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SUGGESTED SOLUTION

CA FOUNDATION

SUBJECT- MATHS, L.R. AND STAT

Test Code – CFP 4012 M

BRANCH - () (Date :)

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1. $\frac{a+b}{a-b} = \frac{1}{5}$

$\therefore$ 5a + 5b = a – b

$\therefore$ 4a = – 6 b

$\therefore \frac{a}{b} = \frac{-6}{4}$

$\therefore \frac{a}{b} = -\frac{3}{2}$

Taking a = – 3k, b = 2k

Now, $\frac{a^2-b^2}{a^2+b^2} = \frac{9k^2-4k^2}{9k^2+4k^2} = \frac{5k^2}{13k^2} = \frac{5}{13}$

i.e. 5 : 13 **[Ans.: C]**

2. $\frac{\sqrt{x+5}+\sqrt{x-16}}{\sqrt{x+5}-\sqrt{x-16}} = \frac{7}{3}\left(if\ \frac{a+b}{a-b} = \frac{c}{d}\ then\ \frac{a}{b} = \frac{c+d}{c-d}\right)$

$\therefore \frac{\sqrt{x+5}}{\sqrt{x-16}} = \frac{10}{4} = \frac{5}{2}$

squaring on both side

$\therefore \frac{x+5}{x-16} = \frac{25}{4}$

$\therefore$ 4x + 20 = 25x – 400

$\therefore$ 21x = 420

$\therefore$ x = 20 **[Ans.: B]**

3. $2^x - 2^{x-1} = 4$

$\therefore 2^x - 2^x \cdot 2^{-1} = 4$

$\therefore 2^x\left(1 - \frac{1}{2}\right) = 4 \quad \therefore 2^x\left(\frac{1}{2}\right) = 4$

$\therefore 2^x = 8 = 2^3$

$\therefore$ x = 3 $\quad\quad$ $\therefore x^x = 3^3 = 27$ **[Ans.: D]**

4. $a^{n-p} \cdot b^{p-m} \cdot C^{m-n}$

$= [x \cdot y^{m-1}]^{n-p} \cdot [x \cdot y^{n-1}]^{p-m} \cdot [x \cdot y^{p-1}]^{m-n}$

$= x^{n-p+p-m+m-n} \cdot y^{(m-1)(n-p)+(n-1)(p-m)+(p-1)(m-n)}$

$= x^\circ \cdot y^\circ = 1$ **[Ans.: A]**

5. $\left(log_{\sqrt{x}}2\right)^2 = log_x 2$

by Trial& Error method

(a) x = 16

LHS $(log_{\sqrt{x}}2)^2 = \left(log_{\sqrt{16}}2\right)^2 = (log_4 2)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

RHS = $\log_x 2 = \log_{16} 2 = \frac{\log 2}{\log 16} = \frac{\log 2}{4\log 2} = \frac{1}{4}$

$\therefore$ x = 16 **[Ans.: A]**

6. $\frac{xy}{x+y} = 1$ $\therefore$ xy = x + y $\therefore$ xy – x = y $\therefore$ x (y – 1) = y

$\therefore$ x = $\frac{y}{y-1}$ **[Ans.: C]**

7. By Trial & Error method

X = 1, LHS = $\frac{6x+2}{4} + \frac{2x^2-1}{2x^2+2} = \frac{8}{4} + \frac{1}{4} = 2 + \frac{1}{4} = {}^9/_4$

RHS = $\frac{10x-1}{4x} = \frac{9}{4}$ $\therefore$ x = 1

x = – 1 LHS = $\frac{-6+2}{4} + \frac{1}{4} = -1 + \frac{1}{4} = -{}^3/_4$

RHS = $\frac{-10-1}{-4} = \frac{-11}{-4} = \frac{11}{4}$ LHS $\neq$ RHS

$\therefore$ x = 1 is the answer **[Ans.: B]**

8. Length = Distance = Speed × Time

Here $\therefore$ $18\left(T - \frac{15}{60}\right) = 12T$

$\therefore$ 18T - $\frac{18}{4}$ = 12T $\therefore$ 6T = $\frac{18}{4}$ $\therefore$ T = $\frac{3}{4}$

