

## HSSC MOCK TEST - 168 (SOLUTION)

1. (A) Total number of arrangements

$$= \frac{10!}{2!2!2!2!} = \frac{10!}{16}$$

The total number of arrangements when

$$I's \text{ come together} = \frac{9!}{2!2!2!} = \frac{9!}{8}$$

The total number of arrangements when I's do not come together

$$= \frac{10!}{16} - \frac{9!}{8} = \frac{9!}{2}$$

$$\therefore \text{The required Probability} = \frac{\frac{9!}{2}}{\frac{10!}{16}} = \frac{4}{5}$$

2. (B)  $A'$  = cofactor of A

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

$$|A'| = (A)^{4-1} \quad [\because \text{Order} = 4]$$

$$|A'| = A^3$$

3. (C) Let X and Y are two persons and they hit a target with the probability A and B respectively.

$$\therefore P(A) = \frac{1}{3} \text{ and } P(B) = \frac{1}{4}$$

$P$  (Probability of hitting the target by any one X or Y)

$$\Rightarrow P(A \cap \bar{B}) + P(\bar{A} \cap B)$$

$$\Rightarrow P(A) \cdot P(\bar{B}) + P(\bar{A}) \cdot P(B)$$

$$\Rightarrow \frac{1}{3} \times \frac{3}{4} + \frac{2}{3} \times \frac{1}{4} = \frac{1}{4} + \frac{1}{6} = \frac{5}{12}$$

4. (C)  $\{(A \cap C) \cup (B \cap C)\} - (A \cap B \cap C)$

5. (C)  $AA^T = 1$

$$\Rightarrow |AA^T| = 1$$

$$\Rightarrow |A|^2 = 1$$

$$\Rightarrow |A| = \pm 1$$

6. (B)  $x = 7 + 7^{\frac{1}{3}} + 7^{\frac{2}{3}}$

$$\Rightarrow x - 7 = 7^{\frac{1}{3}} + 7^{\frac{2}{3}} \quad \dots(i)$$

$$\Rightarrow (x - 7)^3 = (7^{\frac{1}{3}} + 7^{\frac{2}{3}})^3$$

$$\Rightarrow x^3 - 243 - 3 \times x \times 7(x - 7)$$

$$= 7 + 7^2 + 3 \times 7^{\frac{1}{3}} \times 7^{\frac{2}{3}} \left( 7^{\frac{1}{3}} \times 7^{\frac{2}{3}} \right)$$

$$\Rightarrow x^3 - 243 - 21x^2 + 147x = 56 + 21(x - 7)$$

$$\Rightarrow x^3 - 243 - 21x^2 + 147x = 56 + 21x - 147$$

$$\Rightarrow x^3 - 21x^2 + 126x = 152$$

$$\Rightarrow x^3 - 21x^2 + 126x + 8 = 152 + 8$$

$$\Rightarrow x^3 - 21x^2 + 126x + 8 = 160$$

7. (B) Given that  $g(x) = \frac{1}{x}$ ,  $f(x) = \frac{1}{g(x)} = x$

**From option (B)**

$$\text{L.H.S} = f(g(f(g(g(x)))))$$

$$= f\left(g\left(f\left(g\left(\frac{1}{x}\right)\right)\right)\right)$$

$$= f(g(f(x)))$$

$$= f(g(x))$$

$$= f\left(\frac{1}{x}\right) = \frac{1}{x}$$

$$\text{R.H.S.} = g(f(g(g(f(x)))))$$

$$= g(f(g(g(x))))$$

$$= g\left(f\left(g\left(\frac{1}{x}\right)\right)\right)$$

$$= g(f(x))$$

$$= g(x) = \frac{1}{x}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence option B is correct.

8. (C)  $\frac{1 + \cos(B - C) \cos A}{1 + \cos(B - A) \cos C}$

$$\Rightarrow \frac{1 - \cos(B - C) \cos(B + C)}{1 - \cos(B - A) \cos(B + A)} \quad [\because A + B + C = \pi]$$

$$\Rightarrow \frac{1 - \cos^2 B + \sin^2 C}{1 - \cos^2 B + \sin^2 A}$$

$$\Rightarrow \frac{\sin^2 B + \sin^2 C}{\sin^2 B + \sin^2 A} = \frac{b^2 + c^2}{b^2 + a^2}$$

9. (C) Given that

$$x + y = 25 \quad \dots(i)$$

A.T.Q.

$$A = x^3 y^2$$

$$\Rightarrow A = x^3(25 - x)^2$$

$$\Rightarrow A = 625x^3 + x^5 - 50x^4$$

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

$$\Rightarrow \frac{dA}{dx} = 1875x^2 + 5x^4 - 200x^3$$

... (i)

Again, differentiating

$$\Rightarrow \frac{d^2A}{dx^2} = 3750x + 20x^3 - 600x^2$$

...(ii)

for maxima and minima

$$\frac{dA}{dx} = 0$$

$$\Rightarrow 1875x^2 + 5x^4 - 200x^3 = 0$$

$$\Rightarrow 5x^2(x^2 - 40x + 375) = 0$$

$$\Rightarrow x^2(x - 25)(x - 15) = 0$$

$$\Rightarrow x = 0, 15, 25$$

from eq. (ii)

$$\left(\frac{d^2A}{dx^2}\right)_{\text{at } x=15} = 3750 \times 15 + 20 \times 15^3 - 600 \times (15)^2$$

$$= -11250 \text{ (maxima)}$$

$$\left(\frac{d^2A}{dx^2}\right)_{\text{at } x=25} = 3750 \times 25 + 20(25)^3 - 600 \times (25)^2$$

$$= 31250 \text{ (minima)}$$

For maximum value,  $x = 15$  and  $y = 10$

10. (C)  $S = 3^2 + 6^2 + 9^2 + \dots + 45^2$

$$S = 3^2(1^2 + 2^2 + 3^2 + \dots + 15^2)$$

$$S = 3^2 \times \frac{15}{6} (15 + 1) (2 \times 15 + 1)$$

$$S = 9 \times \frac{5}{2} \times 16 \times 31 = 11160$$

81. (A) Pork is the meat of pig while vanison is the meat of **Dear**.

82. (C) Flock is the group of ducks while **Pride** is the group of lions.

83. (A) **Andaman and Nicobar** is an island territory.

84. (A) Only '**729**' is the number whose square root and cube root can be found.

85. (A)  $7 \times 4 + 1 = 29$

$$29 \times 4 + 1 = 117$$

$$6 \times 4 + 2 = 26$$

$$26 \times 4 + 2 = \mathbf{106}$$

$$5 \times 4 + 3 = 23$$

$$23 \times 4 + 3 = 95$$

86. (B)  $(8 \times 5) + (6 + 3) = 49$

$$(7 \times 9) + (16 + 4) = 83$$

$$(11 \times 7) + (14 + 8) = \mathbf{99}$$

87. (B)  $\frac{(42 \times 8) - (21 \times 4)}{4 + 9 \times 3 + 12 \div 2}$

After changing the signs,

$$= \frac{(42 - 8) \div (21 - 4)}{4 \times 9 - 3 \times 12 + 2} = \frac{34}{17 \times 2} = 1$$

### HSSC MOCK TEST - 168 (ANSWER KEY)

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

**Note:- If your opinion differs regarding any answer, please message the mock test and question number to 8860330003**

**Note:- Whatsapp with Mock Test No. and Question No. at 7053606571 for any of the doubts. Join the group and you may also share your suggestions and experience of Sunday Mock Test.**

**Note:- If you face any problem regarding result or marks scored, please contact 9313111777**