

PAPER 3 : QUANTITATIVE APTITUDE

1. Ans. d

Explanation:

$$E = \left[\left(1 + \frac{r}{100} \right)^n - 1 \right] \times 100$$

$$= \left[\left(1 + \frac{6}{200} \right)^2 - 1 \right] \times 100 = 6.09\%$$

2. Ans. d

Explanation:

$$A = P \left(1 + \frac{r}{100} \right)^n$$

$$1 = P \left(1 + \frac{10}{100} \right)^2$$

$$P = 0.83$$

3. Ans. b

Explanation:

JGW

By Option (b)

4. Ans. b

Explanation:

5km

By Option (b)

5. Ans. d

Explanation:

NPSV

By Option (d)

6. Ans. a

Explanation:

6217

By Option (a)

7. Ans. a

Explanation:

Third to the right

By Option (a)

8. Ans. a

Explanation:

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DKUEWKV
 By Option (a)

9. Ans. c
 Explanation:
 North – west
 By Option (c)

10. Ans. a
 Explanation:

$$A = P \left(1 + \frac{r}{100} \right)^n$$

$$A = 50,000 \left(1 + \frac{2}{100} \right)^2$$

$$= 52,020$$

11. Ans. b
 Explanation :

$$A = P \left(1 + \frac{r}{100} \right)^n$$

$$121 = 100 \left(1 + \frac{r}{100} \right)^2$$

$$r = 10\%$$

12. Ans. d
 Explanation:
 SI for 2 years = 5,680 – 5,200 = 480
 SI for 5 years = $\frac{480}{2} \times 5 = 1,200$
 $P = 5,200 - 1,200 = \text{Rs. } 4,000$
 $\text{Rate} = \frac{100 \times 1,200}{4,000 \times 5} = 6\%$

13. Ans. c
 Explanation:
 Rs. 7,500
 By Option (c)

14. Ans. c
 Explanation:

$$\frac{P_n}{P_{n-1}} \times 100$$
 By Option (c)

15. Ans. b
 Explanation:

$$\frac{1}{25}$$

By Option (b)

16. Ans. c
 Explanation:
 Median
 By Option (c)

17. Ans. a
 Explanation:
 Mean
 By Option (a)

18. Ans. a
 Explanation:
 true
 By Option (a)

19. Ans. b
 Explanation:
 Let $x = \sqrt{2 + \sqrt{2 + \sqrt{2 + \dots \infty}}}$
 $x = \sqrt{2 + x}$
 $x^2 = 2 + x$
 $x^2 - x - 2 = 0$
 $x = -1, 2$
 -1 (not possible)

20. Ans. a
 Explanation:
 Let the breadth (B) of the rectangle is x cm,
 So that the length (L) = x + 4cm.
 Perimeter = 2(L + B)
 = 2(x + x + 4) = 4x + 8
 Given, perimeter = breadth + 11 = x + 11
 $\therefore 4x + 8 = x + 11 \Rightarrow 3x = 3 \Rightarrow x = 1$ i.e., breadth = 1 cm
 $\therefore$ length = 1 + 4 = 5 cm

21. Ans. a
 Explanation:

$$P = \frac{R}{r} [1 - (1 + r)^{-n}]$$

$$5,00,000 = \frac{R}{.08} [1 - (1 + 0.8)^{-3}]$$
 R = Rs. 1,94,016.75

22. Ans. b
 Explanation:

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The number of straight lines

$$= {}^nC_2 - {}^xC_2 + 1$$

$$= {}^{15}C_2 - {}^6C_2 + 1 = 91$$

23. Ans. c

Explanation:

The no. of arrangements = Total no. of arrangements – Two 'o's come together-

$$= \frac{6!}{2!} - 5! = 240$$

24. Ans. d

Explanation:

$$\text{Number of ways} = {}^6C_3 \times {}^5C_2 = 200$$

25. Ans. d

Explanation:

$$\text{Different words can be formed} = \frac{11!}{4!4!2!}$$

$$S = 4, P = 2, I = 4$$

26. Ans. c

Explanation:

By option (c)

27. Ans. b

Explanation:

$$9, G, G_2, G_3, G_4, 288$$

$$l = ar^{n-1}$$

$$288 = 9r^5$$

$$r^5 = 2^5$$

$$r = 2$$

$$G_1 = ar = 9 \times 2 = 18$$

$$G_2 = ar^2 = 9 \times 4 = 36$$

$$G_3 = ar^3 = 9 \times 8 = 72$$

$$G_4 = ar^4 = 9 \times 16 = 144$$

28. Ans. b

Explanation:

$$\log_{10} 80 = \log_{10} (8 \times 10)$$

$$= \log_{10} (2 \times 4 \times 10)$$

$$= \log_{10} 2 + \log_{10} 4 + \log_{10} 10$$

$$= x + y + 1$$

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29. Ans. d
 Explanation:
 By option (d)

