



COLUMBIA FOUNDATION SR. SEC. SCHOOL

HALF-YEARLY EXAMINATION (2023-24)

Roll No -

Date: 21.09.23

Class – XI

Subject – MATHEMATICS

M. M. – 80

Time: 3 hours

Syllabus – Chapter - 1 to 8

[SET-A]

General Instructions:

1. This question paper contains **FIVE sections – A, B, C, D & E**. Each part is compulsory. However, there are internal choices in some questions.
2. **Section A** has **18 MCQ's and 02** Assertion-Reason based questions of 1 mark each.
3. **Section B** has **5 Very Short Answer (VSA)-type** questions of 2 marks each.
4. **Section C** has **6 Short Answer (SA)-type** questions of 3 marks each.
5. **Section D** has **4 Long Answer (LA)-type** questions of 5 marks each.
6. **Section E** has **3 source based/case based/passage based/integrated units of assessment** (4 marks each) with sub parts.

SECTION – A

(Multiple Choice Questions)

Each question carries 1 mark

Each MCQ has four options with only one correct option, choose the correct option.

Q.1 If $\sin\theta + \cos\theta = 1$, then the value of $\sin 2\theta$ is equal to

- (A) 1 (B) 0 (C) $\frac{1}{2}$ (D) $\frac{\sqrt{3}}{2}$

Q.2 Which of the following sets is empty?

- (A) $\{x: x \in \mathbb{R}, -3 < x \text{ and } x < 20\}$ (C) $\{x: x \in \mathbb{R}, x^2 = -8\}$
(B) $\{x: x \in \mathbb{R}, x^3 = -8\}$ (D) set of even prime numbers

Q.3 The range of $f(x) = |x - 1| - 1$ is

- (A) $[0, \infty)$ (B) $[-1, \infty)$ (C) $\mathbb{R}$ (D) $(-\infty, -1]$

Q.4 The value of $\sqrt{-64} \times \sqrt{-169}$ is

- (A) 104 (B) -104 (C) 104i (D) -104i

Q.5 Solution set for inequality $5x - 3 < 3x + 1$, $x \in \mathbb{N}$ is

- (A) $(-\infty, 2)$ (B) $\{0, 1, 2\}$ (C) $\{1\}$ (D) $\emptyset$

Q.6 Let $n(A) = m$, and $n(B) = n$. Then the total number of non-empty relations that can be defined from A to B is

- (A) 2^{mn} (B) $2^{mn}-1$ (C) m^n (D) $n^m - 1$

Q.7 If A and B are two sets such that $A \subset B$ then $A \cap B'$ is

- (A) A-B (B) A (C) $\emptyset$ (D) $A \cap B$

Q.8 The value of $\operatorname{cosec}(-1410^\circ)$

- (A) 2 (B) -2 (C) $\frac{1}{2}$ (D) $-\frac{1}{2}$

Q.9 If $z = \cos \frac{\pi}{4} + i \sin \frac{\pi}{6}$, then the value of $|\bar{z}|$ is

- (A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) 1 (D) None of these

Q.10 For any two sets A and B, $(A-B) \cap (B-A) =$

- (A) $(A-B) \cup A$ (B) $(B-A) \cup B$ (C) $(A \cup B) - (A \cap B)$ (D) $(A \cup B) \cap (A \cap B)$