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#TheMathsTutor

CA Foundation June 2022 - Past Year Questions

Mathematics

Ratio & Proportion

1. If x : y = 4 : 6 and 2 : x = 1 : 2 then y = ?
   (a) 4 (b) 6 (c) 1/2 (d) 3/2
2. A bag contains 25 paise, 10 paise and 5 paise coins in the ratio 3 : 2 : 1. The total value is ₹ 40, then the number of 5 paise coins in the bag is
   (a) 40 (b) 45 (c) 48 (d) 50

Indices

3. Find the value of $\frac{3t^{-1}}{t^{-1/3}}$
   (a) $\frac{3}{t^{2/3}}$ (b) $\frac{3}{t^{3/2}}$ (c) $\frac{3}{t^{1/3}}$ (d) $\frac{3}{t^2}$
4. Find the value of a from $(\sqrt{9})^{-8} \times (\sqrt{3})^{-5} = 3^a$
   (a) $\frac{2}{21}$ (b) $\frac{21}{2}$ (c) $\frac{-21}{2}$ (d) $\frac{-2}{21}$

Logarithm

5. If $\log_a \sqrt{3} = \frac{1}{6}$, find the value of a
   (a) 3 (b) 9 (c) 27 (d) 81
6. Find the value of $\log \frac{p^2}{qr} + \log \frac{q^2}{pr} + \log \frac{r^2}{pq}$
   (a) 0 (b) 1 (c) log pqr (d) pqr

Equations

7. If one root of $5x^2 + 13x + a = 0$ be reciprocal of the other, then a is:-
   (a) - 5 (b) 5 (c) 1/5 (d) – 1/5
8. A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is 3 cm longer than the shortest and the third is twice as much as shortest one. Find the length of the shortest piece?
   (a) 15 (b) 18 (c) 20 (d) 22

9. Solve for x and y: $\left(\frac{b}{a}\right)x + \left(\frac{a}{b}\right)y = a^2 + b^2$, $x + y = 2ab$

(c) $x = \frac{a}{b}$, $y = \frac{b}{a}$ (b) x = ab, y = ab (c) x = 3ab, y = - ab (d) x = - 3ab, y = ab

Linear Inequalities

10. A plumber can be paid under two methods as given below:-
(I) ₹ 600 fixed and ₹ 50 per hour
(II) ₹ 170 per hour
If a particular work takes x hours to complete, then find out the value of x for which the method (II) will give better wages to the plumber.
(a) x = 2 (b) x = 3 (c) x = 4 (d) x = 6

Permutations & Combinations

11. If $\frac{n!}{10} = {}^{n-1}P_{n-3}$ then n =
(a) 5 (b) 6 (c) 7 (d) 8
12. How many 4 letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?
(a) 5040 (b) 7020 (c) 5400 (d) 30240
13. The total number of arrangements of 8 persons of a board in a row with the President and the Vice - President occupying middle places is
(a) 6! (b) 7! (c) 6! x 2! (d) 7! x 2!
14. There are 10 flights operating between City A and City B. Find the number of ways by which a person can travel from City A to City B and return by a different flight is
(a) 80 (b) 95 (c) 90 (d) 85
15. Out of 7 boys and 4 girls, a team of 5 is to be chosen. The number of teams such that each team includes at least one girl is
(a) 440 (b) 441 (c) 414 (d) 484
16. A multiple choice test contains five questions and each question has four possible options. How many different answer keys are possible?
(a) 512 (b) 1024 (c) 20 (c) 625
17. Six points are marked on a straight line and five points are marked on another line which is parallel to the first line. How many straight lines including the given two lines can be formed with these points?
(a) 30 (b) 32 (c) 11 (d) 2

Sequences & Series

18. If the nth term of the A.P. 9, 7, 5, . . . is same as the nth term of the A.P. 15, 12, 9, . . ., then n will be
(a) 6 (b) 7 (c) 9 (d) 11

19. The first and last terms of an A.P. are 5 and 905. Sum of the terms is 45,955 then the number of terms is

(a) 98 (b) 99 (c) 100 (d) 101

20. In a G.P., the second term is 12 and the sixth term is 192. Find the eleventh term

(a) 12,288 (b) 3072 (c) 6144 (d) 768

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

(a) 2 (b) $\sqrt{2}$ (c) $\sqrt[4]{2}$ (d) $\sqrt{3}$

Sets, Relations & Functions

22. Two finite sets have a and b elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The value of a and b is

(a) 6, 3 (b) 3, 6 (c) 8, 4 (d) 6, 4

23. Let R = {(3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6)} be a relation on the set A = {3, 6, 9, 12}. Then relation is