D = 12T = 12 × $\frac{3}{4}$ = 9 **[Ans.: B]**

9. $x^2 - 4x + 4 = 0$ $\Delta = b^2 = 4ac$

$\therefore$ $(x-2)^2 = 0$ $= 16 - 4(1)(4)$

$\therefore$ x – 2 = 0 $\therefore$ x = 2 & 2 $= 16 - 16$

$\therefore$ Roots are real & Equal $\Delta = 0$ **[Ans.: B]**

10. $x^2 + 7x + 11 = 0$

$\therefore$ $\alpha + \beta = -\frac{b}{a} = -\frac{7}{1} = -7$ Now $(\alpha+\beta)^2 = (-7)^2 = 49$

$\alpha\beta = \frac{c}{a} = \frac{11}{1} = 11$ $(\alpha+\beta)^2 = 5$

$\alpha - \beta = \frac{\sqrt{\Delta}}{a} = \frac{\sqrt{b^2-4ac}}{a} = \frac{\sqrt{49-44}}{1} = \sqrt{5}$

Sum = S = 49 + 5 = 54
Product = P = 49 × 5 = 245

∴ Equation is x^2 – (sum) · x + Product = 0

∴ $x^2 - 54x + 245 = 0$ **[Ans.: A]**

11. $4 - 3x < 11$ ∴ $4 - 11 < 3x$

∴ $3x > -7$ ∴ $x > -7/3$ ∴ $x > -2.33$

∴ Smallest integer more than –2.33 is – 2. **[Ans. : B]**

12. By trial & error method,

All the points of option (a) are satisfying 3 inequalities. **[Ans.: A]**

13. $5x - 2 \geq 2x + 1$ $2x + 3 < 18 - 3x$

∴ $5x - 2x \geq 1 + 2$ $2x + 3x < 18 - 3$

∴ $3x \geq 3$ ∴ $5x < 15$

∴ $x \geq 1$ ∴ $x < 3$

∴ $1 \leq x < 3$ **[Ans.: C]**

14. Today i.e. Due annuity

Here P = 10,000, n = 16, i = 0.085, PV = ?

$PV = P\left[\frac{(1+i)^n - 1}{i\,(1+i)^n}\right](1 + i)$

$= 10000\left[\frac{(1.085)^{16} - 1}{0.085\,(1.085)^{16}}\right](1.085) = 93042$ **[Ans.: C]**

15. $A = P(1 + i)^n$

Now, $x\,(1.04)^7 = (3903 - x)\,(1.04)^9$

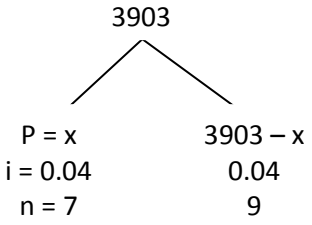
∴ $x = (3903 - x)\,(1.04)^2$

∴ $x = (3903 - x) \cdot (1.0816)$

∴ $x = 4221.4848 - 1.0816\,x$

∴ $2.0816x = 4221.4848$

∴ $x = 2028$ **[Ans.: C]**



16. Here

$x(1 + 0.10)(1 - 0.08)(1 + 0.07) = 15170000$

$\therefore x(1 \cdot 1)(0.92)(1.07) = 15170000$

$\therefore x = 14009456$ **[Ans. : B]**

17. Here P.V. of Annuity = 7000,

$i = \frac{0.08}{4} = 0.02$, $n = 3 \times 4 = 12$, P = ?

