



CA Foundation January 2021 - Past Year Questions

Ratio & Proportion

1. The ratio of two quantities is 15:17. If the consequent of its inverse ratio is 15, then the antecedent is
(a) 15 (b) $\sqrt{15}$ (c) 17 (d) 14
2. In a certain business, A and B received Profit in a certain ratio; B and C received profits in the same ratio. If A gets ₹ 1,600 and C gets ₹ 2,500, then how much does B get?
(a) ₹ 2000 (b) ₹ 2500 (c) ₹ 1000 (d) ₹ 1500
3. The salaries of A, B and C are in the ratio 2:3:5. If increments of 15%, 10% and 20% are allowed respectively to their salaries, then what will be the new ratio of their salaries?
(a) 3:3:10 (b) 10:11:20 (c) 23:33:60 (d) Can't say

Indices

4. 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) $\frac{3}{t^2}$

Logarithm

5. If $\log_a(ab) = x$, then $\log_b(ab)$ is
(a) $\frac{1}{x}$ (b) $\frac{x}{1+x}$ (c) $\frac{x}{x-1}$ (d) None of these

Equations

6. The value of p for which the difference between the root of equation $x^2 + px + 8 = 0$ is 2, is
(a) ± 2 (b) ± 4 (c) ± 6 (d) ± 8
7. If the quadratic equations $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have a common root, then $p + q = ?$
(a) 0 (b) 1 (c) -1 (d) 2

Linear Inequations

8. The common region in the graph of the inequalities $x + y \leq 4$, $x - y \leq 4$, $x \geq 2$, is
(a) Equilateral triangle (b) Isosceles triangle
(c) Quadrilateral (d) Square



Permutations & Combinations

9. Eight chairs are numbered from 1 to 8. Two women and three men are to be seated by allowing one chair for each. First, the women choose the chairs from the chairs numbered 1 to 4 and then men select the chairs from the remaining. The number of possible arrangements is
(a) 120 (b) 288 (c) 32 (d) 1440
10. 'n' locks and 'n' corresponding keys are available but the actual combination is not known. The maximum number of trials that are needed to assign the keys to the corresponding locks is
(a) ${}^{n-1}C_2$ (b) ${}^{n+1}C_2$ (c) $\sum_{k=2}^n (k-1)$ (d) $\sum_{k=2}^n k$
11. There are ten flights operating between city A and city B. The number of ways in which a person can travel from city A to city B and return by different flight, is
(a) 90 (b) 95 (c) 80 (d) 78
12. How many odd numbers of four digits can be formed with digits 0, 1, 2, 3, 4, 7 and 8?
(a) 150 (b) 300 (c) 120 (d) 210
13. In how many different ways, can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd numbered position?
(a) 32 (b) 36 (c) 48 (d) 60
14. ${}^nC_p + 2{}^nC_{p-1} + {}^nC_{p-2} =$
(a) ${}^{n+1}C_p$ (b) ${}^{n+2}C_p$ (c) ${}^{n+1}C_{p+1}$ (d) ${}^{n+2}C_{p-1}$
15. A business house wishes to simultaneously elevate two of its six branch heads. In how many ways these elevations can take place?
(a) 12 (b) 3 (c) 6 (d) 15

Sequences & Series

16. The n^{th} term of the series $3 + 7 + 13 + 21 + 31 + \dots$ is
(a) $4n - 1$ (b) $n^2 + 2n$ (c) $n^2 + n + 1$ (d) $n^3 + 2$
17. The number of integers from 1 to 100 which are neither divisible by 3, nor by 5 nor by 7, is
(a) 67 (b) 55 (c) 45 (d) 33
18. In a geometric progression, the 3rd and 6th terms are, respectively, 1 and $-1/8$. The first term and common ratio are respectively
(a) 4, $1/2$ (b) 4, $-1/4$ (c) 4, $-1/2$ (d) 4, $1/4$
19. The harmonic mean of the roots of the equation $(5 + \sqrt{2})x^2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$, is
(a) 2 (b) 4 (c) 6 (d) 8