(a) an equivalence relation

(b) reflexive and transitive only

(c) reflexive

(d) reflexive and symmetric only

24. If $f(p) = \frac{1}{1-p}$, then $f^{-1}(p)$ is :

(a) $\frac{1}{p-1}$ (b) $1-p$ (c) $\frac{1-p}{p}$ (d) $\frac{p-1}{p}$

Differential Calculus

25. Determine f(x) given that $f'(x) = 12x^2 - 4x$ and $f(-3) = 17$

(a) $f(x) = 4x^3 - 2x^2 + 143$ (b) $f(x) = 4x^3 - 2x^2 - 143$

(c) $f(x) = 3x^4 - x^3 + 17x + 143$ (d) $f(x) = 36x^3 - 8x^2 + 246$

Integral Calculus

26. $\int_0^1 x\, e^x\, dx$

(a) 1 (b) 0 (c) – 1 (d) e

Time Value of Money

27. Find the future value of annuity of ₹ 1,000 made annually for 7 years at interest rate of 14% compounded annually. Given that $(1.14)^7 = 2.5023$

(a) ₹ 10,730.71 (b) ₹ 7,730.71 (c) ₹ 9,730.71 (d) ₹ 11,730.71

28. ₹ 2500 is paid every year for 10 years to pay off a loan. What is the loan amount if the interest rate is 14% p.a. compounded annually?
(a) ₹ 13,840.27 (b) ₹ 15,040.27 (c) ₹ 13,040.27 (d) ₹ 14,040.27

29. ₹ 800 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10^{th} payment? [1.005^{10} = 1.0511]
(a) ₹ 7,816 (b) ₹ 8,716 (c) ₹ 8,176 (d) ₹ 7,176

30. Assuming the discount rate to be 7% p.a. How much would you pay to receive ₹ 200 growing at 5% annually forever?
(a) ₹ 5,000 (b) ₹ 10,000 (c) ₹ 7,500 (d) ₹ 12,500

31. The present value of ₹ 2,000 after 8 years at the rate of 6% p.a. is? Given 1.06^8 = 1.59385
(a) ₹ 1,254 (b) ₹ 1,054 (c) ₹ 3,054 (d) ₹ 2,054

32. The annual rate of simple interest is 12.5%. In how many years will the principal double?
(a) 7 years (b) 8 years (c) 10 years (d) 9 years

33. There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of ₹ 12,000 after 3 years at the same rate?
(a) ₹ 2,260 (b) ₹ 3,972 (c) ₹ 3,279 (d) ₹ 2,679

34. An investment is earning compound interest. ₹ 100 invested in the year 2 accumulated to ₹ 105 by year 4. If ₹ 500 is invested in the year 5, how much will it become by year 10?
(a) ₹ 364.80 (b) ₹ 464.80 (c) ₹ 564.80 (d) ₹ 664.80

35. A company creates a sinking fund of ₹ 2,00,000 in a bank account for 15 years that offers interest rate of 6% p.a. The yearly payment to be paid by the company is? (1.06^{14} = 2.209)
(a) ₹ 8,149 (b) ₹ 8,945 (c) ₹ 9,854 (d) ₹ 11,549

36. An investor is saving to pay off an obligation of ₹ 15,250 which will be due in seven years, if the investor is earning 7.5% simple interest per annum, the amount to be deposited to meet the obligation is?
(a) ₹ 8,000 (b) ₹ 9,000 (c) ₹ 10,000 (d) ₹ 11,000

37. Ramesh invests ₹ 20,000 per year in a fund, which earns 9% per year, for the next ten years. What would be the accumulated value of the investment upon payment of the last installment? (Given 1.09^{10} = 2.36736)
(a) ₹ 3,83,764.96 (b) ₹ 3,03,858.59 (c) ₹ 2,03,858.59 (d ₹ 4,05,858.59

38. Virat made an investment of ₹ 15,000 in a scheme and at the time of maturity the amount was ₹ 25,000. If the CAGR for this investment is 8.88% then calculate the approximate number of years for which the amount was invested?
(a) 6 years (b) 7 years (c) 6.6 years (d) 7.7 years