30. Ans. a
 Explanation:

$$\frac{2^{n+3} - 10 \times 2^{n+1}}{2^{n+1} \times 6}$$

$$= \frac{2^n \times 2^3 - 10 \times 2^n \times 2}{2^{n+1} \times 2 \times 6}$$

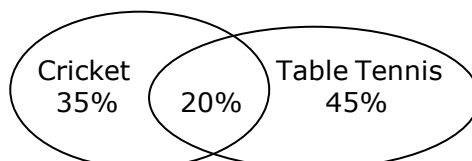
$$= \frac{8 - 20}{12} = \frac{-12}{12} = -1$$

31. Ans. a
 Explanation:

$$\text{Compound annual growth rate} = \left[\frac{v(t_n)}{v(t_o)} \right]^{\frac{1}{t_n - t_o}} - 1$$

$$= \left(\frac{210}{100} \right)^{\frac{1}{4}} - 1 = 26.98\%$$

32. Ans. b
 Explanation:



$$\begin{aligned} \text{No. of students can play cricket} &= 35\% + 20\% \\ &= 55\% \text{ of } 120 \\ &= 66 \end{aligned}$$

33. Ans. d
 Explanation:

$$\begin{aligned} \int \frac{dx}{x + \sqrt{x^2 - 1}} &= \int \frac{x - \sqrt{x^2 - 1}}{(x + \sqrt{x^2 - 1})(x - \sqrt{x^2 - 1})} dx \\ &= \int (x - \sqrt{x^2 - 1}) dx \\ &= \frac{x^2}{2} - \frac{x}{2} \sqrt{x^2 - 1} + \frac{1}{2} \log(x + \sqrt{x^2 - 1}) + C \end{aligned}$$

34. Ans. c
 Explanation:

$$\int_1^2 (x^2 - 5x + 2) dx$$

$$= \left[\frac{x^3}{3} - \frac{5x^2}{2} + 2x \right]_1^2 = -\frac{19}{6}$$

35. Ans. c

Explanation:

$$\begin{aligned} \frac{d}{dx}(x^2 \log x) \\ = x^2 \cdot \frac{1}{x} + 2x \log x \\ = x(1 + 2 \log x) \end{aligned}$$

36. Ans. c

Explanation:

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

37. Ans. a

Explanation:

Co-variance may be positive, negative or zero false

38. Ans. d

Explanation:

The difference between the observed value and the estimated value in regression analysis is known as error or residue

39. Ans. a

Explanation:

The two lines of regression meet at $(\bar{x}, \bar{y})$

40. Ans. a

Explanation:

$$5x + 7y - 22 = 0$$

$$6x + 2y - 22 = 0$$

$$r = \sqrt{\frac{10}{42}}$$

$$b_{yx} = \frac{-5}{7}$$

$$b_{xy} = -\frac{2}{6} \quad -\frac{5}{7} = -\frac{\sqrt{\frac{10}{42}} \times \sqrt{15}}{\sigma_x} \quad \sigma_x = 2.646$$

41. Ans. b

Explanation:

$$b_{yx} = \frac{r \times \sigma_y}{\sigma_x}$$

$$-\frac{3}{4} = -\frac{\sqrt{\frac{3}{2}} \times 2}{\sigma x}$$

$$\sigma x = \sqrt{\frac{16}{3}}$$

$$V_x = \frac{16}{3}$$

42. Ans. a
 Explanation:
 (3,4)(4,3) (2,6) (6,2)
 $= \frac{4}{36}$

43. Ans. d
 Explanation:
 $\frac{5c_3}{12c_3} \times \frac{7c_3}{12c_3} = \frac{7}{968}$
 $\frac{5c_3}{12c_3} \times \frac{7c_3}{12c_3} = \frac{5}{264}$

44. Ans. c
 Explanation:
 Standard normal distribution have inflexion points – 1 & +1.

45. Ans. c
 Explanation:
 $A = \frac{4}{5} \quad A' = \frac{1}{5}$
 $B = \frac{3}{4} \quad B' = \frac{1}{4}$
 $AB' + BA' = \frac{7}{20}$

46. Ans. b
 Explanation:
 SM
 MT
 TW
 WT 53 Saturday = $\frac{2}{7}$
 TF
 FS
 SS

47. Ans. d

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Explanation:

$E(x - \mu)^2$ and $E[x - E(x)]^2$ both are known as variance

48. Ans. b

Explanation:

$\beta(n, p)$ it is Biparametric and Parameters are n and p

49. Ans. d

Explanation:

$$np = 3$$

$$\sqrt{npq} = 1.5$$

$$3q = 2.25$$

$$q = \frac{2.25}{3} \quad q = 0.75, p = 0.75 \text{ so } n = 12$$

50. Ans. a

Explanation:

$$np = 4$$

$$npq = 3$$

$$4q = 3$$

$$q = \frac{3}{4} \quad p = \frac{1}{4} \text{ so } n = 16$$

$$\text{mod } e = (16 + 1) \frac{1}{4} = \frac{17}{4} = (4)$$

51. Ans. c

Explanation:

Rs. 3,500

By Option (c)

52. Ans. c

Explanation:

Fisher's index number

By Option (c)

53. Ans. b

Explanation:

frequency

By Option (b)

54. Ans. a

Explanation:

True

By Option (a)

55. Ans. c

Explanation:

both

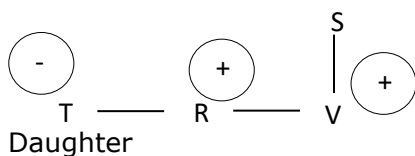
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- By Option (c)
56. Ans. a
 Explanation:
 nth
 By Option (a)
57. Ans. b
 Explanation:
 45 cm
 By Option (b)
58. Ans. c
 Explanation:
 900.09
 By Option (c)
59. Ans. c
 Explanation:
 10
 By Option (c)
60. Ans. c
 Explanation:
 $\sum x^2 = n(\sigma^2 + \bar{x}^2)$
 By Option (c)
61. Ans. a
 Explanation:
 Origin
 By Option (a)
62. Ans. c
 Explanation:
 CV
 By Option (c)
63. Ans. c
 Explanation:
 4
 By Option (c)
64. Ans. c
 Explanation:
 13.5
 By Option (c)
65. Ans. b
 Explanation:
 107.14
 By Option (b)

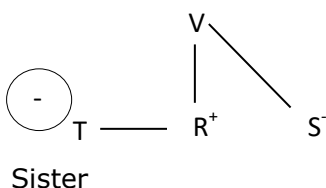
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66. Ans. a
 Explanation:
 $\frac{5}{3}$
 By Option (a)
67. Ans. a
 Explanation:
 Mean = Median = Mode
 By Option (a)
68. Ans. c
 Explanation:
 Product of extreme terms = product of mean terms
 $(23 - x)(78 - x) = (30 - x)(57 - x)$
 $x = 6$
69. Ans. c
 Explanation :
 $A = P \left(1 + \frac{r_1}{100}\right) \left(1 + \frac{r_2}{100}\right) \left(1 + \frac{r_3}{100}\right)$
 $550 = P \left(\frac{109}{100}\right) \left(\frac{106}{100}\right) \left(\frac{103}{100}\right)$
 $P = 462.16$
70. Ans. b
 Explanation :
 $A = P \left(1 + \frac{r}{100}\right)^n$
 $= 8000 \left(1 + \frac{5}{100}\right)^3$
71. Ans. a
 Explanation:
 ${}^{10}C_5 \left(\frac{1}{2}\right)^{10}$
72. Ans. b
 Explanation:
 Mean = $6 \times \frac{1}{2} = 3$
 $SD = \sqrt{6 \times \frac{1}{2} \times \frac{1}{2}} = 1.22$
73. Ans. d

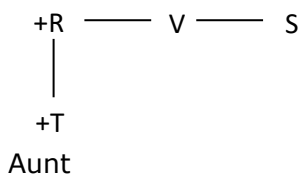
Explanation:



74. Ans. b
 Explanation:



75. Ans. a
 Explanation:



76. Ans. a
 Explanation:
 South

77. Ans. c
 Explanation:
 "The less than Ogive" is a S-shaped curve

78. Ans. c
 Explanation:
 The most stable measure of central tendency is mean

79. Ans. a
 Explanation:

$$A.M. = \frac{6+8+12+36}{4} = 15.5$$

$$G.M. = (6 \times 8 \times 12 \times 36)^{1/4} = 12$$

80. Ans. a
 Explanation:
 $\sigma x = 3$
 $y = 5 - 2x$
 $\sigma y = \frac{2}{1} \times 3 = 6$
 $vy = 36$

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81. Ans. c

Explanation:

$$\begin{aligned} f(x) &= {}^x C_2 \\ &= \frac{x(x-1)}{2} \\ &= \frac{x^2 - x}{2} \\ f'(x) &= \frac{2x-1}{2} \\ f'(3) &= \frac{2 \times 3 - 1}{2} = \frac{5}{2} \end{aligned}$$

82. Ans. b

Explanation:

$$\begin{aligned} \mathbf{fog(x)} &= \mathbf{f[g(x)]} \\ &= f\left[\frac{1}{1-x}\right] \\ &= \frac{\frac{1}{1-x} - 1}{\frac{1}{1-x}} \\ &= x \end{aligned}$$

83. Ans. d

Explanation:

Relation R is Symmetric and Transitive but not Reflexive because (3,3) does not belong to R.