$PV = P\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right](1 + i)$

$\therefore 7000 = P\left[\frac{(1.02)^{12} - 1}{0.02(1.02)^{12}}\right](1.02)$

$\therefore 7000 = P(10.786846)$

$\therefore P = 648.9$ **[Ans.: C]**

18. Here P = 1000, FV = 31371.2, i = 0.045, n = ?

$F.V. = P\left[\frac{(1+i)^n - 1}{i}\right]$

$\therefore 31371.2 = 10000\left[\frac{(1.045)^n - 1}{0.045}\right]$

By Trial & Error n = 20 **[Ans.: B]**

19.

1	2	3	4	5	6	7	8	9
B	G	B	G	B	G	B	G	B

No. of ways $= {}_4P_4 \times {}_5P_5 = 24 \times 120 = 2880$ **[Ans.: D]**

20. No. of ways $= {}_9P_4 \times {}_9P_3 \times {}_{11}P_{11} = \frac{9!}{5!} \times \frac{9!}{6!} \times 11!$

$= \frac{11!}{6!5!} \times 9!\,9!$ **[Ans.: C]**

21. $3 + 2 + 2 = 7$

$\therefore$ No. of ways $= \frac{7!}{3!2!2!} = \frac{5040}{6 \times 2 \times 2} = 210$ **[Ans.: A]**

22. ${}^{n+1}C_{r+1} : {}^nC_r : {}^{n-1}C_{r-1} = 8 : 3 : 1$

$\frac{{}^{n+1}C_{r+1}}{{}^nC_r} = \frac{8}{3}$

$\therefore \frac{n+1}{r+1} = \frac{8}{3}$

$\therefore 3n + 3 = 8r + 8$

$\therefore 3n - 8r = 5$…….. (i)

$\frac{{}^nC_r}{{}^{n-1}C_{r-1}} = \frac{3}{1}$

$\therefore \frac{n}{r} = \frac{3}{1}$

$\therefore n = 3r$ …….. (ii)

$\therefore$ From (i) & (ii) $9r - 8r = 5$

$\therefore r = 5$

$\therefore n = 15$ **[Ans.: B]**

23. No. of ways = ${}^{10}C_4 \times {}^4C_1 \times {}^4C_1 \times {}^4C_1 \times {}^4C_1 \times {}^4C_1$

$= 210 \times 4^6 = 210 \times 4096$

$= 860160$ **[Ans.: A]**

24. let two nos. are a and b

Here $a + b = \frac{13}{6}$ ……. (i)

Let A_1, A2, ……, A_{2n} are even A.M.s.

$\therefore$ a, A_1, A_2, …… A_{2n}, b are in A.P.

$S_n = \frac{n}{2}(a + l)$ $\therefore S_{2n+2} = \frac{(2n+2)}{2}(a + b)$

$\therefore S_{2n+2} = \frac{2(n+1)}{2} \times \frac{13}{6}$

$\therefore S_{2n+2} = \frac{13(n+1)}{6}$ ……(ii)

$\therefore a + A_1 + A_2 + \ldots + A_{2n+b} = \frac{13(n+1)}{6}$

$\therefore A_1 + A_2 + A_3 + \ldots + A_{2n} = \frac{13(n+1)}{6} - (a + b)$

$\therefore A_1 + A_2 + \ldots\ldots + A_{2n} = \frac{13(n+1)}{6} - \frac{13}{6} = \frac{13n+13-13}{6} = \frac{13n}{6}$ …… (iv)

Here $(A_1 + A_2 + \ldots\ldots + A_{2n}) - (2n) = 1$ (given)

$\therefore \frac{13n}{6} - 2n = 1$ $\therefore \frac{13n-12n}{6} = 1$ $n = 6$

$\therefore 2n = 12$ **[Ans.: D]**

25. a, a + 100, a + 200, a + 300, ……., a + 900

$S_n = \frac{n}{2}(a + l)$

$\therefore$ $54500 = \frac{10}{2}(a + a + 900)$

$\therefore$ $10900 = 2a + 900$ $\therefore 2a = 10000$

$\therefore$ $a = 5000$ **[Ans.: C]**

26. By trail and error,

3, –6, 12, –24 **[Ans.: A]**

27. $1 - 1 + 1 - 1 - 1 + 1 - 1 \ldots\ldots\ldots\infty$

For odd terms, sum = 1

For even terms, sum = 0 **[Ans.: D]**

$\therefore$ Sum is not defined

28. Go by choices

Directly put n=2 or 3 in option. For option (c)

