

## HSSC MOCK TEST - 170 (SOLUTION)

2. (A) 
$$\begin{array}{cccccc}
 -1 & 0 & 1 & 8 & 27 & 64 \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 -1^3 & 0^3 & 1^3 & 2^3 & 3^3 & 4^3 \\
 \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow \\
 & +1 & +1 & +1 & +1 & +1
 \end{array}$$

4. (D) In the expansion of  $\left(2x^4 - \frac{1}{4x^2}\right)^{11}$

$$\begin{aligned}
 T_{r+1} &= {}^{11}C_r (2x^4)^{11-r} \left(\frac{-1}{4x^2}\right)^r \\
 &= {}^{11}C_r 2^{11-3r} (-1)^r x^{44-6r} \\
 \text{Hence, } 44 - 6r &= 8 \Rightarrow r = 6 \\
 \text{The Required Coefficient} &= {}^{11}C_6 2^{-7} (-1)^6 \\
 &= \frac{11 \times 10 \times 9 \times 8 \times 7}{5 \times 4 \times 3 \times 2} \times \frac{1}{128} = \frac{231}{64}
 \end{aligned}$$

6. (B) 
$$\begin{array}{ccccccccc}
 & & -1 & & -1 & & & & \\
 & & \downarrow & & \downarrow & & & & \\
 8 & 9 & 7 & 8 & 6 & 7 & 5 & & \\
 & & \uparrow & & \uparrow & & \uparrow & & \\
 & & -1 & & -1 & & -1 & & 
 \end{array}$$

8. (B) 
$$\begin{array}{ccccccc}
 0.5 & 0.55 & 0.65 & 0.8 & 1 \\
 \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
 & +0.55 & +0.1 & +0.15 & +0.20
 \end{array}$$

12. (A) As,  
 E X A M I N A T I O N  
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$   
 $5+24+1+13+9+14+1+20+9+15+4 = 125$   
 Similarly,  
 H A R D W O R K  
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$   
 $8+1+18+4+23+15+18+11 = 98$

14. (D) As, 
$$\begin{array}{ccc}
 \text{AG} & & \text{IO} \\
 \downarrow & & \downarrow \\
 & +8 & 
 \end{array}$$
 Similarly,  

$$\begin{array}{ccc}
 \text{EK} & & \text{MS} \\
 \downarrow & & \downarrow \\
 & +8 & 
 \end{array}$$

20. (B) A.T.Q.,  
 L.C.M.  $\times$  H.C.F. = First number  $\times$  Second number  
 $\Rightarrow 9 \times 360 = 45 \times \text{First number}$   
 $\therefore \text{First number} = 72$

23. (A) A.T.Q.,  
 $100 + 95 + 90 + \dots + x = 975$   
 $\therefore 975 = \frac{n}{2}(200 + (x-1) - 5)$

$$\begin{aligned}
 \Rightarrow 1950 &= n(200 - 5n + 5) \\
 \Rightarrow 1950 &= -5n^2 + 205n \\
 \Rightarrow n^2 - 41n + 390 &= 0 \\
 \Rightarrow n^2 - 26n - 15n + 390 &= 0 \\
 \Rightarrow n(n-26) - 15(n-26) &= 0 \\
 \Rightarrow n &= 15
 \end{aligned}$$

25. (B)  $165 = 3 \times 5 \times 11$   
 $225 = 3 \times 3 \times 5 \times 5$   
 $\therefore \text{Largest number} = 3 \times 5 = 15$

26. (B)  $A = \begin{bmatrix} -7 & 12 \\ -1 & 2 \end{bmatrix}$   
 $|A| = -14 + 12 = -2$   
 Co-factors of A -  
 $C_{11} = (-1)^{1+1}(2) = 2, C_{12} = (-1)^{1+2}(-1) = 1$   
 $C_{21} = (-1)^{2+1}(12) = -12, C_{22} = (-1)^{2+2}(-7) = -7$

$$C = \begin{bmatrix} 2 & 1 \\ -12 & -7 \end{bmatrix}$$

$$\text{Adj } A = C^T = \begin{bmatrix} 2 & -12 \\ 1 & -7 \end{bmatrix}$$

$$A^{-1} = \frac{\text{Adj } A}{|A|}$$

$$A^{-1} = \frac{-1}{2} \begin{bmatrix} 2 & -12 \\ 1 & -7 \end{bmatrix} \Rightarrow 2A^{-1} = \begin{bmatrix} -2 & 12 \\ -1 & 7 \end{bmatrix}$$

