

Mock Test Paper - Series II: August, 2025

Date of Paper: 28th August, 2025

Time of Paper: 2 P.M. to 4 P.M.

MOCK TEST PAPER II

FOUNDATION COURSE

Paper 3: Quantitative Aptitude

Time: 2 Hours

Marks: 100

1. Find the value of $\left[\log_{10} \sqrt{25} - \log_{10} (2^3) + \log_{10} (4)^2 \right]$

(a) x

(b) 10

☒ (c) 1

(d) None

$$\log_{10} \frac{5}{8} \times 16^2 = \log_{10} 10 = 1$$

2. If A: B = 2:5, then (10A + 3B): (5A + 2B) is equal to

☒ (a) 7:4

(b) 7:3

(c) 6:5

(d) 7:9

$$\frac{10(2) + 3(5)}{5(2) + 2(5)} = \frac{20 + 15}{10 + 10} = \frac{35}{20} = 7:4$$

3. The ratio compounded of 4:5 and sub-duplicate of a:9 is 8:15. Then value of "a" is

(a) 2

(b) 3

☒ (c) 4

(d) 5

$$4:5 \quad \sqrt{a}:3$$

$$4\sqrt{a}:15 = 8:15$$

$$4\sqrt{a} = 8$$

$$\sqrt{a} = 2 \quad a = 4$$

4. If $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{1}{x}$ are in proportion, then the value of x will be

☒ (a) 15/2

(b) 6/5

(c) 10/3

(d) 5/6

$$\frac{1}{2} \cdot \frac{1}{x} = \frac{1}{3} \cdot \frac{1}{5}$$

$$\frac{1}{2x} = \frac{1}{15}$$

$$x = \frac{15}{2}$$

Error 5.

If $P = x^{1/3} + x^{-1/3}$ then find value of $3P^3 - 9P$

- (a) 3
- (b) $\frac{1}{2}(x+1/x)$
- ✓ (c) $3(x+1/x)$
- (d) $2((x+1/x))$

$$P^3 - 3P = \frac{x^2+1}{x} =$$

$$3P^3 - 9P = 3\left(x + \frac{1}{x}\right)$$

6. Fourth proportional to $x, 2x, (x+1)$ is:

- (a) $(x+2)$
- (b) $(x-2)$
- ✓ (c) $(2x+2)$
- (d) $(2x-2)$

$$\begin{aligned} ad &= bc \\ xy &= 2x(x+1) \\ y &= 2x+2 \end{aligned}$$

7. The value of $\frac{(3^{n+1} + 3^n)}{(3^{n+3} - 3^{n+1})}$ is equal to

Put $n=0$

- (a) $1/5$
- ✓ (b) $1/6$
- (c) $1/4$
- (d) $1/9$

$$\frac{3+1}{3^3-3} = \frac{4}{24-6} = \frac{1}{6}$$

8. $\lim_{x \rightarrow 3} \frac{x^2-9}{x-3}$ is equal to

- (a) 0
- ✓ (b) 6
- (c) Does not exist
- (d) -6

$$\frac{9-9}{3-3} = \frac{0}{0} \text{ form}$$

L'Hospital Rule. $\lim_{x \rightarrow 3} 2x = 6$

9. Let $f(x) = \frac{x^2-6x+9}{x-3}$, $x \neq 3$, $f(3) = 0$, then $f(x)$ is

- ✓ (a) Continuous at $x = 3$
- (b) Discontinuous at $x = 3$
- (c) Discontinuous for all x

$$\frac{9-18+9}{3-3} = \frac{0}{0}$$

L'Hospital Rule

$$\lim_{x \rightarrow 3} 2x - 6 = 6 - 6 = 0$$

$$f(3) = \lim_{x \rightarrow 3} \text{Hence cts.}$$

(d) None of these

Error 10

If $\frac{3x-2}{5x+6}$ is the duplicate ratio of $2/3$ then the value of 'x' is

(a) 2

✓ (b) 6

(c) 5

(d) 9

$$\frac{3x-2}{5x+6} = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

$$27x - 18 = 20x + 24$$

$$7x = 24 + 18 = 42$$

$$x = 6$$

11. If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be:

(a) $x^2 - 14x + 49 = 0$

(b) $x^2 - 24x + 144 = 0$

✓ (c) $x^2 - 50x + 49 = 0$

(d) $x^2 - 19x + 144 = 0$

$$\alpha + \beta = -7$$

$$\alpha\beta = 12$$

$$(\alpha + \beta)^2 = (-4 - 3)^2 = 49$$

$$(\alpha - \beta)^2 = (-4 + 3)^2 = 1$$

$$\text{Roots} = -4, -3$$

$$\text{Sum} = 49 + 1 = 50$$

$$\text{Product} = 49 \times 1 = 49$$

$$\text{Eq}^n. x^2 - 50x + 49 = 0$$

12. Roots of the equation $2x^2 + 3x + 7 = 0$ are α and β then the value of $\alpha^{-1} + \beta^{-1}$ is

(a) 2

(b) $3/7$

(c) $7/2$

✓ (d) $-19/14$

$$\alpha + \beta = -\frac{3}{2} \quad \alpha\beta = \frac{7}{2}$$

$$\frac{\alpha}{\beta} + \frac{\beta}{\alpha} = \frac{\alpha^2 + \beta^2}{\alpha\beta}$$