$\frac{1}{3}\left(1 - \frac{1}{10^2}\right) = \frac{1}{3}\left[1 - \frac{1}{100}\right] = \frac{1}{3}[1 - 0.01] = \frac{0.99}{3} = 0.33.$ **[Ans.: C]**

29. x – y = {b, c, d, f} **[Ans.: A]**

30. $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(A \cap C) - n(B \cap C) + n(A \cap B \cap C)$

$\therefore\ 100 = 50 + 40 + 30 - 20 - 15 - 10 + x$

$\therefore\ x = 25$

31. $f(x) = x^3 - x^2 + x + 1$

$f(1) = 1 - 1 + 1 + 1 = 2$

$f(-1) = -1 - 1 - 1 + 1 = -2$

$\therefore \frac{f(1)+f(-1)}{2}$

$= \frac{2-2}{2} = \frac{0}{2} = 0$ **[Ans.: C]**

32. $f(x) = \log\left(\frac{1+x}{1-x}\right), \qquad f\left(\frac{2x}{1+x^2}\right) = ?$

$f\left(\frac{2x}{1+x^2}\right) = \log\left[\frac{1+\frac{2x}{1+x^2}}{1-\frac{2x}{1+x^2}}\right] = \log\left[\frac{1+x^2+2x}{1+x^2-2x}\right]$

$= \log\left(\frac{1+x}{1-x}\right)^2 = 2\log\left(\frac{1+x}{1-x}\right) = 2f(x)$ **[Ans.: B]**

33. By trial & error method,

x = 1, y = 2, z = 1 **[Ans.: D]**

34. $15w_1 + 10w_2 = 400$
$5w_1 + 2w^2 = 120$

	G	L
w_1	15	10
w_2	5	2

By trial & error method, $w_1 = 20$, $w_2 = 10$ **[Ans.: B]**

35. $2x - 3y = 3$
$4x - 11y = 11$ By Trial & error, x = 0, y = –1 **[Ans.: C]**

36. $\frac{d}{dx}\left[e^{2\log x}\right] = \frac{d}{dx}\left[e^{\log x^2}\right] = \frac{d}{dx}(x^2) = 2x$ **[Ans.: B]**

37. $y = (1 + x)^{2x}$

$\therefore \log y = 2x \cdot \log (1 + x)$

$\therefore \frac{1}{y} \cdot \frac{dy}{dx} = 2x \cdot \frac{1}{1+x} \cdot (1) + \log(1 + x) \cdot (2)$

$\therefore \frac{1}{y} \cdot \frac{dy}{dx} = 2\left[x\,(x + 1)^{-1} + \log(x + 1)\right]$ [**Ans.: A]**

38. $x^3 - 2x^2y^2 + 5x + y = 5$

$\therefore 3x^2 - [2x^2 \cdot (2yy_1) + y^2\,(4x)] + 5 + y_1 = 0$

$x = 1, y = 1$

$\therefore 3 - [4y_1 + 4] + 5 + y_1 = 0$

$\therefore 3 - 4y_1 - 4 + 5 + y_1 = 0$

$\therefore -3y_1 + 4 = 0$

$\therefore 3y_1 = 4 \quad \therefore y_1 = 4/3$ **[Ans.: A]**

39. $\int \frac{6x+4}{(x-2)(x-3)}\,dx = \int \left(\frac{22}{x-3} - \frac{16}{x-2}\right) dx$