39. Madhavi takes a loan of ₹ 50,000 from ABC bank. The rate of interest is 10% p.a. The first installment will be paid at the end of year 5. Determine the amount (in ₹) of equal installments, if Madhavi wishes to repay the amount in five installments.
(a) ₹ 19,310 (b) ₹ 19, 410 (d) ₹ 19,510 (d) ₹ 19,610

40. Rahul deposits ₹ 3,000 at the start of each quarter in his savings account. If the account earns interest 5.75% p.a. compounded quarterly, how much (in ₹) will he have at the end of 4 years? (Given $1.014375^{16} = 1.25696$)
(a) ₹ 54,397.71 (b) ₹ 58,397.71 (c) ₹ 68,397.71 (d) ₹ 63,397.71

Logical Reasoning

Number Series, Coding Decoding and Odd man out series

41. Find the missing term:- 7, 26, 63, 124, 215, 342, ?
(a) 381 (b) 432 (c) 511 (d) 728
42. Find the missing term:- 9, 27, 31, 155, 161, 1127, ?
(a) 1135 (b) 1235 (c) 1335 (d) 1435
43. Find the missing term:- 12, 9, 13.50, 30.375, ?, 341.71875
(a) 60.752 (b) 90.275 (c) 91.125 (d) 92.175
44. In a certain code 'TELEPHONE' is written as ENOHPELET, how ALIGATOR is coded?
(a) ROTAALIG (b) ROTAGILA (c) LAGITARO (d) ROTAGIAL
45. In a certain code, EARTH is coded as 34215 and VENUS as 73089, then SATURN will be coded as?
(a) 941820 (b) 921804 (c) 942810 (d) 948120

Direction Sense Test

46. Starting from a point, Tina walked 12 m South then she turned left and walked 10 m. She again turned left and walked 12 m, then she turned right and walked 5m. How far and in which direction is she from her starting point?
(a) 10 m towards East (b) 15 m towards East
(c) 15 m towards West (d) 37 m towards East
47. I am facing West, turning to the left I go 20 m, then turning to the left I go 20 m and turning to the right I go 20 m, then again turning to the right I go 40 m and then again turning to right I go 40 m. In which direction am I from my original position?
(a) East (b) West (c) North (d) South
48. Ram was driving his car and at a circle there was a direction pole which was showing all the four directions correctly. Due to wind the direction pole turns in such a manner that now North pointer is showing West. Ram went in the wrong direction thinking that he was travelling East. In which direction was he actually driving?
(a) East (b) North (c) West (d) South
49. A, B, C, D, E, F, G, H and I are nine poles. 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 right in the middle of B and C while E is just in the middle of H and I. The distance between B and I is
(a) 2 km (b) 3 km (c) 1 km (d) 1.5 km

50. 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 this case L % M + N – P, P is in which direction with respect to M
(a) South - East (b) South - West (c) North - East (d) North - West

Seating Arrangements

51. Five persons are sitting on a bench to be photographed. S is to the left of N and to the right of B. M is to the right of N. R is between N and M. Who is sitting immediate right to R?
(a) S (b) M (c) B (d) N

52. Six friends P, Q, R, S, T and U are sitting around the hexagonal table at each corner and are facing the centre of the table. P is second to the left of U. Q is the neighbour of R and S. T is second to the left of S. Which person is sitting opposite to P?
(a) R (b) Q (c) T (d) S

53. Eight persons E, F, G, H, I, J, K and L are seated around a square table, facing centre – two on each side. J is between L and F; G is between I and F; H, a lady member is second to the left of J; F a male member is seated opposite to E, a lady member. There is a lady member between F and I. Who among the following is to the immediate left of F?
(a) G (b) I (c) J (d) H

54. Six friends A, B, C, D, E and F are sitting in a circle and are facing the centre of the circle. F is between C and E. B is between D and A. C and D are opposite to each other. Who are the immediate neighbours of D?
(a) E and F (b) C and B (c) A and F (d) B and E

Blood Relations

55. Ravi is the son of Aman's father's sister. Sahil is the son of Divya who is the mother of Gaurav and grandmother of Aman. Ashok is the father of Tanya and grandfather of Ravi. Divya is the wife of Ashok. How is Ravi related to Divya?
(a) Nephew (b) Son (c) Grandson (d) Father