$$\frac{(\alpha + \beta)^2 - 2\alpha\beta}{\alpha\beta} = \frac{\left(-\frac{3}{2}\right)^2 - 2 \times \frac{7}{2}}{\frac{7}{2}}$$

$$\left(\frac{9}{4} - 7\right) \times \frac{2}{7} = \left(\frac{9-28}{4}\right) \left(\frac{2}{7}\right) = \frac{-19}{14}$$

13. On solving the inequalities $5x + y \leq 100$, $x + y \leq 60$, $x \geq 0$, $y \geq 0$, we get the following situation:

✓ (a) $(0,0)$, $(20,0)$, $(10,50)$, & $(0,60)$

(b) $(0,0)$, $(60,0)$, $(10,50)$, & $(0,60)$

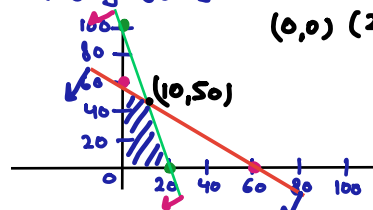
(c) $(0,0)$, $(20,0)$, $(0,100)$ & $(10,50)$

(d) none of these

$$\begin{array}{rcl} 5x + y & = & 100 \\ -x + y & = & 60 \\ \hline 4x & = & 40 \\ x & = & 10 \\ y & = & 50 \end{array}$$

$$\begin{array}{rcl} x + y & = & 60 \\ x = 0 & y = & 60 \\ y = 0 & x = & 60 \end{array}$$

$$(0,0) (20,0) (0,60) (10,50)$$



14. The rules and regulations demand that the employer should employ not more than 5 experienced hands to 1 fresh one and this fact is represented by (Taking experienced person as x and fresh person as y)

Starting option Ans.

✓ (a) $y \geq \frac{x}{5}$

$$\begin{array}{ccc} \text{Exp.} & & \text{Fresh} \\ 1.x & \leq & 5y \end{array}$$

$$\frac{x}{5} \leq y$$

- (b) $5y \leq x$
 ✓ (c) $5y \geq x$
 (d) none of these

15. In what time will be a sum of money doubles itself at 6.25% p.a simple interest?

- (a) 5 years
 (b) 8 years
 (c) 12 years
 ✓ (d) 16 years

$$\frac{1}{6.25} \times 100 =$$

FVD
 16. 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 $(1+0.08)^{10} = 2.158925$)

- ✓ (a) ₹ 156454.88
 (b) ₹ 144865.625
 (c) ₹ 156554.88
 (d) none of these

$$10,000 \left[\frac{(1.08)^{10} - 1}{0.08} \right] (1.08)$$

=)

17. The difference between the simple and compound interest on a certain of 3 years at 5% p.a is ₹ 228.75. The compound interest on the sum of for 2 years at 5% per annum is

- (a) ₹ 3175
 ✓ (b) ₹ 3075
 (c) ₹ 3275
 (d) ₹ 2975

$$228.75 = P [(1.05)^3 - 1 - 0.15]$$

$$P = 30,000$$

$$30,000 [(1.05)^2 - 1] \Rightarrow 3075$$

18. How much time would the simple interest on a certain sum be 0.125 times the principal at 10% per annum

- ✓ (a) $1\frac{1}{4}$ years
 (b) $1\frac{3}{4}$ years
 (c) $2\frac{1}{4}$ years

$$\frac{0.125 \times 100}{10} = 1.25 \text{ years}$$

(d) $2\frac{3}{4}$ years

19. The time in by which a sum of money is 8 times of itself if it doubles itself in 15 years interest compounded annually.

