HSSC MOCK TEST – 164 (SOLUTION)

1. (C) If $n!$, $3\times n!$ and $(n+1)!$ are in GP,

then $\frac{3\times n!}{n!} = \frac{(n+1)!}{3\times n!}$

$\Rightarrow 3 = \frac{(n+1)n!}{3\times n!}$

$\Rightarrow 9 = n + 1 \Rightarrow n = 8$

2. (C) $(1 + x + x^2 + x^3 + \ldots + \infty)^2$

$\Rightarrow \left(\frac{1}{1-x}\right)^2 = (1-x)^{-2} \quad \left(\because S_\infty = \frac{a}{1-r}\right)$

$\Rightarrow 1 + 2x + 3x^2 + \ldots + (n+1)x^n + \ldots\infty$

Hence coefficient of $x^n = (n + 1)$

3. (A) $(998)^{1/3} \Rightarrow (1000 - 2)^{1/3}$

$\Rightarrow (1000)^{1/3}\left[1-\frac{2}{1000}\right]^{1/3}$

$\Rightarrow 10\left[1-\frac{2}{1000}\right]^{1/3}$

$\Rightarrow 10\left[1-\frac{1}{3(500)}+\frac{\frac{1}{3}\left(\frac{1}{3}-1\right)}{2!}\left(\frac{1}{500}\right)^2+\ldots.\right]$

$\Rightarrow 10\left[1-\frac{1}{1500}-\frac{1}{9\times 250000}\right]$

$\Rightarrow 10\left[\frac{2250000-1500-1}{2250000}\right]$

$\Rightarrow \frac{22484990}{2250000} = 9.99$

4. (C) $r_{xy} = \frac{\text{cov}(x,y)}{\sigma_x \sigma_y}$

$\Rightarrow 0.6 = \frac{16}{4\sigma_y}$

$\Rightarrow \sigma_y = \frac{16}{4\times 0.6} = \frac{20}{3}$

5. (A) $n(T \cup C) = 64$, $n(T - C) = 26$, $n(T) = 34$

Now, $n(T) = n(T - C) + n(T \cap C)$

$\Rightarrow 34 = 26 + n(T \cap C) \Rightarrow n(T \cap C) = 8$

Again, we have

$n(T \cup C) = n(T) + n(C) - n(T \cap C)$

$\Rightarrow 64 = 34 + n(C) - 8$

$\Rightarrow 64 = 26 + n(C) \Rightarrow n(C) = 38$

Now, $n(C) = n(C - T) + n(T \cap C)$

$\Rightarrow 38 = n(C - T) + 8 \Rightarrow n(C - T) = 30$

6. (C) $5^x + (5)^{-x} = [5^{x/2} - (5)^{-x/2}]^2 + 2 \geq 2$

If $\sin(e^x) = 5^x + (5)^{-x}$ has solution, we will get $\sin(e^x) \geq 2$

which is not possible as $[\sin\theta] \leq 1$ for all $\theta \in R$.

Hence, no solution exits.

7. (A) $0.1\overline{23} = \frac{123-1}{990} = \frac{122}{990} = \frac{61}{495}$

8. (A) $f(x) = x^2 - 3x + 2$

Now, $f\{f(x)\} = f(x^2 - 3x + 2)$

$\Rightarrow f\{f(x)\} = (x^2 - 3x + 2)^2 - 3(x^2 - 3x + 2) + 2$

$\Rightarrow f\{f(x)\} = x^4 - 6x^3 + 10x^2 - 3x$

9. (D)

10. (B) Number of diagonal in 'n' sided polygon $= {}^nC_2 - n$

$= \frac{n(n-1)}{2} = \frac{n(n-3)}{2}$

11. (A) Two possibilities arise in the given situation

(i) ball transferred is white.

(ii) ball transferred is black.

