



INDIAN SCHOOL MUSCAT

PERIODIC TEST - I

MATHEMATICS

CLASS: XI

Sub. Code: 041

Time Allotted: 50mts.

23 .05.2023

Max .Marks: 20

GENERAL INSTRUCTIONS:

- (i) This question paper consists of 10 questions. All questions are compulsory.
- (ii) Questions 1 - 4 are MCQ and Assertion and Reasoning carrying 1 mark each.
- (iii) Questions 5 - 7 carry 2 marks each.
- (iv) Questions 8 - 9 carry 3 marks each.
- (v) Question 10 is Case Based Question; internal choice is given in 3rd sub question (attempt any one)

SECTION – A (MCQ)

1. Let $A = \{x, y, z\}$ and $B = \{a, b, c, d\}$. Which one of the following is not a relation from A to B? 1
 - (a) $\{(x, a), (x, c)\}$
 - (b) $\{(y, c), (y, d)\}$
 - (c) $\{(z, a), (z, d)\}$
 - (d) $\{(z, b), (y, b), (a, d)\}$
2. The domain of relation $R = \{(x, y) : x^2 + y^2 = 16, x, y \in \mathbb{Z}\}$ is 1
 - (a) $\{0, 1, 2, 3, 4\}$
 - (b) $\{-4, -3, -2, -1\}$
 - (c) $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$
 - (d) None of these
3. If A and B are two sets, then $(A - B) \cup (B - A) \cup (A \cap B)$ is equal to 1
 - (a) Only A
 - (b) $(A \cup B)$
 - (c) $(A \cup B)'$
 - (d) None of these

4. ASSERTION-REASON TYPE QUESTION 1

Directions: The following question contains two statements, **Assertion** and **Reason**. Also, the question has four alternative choices, only one of which is the correct answer. You have to select one of the options (a), (b), (c) and (d) given below.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
- (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion.
- (c) Assertion is correct, reason is incorrect.
- (d) Assertion is incorrect, reason is correct.

Assertion: The number of non-empty subsets of the set $\{a, b, c, d\}$ is 15.

Reason: Number of non-empty subsets of a set having n elements is $2^n - 1$.

SECTION – B

5. A and B are two sets such that $n(A) = 8$ and $n(A \cap B) = 2$, then find $n[(A \cap B)' \cap A]$. 2
Show the working.
6. If A is the set of divisors of the number 15, B is the set of prime numbers smaller than 10 and C is the set of even numbers smaller than 9, then use Venn diagram to find $(A \cup C) \cap B$. 2
7. If $A \times A$ has 9 elements two of which are $(-1, 0)$ and $(0, 1)$, find the set A and the remaining elements of $A \times A$. 2

SECTION – C

8. Let $A = \{1, 2, 3, 4, 5\}$ and $B = \{1, 2, 3, 4\}$. Let **R** be a relation, 'is greater than' from A to B. Write **R** as set of ordered pairs. Find dom (**R**) and range (**R**). 3
9. Let $A = \{a, b, c\}$, $B = \{b, c, d, e\}$, $C = \{c, d, e, f\}$ be the subsets of $U = \{a, b, c, d, e, f\}$. Then verify that (i) $A \cap (B - C) = (A \cap B) - (A \cap C)$ (ii) $(A \cup B)' = A' \cap B'$ 3
(iii) $(A \cap B)' = A' \cup B'$.

SECTION – D

(Case Based Question)

10. In a group of 25 students, it was found that 15 play cricket, 12 play tennis, 11 play football, 5 play both cricket and football, 9 play both cricket and tennis, 4 play both tennis and football and 3 play all three games. Based on this information answer the following questions. 1
- (i) The number of students in the group who play cricket and football and not tennis. 1
- (ii) The number of students who play only one game. 1
- (iii) The number of students who play exactly 2 games. 2

OR

The number of students who do not play any of these games.

End of The Question Paper



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SECTION – A (MCQ)

1. If A and B are two sets, then $(A - B) \cup (B - A) \cup (A \cap B)$ is equal to 1
- (a) Only A (b) $(A \cup B)$ (c) $(A \cup B)'$ (d) None of these

2. **ASSERTION-REASON TYPE QUESTION** 1

Directions: The following question contains two statements, **Assertion** and **Reason**. Also, the question has four alternative choices, only one of which is the correct answer. You have to select one of the options (a), (b), (c) and (d) given below.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
- (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion.
- (c) Assertion is correct, reason is incorrect.
- (d) Assertion is incorrect, reason is correct.

Assertion: The number of non-empty subsets of the set $\{a, b, c, d\}$ is 16.

Reason: Number of non-empty subsets of a set having n elements is $2^n - 1$.