84. Ans. b

Explanation:

$$\begin{aligned} \alpha - \beta &= \sqrt{(\alpha + \beta)^2 - 4\alpha\beta} \\ &= \sqrt{(7)^2 - 4(-9)} = \sqrt{85} \end{aligned}$$

85. Ans. c

Explanation:

By Option (c)

86. Ans. d

Explanation:

$$\begin{aligned} x^2 - (\text{sum of roots})x + \text{product of roots} &= 0 \\ x^2 - (2 - \sqrt{3} + 2 + \sqrt{3})x + (2 - \sqrt{3})(2 + \sqrt{3}) &= 0 \\ x^2 - 4x + 1 &= 0 \end{aligned}$$

87. Ans. b

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Explanation:
 By Option (b)

88. Ans. a

Explanation:

	Machine I	Machine II	
Grade A	2	3	≥ 14
Grade B	1	4	≥ 12

$$2x + 3y \geq 14$$

$$x + 4y \geq 12$$

89. Ans. d

Explanation:

a, x, c are in A. P. Then,

$$2x = a + c$$

$$a + c = 50 \dots\dots (i)$$

a, y, c are in G.P. Then,

$$y^2 = ac$$

$$49 = ac \dots\dots (ii)$$

On solving equation (i) and (ii)

$$a = 1, c = 49$$

90. Ans. a

Explanation:

$$a = 5,00,000, d = 15,000$$

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

$$= \frac{10}{2} [2 \times 5,00,000 + (10 - 1) 15,000]$$

$$= \text{Rs. } 56,75,000$$

91. Ans. d

Explanation:

$$A^{\frac{1}{2}} \times A^{\frac{1}{4}} \times A^{\frac{1}{8}} \dots\dots\dots \infty$$

$$= A^{\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots\dots\dots \infty}$$

$$S_{\infty} = \frac{a}{1 - r}$$

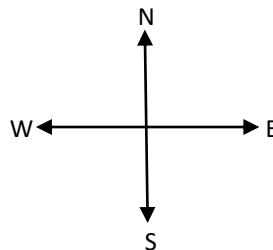
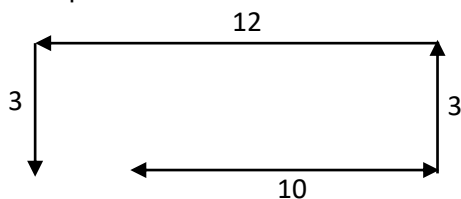
$$= A^{\frac{\frac{1}{2}}{1 - \frac{1}{2}}} = A$$

92. Ans. b

Explanation:

$$\text{White} = 4$$

93. Ans. c
Explanation:



94. Ans. b
Explanation:

$$CI = 60000 \left(1 + \frac{6}{100}\right) \left(1 + \frac{8}{100}\right) \left(1 + \frac{10}{100}\right) - 60,000 = \text{Rs. } 15,556.80$$

95. Ans. a
Explanation:

$$3P = P \left(1 + \frac{r \times 8}{100}\right)$$

$$r = 25\%$$

$$5P = P \left(1 + \frac{25 \times t}{100}\right)$$

$$t = 16 \text{ years}$$

96. Ans. c
Explanation:

$$1Rs. : 50P : 25P$$

$$4x, 5x, 6x$$

$$4x + \frac{250x}{100} + \frac{150x}{100} = 120$$

$$x = 15$$

$$\text{The number of coins of 25 paisa} = 6 \times 15 = 90$$

97. Ans. c
Explanation:
 $A : B = 4 : 5] \times 7$
 $B : C = 7 : 8] \times 5$
 $A : B : C = 28 : 35 : 40$

98. Ans. c
Explanation:
 $A = \{1, 2, 3\}$
Subsets of A = Power set of A
 $\{\phi, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{2, 3\}, \{1, 3\}, \{1, 2, 3\}\}$

99. Ans. a

Explanation:

$$\frac{1}{1 + \frac{a^x}{a^y}} + \frac{1}{1 + \frac{a^y}{a^x}}$$
$$= \frac{a^y}{a^y + a^x} + \frac{a^x}{a^x + a^y} = \frac{a^x + a^y}{a^x + a^y} = 1$$

100. Ans. b

Explanation:

$$A = P \left(1 + \frac{r}{100} \right)^n$$

$$2000 = P \left(1 + \frac{8}{100} \right)^4$$

$$P = \text{Rs. } 1470.06$$

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