56. If X + Y means X is the Mother of Y;
X – Y means X is the Brother of Y;
X % Y means X is the Father of Y;
X x Y means X is the Sister of Y;
Which of the following shows that A is the maternal uncle of B?
(a) B + D x C – A (b) B – D % A (c) A – C + D x B (d) A + C x D – B

57. B and C are siblings. M has two children and he is son of E, who is father-in-law of H. H has only one son. C is not the granddaughter of E. How is B related to E?
(a) Daughter (b) Son (c) Granddaughter (d) Grandson

58. Rani told Jaya, "The girl I met yesterday at the beach was the youngest daughter of the brother-in-law of my friend's mother." How is the girl related to Rani's friend?
(a) Cousin (b) Daughter (c) Mother (d) Aunt

59. A woman going with a boy is asked by another woman about the relationship between them. The woman replied, "My maternal uncle and the uncle of his maternal uncle is the same." How is the lady related to the boy?
(a) Grandmother and Grandson (b) Mother and Son
(c) Brother and Sister (d) Aunt and Nephew

60. Not Known

Statistics

Statistical Description of Data

61. Sweetness of a sweet dish is
(a) An attribute (b) A discrete variable (c) A continuous variable (d) None of these

62. Which of the following is not a mode of presentation of data?
(a) Textual presentation (b) Tabular presentation
(c) External presentation (d) Diagrammatic presentation

63. Which of the following is a continuous variable?
(a) The quantum of days to get a cure from illness
(b) The quantum of oxygen cylinders used to treat a patient
(c) The quantum of drug injected in to a patient
(d) The quantum of tablets prescribes to a patient

64. The collected information on which of the following characteristic do not form data?
(a) The number of files audited are 'less than 6', 'between 5 and 10' and 'more than 9'
(b) The number of files audited are 'very less', 'moderate' and 'very large'
(c) The number of audits in a file
(d) The number of auditors who audited a file

65. We get _____ by plotting cumulative frequency against the respective class boundary.
(a) Histogram (b) Ogives (c) Polygon (d) Pie Chart

66. Types of research data are
(a) Organised data and unorganised data
(b) Qualitative data and Quantitative data
(c) Processed data and unprocessed data
(d) Discrete data and Continuous data

67. Histograms are drawn only when
(a) Frequencies in various class intervals are equal
(b) Class intervals are equal
(c) Class intervals are unequal
(d) For less than type cumulative frequencies

Measures of Central Tendency

68. Which one is not a measure of Central Tendency?
(a) Median (b) Range (c) Arithmetic Mean (d) Harmonic Mean
69. _____ mean is calculated when the values in data do not have equal importance
(a) Arithmetic (b) Harmonic (c) Geometric (d) Weighted
70. Median of a distribution is obtained from
(a) Histogram (b) Less than type Ogives (c) Frequency polygon (d) Pie Chart
71. The mean of 100 students was 45. Later on, it was discovered that the marks of two students were mis-read as 85 and 54 instead of 58 and 45. Find the corrected mean.
(a) 68 (b) 36 (c) 44.64 (d) 52
72. Calculate the 3^{rd} Quartile from the following data:- 40, 35, 51, 30, 21, 25, 16, 29, 27, 32.
(a) 36.25 (b) 30.25 (c) 25 (d) 35
73. The coefficient of deviation based on 25^{th} percentile and 75^{th} percentile of 6, 9, 3, 8, 4, 5, 8 and 4 is
(a) 30 (b) 50 (c) 100/3 (d) 25
74. A seller of pearls kept the pearls in seven boxes labelled from 1 to 7. At the end of a day, he found that j^{th} labelled box contained j number of pearls. Then the average number of pearls per box is
(a) 4 (b) 6.5 (c) 7.5 (d) 8

Measures of Dispersion

75. Which measure of dispersion is based on the absolute deviations?
(a) Range (b) Standard deviation (c) Mean deviation (d) Quartile deviation
76. What is the mean deviation about mean of the following data? 11, 8, 10, 10, 12, 9
(a) 2 (b) 1 (c) 1.5 (d) 1.8
77. Following are the ages of 8 employees of a small firm:- 96, 50, 67, 75, 71, 69, 64, 66. Find the range and its coefficient.
(a) 46, 31.51 (b) 51, 37.67 (c) 43, 29.49 (d) 49, 36.42
78. Find the standard deviation and coefficient of variation for:- 1, 6, 5, 9, 8.
(a) 2.78, 40.83 (b) 2.45, 47.93 (c) 2.78, 47.93 (d) 2.87, 49.37
79. The arithmetic mean and coefficient of variation for variable X are 10 and 30 respectively. Find the variance of (30 – 2x)
(a) 30 (b) 32 (c) 34 (d) 36

