SUGGESTED SOLUTION

CA FOUNDATION

Test Code – JKN_QA_01

(Date :20/09/2020)

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

      $\therefore\ 5a + 5b = a - b$

      $\therefore\ 4a = -6b$

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

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

      Taking $a = -3k,\ b = 2k$

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

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

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

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

      squaring on both side

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

      $\therefore\ 4x + 20 = 25x - 400$

      $\therefore\ 21x = 420$

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

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

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

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

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

      $\therefore\ x = 3\ \ \ \ \ \ \ \ \therefore x^x = 3^3 = 27$ **[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 $= \frac{6x+2}{4} + \frac{2x^2-1}{2x^2+2} = \frac{8}{4} + \frac{1}{4} = 2 + \frac{1}{4} = \frac{9}{4}$

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

    x $= -1$ LHS $= \frac{-6+2}{4} + \frac{1}{4} = -1 + \frac{1}{4} = -\frac{3}{4}$

        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 $\times$ 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 $= 12 \times \frac{3}{4} = 9$ **[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 ≥ 2x + 1   2x + 3 < 18 − 3x

∴ 5x − 2x ≥ 1 + 2   2x + 3x < 18 − 3

∴ 3x ≥ 3   ∴ 5x < 15

∴ x ≥ 1   ∴ x < 3

∴ 1 ≤ 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) · (1.0816)

∴ x = 4221.4848 − 1.0816 x

∴ 2.0816x = 4221.4848

∴ x = 2028 **[Ans.: C]**

3903
P = x   3903 − x
i = 0.04   0.04
n = 7   9
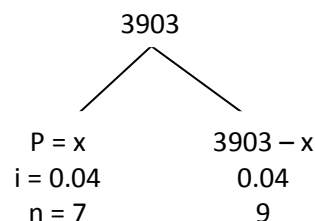
16. Here

x(1 + 0.10) (1 − 0.08) (1 + 0.07) = 15170000

∴ x (1·1) (0.92) (1.07) = 15170000

∴ x = 14009456   **[Ans. : B]**

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

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

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

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

∴ 7000 = P(10.786846)

∴ P = 648.9   **[Ans.: C]**

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

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

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

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 = $_4P_4 \times {_5}P_5$ = 24 × 120 = 2880   **[Ans.: D]**

20. No. of ways = $_9P_4 \times {_9}P_3 \times {_{11}}P_{11} = \frac{9!}{5!} \times \frac{9!}{6!} \times 11!$

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

21. 3 + 2 + 2 = 7

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

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

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

∴ $\frac{n+1}{r+1} = \frac{8}{3}$

∴ 3n + 3 = 8r + 8

∴ 3n − 8r = 5……… (i)

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

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

$\quad \therefore n = 3r$ ………….. (ii)

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

$\therefore r = 5$

$\therefore n = 15$ $\hspace{3cm}$ **[Ans.: B]**

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

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

$\qquad = 860160$ $\hspace{3cm}$ **[Ans.: A]**

24. let two nos. are a and b

Here $a + b = \frac{13}{6}$ $\qquad$ …………. (i)

Let $A_1, A_2, \ldots, A_{2n}$ are even A.M.s.

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

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

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

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

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

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

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

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

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

$\qquad \therefore 2n = 12$ $\hspace{3cm}$ **[Ans.: D]**

25. $a, a + 100, a + 200, a + 300, \ldots, a + 900$

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

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

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

$\therefore a = 5000$ $\hspace{3cm}$ **[Ans.: C]**

26. By trail and error,

    3, −6, 12, −24 **[Ans.: A]**

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

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

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

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

33. By trial & error method,

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

34. $15w_1 + 10 w_2 = 400$

    $5w_1 + 2w^2 = 120$

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

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

$x = 1, y = 1$

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

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

$\therefore -3y_1 + 4 = 0$

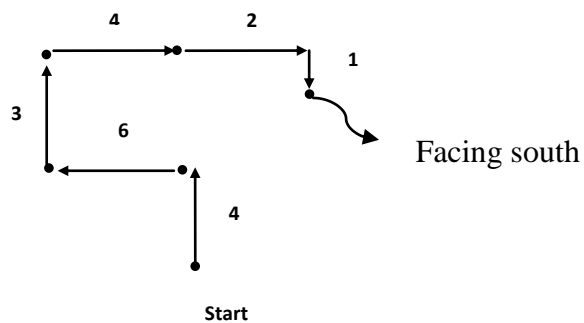$\therefore 3y_1 = 4 \qquad \therefore y_1 = 4/3$ **[Ans.: A]**