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Sets, Relations & Functions

20. The set of cubes of natural numbers is
(a) Null set (b) finite set (c) infinite set (d) singleton set
21. In the set of all straight lines on a plane, which of the following is NOT TRUE?
(a) 'Parallel to' an equivalence relation
(b) 'Perpendicular to' is a symmetric relation
(c) 'Perpendicular to' is an equivalence relation
(d) 'Parallel to' is a reflexive relation
22. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by

$$f(x) = \begin{cases} 2x & \text{for } x > 3 \\ x^2 & \text{for } 1 < x < 3 \\ 3x & \text{for } x \leq 1 \end{cases}$$

then the value of $f(-1) + f(2) + f(4)$ is

- (a) 9 (b) 14 (c) 5 (d) 6

Differential Calculus

23. The cost function of production is given by $C(x) = \frac{x^3}{2} - 15x^2 + 36x$ where x denotes the number of items produced. The level of output for which marginal cost is minimum and the level of output for which the average cost is minimum are given by, respectively
(a) 10 and 15 (b) 10 and 12 (c) 12 and 15 (d) 15 and 10

Integral Calculus

24. $\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2} \right) dx$
(a) $e \left(\frac{e}{2} - 1 \right)$ (b) $e(e - 1)$ (c) e (d) $e^2(e - 1)$

Time Value of Money

25. A certain sum amounted to ₹ 575 at 5% in a time in which ₹ 750 amounted to ₹ 840 at 4%. If the rate of interest is simple, find the sum
(a) ₹ 525 (b) ₹ 550 (c) ₹ 515 (d) ₹ 500
26. Find the amount of compound interest, if an amount of ₹ 50,000 is deposited in a bank for one year at the rate of 8% per annum compounded semi-annually
(a) ₹ 3,080 (b) ₹ 4,080 (c) ₹ 5,456 (d) ₹ 7,856
27. The population of a town increases by 2% of the population at the beginning of that year. The number of years by which the total increase in population would be 40% is
(a) 7 years (b) 10 years (c) 17 years (approx.) (d) 19 years (approx.)



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28. 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) ₹ 10,730.7 (b) ₹ 5,365.35 (c) ₹ 8,756 (d) ₹ 9,892.34
29. Two equal amounts of money are deposited in two banks each at 15% p.a. for 3.5 years in the bank and for 5 years in the other. The difference between the interest amounts from the banks is ₹ 144. Find the sum
 (a) ₹ 620 (b) ₹ 640 (c) ₹ 820 (d) ₹ 840
30. The simple on a sum at 4% p.a. for two years is ₹ 80. Find the compound interest on the same sum for the same period
 (a) ₹ 81.6 (b) ₹ 80.8 (c) ₹ 83.2 (d) ₹ 82.3
31. Which is a better investment, 9% p.a. compounded quarterly or 9.1 % p.a. simple interest?
 (a) 9% compounded (b) 9.1% S.I. (c) Both same (d) Can't say
32. The effective rate of interest corresponding to a nominal rate of 7% p.a. compounded quarterly is
 (a) 7.5% (b) 7.6% (c) 7.7% (d) 7.18%
33. Assuming that the discount rate is 7% p.a. how much would you pay to receive ₹ 200, growing at 5% annually, forever?
 (a) ₹ 2,500 (b) ₹ 5,000 (c) ₹ 7,500 (d) ₹ 10,000
34. A man invested one-third of his capital at 7%, one-fourth at 8% and the remainder at 10%. If the annual income is ₹ 561, the capital is
 (a) ₹ 4,400 (b) ₹ 5,500 (c) ₹ 6,600 (d) ₹ 5,800
35. A sum of money is lent at compound interest rate 20% p.a. two years. It would fetch ₹ 482 more if the interest is compounded half-yearly. Then the sum is
 (a) ₹ 19,800 (b) ₹ 19,900 (c) ₹ 20,000 (d) ₹ 20,100
36. ₹ 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 annually after tenth payment? (Given that $1.005^{10} = 1.0511$)
 (a) ₹ 4,444 (b) ₹ 8,756 (c) ₹ 3,491 (d) ₹ 8,152
37. When 'i' denote the actual rate of interest in decimal, and n denote the number of conversion periods, the formula for computing the effective rate of interest E is given by
 (a) $(1 + i)^n$ (b) $(1 + i)^n - 1$ (c) $1 - (1 + i)^n$ (d) $(1 + i)^{-n}$
38. The present value of an Annuity immediate is the same as
 (a) Annuity regular for (n - 1) years plus the initial receipt in the beginning of the period.
 (b) Annuity regular for (n - 1) years
 (c) Annuity regular for (n + 1) years
 (d) Annuity regular for (n + 1) years plus the initial receipt in the beginning of the period.
39. Matrices
 40. Matrices



