



Indian School Al Wadi Al Kabir

Unit Test (2026-27)

Mathematics (Set 2)

Class: XI

Date: 14.05.2026

Max. Marks: 30

Time: 1 Hour

General Instructions:

1. This question paper is divided into 4 sections- A, B, C and D.
2. Section A comprises of 7 questions of 1 mark each.
3. Section B comprises of 3 questions of 2 marks each.
4. Section C comprises of 3 questions of 3 marks each.
5. Section D comprises of 2 case study-based questions
6. Internal choice has been provided for certain questions

Section A (MCQ-1 mark each)

- Q.1.** Let $U = \{x: x \text{ is a factor of } 48\}$, $A = \{x: x \text{ is a factor of } 12\}$, Then $(A)'$ is: 1 M
- | | |
|----------------------------------|------------------------------|
| A $\{1, 2, 3, 4, 6, 12\}$ | B $\{12, 16, 24\}$ |
| C $\{48\}$ | D $\{8, 16, 24, 48\}$ |
- Q.2.** If N, Z, Q, W, and R represent the sets of natural numbers, integers, rational numbers, whole numbers and real numbers respectively, which of the following order of subsets is correct? 1 M
- | | |
|--|--|
| A $N \subset Z \subset W \subset Q \subset R$ | B $N \subset W \subset Z \subset Q \subset R$ |
| C $R \subset Q \subset Z \subset W \subset N$ | D $W \subset Z \subset N \subset Q \subset R$ |
- Q.3.** If $n(A) = 4$ and $n(B) = 2$, then the number of subsets of $(A \times B)$: 1 M
- | | | | |
|------------|-------------|-------------|--------------|
| A 8 | B 16 | C 64 | D 256 |
|------------|-------------|-------------|--------------|
- Q.4.** The domain of the function $f = \{(1,2), (2,3), (3,4), (4,5), (5,6)\}$ is: 1 M
- | | |
|---------------------------------|------------------------------|
| A $\{1, 2, 3, 4, 5, 6\}$ | B $\{1, 2, 3, 4, 5\}$ |
| C $\{2, 3, 4, 5, 6\}$ | D $\{2, 3, 4, 5\}$ |
- Q.5.** If $(2x + 3y, 2x + 2y) = (19, 16)$, then the values of x and y are: 1 M
- | | |
|-------------------------|-------------------------|
| A $x = 3, y = 5$ | B $x = 3, y = 2$ |
| C $x = 3, y = 4$ | D $x = 5, y = 3$ |

Q.6. The domain of the function $f(x) = \frac{1}{x^2 - 5x + 4}$ 1 M

A $\mathbf{R} - \{1,4\}$ **B** $[1,4]$ **C** $\mathbf{R} - [1,4]$ **D** $\{1,4\}$

Direction for question 7: In question number 7, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

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

Q.7. **Assertion (A):** $\frac{4\pi}{3}$ radian in degree measure is 120° 1 M
Reason (R): Radian measure $= \frac{\pi}{180} \times$ degree measure.

Section B (2 marks each)

Q.8. a) Let $A = \{x: x \text{ is a digit in the number } 34561\}$, and $B = \{x: x \in \mathbf{N}, x < 10\}$. Find 2 M
i. $B - A$
ii. $(B - A) \cup (A - B)$

OR

- b) Draw Venn diagrams for the following: -
i. $A' \cap B'$
ii. $(A \cap B)'$

Q.9. Let $f, g: \mathbf{R} \rightarrow \mathbf{R}$ be defined, respectively by $f(x) = 2x^2 + 1$, $g(x) = 4x - 3$. Find 2M
i. $f(1) + g(0)$
ii. Domain of $\frac{f}{g}$.

Q.10. Convert $\frac{11}{16}$ radians into degrees, minutes, and seconds. (Take $\pi = \frac{22}{7}$) 2M

SECTION C (3 marks each)

Q.11. Let $U = \{1,2,3,4,5,6,7,8,9,10\}$, $A = \{1,3,5,7,8\}$ and $B = \{2,3,4,5\}$; show that 3 M
i. $(A \cup B)' = A' \cap B'$
ii. $(A \cap B)' = A' \cup B'$

Q.12. a) Find the domain of the function: 3 M

$$f(x) = \sqrt{25 - x} + \frac{1}{\sqrt{x^2 - 4}}$$

OR

b) Given the function $f(x) = \sqrt{100 - x^2}$, Then find:

- i) the domain and range of $f(x)$
- ii) $f(8) + f(-6)$.

Q.13. Evaluate:

3 M

- i. $\sin(-225^\circ)$
- ii. $\cos\left(\frac{17\pi}{4}\right)$
- iii. $\tan x$, if $\cos x = \frac{12}{13}$, $x \in IVth$ quadrant.

SECTION D (CASE STUDY QUESTIONS 4 MARKS EACH)

Q.14.

In ISWK, a google form was shared to collect students' preferences for sports. In a classroom of 45 students, it was found that 20 students like basketball, 25 students like football, and 10 students like both basketball and football.

Based on this information, answer the following:

- i. Represent the given situation using Venn diagram. 2 M
- ii. Number of students who like neither basketball nor football 2 M

Q.15. In a school, students of class XI were discussing about the relations and functions. Three Students Ankita, Babita and Kavita form three sets $A = \{1,2,3,4,5\}$, $B = \{2,4,6,8,10\}$ and $K = \{5,7,9\}$

- i) Based on the above information answer the following:
Find $n(A \times B) + n(K \times B)$ 1 M
- ii) A correspondence of elements from A to B given as
 $\{(1,2), (2,2), (3,4), (3,6), (4,4), (5,6)\}$. 1 M

Is it a function? Justify your answer.

- iii) a) Let $R = \{(x,y): x + y < 7, x \in A, y \in B\}$ be a relation from set A to set B. Write the relation in roster form and hence write the domain and range of the relation R. 2 M
- OR
- b) Find the domain and range of the relation
 $R = \{(x,y): 2x+3y=30, x, y \in W, \text{the set of whole numbers}\}$
