

PAPER 3 : QUANTITATIVE APTITUDE

1. Ans. a
Explanation:
Purchasing power of money is inversely proportional to price index number.
2. Ans. a
Explanation:
Age of applicants for life insurance and the premium of insurance-correlation positive
3. Ans. c
Explanation:
The area of a normal Curve is Unity.
4. Ans. b
Explanation:
Less than ogive & more than Ogive intersect at a point called MEDIAN or we can say second quartile.
5. Ans. b
Explanation:
The algebraic sum of deviations taken from mean is zero.
Example:

X_i	$(X_i - \bar{X})$	$\bar{X} = \frac{\sum X_i}{n}$
10	-10	
20	0	
30	10	
	0	
		$= \frac{10 + 20 + 30}{3}$
		$= 20$

Therefore $\sum (X_i - \bar{X}) = 0$
6. Ans. a
Explanation:
Laspeyre's Price Index is based on base year Quantity.
Since Formula is $L = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$
Hence Q_0 is constant.
7. Ans. b
Explanation:
Box-head is the entire upper part of the table which includes columns and sub-column and unit of measurement.
8. Ans. a
Explanation:
 $Q.D < M.D. < S.D$
9. Ans. a
Explanation:
Standard Deviation is independent of change of Origin.

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10. Ans. b
 Explanation:
 If two variable are uncorrelated then regression lines are Perpendicular.
11. Ans. b
 Explanation:
 Correlation coefficient between x and y is equal to G.M of regression coefficients.
12. Ans. c
 Explanation:
 To check the consistency of two data which measure of dispersion will be used CV.
13. Ans. d
 Explanation:

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

$$= \left[\left(1 + \frac{6}{200} \right)^2 - 1 \right] \times 100 = 6.09\%$$
14. Ans. d
 Explanation:
 No. of ways = ${}^7C_4 \times {}^3C_2 + {}^7C_3 \times {}^3C_3$
 $= 105 + 35 = 140$
15. Ans. d
 Explanation:
 $(a, a), (b, b), (c, c) \in R$
 So R is a reflexive relation
 But $(a, b) \in R$ and $(b, a) \notin R$
 Thus, R is not a symmetric relation.
 Also, $(a, b), (b, c) \in R \Rightarrow (a, c) \notin R$
 Hence R is not a transitive relation
16. Ans. b
 Explanation:
 Mean Proportion

$$= \sqrt{\frac{a-b}{a+b} \times \frac{a^2 b^2}{a^2 - b^2}}$$

$$= \frac{ab}{a+b}$$
17. Ans. c
 Explanation:
 Total line can be made by ${}^{10}C_2$
 and 7C_2 lines could not be drawn because points are collinear
 So Remaining $\Rightarrow {}^{10}C_2 - {}^7C_2 + 1$
 $\Rightarrow 25$

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18. Ans. a
 Explanation:
 Which one of the following mean cannot be determined by graphic method.
19. Ans. c
 Explanation:
 $x^2 + x + 2 = 0$
 $\alpha + \beta = -1, \alpha \beta = 2$
 $(\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2 \alpha \beta$
 $1 = \alpha^2 + \beta^2 + 4$
 $\alpha^2 + \beta^2 = -3$
 $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} = \frac{\alpha^2 + \beta^2}{\alpha \beta} = \frac{-3}{2}$
20. Ans. c
 Explanation:
 $S_{\infty} = \frac{a}{1-r}$
 $a = 2, b = \frac{6}{5}$
 $ab = \frac{12}{5}$
21. Ans. c
 Explanation:
 $\sum x^2 = n(\sigma^2 + \bar{x}^2)$
22. Ans. d
 Explanation:
 Mean < Variance
23. Ans. b
 Explanation:
 $(A \cup B)'$
 $= A' \cap B'$
 $= B - A$
24. Ans. b
 Explanation:
 Sum of male and female employees Can not be more than ten so option (b) shows right inequality.
25. Ans. a
 Explanation:
 One root = α
 Other root = α
 Sum = $4\alpha = \frac{-b}{a}$

$$\alpha = \frac{-b}{4a}$$

$$\text{Product} = 3 \alpha^2 = \frac{c}{a}$$

$$\alpha^2 = \frac{c}{3a}$$

$$\frac{b^2}{16a^2} = \frac{c}{3a}$$

$$3b^2 = 16ac$$

26. Ans. c
 Explanation:

$$D = P \left(\frac{R}{100} \right)^2$$

$$768 = P \left(\frac{8}{100} \right)^2$$

$$P = 1,20,000$$

27. Ans. c
 Explanation:

$$A = \{ 1, 2, 3 \}$$

Subsets of A = Power set of A

$$\{ \phi, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{2, 3\}, \{1, 3\}, \{1, 2, 3\} \}$$