3. The domain of relation $R = \{(x, y) : x^2 + y^2 = 16, x, y \in \mathbb{Z}\}$ is 1
- (a) $\{0, 1, 2, 3, 4\}$ (b) $\{-4, -3, -2, -1\}$
- (c) $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$ (d) None of these
4. Let R be the relation on \mathbb{Z} defined by $R = \{(a, b) : a, b \in \mathbb{Z}, a - b \text{ is an integer}\}$. Then 1
- (a) domain of R is $\{2, 3, 4, 5, \dots\}$ (b) range of R is \mathbb{Z}
- (c) Both (a) and (b) (d) None of these

SECTION – B

5. If $A \times A$ has 9 elements, two of which are $(-1, 0)$ and $(0, 1)$, find the set A and the remaining 2
- elements of $A \times A$.
6. Write down all possible subsets of $A = \{1, \{2, 3\}\}$ 2
7. If A is the set of divisors of the number 15, B is the set of prime numbers smaller than 10 2
- and C is the set of even numbers smaller than 9, then use Venn diagram to find $(A \cup C) \cap B$.

SECTION – C

8. Let $A = \{a, b, c\}$, $B = \{b, c, d, e\}$, $C = \{c, d, e, f\}$ be the subsets of $U = \{a, b, c, d, e, f\}$. Then 3
- verify that (i) $A \cap (B - C) = (A \cap B) - (A \cap C)$ (ii) $(A \cup B)' = A' \cap B'$
- (iii) $(A \cap B)' = A' \cup B'$.
9. Let $A = \{x \in \mathbb{N} : x^2 - 5x + 6 = 0\}$, $B = \{x \in \mathbb{W} : 0 \leq x < 2\}$ and $C = \{x \in \mathbb{N} : x < 3\}$, then 3
- verify (i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$ (ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

SECTION – D

(Case Based Question)

10. In a group of 25 students, it was found that 15 play cricket, 12 play tennis, 11 play 1
- football, 5 play both cricket and football, 9 play both cricket and tennis, 4 play tennis and 1
- football and 3 play all three games. Based on this information answer the following
- questions.
- (i) The number of students in the group who play cricket and football and not 1
- tennis.
- (ii) The number of students who play only one game. 1
- (iii) The number of students who play exactly 2 games. 2

OR

The number of students who do not play any of these games.

End of The Question Paper

8221

ROLL NUMBER				
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SET C



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SECTION – A (MCQ)

- The domain of relation $R = \{(x, y) : x^2 + y^2 = 16, x, y \in \mathbb{Z}\}$ is 1
 (a) $\{0, 1, 2, 3, 4\}$ (b) $\{-4, -3, -2, -1\}$
 (c) $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$ (d) None of these
- Let set $X = \{a, b, c\}$ and $Y = \emptyset$. The number of ordered pairs in $X \times Y$ are 1
 (a) 0 (b) 1 (c) 2 (d) 3

3. ASSERTION-REASON TYPE QUESTION 1

Directions: The following question contains two statements, **Assertion** and **Reason**. Also, the question has four alternative choices, only one of which is the correct answer. You have to select one of the options (a), (b), (c) and (d) given below.

- Assertion is correct, reason is correct; reason is a correct explanation for assertion.
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- Assertion is correct, reason is incorrect.
- Assertion is incorrect, reason is correct.

Assertion: The number of non-empty subsets of the set $\{a, b, c, d\}$ is 15.
Reason: Number of non-empty subsets of a set having n elements is 2^n .

4. If A and B are two sets, then $(A - B) \cup (B - A) \cup (A \cap B)$ is equal to 1
 (a) Only A (b) $(A \cup B)$ (c) $(A \cup B)'$ (d) None of these

SECTION – B

5. If A and B are two sets containing 3 and 6 elements respectively, what can be the maximum number of elements in $A \cup B$? Find also minimum number of elements in $A \cup B$. Justify your answer. 2
 6. A and B are two sets such that $n(A) = 8$ and $n(A \cap B) = 2$, then find $n[(A \cap B)' \cap A]$. Show the working. 2
 7. If $A \times A$ has 9 elements two of which are $(-1, 0)$ and $(0, 1)$, find the set A and the remaining elements of $A \times A$. 2

SECTION – C

8. Write the following sets in Roster form. 3
 (i) $A = \{x: x \in \mathbb{R}, 2x + 11 = 15\}$ (ii) $B = \{x: x^2 = x, x \in \mathbb{R}\}$
 (iii) $C = \{x: x \text{ is a positive factor of a prime number } p\}$
 9. Let $A = \{1, 2, 3, 4, 5\}$ and $B = \{1, 2, 3, 4\}$. Let R be a relation, 'is greater than' from A to B . Write R as set of ordered pairs. Find $\text{dom}(R)$ and $\text{range}(R)$. 3

SECTION – D (Case Based Question)

10. In a group of 25 students, it was found that 15 play cricket, 12 play tennis, 11 play football, 5 play both cricket and football, 9 play both cricket and tennis, 4 play both tennis and football and 3 play all three games. Based on this information answer the following questions. 1
 (i) The number of students in the group who play cricket and football and not tennis. 1
 (ii) The number of students who play only one game. 1
 (iii) The number of students who play exactly 2 games. 2
 OR
 The number of students who do not play any of these games.

End of The Question Paper