HSSC MOCK TEST – 180 (SOLUTION)

1. (A) $x^n - y^n = 1$

On differentiating both side w.r.t. 'x'

$$\Rightarrow nx^{n-1} - ny^{n-1}\frac{dy}{dx} = 0$$

$$\Rightarrow x^{n-1} = y^{n-1}\frac{dy}{dx}$$

$$\Rightarrow \frac{dy}{dx} = \left(\frac{x}{y}\right)^{n-1}$$

$$\Rightarrow \frac{dy}{dx} = \left(\frac{y}{x}\right)^{1-n}$$

On comparing with $\frac{dy}{dx} = \sqrt{\frac{y}{x}}$

$$1 - n = \frac{1}{2} \Rightarrow n = \frac{1}{2}$$

2. (C) $(\lambda\,\hat{i} + 2\hat{j} + 3\hat{k}) \times (3\hat{i} - \hat{j} + 4\hat{k}) = 11\hat{i} + 13\hat{j} - 5\hat{k}$

$$\Rightarrow \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \lambda & 2 & 3 \\ 3 & -1 & 4 \end{vmatrix} = 11\hat{i} + 13\hat{j} - 5\hat{k}$$

$$\Rightarrow \hat{i}(8 + 3) - \hat{j}(4\lambda - 9) + \hat{k}(-\lambda - 6) = 11\hat{i} + 13\hat{j} - 5\hat{k}$$

$$\Rightarrow 11\hat{i} + (9 - 4\lambda)\hat{j} + \hat{k}(-\lambda - 6) = 11\hat{i} + 13\hat{j} - 5\hat{k}$$

On comparing

$9 - 4\lambda = 13 \Rightarrow \lambda = -1$

3. (B)
4. (D)
5. (D) A' = cofactor of A

$|A'| = |\text{cofactor of A}|$

$|A'| = (A)^{5-1}$ [$\because$ order = 5]

$|A'| = A^4$

6. (C) Let $y = 7^{53}$

taking log both side

$\Rightarrow \log_{10} y = 53 \log_{10} 7$

$\Rightarrow \log_{10} y = 53 \times 0.8451$

$\Rightarrow \log_{10} y = 44.7903$

The required number of digit = 44 +1= 45

7. (C) The required no. of terms = ${}^{n+2}C_2$

$$= \frac{(n+2)!}{2!n!} = \frac{(n+2)(n+1)n!}{2 \times n!}$$

$$= \frac{(n+1)(n+2)}{2}$$

8. (C) zero
9. (C) 1
10. (D) The required no. of triangle = ${}^{14}C_3 - {}^{6}C_3$

= 364 – 20 = 344

11. (C) Mean of first 13 natural numbers

$$= \frac{13 \times 14}{2 \times 13} = 7$$

$$\sum(x - \bar{x})^2 = (1-7)^2 + (2-7)^2 + (3-7)^2 + (4-7)^2 + (5-7)^2 + (6-7)^2 + (7-7)^2 + (8-7)^2 + (9-7)^2 + (10-7)^2 + (11-7)^2 + (12-7)^2 + (13-7)^2$$

$$\sum(x - \bar{x})^2 = 36 + 25 + 16 + 9 + 4 + 1 + 0 + 1 + 4 + 16 + 25 + 36$$

$$\sum(x - \bar{x})^2 = 182$$

$$\text{S.D.} = \sqrt{\frac{\sum(x - \bar{x})^2}{n}} = \sqrt{\frac{182}{13}} = 3.74$$

12. (C) A = {1, 3, 4, 5}, B = {2, 3, 4, 6} and C = {x, y}

$(A \cap B) = \{3, 4\}$

Now, $(A \cap B) \times C = \{3, 4\} \times (x, y)$

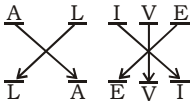
No. of elements in $(A \cap B) \times C = 2 \times 2 = 4$

13. (B) The required Probability = $\frac{{}^{5}C_1 \times {}^{8}C_2}{{}^{13}C_3}$

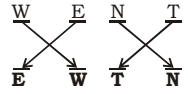
$$= \frac{5 \times 28}{13 \times 22} = \frac{70}{143}$$

70. (A)

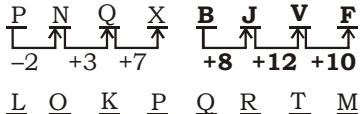
71. (B) As,



Similarly,



72. (B)



73. (D) Expect **K.R. Narayana,** all others were the prime ministers of India. while K.R. Narayana was the **president** of India.

74. (B) $3 \times 1 = 3$
$3 \times 2 = 6$
$6 \times 3 = 18$
$18 \times 4 = 72$
$72 \times 5 = 360$
$360 \times 6 =$ **2160**
$2160 \times 7 = 15120$

75. (A) $6 + \mathbf{7} = 13 \Rightarrow 13 - 2 = 11$ (left)
$\Rightarrow 13 + 1 = 14$ (right)
$11 + 14 = 25 \Rightarrow 25 - 2 = 23$ (left)
$\Rightarrow 25 + 1 = 26$ (right)
$23 + 26 = 49 \Rightarrow 49 - 2 = 47$ (left)
$\Rightarrow 49 + 1 = 50$ (right)

76. (B)

77. (C) Number of female members
$= (1 + 3 + 1 + 2 + 2)$
$= \mathbf{9}$

HSSC MOCK TEST – 180 (ANSWER KEY)

1.	(A)	11.	(C)	21.	(D)	31.	(D)	41.	(D)	51.	(B)	61.	(B)	71.	(B)	81.	(C)
2.	(C)	12.	(C)	22.	(B)	32.	(A)	42.	(A)	52.	(D)	62.	(D)	72.	(B)	82.	(C)
3.	(B)	13.	(B)	23.	(D)	33.	(D)	43.	(A)	53.	(C)	63.	(D)	73.	(D)	83.	(D)
4.	(D)	14.	(A)	24.	(C)	34.	(C)	44.	(D)	54.	(B)	64.	(B)	74.	(B)	84.	(B)
5.	(D)	15.	(B)	25.	(D)	35.	(A)	45.	(B)	55.	(C)	65.	(A)	75.	(A)	85.	(C)
6.	(C)	16.	(C)	26.	(B)	36.	(A)	46.	(C)	56.	(B)	66.	(A)	76.	(B)	86.	(B)
7.	(C)	17.	(B)	27.	(A)	37.	(D)	47.	(B)	57.	(A)	67.	(B)	77.	(C)	87.	(A)
8.	(C)	18.	(A)	28.	(C)	38.	(B)	48.	(A)	58.	(C)	68.	(D)	78.	(B)	88.	(D)
9.	(C)	19.	(D)	29.	(A)	39.	(C)	49.	(A)	59.	(B)	69.	(C)	79.	(C)	89.	(A)
10.	(D)	20.	(A)	30.	(B)	40.	(C)	50.	(C)	60.	(A)	70.	(A)	80.	(A)	90.	(C)