$22 \log (x - 3) - 16 \log (x - 2) + k$ **[Ans.: C]**

40. $\int_1^e \frac{1+\log x}{x}\,dx$

$\int_1^e (1+\log x)^1 \cdot \left(\frac{1}{x}\right) dx$

$= \left[\frac{(1+\log x)^2}{2}\right]_1^e = \frac{(1+\log e)^2}{2} - \frac{(1+\log 1)^2}{2}$

$= \frac{(1+1)^2}{2} - \frac{(1+0)^2}{2} = \frac{4}{2} - \frac{1}{2} = \frac{3}{2}$ **[Ans.: B]**

41. 4832, 5840, 6848, 7856, ……

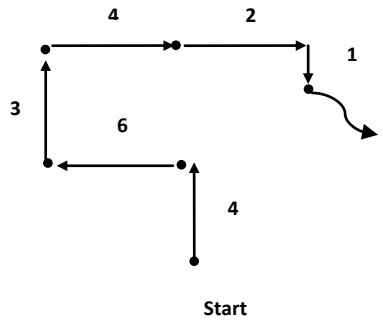
Adding 1008 we get next term

$\therefore 7856 + 1008 = 8864$ **[Ans.: A]**

42. 1, 1, 4, 8, 9, ?, 16, 64

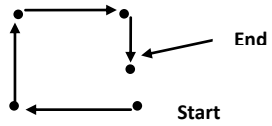
$1^2, 1^3, 2^2, 2^3, 3^2, \underline{\mathbf{3^3}}, 4^2, 4^3$

$3^3 = 27$ **[Ans.: A]**

43. 

Facing south

[Ans.: B]

44. 

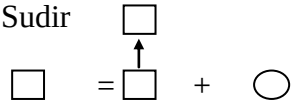
Facing South **[Ans. A]**

45. D B F C E A

F is between B & C **[Ans.: B]**

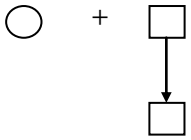
46. D B A E C

A is in the middle **[Ans.: A]**

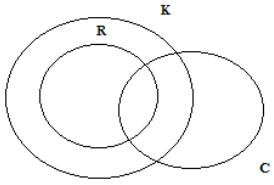
47. Sudir 

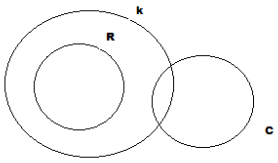
Ramesh Mohan Seema

Seema is wife of Mohan **[Ans.: D]**

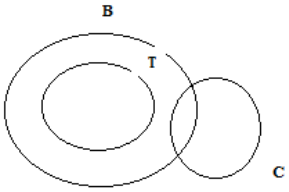
48.  Husband & wife

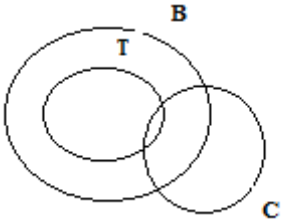
[Ans.: C]

49. 



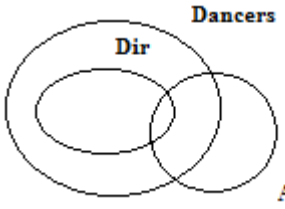
Neither I nor II follows **[Ans.: D]**

50. 



Only (I) follows

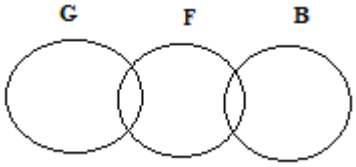
[Ans.: A]

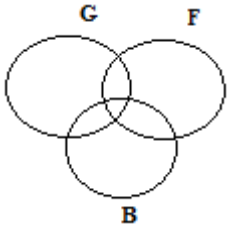
51. 

Only (I) follows. **[Ans.: A]**

Only (I) follows

[Ans.: A]

52. 



