.8 (d) None of these

98. From the following data

Commodity		A	B	C	D
1992 base year	Price	3	5	4	1
	Quantity	18	6	20	14
1993 Current Year	Price	4	5	6	3
	Quantity	15	9	26	15

The Paasche's price index number is :
(a) 146.41 (b) 148.25 (c) 144.25 (d) None

99. 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

100. Consumer price index number goes up from 110 to 200 and the Salary of a worker is also raised from Rs. 325 to Rs. 500. Therefore, in real terms he has no gain, to maintain his previous standard of living he should get an additional amount is :
(a) Rs. 85 (b) Rs. 90.91 (c) Rs. 98.25 (d) None