

**TILAK MAHARASHTRA VIDYAPEETH, PUNE**  
**BACHELOR OF ARTS (B.A.) – GAME ART AND DESIGN (T)**  
**EXAMINATION: DECEMBER - 2022**  
**THIRD SEMESTER**  
**Sub.: Mathematics (Theory) (BSGD-21-306)**

**Date: 20/12/2022**

**Total Marks: 40**

**Time: 2.00pm to 4.00 pm**

**Instructions: All questions are compulsory.**

**Q-1: Solve the following (Any 2) (10)**

- 1) Given a universal set  $X = \{1,2,3,4,5,6,7,8,9\}$   
 $A = \{2,4,6,8\}$ ,  $B = \{1,3,7,8,9\}$   
Obtain the following :  
a)  $A \cup B$       b)  $A \cap B$       c)  $A'$       d)  $B'$       e)  $A - B$
- 2)  $(2+4i) \times (6-2i)$
- 3) Find the modulus of  $(2-3i)$
- 4) Solve:  $6x^2 - 13x - 63$

**Q-2: Solve the following (Any 2) (10)**

- 1) Two unbiased dice are thrown in air. Find the probability that the
  - i. Score is perfect square
  - ii. Score on each dice is same
  - iii. Score is multiple of 5
  - iv. Score on both dice is an even number
- 2) If A and B are two events such that  $P(A) = 0.8$ ,  $P(B) = 0.6$  and  $P(A \cap B) = 0.5$ , find  $P(A \cup B)$
- 3) Add the numbers: a)  $1101 + 1001$     b)  $1110 + 0101$
- 4) Convert  $(42)_{10}$  into binary

**Q-3 Solve the following (Any 2) (20)**

- 1) **Draw Venn Diagrams of following:**
  - a)  $A \cap B$
  - b)  $A \cup B$
  - c) All X's are Y's
  - d) No X's are Y's
  - e) Some X's are Y's
- 2) If  $F(x) = 3x^2 - 5$ , then find  $f(-1)$ ,  $f(-2)$ ,  $f(3)$ ,  $f(5)$ ,  $f(-3)$
- 3) Find  $\text{gof}$  and  $\text{fog}$  if  $f(x) = 2x+1$  and  $g(x) = x-2$