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Logical Reasoning

Number Series, Coding Decoding and Odd man out series

41. $\frac{1}{2}, \frac{3}{4}, \frac{5}{8}, \frac{7}{16}, ?$

- (a) $\frac{9}{32}$ (b) $\frac{10}{17}$ (c) $\frac{11}{34}$ (d) $\frac{12}{35}$

42. Find the missing term:- P3C, R5F, T8I, V12L, ?

- (a) Y17O (b) X17M (c) X17O (d) X16O

43. Find out the odd man in the sequence 8, 27, 64, 196, 216.

- (a) 27 (b) 64 (c) 196 (d) 216

44. In a certain code language, BEAT is written as YVZG, then what will be the code for MILD?

- (a) ONRW (b) NOWR (c) ONWR (d) NROW

45. In a certain code RIPPLE is written as 613382, and LIFE is written as 8192. How will RIFFLE written in that code

- (a) 618892 (b) 689912 (c) 619982 (d) 629981

Direction Sense Test

46. A man is facing west. He turns 45 degrees in the clockwise direction and then another 180 degrees in the same direction and then 270 degrees in the anti-clockwise direction. Which is the facing now?

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

47. One day, Ram left home and bi-cycled 10km southwards, turned right and travelled 5km and turned right and went 10km he turned left and went 10km. how many kilometres he has to cycle to reach his home straight?

- (a) 10 (b) 15 (c) 20 (d) 25

48. Mrs. N walks 19kms towards North. From there she walks 16 kms towards South. Then she walks 4 kms towards East. How far and in which direction is she with reference to her starting point?

- (a) 4km West (b) 6km West (c) 3km East (d) 5km North-East

Seating Arrangements

49. A, B, C and D are playing cards. A and B are partners. D faces towards North. If A faces West, then who faces South?

- (a) C (b) B (c) D (d) Inadequate data

50. A is seated between D and F at around table. C is seated opposite to D. E is in right adjacent to D. Who sits opposite to B?

- (a) A (b) D (c) C (d) F



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51. Four Indians A, B, C and D and four Japanese E, F, G and H are sitting in a circle around a table facing each other in a conference. No two Indians or Japanese are sitting side by side, C who is sitting between G and H, is facing D. F is between D and A and is facing G. H is to the right of B. Who is sitting left of A?
 (a) E (b) F (c) G (d) H
52. Five friends A, B, C, D and E are sitting on a bench. A is sitting next to B; C is sitting next to D, D is not sitting with E; E is at the left end of bench. C is on second position from the right; A is on the right side of B and to the right side of E. A and C are sitting together. What is the position of B?
 (a) Second from right (b) Centre (c) Extreme left (d) Second from left