28. Ans. b
 Explanation:

$$\text{Let the sum be Rs. } x. \text{ Then, } \left(\frac{x \times 10 \times 7}{100 \times 2} \right) - \left(\frac{x \times 12 \times 5}{100 \times 2} \right) = 40$$

$$\Leftrightarrow \frac{7x}{20} - \frac{3x}{10} = 40 \Leftrightarrow x = (40 \times 20) = 800.$$

Hence, the sum is Rs. 800.

29. Ans. b
 Explanation:

$$T_5 = a + 4d = 14 \dots\dots\dots (i)$$

$$T_{12} = a + 11d = 35 \dots\dots\dots (ii)$$

On solving equation (i) and (ii)

$$a = 2$$

30. Ans. c
 Explanation:

$$\begin{aligned} \text{The no. of ways} &= {}^4P_3 \times 4! \\ &= 24 \times 24 = 576 \end{aligned}$$

31. Ans. b
 Explanation:
 $-2x + 3y \geq 6$ Cuts on X axis $(-3, 0)$
 Y axis $(0, 2)$
 and y is more than x so option (B) is Correct.
32. Ans. d
 Explanation:
 $r = -3$
 $S_{\infty} = \frac{a}{1-r}, -1 < r < 1$
33. Ans. d
 Explanation:
 $A = P \left(1 + \frac{r}{100} \right)^n$
 $1 = P \left(1 + \frac{10}{100} \right)^2$
 $P = 0.83$
34. Ans. d
 Explanation:
 SI for 2 years = $5,680 - 5,200 = 480$
 SI for 5 years = $\frac{480}{2} \times 5 = 1,200$
 $P = 5,200 - 1,200 = \text{Rs. } 4,000$
 Rate = $\frac{100 \times 1,200}{4,000 \times 5} = 6\%$
35. Ans. b
 Explanation:
 $= \log_{60} 3 + \log_{60} 4 + \log_{60} 5$
 $= \log_{60} 60 = 1$
36. Ans. c
 Explanation:
 $1Rs. : 50P : 25P$
 $4x, 5x, 6x$
 $4x + \frac{250x}{100} + \frac{150x}{100} = 120$
 $x = 15$
 The number of coins of 25 paisa = $6 \times 15 = 90$
37. Ans. d
 Explanation:
 Different words can be formed = $\frac{11!}{4!4!2!}$

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

38. Ans. c

Explanation:

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

$$\frac{25}{16} P = P \left(1 + \frac{r}{100} \right)^2$$

$$\left(\frac{5}{4} \right)^2 = \left(1 + \frac{r}{100} \right)^2$$

$$\frac{5}{4} = 1 + \frac{r}{100}$$

$$r = 25\%$$

39. Ans. a

Explanation :

Black Red + White Ball

$$\frac{3}{6}$$

$$3C_1 \times 6C_2 + 3C_2 \times 6C_1 + 3C_3 = 64$$

40. Ans. c

Explanation :

$$(A-B) \cup c$$

$$\{2, 6, 9\} \cup \{2, 6, 8\}$$

$$= \{2, 6, 8, 9\}$$

41. Ans. d

Explanation :

$$\log_3 x + \log_3 x = \frac{3}{2}$$

$$\log_3 x \times \frac{3}{2} = \frac{3}{2}$$

$$\log_3 x = 1$$

$$x = 3$$

42. Ans. a

Explanation :

Let cost of one chair and one table are x and y respectively, then

$$5x + 3y = 350 \dots\dots (i)$$

$$3x + 5y = 370 \dots\dots (ii)$$

on solving eqⁿ (i) and eqⁿ (ii)

$$x = 40, y = 50$$

Cost of one table and two chairs is Rs. 130

43. Ans. a

Explanation:

If (b+c), (c+a), (a+b) are in A.p.