(a) 42 years

(b) 43 years

☒ (c) 45 years

(d) 46 years

$$8 = 2^3 \rightarrow 15 \times 3 = 45 \text{ years}$$

20. Present value of a scooter is ₹ 7290, if its value decreases every year by 10% then the value before 3 years is equal to

☒ (a) 10,000

(b) 10,500

(c) 20,000

(d) 20,500

$$7290 = IV(1-0.1)^3$$
$$7290 = IV(0.9)^3$$

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

☒ (a) 10.38%

(b) 5%

(c) 5.04%

(d) 4%

$$\left(1 + \frac{10}{400}\right)^4 - 1 \times 100$$
$$=$$

22. The difference between in simple interest on a sum invested of ₹ 1500 for 3 years is ₹ 18. The difference in their rate is

☒ (a) 0.4

(b) 0.6

(c) 0.8

(d) 0.10

$$18 = 1500 \frac{(r_1 - r_2) \times 3}{100}$$

$$\frac{18}{45} = (r_1 - r_2)$$

Error 23

- What will be the population after 3 years. When the population increases at the rate 3% in I year, 4% in II year and 5% in III year. Initial Population be 25,000

☒ (a) 28,119

(b) 29,118

$$25000 (1.03) (1.04) (1.05) =$$

(c) 27,000

(c) 30,000

24. If ₹ 10,000 is invested at 8% per annum, then compounded quarterly. Then value of investment after 2 years is .

☒ (a) ₹ 11,716.59

$$10,000 [1.02]^8 \Rightarrow$$

(b) ₹ 10,716.59

(c) ₹ 12,715.59

(d) none of these

25. In how many years will a sum of money become double at 5% p.a compound interest

(a) 14 years

$$\frac{69}{5} + .35$$

14.2 Years Correct Ans.

(b) 15 years

(c) 16 years

☒ (d) 14.3 years

26. The future value of an annuity of ₹ 1,000 is made annually for 5 years at interest rate of 14% compounded annually [Given that $(1.14)^5 = 1.92541$] is _____

(a) ₹ 5610

$$1000 \frac{[1.14]^5 - 1}{.14} \Rightarrow$$

☒ (b) ₹ 6610

(c) ₹ 6160

(d) ₹ 5160

27. The number of ways of arranging 6 boys and 4 girls in a row so that all 4 girls are together is:

(a) $6! \cdot 4!$

(b) $2 (7! 4!)$

☒ (c) $7! 4!$

(d) $2 \cdot (6! 4!)$

$$\underbrace{0000} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$$
$$7! 4!$$

Error 28

$15C_{3r} = 15C_{r+3}$ then 'r' is equal to

(a) 2

☒ (b) 3

$$3r = r+3$$

$$2r = 3$$

$$r = \frac{3}{2}$$

$$3r + r + 3 = 15$$

$$4r = 12$$

$$r = 3$$

6 Not possible

(c) 4

(d) 5

29. If ${}^nP_4 = 20$ (nP_2) then the value of 'n' is _____

(a) -2

✓ (b) 7

(c) -2 and 7 both

(d) None of these.

$$\begin{aligned} \cancel{n(n-1)(n-2)(n-3)} &= 20 \cancel{n(n-1)} \\ (n-2)(n-3) &= 5 \times 4 \\ n-2 &= 5 \\ n &= 7 \end{aligned}$$

30. How many different words can be formed with the letters of the word "LIBERTY"

(a) 4050

✓ (b) 5040

(c) 5400

(d) 4500

$$7! = 5040$$

31. If x , y and z are the terms in G.P, then the term x^2+y^2 , $xy + yz$, $y^2 + z^2$ are in

(a) AP

✓ (b) GP

(c) HP

(d) none of the above

$$\begin{aligned} 1+4, 2+8, 4+16 \\ 5, 10, 20 \end{aligned}$$

32. In a G.P. if fourth term is 3 then the product of first seven terms is

(a) 3^5

✓ (b) 3^7

(c) 3^6

(d) 3^8

$$3^7 =$$

33. In a G.P. If the third term of a GP is $\frac{2}{3}$ and 6th term is $\frac{2}{81}$, then the first term is

✓ (a) 6

(b) $\frac{1}{3}$

(c) 9

(d) 2

$$\begin{aligned} a_3 &= \frac{2}{3} & a_6 &= \frac{2}{81} & a &=? \\ \frac{a^3}{a^6} &= \frac{\frac{2}{3}}{\frac{2}{81}} & a^3 &= \frac{1}{27} & a &= \frac{1}{3} \\ & & a\left(\frac{1}{3}\right) &= \frac{2}{3} & & \\ & & a &= 6 & & \end{aligned}$$