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. $\int\limits_{1}^{e} \frac{1+\log x}{x} dx$

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

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

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

41. 4832, 5840, 6848, 7856, ……

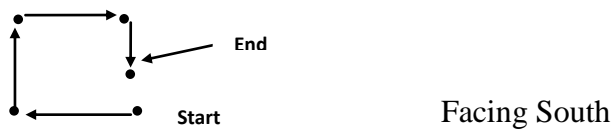Adding 1008 we get next term

$\therefore 7856 + 1008 = 8864$ **[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
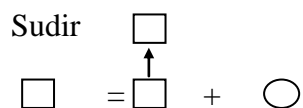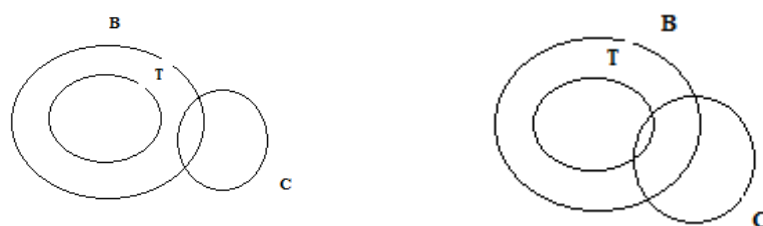

Ramesh Mohan   Seema

Seema is wife of Mohan

[Ans.: D]

48.

   Husband & wife

[Ans.: C]

49.

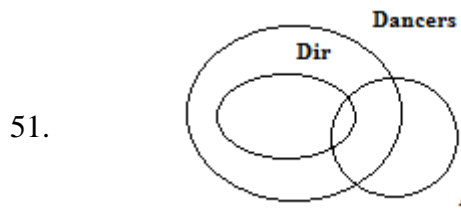Neither I nor II follows

[Ans.: D]

50.

Only (I) follows

[Ans.: A]

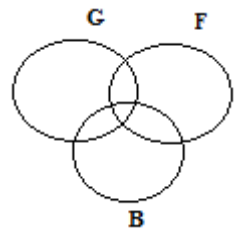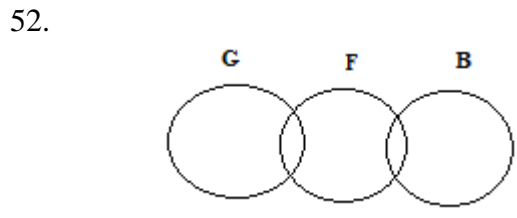51.

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
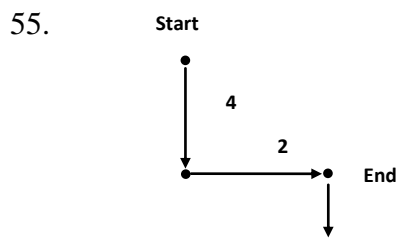
734 → 7 − 3 = 4

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.
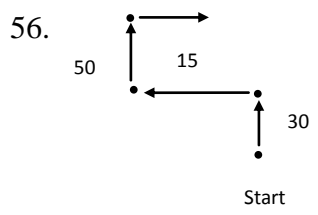
East

[Ans.: B]

57.   Right   S   Q   R   T   Left

P is in front of R.

       Left   V   W   P   U   Right   **[Ans.: D]**

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

59.
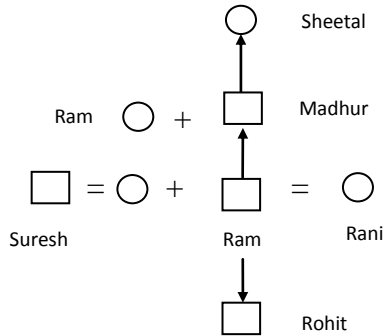
                        ○ Sheetal
                        ↑
       Ram ○ + □ Madhur   Rohit is Nephew of Suresh.
                        ↑
       □ = ○ + □ = ○
       Suresh   Ram   Rani
                        ↓
                   □ Rohit

