HSSC MOCK TEST – 174 (SOLUTION)

1. (B) We know that
$^nC_0 + {}^nC_1x + {}^nC_2x^2 + \ldots\ldots + {}^nC_n = (1+x)^n$
On putting $x = 1$
$^nC_0 + {}^nC_1 + {}^nC_2 + \ldots\ldots + {}^nC_n = (1+1)^n = 2^n$

2. (C) $A\times(B - C) = A\times B + C\times A$
$\Rightarrow A\times B - A\times C = A\times B + C\times A$
$\Rightarrow A\times B + C\times A = A\times B + C\times A$
Hence option (C) is correct.

3. (C) $S_n = 2n^2 + 3n + 4$
$S_{n-1} = 2(n-1)^2 + 3(n-1) + 4$
$S_{n-1} = 2n^2 - n + 3$
Now, $T_n = S_n - S_{n-1}$
$T_n = 2n^2 + 3n + 4 - 2n^2 + n - 3$
$T_n = 4n + 1$
$T_7 = 4\times7 + 1 = 29$

4. (C) Given that $\vec{a} = 3\hat{i} - 2\hat{j} + 2\hat{k}$ and $\vec{b} = -\hat{i} + 2\hat{j} + \hat{k}$
Now, $[(\vec{a} + 2\vec{b})\times(\vec{b} - 3\vec{a})].\vec{a}$
$\Rightarrow [(\vec{a}\times\vec{b}) + 2(\vec{b}\times\vec{b}) - 3(\vec{a}\times\vec{a}) - 6(\vec{b}\times\vec{a})].\vec{a}$
$\Rightarrow [(\vec{a}\times\vec{b}) + 6(\vec{a}\times\vec{b})].\vec{a}$
$\Rightarrow 7(\vec{a}\times\vec{b}).\vec{a} = 0$

5. (D) Digits 0, 1, 2, 3, 4, 5, 6

4	6	5	4	3

$= 4\times6\times5\times4\times3 = 1440$
↓
(3, 4, 5, 6)

6. (C) $\begin{vmatrix} 1 & -1 & -3 & 5 \\ 4 & 2 & -1 & 6 \\ -6 & -4 & 3 & 1 \\ -2 & 0 & 1 & 7 \end{vmatrix}$

Minor of element 2 $= \begin{vmatrix} 1 & -3 & 5 \\ -6 & 3 & 1 \\ -2 & 1 & 7 \end{vmatrix}$
$= 1(21 - 1) + 3(-42 + 2) + 5(-6 + 6)$
$= 20 - 120 = -100$

7. (C) Plane $3x + 4y - 5z + 11 = 0$ and point $(-1, 2, 4)$

Distance $= \left|\dfrac{3\times(-1) + 4\times2 - 5\times4}{\sqrt{3^2 + 4^2 + (-5)^2}}\right|$

$= \dfrac{15}{5\sqrt{2}} = \dfrac{3}{\sqrt{2}}$

8. (C) Marks of students
30, 35, 36, 32, 31, 38, 40, 42

Mean $= \dfrac{30 + 35 + 36 + 32 + 31 + 38 + 40 + 42}{8}$

Mean $= \dfrac{284}{8} = 35.5$

The required number of students = 4

9. (A) $A = \{0, 1, 2, 3, 4, 5, 6\}$, $n = 7$
No. of proper subsets of A $= 2^n - 1 = 2^7 - 1$
$= 128 - 1 = 127$

10. (A) No. of ways $= {}^8P_5$

$= \dfrac{8!}{(8-5)!} = \dfrac{8!}{3!} = 6720$

11. (C) $n(S) = 6\times6 = 36$
$E = \{(6, 4), (5, 5), (4, 6)\}$; $n(E) = 3$

The required Probability $= \dfrac{n(E)}{n(S)} = \dfrac{3}{36} = \dfrac{1}{12}$

12. (D) Let $y = \sqrt{6 + 5\sqrt{6 + 5\sqrt{6 + \ldots.\infty}}}$

$\Rightarrow y = \sqrt{6 + 5y}$
$\Rightarrow y^2 = 6 + 5y$
$\Rightarrow y^2 - 5y - 6 = 0$
$\Rightarrow (y - 6)(y + 1) = 0$
$\Rightarrow y = 6, -1$

Hence $\sqrt{6 + 5\sqrt{6 + 5\sqrt{6 + \ldots.\infty}}} = 6$

13. (D) In the expansion of $\left(x^2 - \dfrac{1}{2x^{1/2}}\right)^9$

$T_{r+1} = {}^9C_r(x^2)^{9-r}\left(\dfrac{-1}{2x^{1/2}}\right)^r$

$T_{r+1} = {}^9C_r\left(\dfrac{-1}{2}\right)^r x^{\frac{36-5r}{2}}$

here, $\dfrac{36 - 5r}{2} = 3$

$\Rightarrow 36 - 5r = 6 \Rightarrow r = 6$

The coefficient of $x^3 = {}^9C_6\left(\dfrac{-1}{2}\right)^6$

$= \dfrac{12\times7}{64} = \dfrac{21}{16}$

70. (C) Total number of IITs in India is 23 and the total number of NITs in India is **31**.

71. (A)

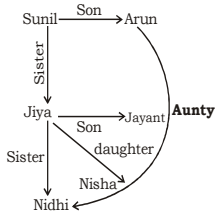
72. (D) Except **Hydrabad**, all others are the world heritage cities.

73. (D) Number of heritage sites in **Bihar** is 2. While in all others, the total number of heritage site is 3.

74. (C) As, 9 + 12 – 10 = 11
and, 12 + 16 – 17 = 11
Similarly,
6 + 11 – **6** = 11

75. (A) As, $\sqrt{9}$, $\sqrt{16}$. $\sqrt{4} > \sqrt{25}$
and, $\sqrt{9}$, $\sqrt{4}$. $\sqrt{1} > \sqrt{\mathbf{16}}$
Similarly,
$\sqrt{49}$, $\sqrt{36}$. $\sqrt{25} > \sqrt{64}$

76. (A)



77. (C) As, 8 × 7 – 8 – 7 = 41
and, 9 × 8 – 9 – 8 = 55
Similarly,
7 × 6 – 7 – 6 = **29**

HSSC MOCK TEST – 174 (ANSWER KEY)

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