HSSC MOCK TEST – 183 (SOLUTION)

1. (D) $f(x) = \log\left(\dfrac{1-x}{1+x}\right)$

    Now, $f\left(\dfrac{1}{2}\right) + f\left(\dfrac{1}{3}\right)$

    $\Rightarrow \log\left(\dfrac{1-\frac{1}{2}}{1+\frac{1}{2}}\right) + \log\left(\dfrac{1-\frac{1}{3}}{1+\frac{1}{3}}\right)$

    $\Rightarrow \log\left(\dfrac{\frac{1}{2}}{\frac{3}{2}}\right) + \log\left(\dfrac{\frac{2}{3}}{\frac{4}{3}}\right) \Rightarrow \log\left(\dfrac{1}{3}\right) + \log\left(\dfrac{1}{2}\right)$

    $\Rightarrow \log\left(\dfrac{1}{6}\right) = -\log 6$

2. (B) Equation $3x^2 + 5x + 7 = 0$

    $\alpha + \beta = -\dfrac{5}{3}$ and $\alpha.\beta = \dfrac{7}{3}$

    Now, $\dfrac{1}{\alpha^3} + \dfrac{1}{\beta^3} \Rightarrow \dfrac{\beta^3 + \alpha^3}{(\alpha\beta)^3}$

    $\Rightarrow \dfrac{(\alpha+\beta)^3 - 3\alpha\beta(\alpha+\beta)}{(\alpha\beta)^3}$

    $\Rightarrow \dfrac{\left(\dfrac{-5}{3}\right)^3 - 3\times\dfrac{7}{3}\times\left(\dfrac{-5}{3}\right)}{\left(\dfrac{7}{3}\right)^3}$

    $\Rightarrow \dfrac{\dfrac{-125}{27} + \dfrac{35}{3}}{\dfrac{343}{27}} = \dfrac{190}{343}$

3. (B) $\dfrac{^nC_1}{^nC_0} + \dfrac{2\,^nC_2}{^nC_1} + \dfrac{3\,^nC_2}{^nC_1} + \dots + \dfrac{n\,^nC_n}{^nC_{n-1}}$

    $\Rightarrow \dfrac{n}{1} + \dfrac{2.\dfrac{n(n-1)}{2}}{n} + \dfrac{3.\dfrac{n(n-1)(n-2)}{6}}{\dfrac{n(n-1)}{2}} + \dots + \dfrac{n.1}{n}$

    $\Rightarrow n + (n-1) + (n-2) + \dots + 1$

    $\Rightarrow 1 + 2 + 3 + \dots + n = \dfrac{n(n+1)}{2}$

4. (B)

5. (D) Coordinate of incentre

    $P\left(\dfrac{ax_1 + bx_2 + cx_3}{a+b+c}, \dfrac{ay_1 + by_2 + cy_3}{a+b+c}\right)$

    vertices are A(0, 0), B(2, $\sqrt{5}$), C(–10, 0)

    $a = \sqrt{12^2 + (\sqrt{5})^2} = 13$

    $b = \sqrt{(-10)^2 + 0^2} = 10$

    $c = \sqrt{(2)^2 + (\sqrt{5})^2} = 3$

    incentre $P = \left(\dfrac{13\times0 + 10\times2 + 3\times(-10)}{13+10+3}, \dfrac{13\times0 + 10\times\sqrt{5} + 3\times0}{13+10+3}\right)$

    $= \left(\dfrac{-10}{26}, \dfrac{10\sqrt{5}}{26}\right) = \left(\dfrac{-5}{13}, \dfrac{5\sqrt{5}}{13}\right)$

6. (B) We know that

    $\lim_{x\to\infty}[f(x)]^{g(x)} = e^{\lim_{x\to\infty} g(x)[f(x)-1]}$

    Now, $\lim_{x\to\infty}\left(\dfrac{x^2 + 2x + 5}{x^2 - 3x + 6}\right)^x$

    $\Rightarrow e^{\lim_{x\to\infty} x\left[\frac{x^2+2x+5-x^2+3x-6}{x^2-3x+6}\right]} \Rightarrow e^{\lim_{x\to\infty} x\left[\frac{5x-1}{x^2-3x+6}\right]}$

    $\Rightarrow e^{\lim_{x\to\infty}\left[\frac{5x^2-x}{x^2-3x+6}\right]} \Rightarrow e^{\lim_{x\to\infty}\left[\frac{5-\frac{1}{x}}{1-\frac{3}{x}+\frac{6}{x^2}}\right]}$