[Ans.:D]

60.
            ○
            ↑
       □   ○   Wife   **[Ans.: B]**
       Man + Lady
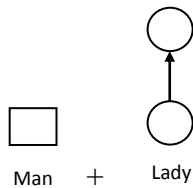
61.   D   **[Ans.: D]**

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

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

$\therefore 5.1 - 6.35$

$6.35 - 8.55$

$2.5 \times 9 = 22.5$

$\therefore LCB$ 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 $= \dfrac{25}{292}$ **[Ans.: D]**

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

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

66.

x_i	f_i	$f_i x_i$
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. $= \dfrac{n_1 + n_2}{\frac{n_1}{H_1} + \frac{n_2}{H_2}} = \dfrac{15+13}{\frac{15}{75} + \frac{13}{65}} = \dfrac{28}{\frac{1}{5} + \frac{1}{5}} = \dfrac{28 \times 5}{2} = 70$ **[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 $\left(\dfrac{n+1}{4}\right)^{th}$ observation = value of $(2.75)^{th}$ observation.

     = 23 + 0.75(24 − 23) = 23.75

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

     = 35 + 0.25 (39 − 35) = 36

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

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

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

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

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

                     $\therefore$ 3 × MD_x = 5 × MD_y

                     $\therefore$ 3 × 12 = 5 × MD_y

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

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

74. $y = 2x + 5$ $y = 2x + 5$

          = S.D. of y = 2 × S.D. of x   Mean of y = 2 × Mean of x + 5

          = S.D. of y = 2 × 5 = 10   = 2 × 10 + 5

                                                            Mean of y = 25

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

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

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

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

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

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

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

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

          Here $r = 0.5$

          Now, $b_{yx} = r \cdot \dfrac{s_y}{s_x}$ $\therefore\ 1 = 0.5 \times \dfrac{s_y}{s_x}$ $\therefore \dfrac{s_y}{s_x} = 2$

                                            $\therefore \dfrac{s_y^2}{s_x^2} = 4$ **[Ans.: C]**

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

          $80x = 30y - 428 = 0$

          $\therefore R^2 = \dfrac{16 \times 30}{80 \times 20} = 0.3$ $\therefore r = 0.173$ **[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 $\rightarrow$ 4   5   IR & II B   OR IB & IIR

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

        9   8

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

$= 0.8 + 0.6 + 0.5 - 0.46 - 0.48 - 0.32 + 0.26$

$= 0.9$ **[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 $E(x) = 1.3$

$\therefore \Sigma x_i P(xi) = 1.3$

$\therefore 10y + 0.6 = 1.3$

$\therefore 10y + 0.7$

$\therefore y = 0.07$

Now, $4y + k + 0.3 = 1$

$\therefore 0.28 + k + 0.3 = 1$

$\therefore k = 0.42$

$\therefore P(X = 0) = 0.42$ **[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, $n(A) = 6$

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

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

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

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

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

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

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

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

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

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

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

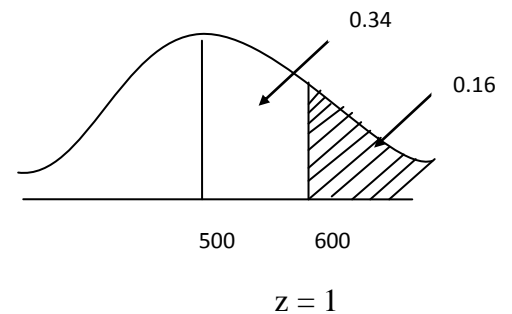91. $QD = \dfrac{2}{3} SD$ $\therefore 3QD = 2SD$ **[Ans.: A]**

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

$\therefore z = 1$

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

$\therefore \sigma = 100$

0.34

0.16

500   600

z = 1

[Ans.: B]

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

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

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

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

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

98. $I_P = \dfrac{\sum P_1 q_1}{\sum P_0 q_1} \times 100 = \dfrac{60 + 45 + 156 + 45}{45 + 45 + 104 + 15} \times 100$ **[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 (?) $= 590.91 - 500 = 90.91$ **[Ans.: B]**