



IDEAL INDIAN SCHOOL, DOHA-QATAR
MODEL QUESTION PAPER 2021-22
FIRST TERMINAL EXAMINATION, JUNE 2021
MATHEMATICS

CLASS : XI

M.Marks : 40
Time : 1.5 hrs.

General Instructions:

1. This question paper contains two parts **A and B**. Each part is compulsory. Part A carries 11 marks and Part B carries 29 marks.
2. **Part-A** has Objective Type Questions and **Part -B** has Descriptive Type Questions
3. Both Part A and Part B have choices.

Part – A:

1. It consists of two sections- I and II.
2. Section I comprises of 7 very short answer type questions.
3. Section II contains 1 case studies. Case study comprises of 5 case-based MCQs. An examinee is to attempt any 4 out of 5 MCQs.

Part – B:

1. It consists of three sections- III, IV and V.
2. Section III comprises of 5 questions of 2 marks each.
3. Section IV comprises of 3 questions of 3 marks each.
4. Section V comprises of 2 questions of 5 marks each.
5. Internal choice is provided in 2 questions of Section –I, 2 questions of Section –III, 1 questions of Section IV and 1 questions of Section-V. You have to attempt only one of the alternatives in all such questions.

Part A

Section - I

(Question numbers 01 to 7 carry 1 mark each.)

1. If **N** is the set of natural numbers and **W** is the set of whole numbers, then what is **W – N**?
2. Write all the possible subsets of $A = \{5, 6\}$.

OR

3. If $A = \{5, \{5\}, 6\}$, how many elements has $P(A)$?
4. Evaluate $\frac{f(1.2)-f(1)}{1.2-2}$ if $f(x) = x^3$.
5. **(a)** Write $[-5, 9]$ in set-builder form. **(b)** Write $\{x : x \in \mathbb{R}, -3 \leq x \leq 7\}$ as interval.

OR

Write the set $A = \{x : x \in \mathbb{N} \text{ and } x^2 < 25\}$ in roster form.

6. Write the domain and range of $f(x) = x^2 + 1$.
7. Under which condition a relation f from A to B is said to be a function?

Section - II

Questions in this section carry 1 mark each.

Case study based questions are compulsory. Attempt any 4 sub-parts from question 8 (i-v) .

8. In the following figure small square represents the persons who know English, triangle to those who know Marathi, big square to those who know Telugu and circle to those who know Hindi. In the different regions of the figures from 1 to 12 are given

<p>i</p>	<p>How many persons can speak English and Hindi both the languages only ?</p> <p>a) 5 b) 8 c) 7 d) 18</p>	
<p>ii</p>	<p>How many persons can speak all the languages?</p> <p>a) 1 b) 8 c) 2 d) None</p>	
<p>iii</p>	<p>How many persons can speak Marathi and Telugu both ?</p> <p>a) 10 b) 11 c) 3 d) None of these</p>	
<p>iv</p>	<p>How many persons can speak English, Hindi and Telugu ?</p> <p>a) 8 b) 2 c) 7 d) None of these</p>	
<p>v</p>	<p>How many persons can speak ONLY Telugu ?</p> <p>a) 10 b) 11 c) 3 d) None of these</p>	

PART - B
Section III

Questions in this section carry 2 marks each.

9. Write the domain of: $f = \{(4,2), (9,1), (6,1), (10,3)\}$

OR

Determine the domain of the function $\frac{1}{\sqrt{2x+1}}$.

10. Let A and B be two finite sets such that $n(A - B) = 30$, $n(A \cup B) = 180$, $n(A \cap B) = 60$, find $n(B)$.

11. Let $U = \{x : x \in \mathbb{N}, x \leq 10\}$; $A = \{x : x \text{ is an odd number}, 0 < x < 9\}$; $B = \{2, 3, 5, 7\}$. Write the set $(A' \cup B')$.

12. A function f is defined by $f(x) = 2x - 5$. Write down the values of (i) $f(0)$, (ii) $f(7)$, (iii) $f(-3)$

OR

Let $f(x) = x^2 + 5$ and $g(x) = \frac{x}{1+x}$ be two real functions. Find $(f + g)(x)$, $(f - g)(x)$, $(fg)(x)$, $(f/g)(x)$

13. If $A = \{a_1, a_2\}$ and $B = \{b_1, b_2, b_3\}$, then write $A \times B$.

Section-IV

Questions in this section carry 3 marks each.

14. Define and verify De Morgan's Law.

OR

(a) Check which of the following pair of sets are disjoint? Give reason(s).

(i) $\{1, 2, 3, 4\}$ and $\{x : x \text{ is a natural number and } 4 \leq x \leq 6\}$.

(ii) $\{x : x \text{ is a vowel in English alphabet}\}$ and $\{x : x \text{ is a consonant in English alphabet}\}$.

(b) Write $[-5, 9]$ in set-builder form.

(c) Write $\{x : x \in \mathbb{R}, -3 \leq x \leq 7\}$ as interval.

15. If A, B and C are three sets and U is the universal set such that $n(U) = 500$, $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$. Find the value of $n(A' \cap B')$.

16. Let $A = \{1, 2, 3, 4\}$, $B = \{1, 5, 9, 11, 15, 16\}$ and $f = \{(1,5), (2,9), (3,1), (1,9), (4,11)\}$. Are the following true? Give reason (s) to support your answer.

(a) f is a relation from A to B.

(b) f is a function from A to B.

Section- V

Questions in this section carry 5 marks each.

17. (a) Sketch the graph for Modulus function. Hence mention its domain & range as well.

(b) Sketch the graph of $f(x) = |x + 5|$. Also write its domain and range.

18. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T and 26 read newspaper I, 9 read both Hand I, 11 read H and T, 8 read both T and I and 3 read all the three newspapers. Find the number of people who read (a) at least one of the newspapers (b) exactly one newspaper.

OR

In a town of 10000 families, it was found that 40% families buy fruit A, 20% families buy fruit B, 10% families buy fruit C, 5% families buy A and B, 3% buy B and C and, 4% buy A and C. If 2% families buy all the three kind of fruits, find the number of families which buy (a) fruit A only (b) none of A, B and C.
