

## INDIAN SCHOOL MUSCAT

### FIRST PERIODIC TEST

#### APPLIED MATHEMATICS

CLASS: XI

Sub.Code: 241

Time Allotted: 50mins.

23.05.2023

Max .Marks: 20

#### GENERAL INSTRUCTIONS:

- This question paper has three sections.
- Section A contains 3 MCQ and 1 Assertion Reasoning Question, each of 1 mark.
- Section B contains 3 questions of 2 marks each.
- Section C contains 2 questions of 3 marks each.
- Section D contains 1 Case Based Question of 4 marks.
- All questions are compulsory.

#### **SECTION A**

1. Find x and y, if (4x + 3, y) = (-1, 3x + 5) 1

(a) 
$$x = 1, y = 2$$
 (b)  $x = -1, y = -2$  (c)  $x = -1, y = 2$  (d)  $x = 1, y = -2$ 

b) 
$$x = -1, y = -2$$

(c) 
$$x = -1, y = 2$$

(d) 
$$x = 1, y = -2$$

Assertion(A): Number of non-empty subsets of the set {2,3,5,7,11} is 31 Reason(R): Number of proper subsets of the set A with n(A) = k is  $2^k - 1$ 

1

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Set builder form of the interval [2, 7) is

1

- (a)  $\{x: x \in R \text{ and } 2 \le x \le 7\}$
- (b)  $\{x: x \in R \text{ and } x \leq 7\}$
- (c)  $\{x: x \in Z \text{ and } 2 \le x < 7\}$
- (d)  $\{x: x \in R \text{ and } 2 \le x < 7\}$

Which of the following statements is correct?

- (a)  $0 \subset \{0, 1, 2\}$  (b)  $0 \in \{\{0\}, 1, 2\}$  (c)  $\{0\} \in \{\{0\}, 1, 2\}$  (d)  $2 \subset \{\{0\}, 1, 2\}$

#### **SECTION B**

- The Cartesian product  $A \times A$  has 9 elements among which are found (-2, 0) and (1,0). Find the set A and the remaining elements of  $A \times A$

2

Verify De Morgan's law  $(A \cap B)' = A' \cup B'$  by using Venn diagrams. 6.

- 2
- In a class, 56% of the students like to play football and 48% of the students like to play cricket and 18% of the students like to play both the games. Find the percentage of the students do not like to play both the games.

2

#### **SECTION C**

- If  $R=\{(x, y): x, y \in W, 2x + y = 10\}$  then find the domain and range of R. Also, write R 3 in roster form.
  - If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{1, 2, 3, 5\}$ ,  $B = \{2, 4, 6, 9\}$  and  $C = \{2, 3, 6, 8\}$ , then find  $3 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{1, 2, 3, 5\}$ ,  $A = \{1, 2,$ (a)  $A \cap (B \cup C)$  (b) (C - A)'(c)  $n[A \times (B \cap C)]$

#### **SECTION D**



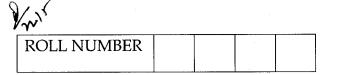
In a library, out of 25 students, 15 students read mathematics book, 12 students read physics book while 11 students read chemistry book. 5 students read both mathematics and chemistry, 9 students read both physics and mathematics. 4 students read both physics and chemistry and 3 students read all three subject books. By drawing a Venn Diagram, find the number of students who read



- (i) exactly one of the books.
- (ii) Mathematics but not Physics
- (iii) at least one of the books (OR)
- (iii) none of the books

1

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#### **SECTION A**

- Which of the following statements is correct? 1 1. (a)  $0 \subset \{0, 1, 2\}$ (b)  $0 \in \{\{0\}, 1, 2\}$ (c)  $\{0\} \in \{\{0\}, 1, 2\}$  (d)  $2 \subset \{\{0\}, 1, 2\}$ 1 Set builder form of the interval (2, 7] is (a)  $\{x: x \in R \text{ and } 2 < x \le 7\}$  (b)  $\{x: x \in R \text{ and } 2 \le x < 7\}$ (d)  $\{x: x \in R \text{ and } x \leq 7\}$ (c)  $\{x: x \in Z \text{ and } 2 \le x < 7\}$ Find x and y, if  $(x^2 - 4x, y + 3) = (-4, 5)$ 1 (a) x = -1, y = 2 (b) x = 2, y = -2 (c) x = 4, y = -2 (d) x = 2, y = 21 Assertion(A): Number of non-empty subsets of the set {2,3,5,7,11} is 31 Reason(R): Number of proper subsets of the set A with n(A) = k is  $2^k$ (a) Both A and R are true and R is the correct explanation of A.
  - (b) Both A and R are true but R is not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.