34. Sum upto infinity series $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{2^5} + \dots$

- (a) 19/24
- (b) 24/19
- (c) 5/24
- (d) none of these

$$\frac{1}{2} + \frac{1}{2^3} + \frac{1}{2^5} + \dots + \frac{1}{3^2} + \frac{1}{3^4} + \dots$$

$$\frac{\frac{1}{2}}{1 - \frac{1}{4}} + \frac{\frac{1}{9}}{1 - \frac{1}{9}} \Rightarrow \frac{1}{2} \times \frac{4}{3} + \frac{1}{9} \times \frac{9}{8}$$

$$\frac{2}{3} + \frac{1}{8} = \frac{16+3}{24} = \frac{19}{24}$$

35. If $f(x) = \frac{2+x}{2-x}$, then $f^{-1}(x)$:

- (a) $\frac{2(x-1)}{x+1}$
- (b) $\frac{2(x+1)}{x-1}$
- (c) $\frac{x+1}{x-1}$
- (d) $\frac{x-1}{x+1}$

$$\frac{2+x}{2-x} = y$$

$$2+x = 2y - xy$$

$$x + xy = 2y - 2$$

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

$$x = \frac{2(y-1)}{y+1}$$

$$f^{-1}(x) = \frac{2(x-1)}{x+1}$$

36. If $f: \mathbb{R} \rightarrow \mathbb{R}$ is a function, defined by $f(x) = 2^x$; then $f(x+y)$ is

- (a) $f(x) + f(y)$
- (b) $f(x) \cdot f(y)$
- (c) $f(x) \div f(y)$
- (d) none

$$f(x+y) = 2^{x+y} = 2^x \cdot 2^y$$

$$= f(x) \cdot f(y)$$

37. If $f(x) = x+2$, $g(x) = 7^x$, then $g \circ f(x) =$ _____

- (a) $7^x \cdot x + 2 \cdot 7^x$
- (b) $7^x + 2$
- (c) $49(7^x)$
- (d) none of these

$$g \circ f(x) = g(f(x)) = g(x+2)$$

$$= 7^{x+2}$$

$$= 7^x \cdot 7^2$$

$$= 49 \cdot 7^x$$

38. 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 of these

$$\frac{dx}{dt} = 2 \quad \frac{dy}{dt} = 2t$$

$$\frac{dy}{dx} = \frac{2t}{2} = t$$

39. Evaluate $\int_{-1}^1 (e^x - e^{-x}) dx$

- (a) 1
- (b) 0
- (c) -1
- (d) none of these

$$e^x + e^{-x} \Big|_{-1}^1 \Rightarrow e + e^{-1} - e^{-1} - e = 0$$

40. if $xy = 1$ then $y^2 + \frac{dy}{dx} = ?$

- (a) 1
- (b) 0
- (c) 2
- (d) none of these

$$y = \frac{1}{x}$$

$$\frac{dy}{dx} = -\frac{1}{x^2}$$

$$y^2 + \frac{dy}{dx} \Rightarrow \frac{1}{x^2} - \frac{1}{x^2} = 0$$

41. The missing term of the series 11, 10, 14, 27, 66.5, 198.5

- (a) 14
- (b) 16
- (c) 21
- (d) 19

$$\begin{array}{c} \text{---} \text{---} \text{---} \text{---} \text{---} \\ \times 1 - 1 \quad \times 1.5 - 1 \quad \times 2 - 1 \quad \times 2.5 - 1 \quad \times 3 - 1 \end{array}$$

$$\begin{array}{l} \times 1 - 1 \\ \times 1.5 - 1 \\ \times 2 - 1 \\ \times 2.5 - 1 \\ \times 3 - 1 \end{array}$$

42. What comes at last place in R, U, X, A, D, ?

- (a) E
- (b) F
- (c) G
- (d) H

$$\begin{array}{c} \text{---} \text{---} \text{---} \text{---} \text{---} \\ +3 \quad +3 \quad +3 \quad +3 \quad +3 \end{array}$$

43. If $Z = 52$ and $ACT = 48$, then BAT will be equal to

- (a) 39 $Z = 26 \times 2$ $ACT = 1 + 3 + 20 = 24 \times 2$
 (b) 41 $BAT = 2 + 1 + 20 = 23 \times 2 = 46$
 (c) 44
 ✓ (d) 46

44. If $ROSE$ is coded as 6821, $CHAIR$ is coded as 73456 and $PREACH$ is coded as 961473, what will be the code for $SEARCH$?

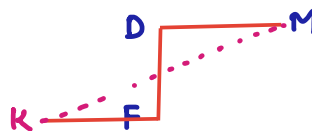
- (a) 246173 **214673**
 ✓ (b) 214673
 (c) 214763
 (d) 216473

45. If $E = 5$ and **READ** is coded as 7, then what is the code of '**DEAR**'?

- (a) 6 **No. of values + 1** $4 + 3 = 7$
 ✓ (b) 7 E
 (c) 8 $\downarrow$
 (d) 9 $1 + 4$

46. M is to the East of D , F is to the South of D and K is to the West of F . M is in which direction with respect to K ?

