Total printed pages 01

Name :_____R. No.___ Class/ Sec:_____ Date:_____ Invig. Sign_____

ATOMIC ENERGY CENTRAL SCHOOL, NARORA

CLASS XII MATHEMATICS UNIT TEST FIRST 2018-19

MM: 50 TIME : 1:30 Hr.

General Instructions:

- All questions are compulsory and marks are mentioned in front of each question.
- Electronic devices are prohibited to use in the examination.
- Use Blue or Black Pen only.
- Question number1 carry 2 marks, question number 2 to 4 are 4 marks each and Question number 5 to 10 are 6 marks each.

1 A matrix of order 3 x 3 has determinant 5, find $|3A|$

2 Find the interval in which function $f(x) = \sin x + \cos x,\ 0 \le x \le 2\pi$ increasing or decreasing

3 If $y = \cos x^x$, find dy/dx

4 Using differential find the approximate value of $\sqrt{(0.037)}$

5 Prove that the relation R on Z of all integers defined by $(a, b) \in R$ if $(a - b)$ is divisible by 5 is an equivalence relation

6 Using properties of determinant prove that

$$\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix} =$$

$(a- b)(b-c)(c-a)(a+b+c)$

7 Find k, if $f(x) = \begin{cases} \frac{k \cos x}{\pi - 2x}, & \text{if } x \neq \pi/2 \\ 3 & \text{if } x = \pi/2 \end{cases}$ is continues at $x = \pi/2$

8 An open box, with a square base is to be made out of a given quantity of metal sheet of area c^2. Show that the maximum volume is $c^3/6\sqrt{3}$

9 Using elementary transformation find the inverse of the matrix

$$\begin{bmatrix} 7 & 4 \\ 5 & 2 \end{bmatrix}$$

10 Show that the curves $2x = y^2$ and $2xy = k$ cut at right angle, if $k^2 = 8$