#### **SECTION B**

5. Verify De Morgan's law  $(A \cup B)' = A' \cap B'$  by using Venn diagrams.

- 2
- 6. In a class, 56% of the students like to play football and 48% of the students like to play cricket and 18% of the students like to play both the games. Find the percentage of the students do not like to play both the games.
- 2
- 7. If (-2,1), (2,5), (0,3), (1,1) are some of the elements of  $A \times B$ , then find sets A and B. Also, 2 find the remaining elements of  $A \times B$

#### **SECTION C**

- 8. If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{1, 2, 3, 5\}$ ,  $B = \{2, 4, 6, 9\}$  and  $C = \{2, 3, 6, 8\}$ , then find 3 (a)  $A \cup (B \cap C)$  (b) (C B)' (c)  $n[A \times (B \cup C)]$
- 9. If  $R=\{(x, y): x, y \in W, 2x + y = 10\}$  then find the domain and range of R. Also, write R 3 in roster form.

#### **SECTION D**

### 10. CASE BASED QUESTION:

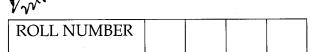
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#### **SECTION A**

Find x and y, if (x - 1, y + 3) = (2, x + 4)1.

1

(a) 
$$x = 1, y = 2$$

(a) 
$$x = 1, y = 2$$
 (b)  $x = -1, y = -2$  (c)  $x = 3, y = 4$  (d)  $x = 2, y = 6$ 

(c) 
$$x = 3, y = 4$$

(d) 
$$x = 2, y = 6$$

Which of the following statements is correct?

1

1

(a) 
$$\{0\} \in \{\{0\}, 1, 2\}$$

(b) 
$$0 \in \{\{0\}, 1, 2\}$$

(c) 
$$0 \subset \{0, 1, 2\}$$

(d) 
$$2 \subset \{\{0\}, 1, 2\}$$

Assertion(A): Number of non-empty subsets of the set {2,3,5,7,11} is 32 Reason(R): Number of proper subsets of the set A with n(A) = k is  $2^k - 1$ 

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Set builder form of the interval [2, 7] is

(a) 
$$\{ x: x \in Z \text{ and } 2 \le x < 7 \}$$

(b) 
$$\{x: x \in R \text{ and } 2 \le x < 7\}$$
  
(d)  $\{x: x \in R \text{ and } x \le 7\}$ 

(c) 
$$\{x: x \in R \text{ and } 2 \le x \le 7\}$$

(d) 
$$\{x: x \in R \text{ and } x \leq 7\}$$

#### **SECTION B**

- The Cartesian product  $A \times A$  has 9 elements among which are found (-2, 0) and (1,1). 2 Find the set A and the remaining elements of  $A \times A$
- In a class, 56% of the students like to play football and 48% of the students like to play cricket and 18% of the students like to play both the games. Find the percentage of the students do not like to play both the games.
  - 2

Verify De Morgan's law  $(A \cap B)' = A' \cup B'$  by using Venn diagrams.

2

#### **SECTION C**

- $If \ U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, \ A = \{1, 2, 3, 5\}, \ B = \{2, 4, 6, 9\} \ and \ C = \{2, 3, 6, 8\}, \ then \ find \ A = \{1, 2, 3, 5\}, \ A$ 8. (a)  $A \cap (B \cup C)$  (b) (B - A)'(c)  $n[A \times (A \cap C)]$
- If  $R = \{(x, y): x, y \in W, 2x + y = 10\}$  then find the domain and range of R. Also, write R 3 in roster form.

#### **SECTION D**

#### 10. CASE BASED QUESTION:

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