Neither I nor II follows **[Ans.: D]**

53. B →2, O → 5, R → 4, E → 8, S → 9

BORBERS = 2542849 **[Ans.: A]**

54. 835 → 8 – 3 = 5

734 → 7 – 3 = 4

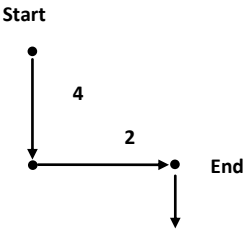
642 → 6 – 4 = 2 ∴ 751 is odd man out.

751 → 7 – 5 ≠1

853 → 8 – 5 = 3

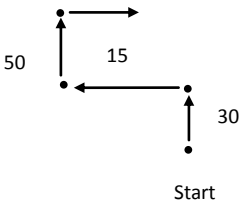
981 → 9 – 8 = 1

532 → 5 – 3 = 2 **[Ans.: A]**

55. 

South

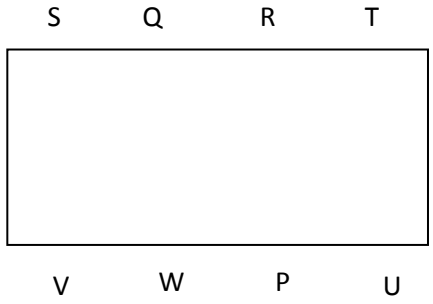
[Ans.: D]

56. 

East

[Ans.: B]

57. Right



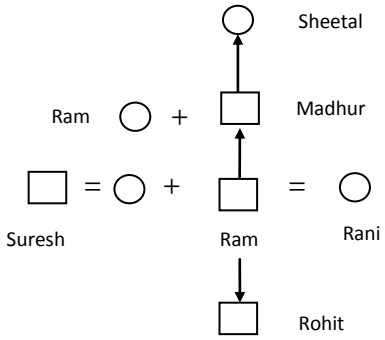
Left

P is in front of R.

Left Right **[Ans.: D]**

58. Q is the immediate right of R. **[Ans.: D]**

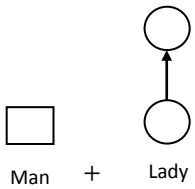
59.



Rohit is Nephew of Suresh.

[Ans.:D]

60.



Wife **[Ans.: B]**

61. D **[Ans.: D]**

62. UCB = LCB + $\frac{Width}{2}$

$\therefore$ UCB = 5.1 + $\frac{2.5}{2}$ = 6.35

$\therefore$ 5.1 – 6.35

6.35 – 8.55

2.5 × 9 = 22.5

$\therefore$ LCB of highest class = 5.1 + 22.5

= 27.6

$\therefore$ UCB of highest class = 27.6 + 2.5

= 30.1

5.1 + 22.5(27.6) – 30.1

[Ans.: A]

63. In 2000 In 2004

	MTU	Non MTU	Total
M	1175	375	1550
F	25	175	200
Total	1200	550	1750

	MTU	Non MTU	Total
M	1508	42	1550
F	292	8	300
Total	1800	50	1850

Ratio of female members of trade union = $\frac{25}{292}$ **[Ans.: D]**

64. B **[Ans.: B]**

65. A **[Ans.: A]**

66.

x_i	f_i	f_ix_i
1	1	1
2	2	4
3	3	9
4	4	16
5	5	25
	15	55

$$\bar{x} = \frac{\sum f_i x_i}{\sum f_i} = \frac{55}{15} = \frac{11}{3}$$

[Ans.: B]

67. Combined H.M. = $\frac{n_1+n_2}{\frac{n_1}{H_1}+\frac{n_2}{H_2}} = \frac{15+13}{\frac{15}{75}+\frac{13}{65}} = \frac{28}{\frac{1}{5}+\frac{1}{5}} = \frac{28\times5}{2} = 70$ **[Ans.: C]**

68. By Trial & Error, Numbers are 4 and 64 **[Ans.: B]**

69. (C) **[Ans.: C]**

70. 20, 23, 24, 27, 29, 31, 32, 35, 39, 40 n = 10

Q_{11} = Value of $\left(\frac{n+1}{4}\right)^{th}$ observation = value of $(2.75)^{th}$ observation.

