INDIAN SCHOOL SOHAR **SET II**

UNIT TEST II (2023-24)
MATHEMATICS (CODE-041)

CLASS: XI **MAX. MARKS: 20**
DATE: 15/01/24 **TIME: 40 MINUTES**

General Instructions:

1. This Question paper contains - four sections A, B, C and D. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 4 MCQ's and 1 Assertion-Reason based questions of 1 mark each.
3. Section B has 2 Very Short Answer (VSA)-type questions of 2 mark each.
4. Section C has 2 Short Answer (SA)-type questions of 3 mark each.
5. Section D has 1 Long Answer (LA)-type questions of 5 marks.

	SECTION – A (Multiple Choice Questions) Each question carries 1 mark
1.	For parabola $y^2 = 8x$, the focus and directrix are (a) F (-2,0), x = -2 (b) F(2,0), x = 2 (c) F(2,0), x = -2 (d) F(-2,0), x = 2
2.	The foci of the ellipse are $(\pm 5\ , 0)$ and the length of its major axis is 20. (a) $\frac{x^2}{100} + \frac{y^2}{75} = 1$ (b) $\frac{x^2}{25} + \frac{y^2}{100} = 1$ (c) $\frac{x^2}{75} + \frac{y^2}{100} = 1$ (d) not defined
3.	The $\lim_{x \to 0} \frac{x}{\cos x}$ (a) 0 (b) $\frac{\pi}{2}$ (c) 1 (d) not defined
4.	Find $\frac{d}{dx}\left(\frac{1}{x} + \sqrt{x}\right)$ (a) $\frac{1}{x^2} + 2\sqrt{x}$ (b) $-\frac{1}{x^2} + 2\sqrt{x}$ (c) $x^2 + 2\sqrt{x}$ (d) $\frac{-1}{x^2} + \frac{1}{2\sqrt{x}}$
5.	Assertion – Reason based question In the following question, a statement of assertion (A) is followed by a statement of reason (R). Choose the correct answer out of the following choices. (a) Both A and R are true and R is correct explanation of A (b) Both A and R are true and R is not correct explanation of A (c) A is true but R is false (d) A is false but R is true Assertion (A) : The arithmetic mean between two numbers is 34 and their geometric mean is 16. The numbers are 64 and 4. Reason (R) : For two numbers a and b, A.M. = $\frac{a+b}{2}$ and G.M. = $\sqrt{ab}$
	SECTION – B [This section comprises of very short answer type questions (VSA) of 2 marks each]
6.	If a parabolic reflector is 60 cm in diameter and 45 cm deep, find its focus. [OR] Find area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 16y$ to the ends of its latus rectum.
7.	Which term of the G.P. 3, 6, 12, 24…….is 3072

	SECTION – C [This section comprises of very short answer type questions (SA) of 3 marks each]
8.	Find the equation of the hyperbola with length of its latus rectum as 36 and its foci are $(0, \pm 12)$.
9.	The sum of the first three terms of a G.P is $\frac{39}{10}$ and product is 1. Find the numbers. [OR] Find the sum 0.6 + 0.66 + 0.666 + 0.6666 + ……..upto n terms
	SECTION – D [This section comprises of long answer type questions (LA) of 5 marks]
10.	If $y = \frac{\sin x + \cos x}{\sin x - \cos x}$, show that $\frac{dy}{dx} = \frac{-2}{1 - sin\, 2x}$ [OR] Do as directed. (a) Find the derivative of y = $\left(\sqrt{x} + \frac{1}{x}\right)\left(\sqrt{x} - \frac{1}{x}\right)$ (b) Find the derivative of f(x) = cos x from first principle.