

TILAK MAHARASHTRA VIDYAPEETH, PUNE
BACHELOR OF ARTS (B.A.) – GAME ART AND DESIGN
EXAMINATION: MAY - 2025
THIRD SEMESTER
Sub.: Mathematics (BAGD19-306)

Date: 9/05/2025

Total Marks: 40

Time: 10.00 am to 12.00 pm

Instructions: All questions are compulsory.

Q. 1. Solve the following (Any 2)

(10)

1. Check whether the given sets are equal sets: $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 1, 3\}$.
If $A = \{1, 3, 5, 7, 9, 11\}$ and $B = \{1, 2, 3, 13\}$, then find:
i) $A - B$
ii) $B - A$.
2. If $f(x) = x^2 - x - 1$ and $g(x) = x - 1$, then find $f \circ g$ and $g \circ f$.
3. An urn contains 5 red, 2 white, 3 blue balls. If 5 balls are drawn at random, the probability of obtaining 3 red, 1 white and 1 blue ball is?

Q. 2. Solve the following (Any 2)

(10)

1. In a class of 100 students, 35 like science and 45 like math. 10 like both. How many like either of them and how many like neither?

2. Solve A+B

$$A = \begin{vmatrix} 2 & 4 & -4 \\ 3 & -2 & 1 \\ -2 & -4 & 1 \end{vmatrix} \quad B = \begin{vmatrix} 6 & 2 & 1 \\ 5 & 0 & -2 \\ 2 & 7 & -3 \end{vmatrix}$$

3. Test for Consistency and Solve

$$\begin{aligned} x + y &= 4 \\ 3x + 4y &= 7 \\ 11x + 10y &= 7 \end{aligned}$$

4. Find the modulus of : $(2-i)(3-5i)$

Q. 3. Solve the following (Any 2)

(20)

1. Let $f : [2, 3, 4, 5] \rightarrow [3, 4, 5, 9]$ and $g : [3, 4, 5, 9] \rightarrow [7, 11, 15]$ be functions defined as $f(2) = 3$, $f(3) = 4$, $f(4) = f(5) = 5$ and $g(3) = g(4) = 7$ and $g(5) = g(9) = 11$. Find $g \circ f$.
2. In a certain examination out of 50 candidates 30 passed in Economics, 35 passed in Psychology and 10 failed in both the subjects. A Candidate is selected at random. Find the probability that he has passed in Economics, if it is known that he has passed in Psychology.
3. Let $A = \{3, 5, 7\}$, $B = \{2, 3, 4, 6\}$ and $C = \{2, 3, 4, 5, 6, 7, 8\}$
(i) Verify $(A \cap B)' = A' \cup B'$
(ii) Verify $(A \cup B)' = A' \cap B'$

4. **Solve using Cramer's rule:**

$$x+y+4z = 4$$

$$2x+3y+6z = 5$$

$$-3x+2y+z = -4$$