    $\Rightarrow e^{\left(\frac{5-0}{1-0}\right)} = e^5$

7. (B) Differential equation

    $x\dfrac{dy}{dx} + y = x^3 y^6$

    $\dfrac{1}{y^6}\dfrac{dy}{dx} + \dfrac{1}{xy^5} = x^2$

    Let $\dfrac{1}{y^5} = v$

    $\dfrac{-5}{y^6}\dfrac{dy}{dx} = \dfrac{dv}{dx}$

    $\dfrac{1}{y^6}\dfrac{dy}{dx} = \dfrac{-1}{5}\dfrac{dv}{dx}$

    $\dfrac{-1}{5}\dfrac{dv}{dx} + \dfrac{v}{x} = x^2$

    $\dfrac{dv}{dx} - \dfrac{5}{x}v = -5x^2$

It is a linear equation

Here P = $\dfrac{-5}{x}$, Q = $-5x^2$

I.F = $e^{\int \frac{-5}{4}dx}$

I.F = $e^{-5\log x} = \dfrac{1}{x^5}$

Solution of differential equation

$v \times \text{I.F} = \int Q. \times \text{I.F} dx$

$v \times \dfrac{1}{x^5} = \int (-5x^2) \times \dfrac{1}{x^5} dx$

$\dfrac{1}{x^5 y^5} = -5 \int \dfrac{1}{x^3} dx$

$x^5.y^5 = -5. \dfrac{x^{-3+1}}{-3+1} + c$

$x^5.y^5 = \dfrac{-5}{-2} \times \dfrac{1}{x^2} + c$

$x^5.y^5 = \dfrac{5}{2} x^2 + c$

8. **(B)** $z = \dfrac{-2(1+2i)}{3+i} = \dfrac{-2-4i}{3+i}$

$z = \dfrac{-2-4i}{3+i} \times \dfrac{3-i}{3-i}$

(Rationalizing Numerator and denominator)

$z = \dfrac{-6+2i-12i+4i^2}{10}$

$z = \dfrac{-6-10i-4}{10} = \dfrac{-10-10i}{10}$

$\therefore z = -1 - i$

$\therefore \theta = \dfrac{\pi}{4}$

9. **(C)** A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
Number of subset of A containing two elelment
= 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1
= 45

10. **(C)** Given that A = [x : x^2 = 1}, B = {x : x^4 = 1}
$\Rightarrow$ A = {-1, 1}, B = {-1, 1, -i, i}
Now, (A$\cup$B) = {1, -1, -i, i}
Hence n(A$\cup$B) = 4

11. **(B)** Let $x = 2 + \dfrac{1}{2 + \dfrac{1}{2 + ...\infty}}$

$\Rightarrow x = 2 + \dfrac{1}{x} \Rightarrow x^2 - 2x - 1 = 0$

$\Rightarrow x = \dfrac{2 \pm \sqrt{4+4}}{2} \Rightarrow x = 1 \pm \sqrt{2}$

But the value of given expression can not be negative or less then 2, therefore $(1+\sqrt{2})$ is required answer.

12. **(B)** There are 4 prizes and three students since each prizes cna be given to any persons
$\therefore$ Required no. of ways = 3 × 3 × 3 × 3 = 3^4.

13. **(D)** Since, adjoint of square matrix A is B and value determinant of A is α.
then AB = |A|I = αI

14. **(B)** The required no. of triangles
= $^{14}C_3 - {}^8C_3$
= 364 − 56
= 308

70. **(A)** The location of operation Blue star was at Punjab. While the location of operation Viraat was at **Srilanka**.

71. **(D)**

B	H	W	N		H	P	G	Z

+6
+8
+10
+12

Similarly,

G	C	F	L		**M**	**K**	**P**	**X**

+6
+8
+10
+12
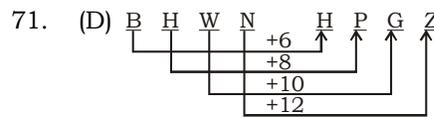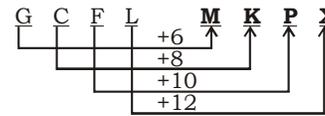
72. **(D)** Except **Meghdoot**, all others are the operations done by Navy while Meghdoot is done by Airforce.

73. **(A)** 120 = 5 × 4 × 3 × 2 × 1
24 = 4 × 3 × 2 × 1
720 = 6 × 5 × 4 × 3 × 2 × 1
840 is not the value of factorial of any natural number.