Now,  $A + 2A^{-1}$   
 $\Rightarrow \begin{bmatrix} -7 & 12 \\ -1 & 2 \end{bmatrix} + \begin{bmatrix} -2 & 12 \\ -1 & 7 \end{bmatrix}$   
 $\Rightarrow \begin{bmatrix} -9 & 24 \\ -2 & 9 \end{bmatrix}$

27. (A) Vectors  $4\hat{i} - (2\lambda + 1)\hat{j} + (3-\lambda)\hat{k}$   
 and  $2\lambda\hat{i} + 4\hat{j} - \hat{k}$  are perpendicular,  
 then,  $4 \times 2\lambda - (2\lambda + 1) \times 4 + (3 - \lambda) \times (-1) = 0$   
 $\Rightarrow 8\lambda - 8\lambda - 4 - 3 + \lambda = 0$   
 $\Rightarrow \lambda - 7 = 0 \Rightarrow \lambda = 7$

28. (D)  $A = \begin{bmatrix} 3i & 4-3i \\ -4-3i & -2i \end{bmatrix}$   
 $\bar{A} = \begin{bmatrix} -3i & 4+3i \\ -4+3i & 2i \end{bmatrix}$   
 $(\bar{A})' = \begin{bmatrix} -3i & -4+3i \\ 4+3i & 2i \end{bmatrix}$   
 $A^* = - \begin{bmatrix} 3i & 4-3i \\ -4-3i & -2i \end{bmatrix}$   
 $A^* = -A$   
 Hence matrix is skew-hermitian matrix.

31. (B)  $S_n = 3 + 7 + 12 + 18 + \dots + t_n \dots (I)$   
 $S_n = 3 + 7 + 12 + \dots + t_{n-1} + t_n \dots (II)$   
 Subtracting equation (I) - (II)  
 $0 = 3 + 4 + 5 + 6 + \dots + (t_n - t_{n-1}) - t_n$   
 $t_n = 3 + 4 + 5 + 6 + \dots + (t_n - t_{n-1})$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$t_n = \frac{n}{2} [6 + (n-1) \times 1]$$

$$t_n = \frac{n}{2} [(n+5)]$$

$$t_1 + t_2 + t_3 + t_4 + \dots + t_n$$

$$= \sum_{i=1}^n \frac{n}{2} (n+5)$$

$$= \frac{1}{2} \sum_{i=1}^n n^2 + 5n$$

$$= \frac{1}{2} \left[ \frac{n(n+1)(2n+1)}{6} + \frac{5n(n+1)}{2} \right]$$

$$= \frac{n(n+1)(n+8)}{6}$$

34. (C)  $30 + 5 \div - 10 \times 5 = 22$   
 After changing the signs,  
 $30 - 5 \times 4 + 10 \div 5 = 22$   
 $\Rightarrow 30 - 20 + 2 = 22$   
 $\Rightarrow 12 \neq 22$

37. (C)  $\frac{b}{+3} \frac{e}{-1} \frac{d}{+2} \frac{f}{+3} \frac{i}{-1} \frac{h}{+2} \frac{j}{+3} \frac{m}{-1} \frac{l}{-1}$

45. (B) The required number of ways =  $(8-1)!$   
 $= 7! = 5040$

47. (D) Given that  $\tan A = \frac{-1}{3}$  and  $\tan B = \frac{1}{2}$

$$\text{Now, } \tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \cdot \tan B}$$

$$\Rightarrow \tan(A-B) = \frac{\frac{-1}{3} - \frac{1}{2}}{1 + \left(\frac{-1}{3}\right) \times \frac{1}{2}}$$

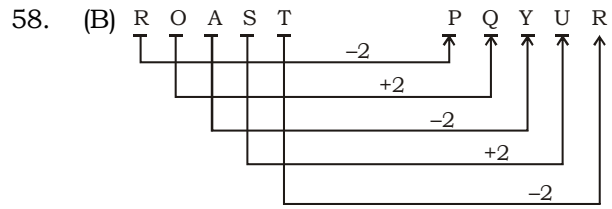
$$\Rightarrow \tan(A-B) = \frac{\frac{-5}{6}}{\frac{6}{6}}$$

$$\Rightarrow \tan(A-B) = -1 \Rightarrow A-B = \frac{3\pi}{4}$$

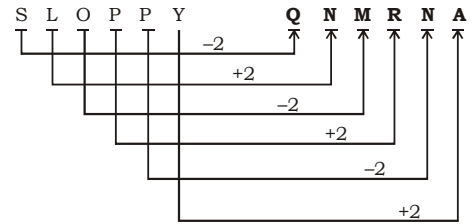
48. (D) As,  $\frac{17}{\times 3+1} \frac{52}{\uparrow}$

Similarly,  $\frac{1}{\times 3+1} \frac{4}{\uparrow}$

55. (B) As, the sum of numerical values of the words of MADRAS is 56.  
 Similarly, the sum of numerical values of the words of CALCUTTA is **81**.