= 23 + 0.75(24 – 23) = 23.75

Q_3 = Value of 3 $\left(\frac{n+1}{4}\right)^{th}$ observation = value of $(8.25)^{th}$ observation

= 35 + 0.25 (39 – 35) = 36

Coefficient of QD = $\frac{Q_3-Q_1}{Q_3+Q_1} \times 100 = \frac{12.25}{59.75} \times 100 = 20.5$ **[Ans: A]**

71. $\frac{7}{2}x + \frac{1}{3}y = 10$ $\therefore \frac{1}{3}y = 10 - \frac{7}{2}x$

$\therefore \frac{1}{3}R_y = \frac{7}{2}R_x$ $\therefore \frac{1}{3}R_y = \frac{7}{2} \times 1.2$

$\therefore R_y = 12.6$ **[Ans.: B]**

72. $5y - 3x = 10$ $\therefore 3x = 5y - 10$

$\therefore 3 \times MD_x = 5 \times MD_y$

$\therefore 3 \times 12 = 5 \times MD_y$

$\therefore MD_y = 7.2$ **[Ans.: A]**

73. C (Result) **[Ans.: C]**

74. $y = 2x + 5$

$= S.D. \text{ of } y = 2 \times S.D. \text{ of } x$

$= S.D. \text{ of } y = 2 \times 5 = 10$

$y = 2x + 5$

$Mean \text{ of } y = 2 \times Mean \text{ of } x + 5$

$= 2 \times 10 + 5$

$Mean \text{ of } y = 25$

C.V. of $y = \frac{S.D.of\ y}{Mean\ of\ y} \times 100 = \frac{10}{25} \times 100 = 40$ **[Ans.: A]**

75. $Q.D. = \frac{Q_3 - Q_1}{2} = \frac{40-15}{2} = 12.5$

QD : M D : SD = 10 : 12 : 15

$\therefore \frac{QD}{MD} = \frac{10}{12}$ $\therefore$ MD $= \frac{12 \times QD}{10} = \frac{12 \times 12.5}{10} = 15$ **[Ans.: C]**

76. $r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6(30)}{10(99)} = 0.82$ **[Ans.: A]**

77. C **[Ans.: C]**

78. $r = \frac{Cov(x,y)}{s_x \cdot s_y}$ $\therefore 0.28 = \frac{7.6}{3 \times S_y}$ $\therefore S_y$ 9.04 **[Ans.: B]**

79. Y on X Regression line is y = x + 2 $\therefore$ byx = 1

Here r = 0.5

Now, $b_{yx} = r \cdot \frac{S_y}{S_x}$ $\therefore 1 = 0.5 \times \frac{S_y}{S_x}$ $\therefore \frac{S_y}{S_x} = 2$

$\therefore \frac{S_y^2}{S_x^2} = 4$ **[Ans.: C]**

80. $16x - 20y + 132 = 0$

$80x = 30y - 428 = 0$

$\therefore R^2 = \frac{16 \times 30}{80 \times 20} = 0.3$ $\therefore r = 0.173$ **[Ans.: C]**

81. C **[Ans.: C]**

82. Here $P(A \cap B') = 0.4$ $P(A') = 0.6$ $\therefore P(A) = 0.4$

$\therefore P(A) - P(A \cap B) = 0.4$

$\therefore 0.4 - P(A \cap B) = 0.4$

$\therefore P(A \cap B) = 0$ $\therefore$ A & B are mutually exclusive. **[Ans.: D]**

83. I II

R → 4 5 IR & II B OR IB & IIR

B → 5 3 = $\frac{4}{9}\times\frac{3}{8} + \frac{5}{9}\times\frac{5}{8} = \frac{37}{72}$ **[Ans.: C]**