$$\text{Then } 2(c+a) = b+c+a+b$$

$$2b = a+c$$

44. Ans. a
 Explanation :
 No. of diagonals = $n_{c_2} - n$

45. Ans. a
 Explanation :
 $n(A \times B) = n(A) \times n(B)$
 $= 5 \times 3 = 15$

46. Ans. a
 Explanation:
 $5x + 7y - 22 = 0$
 $6x + 2y - 22 = 0$
 $r = \sqrt{\frac{10}{42}}$
 $byx = \frac{-5}{7}$
 $bxy = -\frac{2}{6} \quad -\frac{5}{7} = -\frac{\sqrt{\frac{10}{42}} \times \sqrt{15}}{\sigma x} \quad \sigma x = 2.64 \quad 6$

47. Ans. b
 Explanation:
 Coefficient of range = $\frac{L - S}{L + S}$
 Where $L \rightarrow$ for largest value
 $S \rightarrow$ for smallest value
 Coefficient of range = $\frac{40 - 10}{40 + 10} = \frac{30}{50} = \frac{3}{5}$

48. Ans. b
 Explanation:
 $G.M. = (2 \times 2^2 \times 2^3 \times 2^4 \times 2^5 \times 2^6)^{1/6}$
 $= 2^{7/2}$

49. Ans. b
 Explanation:
 Revised salary = $\frac{200}{110} \times 325 = 590.90$
 It means worker is in loss.

50. Ans. d
 Explanation:
 Regression coefficient are independent of change of origin but not scale (As per Fundamental Principle)

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51. Ans. d

Explanation:

$$m = 150 \times \frac{2}{100} = 3 \quad p(\text{more than } 2) = 1 - \frac{e^{-3}3^0}{0!} - \frac{e^{-3}3^1}{1!} - \frac{e^{-3}3^2}{2!}$$

$$= 1 - \frac{e^{-3}3^0}{0!} - \frac{e^{-3}3^1}{1!} - \frac{e^{-3}3^2}{2!} = 0.58$$

52. Ans. b

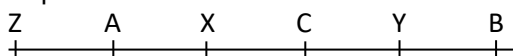
Explanation:

$$\alpha - \beta = \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$$

$$= \sqrt{(7)^2 - 4(-9)} = \sqrt{85}$$

53. Ans. a

Explanation:



54. Ans. c

Explanation:

$$H + 2 = J$$

$$O + 2 = Q$$

$$N + 2 = P$$

$$E + 2 = G$$

$$Y + 2 = A$$

Now,

$$V - 2 = T$$

$$C - 2 = A$$

$$T - 2 = R$$

$$I - 2 = G$$

$$G - 2 = E$$

$$V - 2 = T$$

$$U - 2 = S$$

55. Ans. c

Explanation:

$$\text{MINK} - \text{M} = \text{INK}$$

56. Ans. d

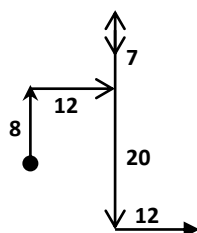
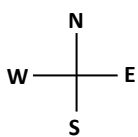
Explanation:

$$C + 2 = E + 2 = G + 2 = I$$

Then, J180P is wrong.

57. Ans. b

Explanation:

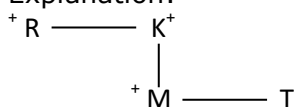


Correct direction SE
 But best option South

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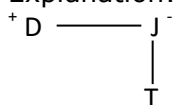
58. Ans. b

Explanation:



59. Ans. a

Explanation:



60. Ans. c

Explanation:

B is the son of C but C is not the mother of B means C is the father of B.

A is married to C means A is the mother of B.

F is the brother of B means F is the son of A and C.

D is daughter of A means D is daughter A and C. A is the mother and hence female. B is the son and hence male. C is the husband and hence male. D is the daughter and hence female. E is the brother and hence male. F is the son and hence male.

So, there are four males.

