

HSSC MOCK TEST – 166 (SOLUTION)

1. (B) Two dice are thrown
 $n(S) = 36$
 $E = \{(6, 4), (4, 6), (5, 5)\}$ [\because Sum is 10.]
 $n(E) = 3$

The required Probability = $\frac{3}{36} = \frac{1}{12}$

2. (C) $a = 24, b = 36$

H.M. = $\frac{2ab}{a+b}$

H.M. = $\frac{2 \times 24 \times 36}{60} = \frac{144}{5}$

3. (C) $x^2 - 16x + 28 > 0$

$(x - 14)(x - 4) > 0$

$x < 4$ and $x > 14$

4. (B) $\tan 750 - \cot 390^\circ$

$\Rightarrow \tan(2 \times 360 + 30) - \cot(360 + 30^\circ)$

$\Rightarrow \tan 30 - \cot 30$

$\Rightarrow \frac{1}{\sqrt{3}} - \sqrt{3} = \frac{-2}{\sqrt{3}}$

5. (B) Digits 0, 1, 2, 3, 4, 6, 7, 9

(i) When last digit is '0'

$\boxed{5 \ 1} = 5$

(ii) When last digit is '2'

$\boxed{5 \ 1} = 5$

(ii) When last digits is '4'

$\boxed{4 \ 1} = 4$

(iii) When last digit is '6'

$\boxed{4 \ 1} = 4$

The required number = $5 + 5 + 4 + 4$
 $= 18$

6. (C) In the expansion of $\left(3x^2 - \frac{1}{2x^3}\right)^7$

$T_{r+1} = {}^7C_r (3x^2)^{7-r} \left(\frac{-1}{2x^3}\right)^r$

$= {}^7C_r 3^{7-r} \left(\frac{-1}{2}\right)^r x^{14-5r}$

Here, $14 - 5r = 4 \Rightarrow r = 2$

Coefficient of $x^4 = {}^7C_2 3^5 \left(\frac{-1}{2}\right)^2$

$= \frac{21 \times 81}{4} = \frac{1701}{4}$

7. (C) Let numbers = $x - 6, x - 5, x - 4, x - 3, x - 2, x - 1, x, x + 1, x + 2, x + 3, x + 4, x + 5, x + 6$

A.T.Q.,

Sum = 1677

$13x = 1677 \Rightarrow x = 129$

9th term = $x + 2$

$= 129 + 2 = 131$

8. (B) The required number of ways = 8^6

9. (B)

Class	x	f	$f \times x$	$d = x - A $	$f \times d$
0-10	5	11	55	30	330
10-20	15	14	210	20	250
20-30	25	15	375	5	75
30-40	35	16	560	5	80
40-50	45	12	540	20	240
50-60	55	32	1760	30	960
		$\Sigma f = 100$	$\Sigma f \times x = 3500$	$\Sigma f \times d = 1965$	

Mean A = $\frac{\Sigma f \times x}{\Sigma f}$

$A = \frac{3500}{100} = 35$

Mean-Deviation = $\frac{\Sigma f \times d}{\Sigma f}$

$= \frac{1965}{100} = 19.65$

10. (B) Standard deviation of $x_1, x_2, x_3, \dots, x_n = 10$

Standard deviation of $y_1, y_2, y_3, \dots, y_n = 13$

Standard deviation of $x_1 - y_1, x_2 - y_2, \dots$

$\dots, x_n - y_n = 13 - 10 = 3$

11. (C) $x + y = t + \frac{1}{t}$ and $x^2 + y^2 = t^2 + \frac{1}{t^2}$

On squaring

$\Rightarrow x^2 + y^2 + 2xy = t^2 + \frac{1}{t^2} + 2$

$\Rightarrow x^2 + y^2 + 2xy = x^2 + y^2 + 2$



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$$\Rightarrow 2xy = 2$$

$$\Rightarrow y = \frac{1}{x}$$

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

$$\Rightarrow \frac{dy}{dx} = \frac{-1}{x^2}$$

12. (B)

13. (A) Let $y = 4^{73}$

$$\Rightarrow y = 2^{146}$$

taking log both side

$$\Rightarrow \log y = 146 \log 2$$

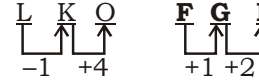
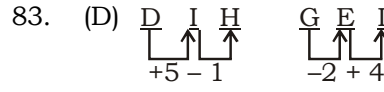
$$\Rightarrow \log y = 146 \times 0.3010 = 43.946$$

Hence no. of digits = 43 + 1 = 44

81. (C) Plumline is used by Manson for determining the vertical on an upright surface. While **scalpel** is used by surgeon for **surgery**.

82. (A) As, $(16 + 1)^2 + 1 = 290$

Similarly, $(31 + 1)^2 + 1 = 1025$



84. (C) Except **2198**, all others are the perfect cubes.

85. (C) $5 + 6 = 11$, $11 + 6 = 17$, $17 + 11 = 28$

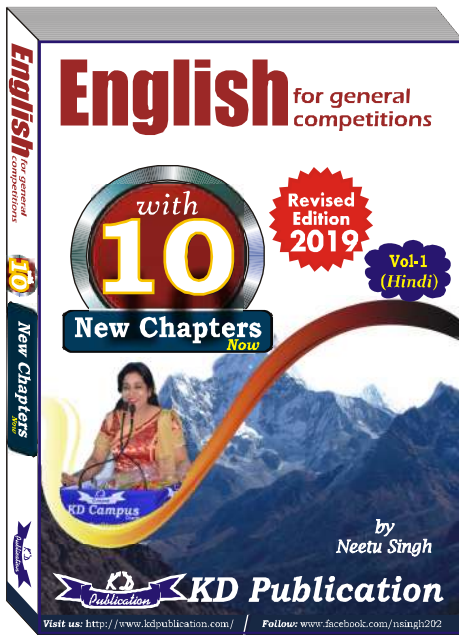
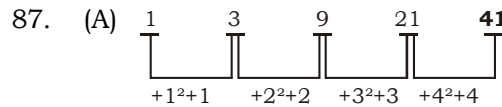
$28 + 17 = 45$, $28 + 45 = 73$, $73 + 45 = 118$

86. (B) As, $9 + 4 + 6 - (5 + 3) = 11$

and, $8 + 6 + 4 - (4 + 2) = 12$

Similarly,

$$5 + 4 + 5 - (2 + 3) = 9$$



HSSC MOCK TEST – 166 (ANSWER KEY)

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