9 8

84. P (A ∪ B ∪ C) = P(A) + P(B) + P(C) – P(A ∩ B) – P(A∩ C) – P(B ∩ C) + P(A∩ B∩ C)

= 0.8 + 0.6 + 0.5 – 0.46 – 0.48 – 0.32 + 0.26

= 0.9 **[Ans.: B]**

85.

x_i	$P(x_i)$	x_i P(x)
0	k	0
1	y	y
2	0.3	0.6
3	3y	9y
	4y + k + 0.3 = 1	10y + 0.6

Here E(x) = 1.3

∴ Σx_i P(xi) = 1.3

∴ 10 y + 0.6 = 1.3

∴10 y + 0.7

∴ y = 0.07

Now, 4y + k + 0.3 = 1

∴ 0.28 + k + 0.3 = 1

∴ k = 0.42

∴ P (X = 0) = 0.42 **[Ans.: B]**

86. $n(S) = 6^3 = 216$

Event A = same number appears on each of the three dice.

= {(1, 1, 1); (2,2, 2); (3, 3,3); (4, 4, 4) ; (5, 5, 5); (6, 6, 6)}

So, n(A) = 6

P(E) = $\frac{6}{6\times6\times6} = \frac{1}{36}$ **[Ans.: C]**

87. (B) **[Ans.: B]**

88. $q = \frac{Variance}{Mean} = \frac{3}{4}$ $\therefore p = \frac{1}{4}$

$n = \frac{Mean}{p}$ $\therefore n = \frac{4}{1/4}$ $\therefore n = 16$

Now, $(n + 1) \cdot p = 17\left(\frac{1}{4}\right) = 4.25$

$\therefore$ Mode = 4 **[Ans.: A]**

89. (A) **[Ans.: A]**

90. $E(x) = 2.2$ $\therefore m = 2.2$

$P(x \le 2/x \ge 1) = \frac{P[x \le 2 \cap x \ge 1]}{P(x \ge 1)} = \frac{P(1)+P(2)}{1-P(0)}$

$= \frac{e^{-m} \cdot m + \frac{e^{-m} \cdot m^2}{2}}{1-e^{-m}} = \frac{e^{-2.2}[2.2+2.42]}{1-e^{-2.2}}$

$= \frac{0.1108(4.62)}{1-0.1108} = \frac{0.511896}{0.8892} = 0.58$ **[Ans.: A]**

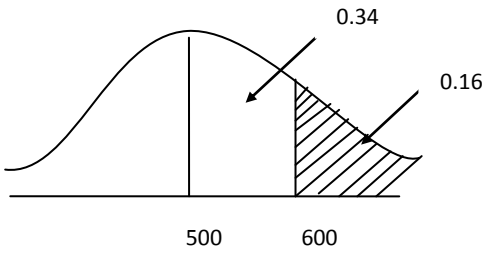
91. $QD = \frac{2}{3} SD$ $\therefore 3QD = 2SD$ **[Ans.: A]**

92. $r = 500$, $P(x \ge 600) = 0.16$

$\therefore z = 1$

$\therefore \frac{x-\mu}{\sigma} = 1$ $\therefore \frac{600-500}{\sigma} = 1$

$\therefore \sigma = 100$



z = 1

[Ans.: B]

93. (C) **[Ans.: C]**

94. (B) **[Ans.: B]**

95. (A) **[Ans.: A]**

96. (D) **[Ans.: D]**

97. $IN = \frac{\sum IW}{\sum w} = \frac{625+134+750}{10} = \frac{1509}{10} = 150.9$ **[Ans.: A]**

98. $I_p = \frac{\sum P_1 q_1}{\sum P_0 q_1} \times 100 = \frac{60+45+156+45}{45+45+104+15} \times 100$ **[Ans.: A]**

99. $F = \sqrt{L \times P}$

$\therefore 150 = \sqrt{L \times 144}$ $\therefore L = 156.25$ **[Ans.: B]**

100. $110 \rightarrow 200$

$325 \quad (?)$ $= 590.91 - 500 = 90.91$ **[Ans.: B]**