

Reg. No. :

Name :

First Semester B.A. Degree Examination, January 2024

First Degree Programme under CBCSS

Mathematics

Complementary Course I for Economics

MM 1131.5 : MATHEMATICS FOR ECONOMICS – I

(2021 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

All the first **ten** questions are compulsory. They carry **1** mark each.

1. Give an example of an infinite set.
2. State De Morgan's law.
3. Define intersection of two sets A and B.
4. Define power set of a set.
5. Every subset of an infinite set is finite. True or False.
6. What is the degree of $x^2 - 9 = 0$?
7. Solve $5x - 10 = 0$.
8. What is a quadratic equation?
9. Solve $3x = 7$.
10. Write the condition for a quadratic equation to have no real solution.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **eight** questions. These question carries **2** marks each.

11. Write all subsets of $\{1,2\}$.
12. If $A = \{1,2,3,4\}$ and $B = \{2,4,6,8\}$. Find $A - B$.
13. If $A = \{a,b,c\}$ and $B = \{1,2\}$. Find $A \times B$.
14. If $A = \{a,b,c\}$ and $B = \{1,2\}$. Find $A \cup B$.
15. Define a function from a set A to a set B.
16. If $A = \{1,2,3,4\}$ and $B = \{2,4,6,8\}$. Find $A \cap B$.
17. Solve $x^2 - 4x + 3 = 0$.
18. Solve $7x + 1 = 3x + 9$.
19. Solve $x + y = 2$, $x - y = 0$.
20. Given Supply: $q_s = 3p + 12$ and Demand: $q_d = -2p + 27$, find equilibrium price.
21. Solve $\frac{a}{b} = \frac{c}{x}$.
22. Solve $x^2 - 5x + 6 = 0$.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. These question carries **4** marks each.

23. Find the power set of $A = \{a,b,c\}$.
24. Find $A \times B$, where $A = \{x \mid x = 1,2\}$ and $B = \{y \mid y = x + 1\}$.
25. Find the domain and range of the relation $R = \{(x,y) \in A \times B \mid x = 3y\}$, where $A = \{1,2,3,4,5,6\}$ and $B = \{1,2,3,4,5,6,7,8,9,10\}$.
26. Let $A = B = \{1,2,3,4\}$ and let R be the relation xRy if $x \leq y$. Find xRy .
27. $A = \{1,2,3,4,5\}$, $B = \{2,4,6,8\}$ and $C = \{6,8,10\}$. Find $(A \cup B) - C$.
28. Solve $x^2 + 8x + 7 = 0$.

29. Solve $x - y = 5$, $x + y = 11$.

30. Solve $x^2 + 10x - 24 = 0$.

31. A market demand curve is given by $D = 36 - 9p$. Find the maximum price anybody will pay for a commodity.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. These question carries **15** marks each.

32. (a) If $A = \{1,2,3\}$ and $B = \{a,b\}$. Find $A \times B$, $B \times A$, $A \times A$ and $B \times B$.
(b) Let $A = B = \{1,2,3,4\}$. Find xRy if R is given by $y = x - 1$.
33. Let $U = \{1,2,3,4,5,6,7,8,9,10\}$, $A = \{1,2,3,4\}$, $B = \{3,4,5,6\}$ and $C = \{6,7,8,10\}$. Find $A - B$, $C - B$, C' and $A \cup B \cup C$.
34. Solve the following quadratic equations:
(a) $x^2 - 5x - 6 = 0$
(b) $x^2 - 6x + 9 = 0$
(c) $x^2 - 4x - 21 = 0$
35. Solve the following equations.
(a) $2x + 3y = 18$, $3x - 4y = -7$
(b) $5x + 2y = 3$, $2x + 3y = -1$

(2 × 15 = 30 Marks)