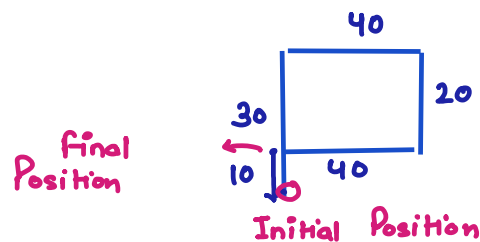
- (a) South-West
 (b) North-West
 ✓ (c) North-East
 (d) South-East



Error 47

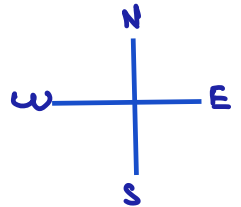
A cyclist goes 30 km to North and then turning to goes 40 km. Again he turns to his right and goes 20 km. After this he turns to his right and goes 40 km. How far is the from his starting point?

- (a) 0 km.
 ✓ (b) 10 km.
 (c) 25 km.
 (d) 40 km.



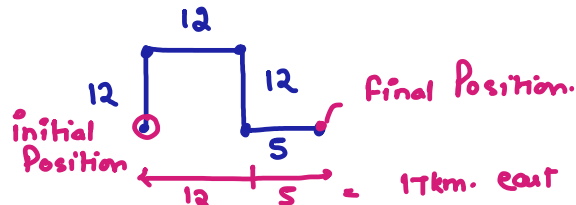
48. A boy from his home, first walks 20 m in North-West direction then 20 m in South - West direction. Next, he walks 20m South - East direction. Finally, he turns towards his house. In which direction is he moving?

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



49. Raju leaves his house and walks 12 km towards North. He turns right and walks another 12 km. He turns right, walks 12 km more and turns left to walk 5 km. How far is he from his home and in which direction?

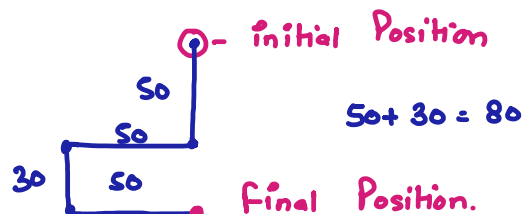
- (a) 7 km east
 (b) 10 km east
 ✓ (c) 17 km east
 (d) 24 km eas



50. A child goes 50 meter towards South and then turning to his right, he goes 50 meter. Then, turning to his left, he goes 30 meter. Again he turns to his left and goes 50 meter. How far is he from his initial position?

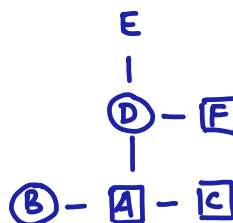
ICAI (a)

- (a) 30 m
 (b) 40 m
 (c) 50 m
 ✓ (d) 80 m



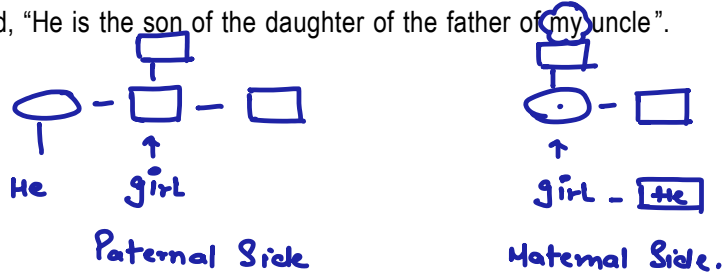
51. D is daughter of E. A is son of D . C is brother of A and B is sister of A . F is brother of D. How F is related to B?

- (a) Father-in -Law
 ✓ (b) Uncle
 (c) Brother
 (d) Mother-in-law



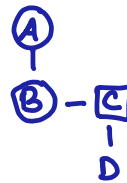
52. Introducing a boy a girl said, "He is the son of the daughter of the father of my uncle".
Who is the boy to the girl?

- (a) Brother
(b) Nephew
(c) Uncle
(d) Son-in-law



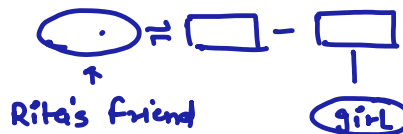
53. It is given that "A is the mother of B; B is the sister of C; C is the father of D". How is A related to D?

- (a) Mother
(b) Grandmother
(c) Aunt
(d) Sister



54. Rita told Mani, "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 Rita's friend ?

- (a) Cousin
(b) Daughter
(c) Niece
(d) Aunt



55. Sanjay has three daughters, and each daughter has a brother. How many male members are there in the family?

- (a) 4
(b) 2
(c) 3
(d) 1



Directions (Q 56-57): Study the following information carefully and answer the questions given below.