Blood Relations

53. P is the brother of Q and R, S is the mother of R. T is the father of P. Which of the following statements cannot be definitely true?
 (a) S is the mother of P (b) P is the son of S
 (c) T is the husband of S (d) Q is the son of T
54. Pointing to a lady in a photograph, Ram said, "Her son's father is the son-in-law of my mother." How is Ram related to the lady?
 (a) Aunt (b) Cousin (c) Sister (d) Mother
55. A girl introduced a boy as the son of the daughter of the father of her uncle. The boy is girl's
 (a) Son (b) Brother (c) Son-in-law (d) Uncle
56. Pointing to lady Sahil said, "She is the daughter of woman who is the mother of the husband of my mother." Who is the lady to Sahil?
 (a) Sister (b) Aunt (c) Daughter (d) Sister-in-law
57. Syllogism
 58. Syllogism
 59. Syllogism
 60. Syllogism

Statistics

Statistical Description of Data

61. A variable with qualitative characteristic is known as
 (a) Quality variable (b) Attribute (c) Discrete variable (d) Continuous variable
62. The accuracy and consistency of data can be verified by
 (a) Scrutiny (b) Internal checking (c) External checking (d) Double checking
63. The left part of the table providing the description of rows is
 (a) Caption (b) Box-head (c) Stub (d) Body



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64. Mode can be obtained from
 (a) Frequency polygon (b) Histogram (c) Ogive (d) All of the above
65. Most of the commonly used distributions are
 (a) Bell shaped (b) U-shaped (c) J-shaped (d) Mixed curve
66. Which of the following is suitable for the graphical representation of cumulative frequency distribution?
 (a) Frequency polygon (b) Histogram (c) Ogive (d) Pie Chart
67. Sweetness of a dish is
 (a) An Attribute (b) Discrete variable (c) Continuous variable (d) Variable
68. A bar chart is data drawn for
 (a) Continuous data (b) Nominal data
 (c) Time series data (d) Comparing different components
69. A tabular presentation can be used for
 (a) Continuous series data (b) Nominal data
 (c) Time series data for longer period (d) Primary data
70. From a histogram one cannot compute the approximate value of
 (a) Mode (b) Standard deviation (c) Median (d) Mean

Measures of Central Tendency

71. From the records on sizes of shoes sold in a shop, one can compute the following to determine the most preferred shoe size?
 (a) Mean (b) Median (c) Mode (d) Range
72. Which of the following measure does not possess mathematical properties?
 (a) A.M. (b) G.M. (c) H.M. (d) Median
73. If $y = 3 + (4.5)x$ and the mode for x-value is 20, then the mode for y-value is
 (a) 3.225 (b) 12 (c) 24.5 (d) 93
74. If there are two groups with n_1 and n_2 observations and H_1 and H_2 are respective harmonic means, then the harmonic mean of combined observation is
 (a) $\frac{n_1 H_1 + n_2 H_2}{n_1 + n_2}$ (b) $\frac{n_1 H_1 + n_2 H_2}{H_1 + H_2}$ (c) $\frac{n_1 + n_2}{n_1 H_1 + n_2 H_2}$ (d) $\frac{(n_1 + n_2) H_1 H_2}{n_1 H_2 + n_2 H_1}$

Measures of Dispersion

75. The best statistical measure used for comparing two series is
 (a) Mean absolute deviation (b) Range
 (c) Co-efficient of variation (d) Standard deviation
76. The relationship between P-series and Q-series is given by $2P - 3Q - 10 = 0$. If the range of P-series is 18. What would be the range of Q?
 (a) 10 (b) 15 (c) 9 (d) 12



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77. It is given that the mean is 10 and standard deviation is 3.2. If the observations are increased by 4, then the new mean and standard deviations are:
(a) Mean = 10, S.D. = 7.2 (b) Mean = 10, S.D. = 3.2
(c) Mean = 14, S.D. = 3.2 (d) Mean = 14, S.D. = 7.2
78. Which one of the following is a relative measure of dispersion?
(a) Range (b) Mean Deviation
(c) Standard Deviation (d) Coefficient of Quartile Deviation
79. Find the coefficient of mean deviation about mean for the data: 5, 7, 8, 10, 11, 13, 19
(a) 17.28 (b) 28.57 (c) 22.22 (d) 32.10