Probability

80. If P(A) = 0.3 and P(B) = 0.8 and P(B/A) = 0.5. Find P (AUB).
(a) 0.6 (b) 0.75 (c) 0.9 (d) 0.95

81. What is the chance that a leap year selected at random will contain 53 Fridays?
(a) 1/7 (b) 2/7 (c) 3/7 (d) 4/7

82. Thirty balls are serially numbered and placed in a bag. Find the probability that the first ball drawn is multiple of 3 or 5.
(a) 8/15 (b) 2/15 (c) 1/2 (d) 7/15

83. The odds in favour of event A in a trial is 3 : 1. In a three independent trials, the probability of no occurrence of the event A is
(a) 1/64 (b) 1/32 (c) 1/27 (d) 1/8

84. The odds in favour of an event A is 2 : 3 and odds against of an event B is 6 : 4. The probability that only one event occurs is y/25 where y is
(a) 12 (b) 15 (c) 18 (d) 9

85. Two unbiased dice are rolled. The probability of getting 1 in at least one die is x/36 where x is
(a) 1 (b) 2 (c) 11 (d) 12

Theoretical Distributions

86. The mean of Binomial distribution is
(a) Always less than its variance
(b) Always more than its variance
(c) Always equal to its variance
(d) Always equal to its standard deviation

87. The Binomial distribution, having mean as 3 and standard deviation as 1.5, has number of trials equal to
(a) 4 (b) 6 (c) 8 (d) 12

88. The standard deviation of a Poisson variate X is 1.732. Then P(-2.9 < X < 3.54) =
(a) 13 e^{-3} (b) 11 e^{-3} (d) 9 e^{-3} (d) 3 e^{-3}

89. The variance of a normal distribution is given to be 16. The mean deviation about mode is
(a) 3.2 (b) 8 (c) 12.8 (d) 12

90. For a normal distribution, the first and third quartile are 37 and 49, then the mode of the distribution is
(a) 49 (b) 39 (c) 37 (d) 43

Correlation

91. If the plotted points in a Scatter diagram lie from lower left to upper right, then the correlation is
(a) Negative (b) Perfect Negative (c) Zero (d) Positive

92. For finding correlation between two qualitative characteristics, we use
(a) Scatter diagram (b) Karl Pearson's coefficient of correlation
(c) Rank correlation coefficient (d) Coefficient of concurrent deviation

93. For n pairs of observations, the coefficient of concurrent deviation is found to be $\frac{1}{\sqrt{5}}$. If there are six concurrent deviations, then n =
(a) 11 (b) 10 (c) 9 (d) 8

94. Karl Pearson's coefficient is defined from
(a) Grouped data (b) Ungrouped data (c) Any data (d) Scattered data

Regression

95. For positive and perfectly correlated random variables, one of the regression coefficients is 1.3 and the standard deviation of X is 2, then the variance of Y is
(a) 2.66 (b) 6.76 (c) 6.56 (d) 3.16

Index Numbers

96. The test of shifting the base is called
(a) Unit Test (b) Time Reversal Test (c) Factor Reversal Test (d) Circular Test

97. Let p_0 and p_1 be the prices of a commodity in the base and current year respectively. The price relative with respect to base year is
(a) $\frac{p_1}{p_0}$ (b) $\frac{p_0}{p_1}$ (c) $\frac{p_1 - p_0}{p_0}$ (d) $\frac{p_1 - p_0}{p_1}$

98. The Laspeyre's index number is a weighted aggregate method by taking _____ as weights.
(a) Quantity consumed in the base year
(b) Quantity consumed in the current year
(c) Value of items consumed in the base year
(d) Value of items consumed in the current year

99. Which one of the following methods is based on geometric mean for calculating an index number?
(a) Fisher's method (b) Kelley's method (c) Paasche's method (d) Laspeyre's method

100. Which one of the following test is not applied for selecting an index number?
(a) Time Reversal (b) Price Relative (c) Factor Reversal (d) Circular