- I. P, Q, R, S, T, U and V are sitting on a wall and all of them are facing West.
II. S is on the immediate left of R.

III. T is at an extreme end and has Q as his neighbor. T Q V U S R P

IV. V is between Q and U.

V. S is sitting third from the north end.

Ⓣ Q V U

56. Who is sitting to the left of S ?

(a) Q

☒ (b) U

(c) T

(d) R

57. Which of the following pairs of people are sitting at the extreme ends?

(a) QV

(b) PR

☒ (c) TP

(d) ST

58. Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. Who is sitting immediate right to Reeta?

(a) Bindu

(b) Rani

☒ (c) Mary

(d) Seema

Bindu Seema Rani Reeta Mary

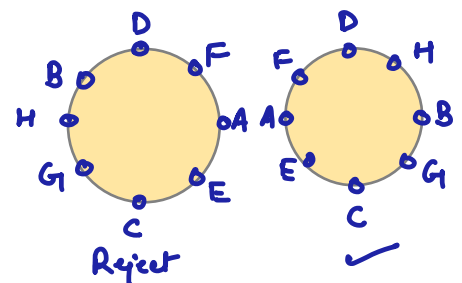
(Directions 59-60) . Four ladies A, B, C and D and four gentlemen E, F, G and H are sitting in circle around a table facing each other

(i) No two ladies or gentlemen are sitting side by side

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

(iii) F is between D and A and facing G

(iv) H is to the right of B



59. Who is immediate neighbor of B ?

- ☒ (a) G and H
- (b) E and F
- (c) A and B
- (d) None of the above

60. Who is sitting left of A

- ☒ (a) F
- (b) E
- (c) C
- (d) D

61. Median of a distribution can be obtained from

- (a) Frequency polygon
- (b) Histogram
- ☒ (c) Ogives
- (d) None of these.

62. The _____ the size of the sample more reliable is the result.

- (a) Medium
- (b) Smaller
- ☒ (c) Larger
- (d) None of these

63. The Standard deviation of the _____ distribution is called standard error.

- (a) Normal
- (b) Poisson
- (c) Binomial
- ☒ (d) Sampling

64. For a set of observations, the sum of absolute deviations is _____, when the deviations are taken from the median.

- (a) Zero
- (b) Maximum
- ☒ (c) Minimum
- (d) None of these

65. For open-end classification, which of the following is the best measure of central tendency?

- (a) AM
- (b) GM
- ☒ (c) Median
- (d) Mode

66. The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is

- ☒ (a) 10
- (b) 20
- (c) 25
- (d) 8.30

$Q_1 \quad Q_2 \quad Q_3$

$$Q.D. = \frac{Q_3 - Q_1}{2} = \frac{65 - 45}{2} = 10$$

Err = 67

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 ^{of y}

- (a) 25
- (b) 30
- ☒ (c) 40
- (d) 20

$$\sigma = 5 \quad \bar{x} = 10$$

$$\sigma_y = 10 \quad \bar{y} = 25$$

$$CV_y = \frac{\sigma_y}{\bar{y}} \times 100$$

$$= \frac{10}{25} \times 100 = 40$$

68. For a moderately skewewd distribution, the median is twice the mean, then the mode is _____ times the median.

- (a) 3
- ☒ (b) 2
- (c) $\frac{2}{3}$

$$\text{Median} = 2 \text{ Mean}$$

$$\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$$

$$= 3 \text{ Median} - \text{Median}$$

$$= 2 \text{ Median}$$

(d) $\frac{3}{2}$

69. If average marks for a group of 30 girls is 80, a group of boys is 70 and combined average $\bar{x} = 76$, then how many boys are in the group?

(a) 21

☒ (b) 20

(c) 22

(d) 19

$$76 = \frac{30 \times 80 + n_2 \times 70}{30 + n_2} \quad \text{GMC}$$

70. The median value of the set of observations 46, 36, 72, 87, 19, 66, 56 and 91

(a) 53

(b) 87

☒ (c) 61

(d) 19

$$19, 36, 48, \underline{56, 66}, 72, 87, 91$$

$$\frac{56 + 66}{2} = \frac{122}{2} = 61$$

71. If two variables a and b are related by $c = ab$ then GM. of c =

(a) GM of a + GM of b

☒ (b) GM of a $\times$ GM of b

(c) GM of a - GM of b

(d) GM of a / GM of b

72. If there are three observations 15, 20, 25 then the sum of deviation of the observations from their AM is.

☒ (a) 0

(b) 5

(c) -5

(d) 10

$$\sum (x_i - \bar{x}) = 0$$

73. The mean weight of 15 students is 110 kg. The mean weight of 5 of them is 100 kg. and of another five students is 125 kg. then the mean weight of the remaining students is :