Probability

80. An event that called can be subdivided into further events is called as
(a) Composite event (b) Complex event
(c) Mixed event (d) Simple event
81. Three identical and balanced dice are rolled. The probability that the same number will appear on each of them is
(a) $1/6$ (b) $1/18$ (c) $1/36$ (d) $1/24$
82. A basket contains 15 white balls, 25 red balls and 10 blue balls. If a ball is selected at random, the probability of selecting a colored ball is
(a) 0.20 (b) 0.25 (c) 0.60 (d) 0.70
83. Two dice thrown simultaneously. The probability of a total score of 5 from the outcome of dice is
(a) $1/18$ (b) $1/12$ (c) $1/9$ (d) $2/5$
84. If an unbiased coin is tossed twice, then the probability of obtaining at least one tail is
(a) 1 (b) 0.5 (c) 0.75 (d) 0.25
85. If an unbiased coin is tossed three times, what is the probability of getting more than one head?
(a) $1/2$ (b) $3/8$ (c) $7/8$ (d) $1/3$

Theoretical Distributions

86. A coin with probability for head as $1/5$ is tossed 100 times. The standard deviation of the number of heads turned up is
(a) 3 (b) 2 (c) 4 (d) 6
87. If X is a Poisson variable, and $P(X = 1) = P(X = 2)$, then $P(X = 4)$ is
(a) $\frac{2}{3}e^{-2}$ (b) $\frac{2}{3}e^4$ (c) $\frac{3}{2}e^{-2}$ (d) $\frac{3}{2}e^4$
88. Which one of the following is an uni-parametric distribution?
(a) Poisson (b) Normal (c) Binomial (d) Hyper geometric
89. For a normal distribution, the value of third moment about mean is
(a) 0 (b) 1 (c) 2 (d) 3



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Correlation

90. For the set of observations $\{(1, 2), (2, 5), (3, 7), (4, 8), (5, 10)\}$, the value of Karl-Pearson's coefficient of correlation is approximately given by
(a) 0.755 (b) 0.655 (c) 0.525 (d) 0.985
91. The co-efficient of correlation between x and y is 0.5, the covariance is 16 and the standard deviation of x is 4. Then the standard deviation of y is
(a) 4 (b) 8 (c) 16 (d) 64

Regression

92. The intersecting point of the two regressions lines: y on x and x on y is
(a) $(0, 0)$ (b) (\bar{x}, \bar{y}) (c) (b_{yx}, b_{xy}) (d) $(1, 1)$
93. Given that the variance of x is equal to the square of standard deviation of y and the regression line of y on x is $y = 40 + 0.5(x - 30)$. Then the regression line of x on y is
(a) $y = 40 + 4(x - 30)$ (b) $y = 40 + (x - 30)$
(c) $y = 40 + 2(x - 30)$ (d) $y = 30 + 2(x - 40)$
94. The regression coefficients remain unchanged due to
(a) Shift of scale (b) Shift of origin
(c) Replacing x values by $1/x$ (d) Replacing y values by $1/y$

Index Numbers

95. The cost of living index is always
(a) Price index number (b) Quantity index number
(c) Weighted index number (d) Value index number
96. Fishers index number does not satisfy
(a) Unit test (b) Circular test
(c) Time reversal test (d) Factor reversal test
97. When the prices for quantities consumed of all commodities are changing in the same ratio, then the index numbers due to Laspeyre's and Paasche's will be
(a) Equal (b) Unequal
(c) Reciprocal of Marshall Edgeworth's Index number
(d) Reciprocal of Fisher's Index number
98. 99. 100. Time Series



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