



Date: 15/07/22
GRADE: XIA


MONTHLY TEST -02 (2022-23)
APPL.MATHEMATICS [241]

Max marks: 20
Time: 1 Hour

General Instructions:

- 1) Questions 1 to 4 carries 1 mark each.
- 2) Questions 5 to 8 carries 2 marks each.
- 3) Questions 9 and 10 carries 4 marks each.

Sl.No	Questions	Marks
SECTION A		
1	If $n(A \cup B) = 18$, $n(A - B) = 5$, $n(B - A) = 3$ then find $n(A \cap B)$ a) 8 b) 10 c) 26 d) 16	1
2	Write $\{x : x \in R, -3 \leq x < 7\}$ as interval. a) $(-3, 7)$ b) $[-3, 7]$ c) $[-3, 7)$ d) $(-3, 7]$	1
3	If $A = \{1, 2, 4\}$, $B = \{2, 4, 5\}$, $C = \{2, 5\}$ then $(A - B) \times (B - C)$ a) $\{(1, 2), (1, 5), (2, 5)\}$; b) $\{(1, 4)\}$ c) $\{1, 4\}$; d) None	1
4	Write in setbuilder form. $\{(1, \frac{1}{2}), (2, \frac{2}{9}), (3, \frac{3}{28}), (4, \frac{4}{65}) \dots \dots (10, \frac{10}{1001})\}$	1
SECTION B		
5	Using venn diagram prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$	2
6	Verify De'Morgan's laws :- $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ $A = \{1, 3, 4, 5, 7, 9, 10\}$ $B = \{1, 3, 4, 5, 7, 8, 10\}$	2
7	Find a and b if $(a + b, 2a - b) = (8, 7)$	2
8	If $R = \{(x, y) : x, y \in Z, x^2 + y^2 = 64\}$, then, Write R in roster form	2

SECTION C		
9	<p>Let $A = \{1,2,3,4\}$, $B = \{1,4,9,16,25\}$ and R be a relation defined from A to B as, $R = \{(x, y): x \in A, y \in B \text{ and } y = x^2\}$</p> <p>(a) Depict this relation using arrow diagram. (b) Find domain of R. (c) Find range of R. (d) Write co-domain of R.</p>	4
10	<p>There are three brands of masks available for sale in a city - brand A, brand B and brand C. In a town of 10000 families, it was found that 40% families buy brand A, 20% buy brand B and 10% buy brand C. Also 5% families buy brands A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three brands.</p>  <p>Based on the above information answer the following:</p> <p>(i) Number of families which buy the mask of brand A only, is (a) 3030 (b) 3300 (c) 3003 (d) 4500</p> <p>(ii) Number of families which buy the mask of exactly two brands, are (a) 600 (b) 990 (c) 60 (d) 6000</p> <p>(iii) What is the number of families which buy the mask of exactly one brand? (a) 2500 (b) 5020 (c) 5200 (d) 2000</p> <p>(iv) Number of families which buy the mask of brands A and C but not B is (a) 20 (b) 2000 (c) 400 (d) 200</p>	4