

**FIRST YEAR HIGHER SECONDARY EXAMINATION  
SAMPLE QUESTION PAPER  
MATHEMATICS(SCIENCE)**

Max. Marks: 60

Time: 2 hours 15 minutes

**Answer any 6 questions from 1 to 8. Each question carries 3 marks**

1.  $A = \{x : x \text{ is an even natural number less than } 7\}$ 
  - (a) Write A in roster form (1)
  - (b) List all subsets of A having 2 elements. (2)
2. (1) If  $n(A) = 3$ ,  $n(B) = 4$ , then the number of relations from A to B is ....
  - (a)  $2^3$  (b)  $3^4$  (c)  $4^3$  (d)  $2^{12}$  (1)
  - (b) Find the domain and range of the relation  $R = \{(x, y) : y = x+2, x \in \mathbb{N}, x < 5\}$ . (2)
3. Solve the inequality  $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$ . (3)
4. Find the value of n, If  $n P_5 = 42 \cdot n P_3$  (3)
5. Find the center and radius of the circle  $x^2 + y^2 - 4x - 8y - 45 = 0$ . (3)
6. (i) Which of the following points lie in the 6<sup>th</sup> octant?
  - (a) (-4, 2, -5) (b) (-4, -2, -5) (c) (4, -2, -5) (d) ((4, 2, 5) (1)
  - (ii) Find the distance between the points (3, -2, 5) and (4, 3, -2). (2)
7.  $\lim_{x \rightarrow 0} \frac{\sin 3x}{x}$  ? (3)
8. (a) A card is selected from a pack of 52 card, calculate the probability that the card is an ace of spade. (2)
- (b) A die is thrown twice. Find the number of possible outcomes. (1)

Answer any 6 questions from 9 to 16. Each carries 4 marks.

9. (a) Value of  $i^{50} = \dots$  (1)
- (b) Express  $\frac{5+i}{2+3i}$  in the form of  $a + ib$ . (3)
10. (a) Find  $(a + b)^4 - (a - b)^4$  (2)
- (b) Hence evaluate  $(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4$  (2)
11. Let  $U = \{1, 2, 3, 4, 5, 6\}$ ,  $A = \{2, 3\}$ ,  $B = \{3, 4, 5\}$ . Find (a)  $A^c$  and  $B^c$ .  
(b) Verify  $(A \cup B)^c = A^c \cap B^c$ . (4)
12. Find the sum of the sequence 7, 77, 777, ..... to 'n' terms (4)
13. (a) Draw the graph of  $|x| - 1$ . (2)
- (b) Find the domain of the function  $f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$  (2)

14. Find the co-ordinate of foci, eccentricity, vertices and latus rectum of the ellipse  

$$\frac{x^2}{25} + \frac{y^2}{9} = 1. \quad (4)$$
15. Given that  $P(A) = 0.5$ ,  $P(B) = 0.6$  and  $P(A \cup B) = 0.8$ . Find  
 (a)  $P(A \text{ and } B)$  (2)  
 (b)  $P(\text{not } A)$  (1)  
 (c)  $P(\text{neither } A \text{ nor } B)$  (1)
16. (a) If  $n_{C_9} = n_{C_8}$ , then find  $n_{C_{17}}$ . (1)  
 (b) Find the number of arrangements of the letters of the word INDEPENDENCE (4)

**Answer any 3 questions from 17 to 20. Each carries 6 marks.**

17. From the following table

<b>Class</b>	30-40	40-50	50-60	60-70	70-80	80-90	90-100
<b>Frequency</b>	3	7	12	15	8	3	2

- (a) Find mean (3)  
 (b) Find variance (3)
18. (a) Find the derivative of  $\frac{1}{x}$  from the first principle. (3)  
 (b) Find  $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^2 - 4}$  (3)
19. (a) Reduce the equation of the straight line  $3x - 4y + 12 = 0$  into intercept form. Hence write its x and y intercept. (3)  
 (b) Find the equation of the line parallel to the line  $3x - 4y + 2 = 0$  and passing through the point  $(-2, 3)$ . (3)
20. (a) Find the degree measure corresponding to  $\frac{5\pi}{3}$  (1)  
 (b) If  $\tan x = \frac{-5}{12}$ , x lies in the second quadrant. Then find the values of other five trigonometric functions. (3)  
 (c) Prove that  $\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2} \cos x$  (2)

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