61. Ans. b

Explanation:

1, 10, 37, 118

$$1 \times 3 + 7 = 10$$

$$10 \times 3 + 7 = 37$$

$$37 \times 3 + 7 = 118$$

$$118 \times 3 + 7 = 361$$

62. Ans. a

Explanation:

$$H + 1 = I \quad \text{Now, } N + 1 = O$$

$$E + 1 = F \quad O + 1 = P$$

$$A + 1 = B \quad R + 1 = S$$

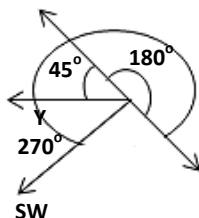
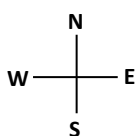
$$L + 1 = M \quad T + 1 = U$$

$$T + 1 = U$$

$$H + 1 = I$$

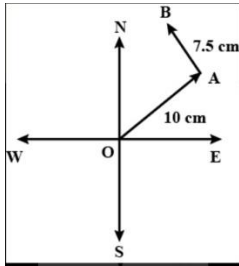
63. Ans. a

Explanation:

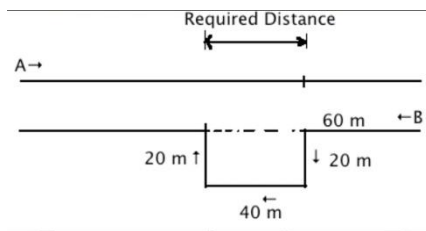


64. Ans. d

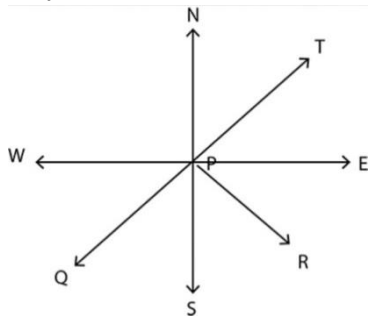
Explanation:



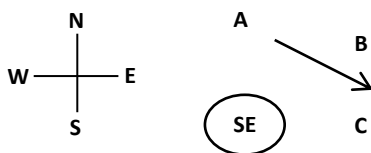
65. Ans. c
Explanation:



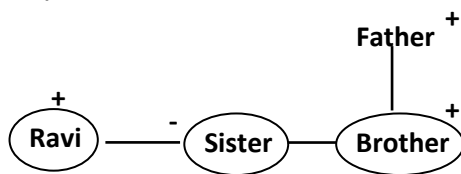
66. Ans. b
Explanation:



67. Ans. b
Explanation:



68. Ans. c
Explanation:



Answer- Sister

69. Ans. c

Explanation:

2nd = (1st + 1) : 3rd = (2nd + 2); 4th = (3rd + 3); 5th = (4th + 4).

But 18 = 6th term not equal ? 5th + 5 = 14 + 5 = 19.

70. Ans. b

Explanation:

The correct pattern is $x \times 2 - 2$.

So, 48 is wrong and must be replaced by $(26 \times 2 - 2)$ i.e. 50.

71. Ans. a

Explanation:

L	N	P	Q	R	M	R
E						I
F						G
T						H

72. Ans. d

Explanation: Let the sides of a triangle are in $6x$, $4x$ and $3x$

Then $6x + 4x + 3x = 52$

$$x = 4$$

The length of the smallest side = $3 \times 4 = 12$ cm

73. Ans. a

Explanation:

Each letter is represented by a particular number, so using the codes already given,

M = 7

O = 2

L = 4

E = 9

K = 5

So, the code for MOLEK is 7 2 4 9 5.

74. Ans. c

Explanation:

$${}^n P_r = r! \cdot {}^n C_r$$

$$2880 = r! \times 120$$

$$r! = 24$$

$$r = 4$$

75. Ans. d

Explanation:

Number of permutations of n distinct objects taken r at a time when a particular

object is not taken in any arrangement is ${}^{n-1}P_r$

$$\text{No. of arrangements} = {}^{14}P_6$$

76. Ans. b

Explanation:

$$\sqrt{\frac{n^2 - 1}{12}} = 2$$

$$\frac{n^2 - 1}{12} = 4$$

$$n = 7$$

77. Ans. d

Explanation :

The candidate can select 8 questions by selecting at last three from each part in the following ways:

(a) 3 questions from part A and 5 questions from part

$$B = {}^7C_3 \times {}^5C_5 = 35 \text{ ways}$$

(b) 4 questions from part A and part B each

$$B = {}^7C_4 \times {}^5C_4 = 175 \text{ ways}$$

(c) 5 questions from part A and questions from part

$$B = {}^7C_5 \times {}^5C_3 = 210 \text{ ways}$$

Hence, the total number of ways in which the candidate can select the question will be $= 35 + 175 + 210 = 420$ ways.

