

Class: XI Science
Date: 14/09/24

MARKING SCHEME

Duration: 3 Hour
Max. Marks: 80

Q No.	Answer	Scheme
1	(C)	6
2	(C)	A=B
3	(C)	∞
4	(D)	a=1,b=7
5	(B)	{(1, 4)}
6	(D)	$2^{mn}-1$
7	(D)	$\frac{11\pi}{6}$
8	(B)	-450°
9	(B)	$-\frac{4}{5}$ or $\frac{4}{5}$
10	(D)	$y \neq 0$
11	(A)	5-4i
12	(D)	$a^2+b^2 = c^2+d^2$
13	(A)	$x \in (10, \infty)$
14	(C)	$(-\infty, -5) \cup (5, \infty)$
15	(B)	$\{x: 1 \leq x < 5, x \in R\}$
16	(C)	$n!+(n+1)!$
17	(D)	None of these
18	(B)	49
19	(A)	
20	(A)	
21		$A \cup B = [0,2] \cup [1,3], A \cap B = [1,2]$
22		$R = \{(-6,1), (-1, -6), (-2, -3), (-3, -2), (1,6), (6,1), (2,3), (3,2)\}$
23		$2 \cdot \frac{1}{4} + (2)^2 \cdot \frac{1}{4} = \frac{1}{2} + 1 = 3/2$ <p align="center">OR</p> $\sin(45^\circ+30^\circ)$ $= \sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ$ $= \frac{\sqrt{3}+1}{2\sqrt{2}}$
24		$a+b=5, 3a+2b=2$ on solving $a=-12, b=17$ <p align="center">OR</p>

	$\frac{1+7i}{3-4i} \text{ rationalise}$ $\frac{-25+25i}{25} = -1+i$
25	$2(5-2x) \leq x-30$ $-5x \leq -40$ $x \geq 8, x \in [8, \infty)$
26	$2^m - 2^n = 112$ <p>On solving $n=4$ and $m-n=3$ $n=4, m=7$</p>
27	$(A \times B) \cap (C \times D) = \{(2,3), (2,5), (4,3), (4,5)\}$ $(A \cap C) \times (B \cap D) = \{(2,3), (2,5), (4,3), (4,5)\}$ <p>Hence, $(A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)$</p>
28	$\sin x = -3/5,$ $\cos x = \pm \frac{4}{5}, \sec x = -5/4 \text{ and } \tan x = 3/4, \text{ since } x \text{ lies in } 3^{\text{rd}} \text{ quadrant.}$ $\frac{\sec x - \tan x}{\sec x + \tan x} = \frac{2}{1} \Rightarrow x = 42^\circ$ <p style="text-align: center;">OR</p> $\left(\frac{180}{\pi} \times \frac{11}{15}\right)^\circ = \left(\frac{180 \times 11 \times 7}{22 \times 15}\right)^\circ = 42^\circ$
29	<p>We have $\frac{(a^2+1)^2}{2a-i} = x+iy$</p> <p>Taking conjugate on both side and multiply with given expression</p> $x^2 + y^2 = \frac{(a^2+1)^4}{4a^2+1}$ <p style="text-align: center;">OR</p> <p>LCM of denominator</p> $\frac{[x+(x-2)i](3-i)+[2y+(1-3y)i](3+i)}{(3+i)(3-i)} = i$ $(4x+9y-3) + i(2x-7y-3) = 10i$ <p>On equating and solving $x=3, y=-1$</p>
30	$\frac{2x-3}{4} - \frac{4x}{3} \geq -6$ $\frac{-9-10x}{12} \geq -6$ $-9-10x \geq -72$ $-10x \geq -63$ $x \leq 63/10, x \in \left(-\infty, \frac{63}{10}\right)$
31	Total number of seating arrangements = $3 \times 4 \times 3 \times 2 \times 1 = 72$
32	i) Proper Venn Diagram ii) Proper Venn Diagram
33	$\theta = 54^\circ = 54 \times \frac{\pi}{180} = \frac{3\pi}{10} \text{ radians}$ $\theta = \frac{l}{r}, \frac{3\pi}{10} = \frac{88}{r}$ $R = 93.41 \text{ m}$ <p style="text-align: center;">OR</p> $\frac{1+\frac{1}{\sqrt{3}}}{1-\frac{1}{\sqrt{3}}} + \frac{\sqrt{3}-1}{\sqrt{3}+1}$

	$\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1}$ $\frac{8}{2} = 4$
34	<p>Shortest side be x cm Longest side be 2x cm Third side x+2 cm As per question $4x+2 > 166$ $x > 41$ Hence the minimum length of the shortest side is more than 41cm.</p>
35	<p>1digit nos =5 ways 2digit nos =25 ways 3digit nos = 100 ways 4 digit nos = 300 ways 5 digit nos = 600 ways 6 digit nos = 600 ways Total nos = 1630</p> <p style="text-align: center;">OR</p> $\frac{(2n)!}{7!(2n-7)!} : \frac{n!}{4!(n-4)!} = 24:1.$ $\frac{(2n)!}{7!(2n-7)!} \times \frac{4!(n-4)!}{n!} = \frac{24}{1}$ $(2n-1)(2n-3)(2n-5) = 9 \times 7 \times 5$ $2n-1 = 9$ $n = 5$
36	<p>(A) No, unmarried women is graduate (B) No. of unmarried women = 12 (C) 6 graduate men who are unmarried.</p>
37	<p>(A) $y = x^3$ (B) Real number (C) Real number</p>
38	<p>(A) a=-2, b=2 (B) a=-2, b=2 (C) a=1, b= 0</p>
