

HSSC MOCK TEST – 159 (SOLUTION)

1. (C) Differential equation

$$\left(\frac{dy}{dx}\right)^2 + \frac{d^2y}{dx^2} + 2y = \frac{dx}{dy}$$

$$\Rightarrow \left(\frac{dy}{dx}\right)^2 + \frac{d^2y}{dx^2} + 2y = \frac{1}{\frac{dy}{dx}}$$

$$\Rightarrow \left(\frac{dy}{dx}\right)^3 + \frac{d^2y}{dx^2} \cdot \frac{dy}{dx} + 2y \frac{dy}{dx} = 1$$

2. (B) $\sin(120 - x) + \sin(120 + x)$

$$\Rightarrow \sin \frac{120 - x + 120 + x}{2} \cdot \cos \frac{120 - x - 120 - x}{2}$$

$$\Rightarrow \sin 120 \cdot \cos x$$

$$\Rightarrow \frac{\sqrt{3}}{2} \cos x$$

3. (D) Series

$$S = \frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \dots \text{upto 10 terms}$$

$$S = \frac{1}{3} \left[\left(1 - \frac{1}{4}\right) + \left(\frac{1}{4} - \frac{1}{7}\right) + \dots + \left(\frac{1}{28} - \frac{1}{31}\right) \right]$$

$$S = \frac{1}{3} \left(1 - \frac{1}{31}\right)$$

$$S = \frac{1}{3} \times \frac{30}{31} = \frac{10}{31}$$

4. (A) Quadratic equation

$$3x^2 + px + 12 = 0$$

One root is 4.

and let other root = α

$$\text{Product of the roots} = \frac{12}{3}$$

$$\Rightarrow 4 \times \alpha = 4 \Rightarrow \alpha = 1$$

5. (A) Word "TEACHER"

$$\begin{aligned} \text{The required no. of permutation} &= \frac{7!}{2!} \\ &= 2520 \end{aligned}$$

6. (A) Given that $P(A) = \frac{1}{4}$, $P(A \cap B) = \frac{2}{3}$ and

$$P(A \cup B) = \frac{1}{3}$$

We know that

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

$$\Rightarrow \frac{1}{3} = \frac{1}{4} + P(B) - \frac{2}{3}$$

$$\Rightarrow \frac{1}{3} - \frac{1}{4} + \frac{2}{3} = P(B) \Rightarrow P(B) = \frac{3}{4}$$

$$\text{Now, } P(A/B) = \frac{P(A \cap B)}{P(B)}$$

$$= \frac{2/3}{3/4} = \frac{8}{9}$$

7. (B) The required number of hand shakes in party = ${}^{17}C_2$

$$= \frac{17 \times 16}{2} = 136$$

8. (C) $n(S) = 6 \times 6 \times 6 = 216$

$$E = \left\{ (6,6,2), (6,2,6), (6,5,3), (6,3,5), (6,4,4), (5,6,3), (5,3,6), (5,5,4), (5,4,5), (4,6,4), (4,4,6), (4,5,5), (3,6,5), (3,5,6), (2,6,6) \right\}$$

$$n(E) = 15$$

$$\text{The required Probability } P(E) = \frac{n(E)}{n(S)}$$

$$= \frac{15}{216} = \frac{5}{72}$$

9. (A) $n(S) = {}^{12}C_3 = 220$

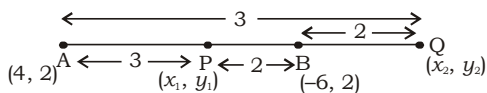
$$n(E) = {}^7C_2 \times {}^5C_1$$

$$= \frac{7 \times 6}{2} \times 5 = 105$$

$$\text{The required Probability } P(E) = \frac{n(E)}{n(S)}$$

$$= \frac{105}{220} = \frac{21}{44}$$

10. (B)



$$x_1 = \frac{3 \times (-6) + 2 \times 4}{3 + 2}, y_1 = \frac{3 \times 2 + 2 \times 2}{3 + 2}$$

$$x_1 = -2, y_1 = 2$$

Point P(x_1, y_1) = (-2, 2)

$$x_2 = \frac{3 \times (-6) - 2 \times 4}{3 - 2}, y_2 = \frac{3 \times 2 - 2 \times 2}{3 - 2}$$

$$x_2 = -26, y_2 = 2$$

Point Q(x_2, y_2) = (-26, 2)

$$\text{Now, } PQ = \sqrt{(-2 + 26)^2 + (2 - 2)^2}$$

$$= \sqrt{576 + 0} = 24$$

11. (C) Let the 5 consecutive even numbers

= $x, x + 2, x + 4, x + 6$ and $x + 8$

ATQ,

$$x + x + 2 + x + 4 + x + 6 + x + 8 = 5A$$

$$\Rightarrow 5x = 5A - 20$$

$$\Rightarrow x = A - 4$$

\therefore Required average

$$\frac{A - 4 + A - 2 + A + A + 2 + A + 4 + A + 6 + A + 8 + A + 10 + A + 12 + A + 14}{10}$$

$$= \frac{10A + 50}{10} = A + 5$$

12. (D) Let population of city before 2 year = x
ATQ,

$$\frac{x \propto 105 \propto 105}{100 \propto 100} = 30870$$

$$\Rightarrow x = \frac{30870 \propto 100 \propto 100}{105 \propto 105} = 28000$$

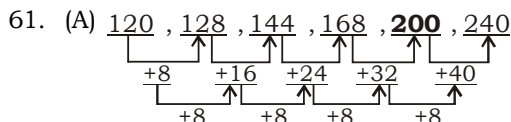
13. (D) Let the speed of 100 m long train = x m
ATQ,

$$\left| \frac{100, 150}{9} \right| \propto \frac{18}{5} = \text{Relative speed}$$

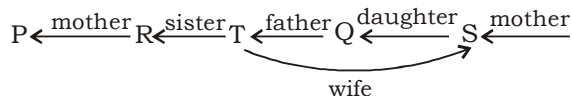
$$\Rightarrow \text{Relative speed} = 100 \text{ km/hr}$$

$$\text{and, } x + 40 = 100$$

$$\Rightarrow x = 100 - 40 = 60$$



63. (D)



64. (A) $27 \div 3 - 18 \div 3 \times 2 = 18$

After interchanging the signs

$$27 + 3 - 18 \div 3 \times 2$$

$$= 30 - 12 = 18$$

65. (A) As, $\frac{16}{\times 16 - 16}$ similarly, $\frac{240}{\times 6 - 6}$

HSSC MOCK TEST - 159 (ANSWER KEY)

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