Similarly,



65. (B) A.T.Q.,

$$550 = \frac{5500 \times 4 \times \text{time}}{100}$$

$$\Rightarrow \text{time} = 2.5 \text{ years}$$

66. (C) Let marks of 6th students =  $x$   
 A.T.Q.,

$$2 \times \frac{45}{2} + 3 \times 24 + x + x + 3 + x + 9 = 30 \times 8$$

$$\Rightarrow 3x = 240 - 129$$

$$\Rightarrow x = 37$$

$$\therefore \text{Marks of 9th student} = 37 + 9 = \mathbf{46}$$

74. (C) Equation  $ax^2 + bx + c = 0$

$$\alpha + \beta = \frac{-b}{a} \text{ and } \alpha\beta = \frac{c}{a}$$

$$\text{Now, } \frac{\alpha}{\beta} + \frac{\beta}{\alpha}$$

$$\Rightarrow \frac{\alpha^2 + \beta^2}{\alpha\beta}$$

$$\Rightarrow \frac{(\alpha + \beta)^2 - 2\alpha\beta}{\alpha\beta}$$

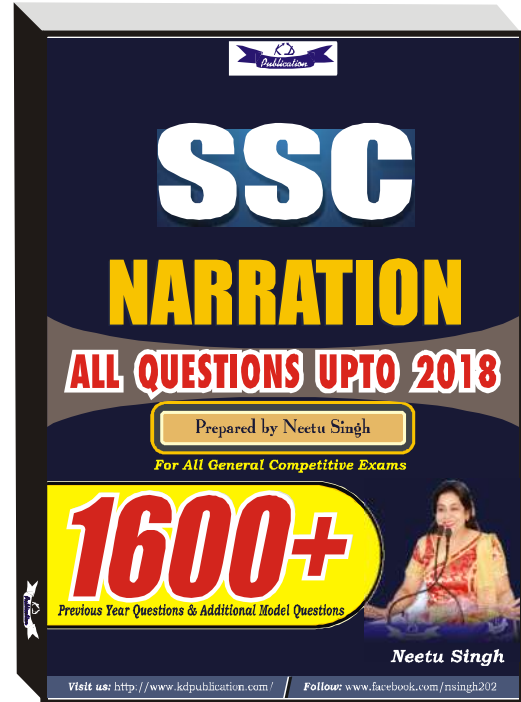
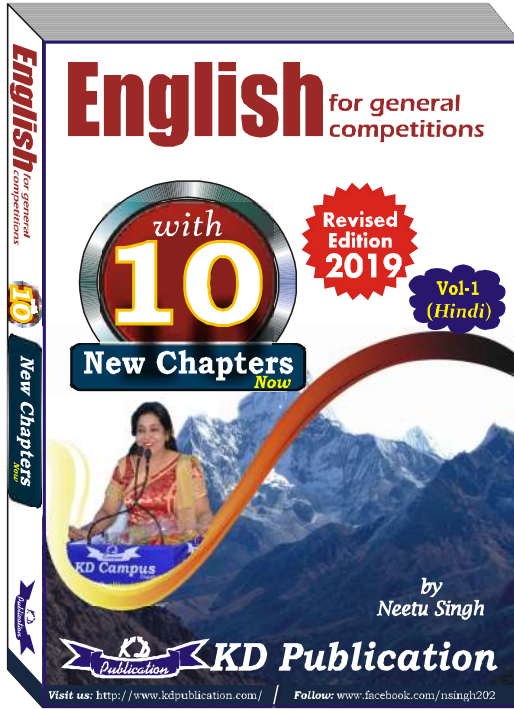
$$\Rightarrow \frac{\left(\frac{-b}{a}\right)^2 - 2 \times \frac{c}{a}}{\frac{c}{a}}$$

$$\Rightarrow \frac{\frac{b^2}{a^2} - \frac{2c}{a}}{\frac{c}{a}}$$

$$\Rightarrow \frac{\frac{b^2 - 2ac}{a^2}}{\frac{c}{a}} = \frac{b^2 - 2ac}{ac}$$

**HSSC MOCK TEST – 170 (ANSWER KEY)**

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