78. Ans. c

Explanation:

$$r = \frac{25}{6 \times 5} = \frac{25}{30} = 0.833$$

79. Ans. c

Explanation:

$$Z = 3m - 2\bar{x}$$

$$18 = 3m - 48$$

$$66 = 3m$$

$$m = 22$$

80. Ans. d

Explanation:

$$50 \times 2850 - 8000 + 7800$$

$$= 2846$$

81. Ans. c

Explanation:

Intersecting point of less than ogive and more than ogive curve Median.

82. Ans. a

Explanation:

The Sum of difference between ranks for spearmen rank correlation coefficient is 0.

83. Ans. a

Explanation :

$$\frac{1}{7!} + \frac{1}{8 \times 7!} = \frac{N}{9 \times 8 \times 7!}$$

$$1 + \frac{1}{8} = \frac{N}{72}$$

$$\frac{9}{8} \times 72 = N$$

$$N = 81$$

84. Ans. d
 Explanation:
 Random Variable can be All of these.
85. Ans. c
 Explanation:
 Skewness of normal distribution is Zero.
86. Ans. c
 Explanation:
 Standard Normal Variate.
87. Ans. c
 Explanation:
 $A : B = 4 : 5] \times 7$
 $B : C = 7 : 8] \times 5$
 $A : B : C = 28 : 35 : 40$
88. Ans. b
 Explanation:
 $9, G, G_2, G_3, G_4, 288$
 $l = ar^{n-1}$
 $288 = 9r^5$
 $r^5 = 2^5$
 $r = 2$
 $G_1 = ar = 9 \times 2 = 18$
 $G_2 = ar^2 = 9 \times 4 = 36$
 $G_3 = ar^3 = 9 \times 8 = 72$
 $G_4 = ar^4 = 9 \times 16 = 144$
89. Ans. c
 Explanation:
 $\frac{d}{dx}(x^2 \log x)$
 $= x^2 \cdot \frac{1}{x} + 2x \log x$
 $= x(1 + 2 \log x)$
90. Ans. b

Explanation:

If rank is in reverse order then spearman rank correlation coefficient is -1.

91. Ans. c

Explanation:

Commodity	R	W	RW
I	110	3	330
II	120	3	360
III	70	1	70
Total		7	760

$$\text{Weighted Price Index} = \frac{\sum RW}{\sum W} = \frac{760}{7} = 108.5$$

92. Ans. a

Explanation:

Chronological classification is classification of units on the basis of time.

93. Ans. a

Explanation:

$$b_{vu} = \frac{p}{q} \times b_{yx}$$

$$= \frac{-3}{2} \times -1.2 = 1.8$$

94. Ans. c

Explanation:

$$\text{New Mean} = \frac{\bar{x}}{\alpha} \quad \text{New Mean} = \frac{\bar{x}}{\alpha} + 10$$

95. Ans. a

Explanation:

$$\frac{\left(\frac{x}{y} - 1\right)}{\left(\frac{x^2}{y^2} - 1\right)}$$

$$\Rightarrow \left(\frac{x-y}{y}\right) \times \frac{y^2}{x^2 - y^2}$$

$$\Rightarrow \frac{y}{x+y}$$

96. Ans. b

Explanation:

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

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

97. Ans. c

Explanation:

Sum of deviation from mean for any set of observation is Zero.

Example:	X_i	$(X_i - \bar{X})$	$\bar{X} = \frac{\sum X_i}{n}$
	10	-10	
	20	0	
	30	10	
		<u>0</u>	$= \frac{10 + 20 + 30}{3}$
			$= 20$

Therefore $\sum (X_i - \bar{X}) = 0$

98. Ans. a

Explanation:

The regression line : $y - \bar{y} = b_{yx} (x - \bar{x})$

or $y - 8.8 = 1.24(x - 5.5)$

$\Rightarrow y = 1.24x + 1.98$

99. Ans. c

Explanation:

Suitable form of average in this case is HM because it used for average rate.

100. Ans. b

Explanation:

X	P	PX
5	1/3	5/3
6	1/4	6/4
7	5/12	35/12

$$\frac{5}{3} + \frac{6}{4} + \frac{35}{12}$$

$$\frac{20 + 18 + 35}{12} = 6.08$$

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