(a) 120

☒ (b) 105

(c) 115

$$\begin{array}{ccc} n = 15 & \bar{x} = 110 \\ \swarrow & \downarrow & \searrow \\ n_1 = 5 & n_2 = 5 & n_3 = 5 \\ \bar{x}_1 = 100 & \bar{x}_2 = 125 & \bar{x}_3 = ? \end{array}$$

$$15 \times 110 = 5 \times 100 + 5 \times 125 + 5 \times \bar{x}_3$$

(d) None of these

74. If the Arithmetic mean between two numbers is 64 and the Geometric mean between them is 16. The Harmonic Mean between them is _____.

(a) 64

☒ (b) 4

(c) 16

(d) 40

$$\begin{aligned} G_m^2 &= A_m \cdot H_m \\ 16^2 &= 64 \cdot H_m \\ 4 \cdot \cancel{256} &= 64 \cdot H_m \end{aligned}$$

75. The regression coefficients remain unchanged due to

☒ (a) Shift to origin

(b) Shift to scale

(c) Always

(d) Never

76. If the plotted points in a scatter diagram lie from upper left to lower right, then the correlation is

(a) Positive

(b) Zero

☒ (c) Negative

(d) none of these.



77. The covariance between two variables is

(a) Strictly positive

(b) Strictly negative

(c) Always 0

☒ (d) Either positive or negative or zero.

78. If the coefficient of correlation between two variables is -0.9 , then the coefficient of determination is

(a) 0.9

☒ (b) 0.81

(c) 0.1

$$r^2 = (-0.9)^2 = 0.81$$

(d) 0.19.

79. For a probability of a random variable x is given below :

X: x_i	1	2	4	5	6
P: P_i	0.15	0.25	0.2	0.3	0.1

What is the Standard deviation of x ?

(a) 1.49

(b) 1.56

☒ (c) 1.69

(d) 1.72

$$\sqrt{\sum P_i x_i^2 - (\sum P_i x_i)^2}$$

$$\sqrt{15.45 - (3.55)^2} \Rightarrow \sqrt{2.8475} = 1.6875$$

80. Given that for two events A and B, $P(A) = 3/5$, $P(B) = 2/3$ and $P(A \cup B) = 3/4$, what is $P(A/B)$?

(a) 0.655

(b) 13/60

(c) 31/60

☒ (d) 0.775

$$P(A/B) = \frac{P(A \cap B)}{P(B)}$$

$$= \frac{\frac{31}{60} \times \frac{2}{3}}{\frac{2}{3}} = \frac{31}{40} = 0.775$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\frac{3}{4} = \frac{3}{5} + \frac{2}{3} - P(A \cap B)$$

$$P(A \cap B) = \frac{3}{5} + \frac{2}{3} - \frac{3}{4}$$

$$= \frac{36 + 40 - 45}{60}$$

$$= \frac{31}{60}$$

$$= \frac{31}{60}$$

81. If $2x + 3y + 4 = 0$ and $V(x) = 6$ then $V(y)$ is

☒ (a) 8/3

(b) 9

(c) 9

(d) 6

$$V_x = 6 \quad V_y = \left(-\frac{2}{3}\right)^2 = \frac{4}{9} \times 6^2 = \frac{8}{3}$$

82. X and Y stand in a line with 6 other people. What is the probability that there are 3 persons between them?

(a) 1/5

(b) 1/6

☒ (c) 1/7

(d) 1/3

x . . . y . . .

$$\frac{4 \times 2! \times 6!}{8!} = \frac{4 \times 2 \times 6!}{8 \times 7 \times 6!} = \frac{1}{7}$$

83. Four unbiased coins are tossed simultaneously. The expected number of heads is :

X: x_i	0	1	2	3	4
P(x) p_i	1/16	4/16	6/16	4/16	1/16

- (a) 1
(b) 2
(c) 3
(d) 4

$$\sum p_i x_i =$$

$$4 \times \frac{1}{2} = 2$$

84. Assume that the probability for rain on a day is 0.4. An umbrella salesman can earn ₹ 400 per day in case of rain on that day will lose ₹ 100 per day if there is no rain. The expected earnings (in ₹) per day of the salesman is .

- (a) 400
(b) 200
(c) 100
(d) 0

$$\begin{array}{ccc} x_i & 400 & -100 \\ p_i & 0.4 & 0.6 \end{array}$$

$$400 \times 0.4 - 100 \times 0.6$$

85. The covariance between two variables X and Y is 8.4 and their variances are 25 and 36 respectively. Calculate Karl Pearson's coefficient of correlation between them.