Case I

P (Selecting white ball from Ist bag)

$= \frac{5}{9}$

After transferring the selected white ball to the lInd bag

P (white ball from IInd bag) = $\frac{8}{17}$

Probability of both these events happening together $= \frac{5}{9} \times \frac{8}{17} = \frac{40}{153}$

Case II

P (Selecting black ball from Ist bag) $= \frac{4}{9}$

After transferring the selected black ball to the lInd bag

P (white ball from IInd bag) $= \frac{7}{17}$

Probability of both these events happening together $= \frac{4}{9} \times \frac{7}{17} = \frac{28}{153}$

Required probability $= \frac{40}{153} + \frac{28}{153} = \frac{68}{153}$

12. (A) Word "MOTHER"
The required arrangements $= {}^5C_3 \times 4!$
$= \frac{5!}{2!3!} \times 4! = \frac{5 \times 4 \times 24}{2} = 240$

13. (D) The set of all prime numbers

14. (A) $7^\circ 30' = \left(7 + \frac{1}{2}\right)^\circ = \left(\frac{15}{2}\right)^\circ$

$\Rightarrow 7^\circ 30' = \left(\frac{15}{2} \times \frac{\pi}{180}\right)^C = \left(\frac{\pi}{24}\right)^C$

81. (B) As, $(1)^3 \times 8 = 8$
Similarly, $(3)^3 \times 8 = \mathbf{216}$

82. (A) As, $\overset{14}{\underset{14\times3+14\div2}{\uparrow}}\ \overset{49}{\uparrow}$

Similarly, $\overset{18}{\underset{18\times3+18\div2}{\uparrow}}\ \overset{\mathbf{63}}{\uparrow}$

83. (C) Except **492765831**, all others are written with the help of 8 digits.

84. (D) Except **PHRASE**, in all others vowel A used two times.

85. (B) As, 54 – 32 = 22
Similarly, 48 – 26 = **22**

86. (A) As, $\frac{-2+0}{2} = -1$

and, $\frac{-1+1}{2} = 0$

Similarly, $\frac{10+2}{2} = \mathbf{6}$

87. (B) 81 192 375 648 **1029**
$(9)^2-(0)^2$ $(14)^2-(2)^2$ $(20)^2-(5)^2$ $(27)^2-(9)^2$ $(35)^2-(14)^2$
+5 +2 +6 +3 +7 +4 +8 +5

88. (C)

HSSC MOCK TEST – 164 (ANSWER KEY)

1.	(C)	11.	(A)	21.	(A)	31.	(D)	41.	(C)	51.	(C)	61.	(B)	71.	(C)	81.	(B)	91.	(C)
2.	(C)	12.	(A)	22.	(A)	32.	(D)	42.	(D)	52.	(C)	62.	(C)	72.	(B)	82.	(A)	92.	(D)
3.	(A)	13.	(D)	23.	(B)	33.	(C)	43.	(C)	53.	(C)	63.	(A)	73.	(A)	83.	(C)	93.	(C)
4.	(C)	14.	(A)	24.	(B)	34.	(A)	44.	(D)	54.	(C)	64.	(A)	74.	(B)	84.	(D)	94.	(C)
5.	(A)	15.	(B)	25.	(B)	35.	(C)	45	(C)	55.	(A)	65.	(B)	75.	(D)	85.	(B)	95.	(B)
6.	(C)	16.	(C)	26.	(B)	36.	(B)	46.	(C)	56.	(D)	66.	(D)	76.	(C)	86.	(A)	96.	(B)
7.	(A)	17.	(B)	27.	(A)	37.	(B)	47.	(D)	57.	(B)	67.	(D)	77.	(C)	87.	(B)	97.	(B)
8.	(A)	18.	(C)	28.	(B)	38.	(D)	48.	(C)	58.	(B)	68.	(B)	78.	(B)	88.	(C)	98.	(D)
9.	(D)	19.	(B)	29.	(C)	39.	(C)	49.	(C)	59.	(C)	69.	(D)	79.	(A)	89.	(C)	99.	(D)
10.	(B)	20.	(B)	30.	(C)	40.	(B)	50.	(D)	60.	(A)	70.	(C)	80.	(C)	90.	(C)	100.	(A)