

**HSSC MOCK TEST - 168 (SOLUTION)**

2. (D)  $\begin{array}{cccccc} 19 & 23 & 26 & 30 & 33 & 37 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +4 & +3 & +4 & +3 & +4 & \end{array}$

3. (C)  $\begin{array}{cccccc} I & N & D & I & A & N \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 17 & 27 & 7 & 17 & 1 & 27 \end{array} = 96$

6. (A) ATQ,  

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1+0 & 1+1 \\ 0+0 & 0+1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}^2 = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$$

$$\therefore \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}^n = \begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$$

25. (D)  $\begin{array}{cccccc} 1 & 3 & 7 & 13 & 21 & 31 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +2 & +4 & +6 & +8 & +10 & \end{array}$

26. (B)  $x = g(t)$  and  $y = f(t)$   
 $\Rightarrow \frac{dx}{dt} = g'(t), \frac{dy}{dt} = f'(t)$   
 $\Rightarrow \frac{d^2x}{dt^2} = g''(t), \frac{d^2y}{dt^2} = f''(t)$

Now,  $\frac{dy}{dx} = \frac{dy}{dt} \times \frac{dt}{dx}$

$$\Rightarrow \frac{dy}{dx} = \frac{f'(t)}{g'(t)}$$

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

$$\Rightarrow \frac{d^2y}{dx^2} = \frac{g'(t)f''(t) - f'(t)g''(t)}{\{g'(t)\}^2}$$

Given that  $\frac{d^2y}{dx^2} = 0$

$$\Rightarrow g'(t)f''(t) - f'(t)g''(t) = 0$$

$$\Rightarrow \frac{dx}{dt} \cdot \frac{d^2y}{dt^2} - \frac{dy}{dt} \cdot \frac{d^2x}{dt^2} = 0$$

$$\Rightarrow \frac{dx}{dt} \cdot \frac{d^2y}{dt^2} = \frac{dy}{dt} \cdot \frac{d^2x}{dt^2}$$

28. (A) We Know that,  
 $(1+x)^n = C_0 + C_1x + C_2x^2 + C_3x^3 + \dots + C_nx^n$   
 On differentiating both side w.r.t. 'x'  
 $\Rightarrow x(1+x)^{n-1} = 0 + C_1 + 2C_2x + 3C_3x^2 + \dots + nC_nx^{n-1}$   
 On putting  $x = 1$   
 $\Rightarrow n(1+1)^{n-1} = C_1 + 2C_2 + 3C_3 + \dots + nC_n$   
 $\Rightarrow C_1 + 2C_2 + 3C_3 + \dots + nC_n = n \cdot 2^{n-1}$

34. (B)  $A' = \text{cofactor of } A$   
 $|A'| = |\text{cofactor of } A|$   
 $|A'| = (A)^{4-1} \quad [\because \text{Order} = 4]$   
 $|A'| = A^3$

35. (A)  $A = \begin{bmatrix} 2 & 4 \\ 4 & 4 \end{bmatrix}$  and  $A^2 = \begin{bmatrix} 20 & 24 \\ 24 & 32 \end{bmatrix}$

**From option A**

$$A^2 - 6A - 8I = \begin{bmatrix} 20 & 24 \\ 24 & 32 \end{bmatrix} - 6 \begin{bmatrix} 2 & 4 \\ 4 & 4 \end{bmatrix} - 8 \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$A^2 - 6A - 8I = \begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix} - \begin{bmatrix} 8 & 0 \\ 0 & 8 \end{bmatrix}$$

$$A^2 - 6A - 8I = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$$

$$A^2 - 6A - 8I = 0$$

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

50. (D)  $30\theta 10\gamma 5\alpha 10\beta 20$   
 After changing the signs,  
 $30 \div 10 \times 5 + 10 - 20$   
 $= 15 - 10 = 5$

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

**From option (B)**

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

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

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

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

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

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

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

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

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

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

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

Hence option B is correct.

56. (B)  $n(S) = {}^{11}C_3 = 165$   
 $n(E) = {}^4C_2 \times {}^2C_1 \times {}^5C_0 + {}^4C_2 \times {}^2C_0 \times {}^5C_1 + {}^4C_3 \times {}^2C_0 \times {}^5C_0$   
 $n(E) = 6 \times 2 \times 1 + 6 \times 1 \times 5 + 4 \times 1 \times 1 = 46$

The required Probability =  $\frac{46}{165}$

57. (D)  $\{x : x + 6 = 6\} = \{0\}$

58. (D) Three-digit numbers

$\begin{array}{|c|c|c|} \hline 9 & 10 & 10 \\ \hline \end{array} = 9 \times 10 \times 10 = 900$

'0' can't put here

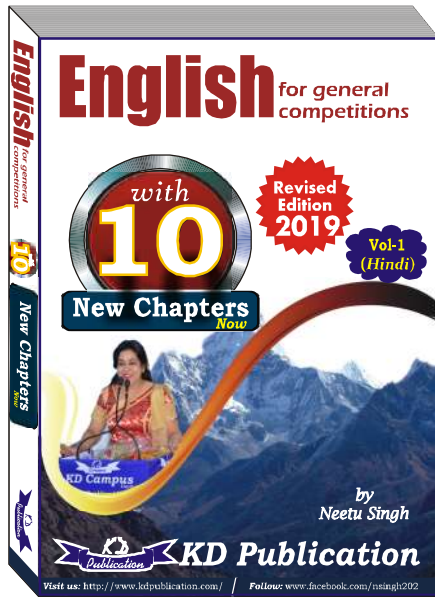
60. (A)  $\begin{array}{c} S \\ +4 \swarrow \quad \searrow -3 \\ W \quad P \end{array} \quad \begin{array}{c} O \\ +4 \swarrow \quad \searrow -3 \\ S \quad L \end{array} \quad \begin{array}{c} L \\ +4 \swarrow \quad \searrow -3 \\ P \quad I \end{array} \quad \begin{array}{c} I \\ +4 \swarrow \quad \searrow -3 \\ M \quad F \end{array} \quad \begin{array}{c} D \\ +4 \swarrow \quad \searrow -3 \\ H \quad A \end{array}$

$\begin{array}{c} W \\ +4 \swarrow \quad \searrow -3 \\ A \quad T \end{array} \quad \begin{array}{c} A \\ +4 \swarrow \quad \searrow -3 \\ E \quad X \end{array} \quad \begin{array}{c} T \\ +4 \swarrow \quad \searrow -3 \\ X \quad Q \end{array} \quad \begin{array}{c} E \\ +4 \swarrow \quad \searrow -3 \\ I \quad B \end{array} \quad \begin{array}{c} R \\ +4 \swarrow \quad \searrow -3 \\ V \quad O \end{array}$

64. (A) If A, B, C are in G.P., then  
 $B^2 = AC$   
 $\therefore x^2 + 36 - 12x = 4x + 36$   
 $\Rightarrow x^2 + 36 = 16$   
 $\Rightarrow x = 01, 16$

71. (B) AIDS is caused by virus, while Malaria is caused by **Bacteria**.

72. (D)  $E \xleftarrow{\text{opp.}} V \quad G \xleftarrow{\text{opp.}} T$   
 $J \xleftarrow{\text{opp.}} Q \quad P \xleftarrow{\text{opp.}} K = L$



### HSSC MOCK TEST – 169 (ANSWER KEY)

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