- (a) 0.82
(b) 0.28
(c) 0.01
(d) 0.09

$$\text{Cov}(x, y) = 8.4 \quad \sigma_x = 5 \quad \sigma_y = 6$$

$$r = \frac{\text{Cov}(x, y)}{\sigma_x \sigma_y} = \frac{8.4}{5 \times 6} \Rightarrow \frac{8.4}{30} = 0.28$$

86. What is the probability of getting 3 heads if 6 unbiased coins are tossed simultaneously?

- (a) 0.3125
(b) 0.25
(c) 0.6825
(d) 0.50

$${}^6C_3 \left(\frac{1}{2}\right)^3 \left(\frac{1}{2}\right)^3 \quad \text{Head} = \frac{1}{2}$$

$$\frac{6 \times 5 \times 4}{6} \times \frac{1}{2^6} = \frac{5}{16} \Rightarrow$$

87. The mode of the binomial distribution for which the mean is 4 variance 3 is equal to?

- (a) 4
(b) 4.5

$$\begin{array}{ll} np = 4 & npq = 3 \\ n \cdot \frac{1}{4} = 4 & q = \frac{3}{4} \quad p = \frac{1}{4} \\ n = 16 & \end{array}$$

$$\text{Mode} = (n+1)p \Rightarrow \frac{17}{4} = 4.25$$

- (c) 4.25
(d) 4.1
88. For Poisson Distribution :
- (a) Mean and Standard Deviation are equal
☒ (b) Mean and Variance are equal
(c) Standard Deviation and Variance are equal
(d) Both (a) and (b) are equal
89. If a variate x has, $\text{mean} > \text{variance}$, then the distribution will be ____
- ☒ (a) Binomial Distribution
(b) Poisson Distribution
(c) Normal Distribution
(d) T-Distribution
90. An example of a bi-parametric continuous probability distribution
- (a) Binomial
(b) Poisson
☒ (c) Normal
(d) Chi-square

91. For a poisson variate X , $P(x=2) = 3 P(x=4)$, then the standard deviation of X is

(a) 2

(b) 4

☒ (c) $\sqrt{2}$

(d) 3

$$\frac{e^{-m} \cdot m^2}{2!} = 3 \cdot \frac{e^{-m} \cdot m^4}{4!} \quad m^2$$

$$\frac{1}{2} = \frac{3 \cdot m^2}{4 \times 3 \times 2} \quad m^2 = 4 \quad m = 2 \quad SD = \sqrt{2}$$

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

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

☒ (a) 10

(b) 4

- (c) 40
- (d) none of these

93. The ^{absolute}diviations are minimum when taken from

- (a) Mean
- ☒ (b) Median
- (c) Mode
- (d) GM

94. Histogram is useful to determine graphically the value of

- (a) Arithmetic Mean
- (b) Median
- ☒ (c) Mode
- (d) HM

95. If x and y are related as $3x-4y = 20$ then the Quartile deviation of x is 12, then the Quartile deviation of y is :

$$QD_x = 12 \quad QD_y = \frac{3}{4} \times 12 = 9$$

- (a) 14
- (b) 15
- (c) 16
- ☒ (d) 9

96. The base year _____

- ☒ (a) Is the reference year from which changes in the index are measured
- (b) Is always last year
- (c) Is the first year the index is created
- (d) Is the current year the index is created

97. Monthly salary of an employee was ₹ 10,000 in the year 2000 and it was increased to ₹ 20,000 in the year 2013 while the consumer price index number is 240 in year 2013 with the base year 2000, what should be his salary in comparison of consumer price index in the year 2013 ?

- (a) 2,000
- (b) 16,000

Year	Index	Salary
2000	100	10,000
2013	240	20,000

21

$$\frac{240}{100} \times 10,000 = 24,000$$

☒ (c) 24,000

(d) None

98. Find the Paasche's Index number for prices from the following

Commodity	Base year		Current year	
	Price P_0	Commodity Q_0	Price P_1	Commodity Q_1
A	1	6	3	5
B	3	5	8	5
C	4	8	10	6

☒ (a) 261.36

(b) 265.48

(c) 274.32

(d) 282

$$\frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100 \Rightarrow \frac{115}{44} \times 100$$

99. Index numbers are not helpful in

(a) Framining Economic Policies

(b) Revealing Trend

(c) Forecasting

☒ (d) Identifying errors

100. The weight average of price relatives of commodities when the weight is equal to the value of commodities in base year yields _____ index number

(a) Fisher's Ideal

☒ (b) Laspyres

(c) Paasches

(d) Marshall-Edgeworth