74. **(A)** As, $14^2 - 9^2 = 115$
and, $13^2 - 7^2 = 120$
Similarly, $18^2 - 9^2 = $ **243**

75. **(A)** As, (12 × 8 × 5) ÷ 40 = 12
and, (9 × 9 × 4) ÷ 27 = 12
Similarly, (14 × 3 × 6) ÷ **21**

76. **(D)**
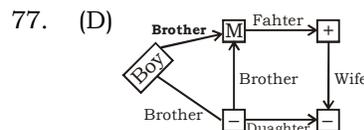
77. **(D)**

HSSC MOCK TEST – 183 (ANSWER KEY)

1.	(D)	11.	(B)	21.	(B)	31.	(C)	41.	(A)	51.	(A)	61.	(C)	71.	(D)	81.	(A)
2.	(B)	12.	(B)	22.	(A)	32.	(C)	42.	(B)	52.	(D)	62.	(D)	72.	(D)	82.	(B)
3.	(B)	13.	(D)	23.	(D)	33.	(A)	43.	(A)	53.	(C)	63.	(B)	73.	(A)	83.	(A)
4.	(B)	14.	(B)	24.	(C)	34.	(C)	44.	(A)	54.	(D)	64.	(B)	74.	(A)	84.	(A)
5.	(D)	15.	(B)	25.	(A)	35.	(D)	45.	(C)	55.	(D)	65.	(A)	75.	(A)	85.	(D)
6.	(B)	16.	(C)	26.	(B)	36.	(A)	46.	(B)	56.	(B)	66.	(B)	76.	(D)	86.	(C)
7.	(B)	17.	(A)	27.	(C)	37.	(A)	47.	(B)	57.	(B)	67.	(C)	77.	(D)	87.	(C)
8.	(B)	18.	(C)	28.	(D)	38.	(C)	48.	(D)	58.	(B)	68.	(B)	78.	(C)	88.	(D)
9.	(C)	19.	(B)	29.	(A)	39.	(C)	49.	(A)	59.	(B)	69.	(B)	79.	(D)	89.	(D)
10.	(C)	20.	(C)	30.	(B)	40.	(A)	50.	(B)	60.	(B)	70.	(A)	80.	(A)	90.	(D)
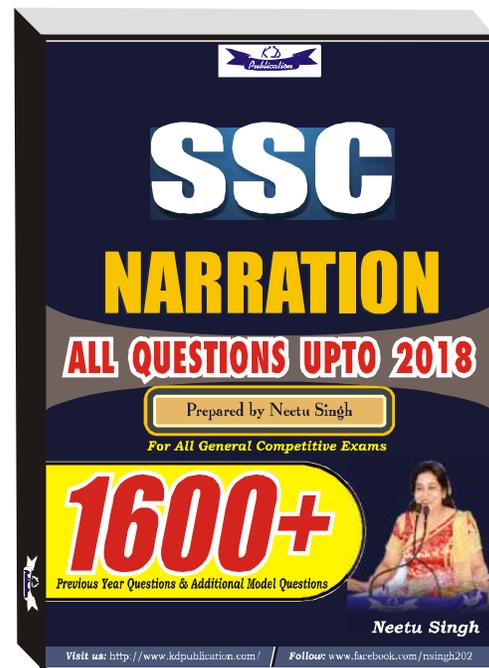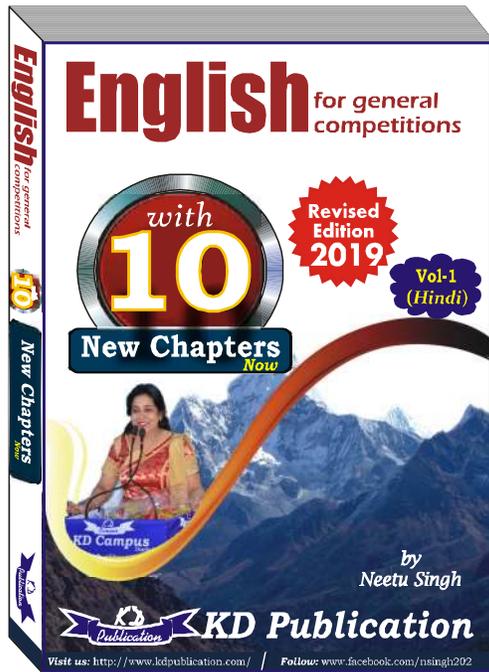
Note:- If your opinion differs regarding any answer, please message the mock test and question number to 8860330003

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