2020
MATHEMATICS - GENERAL
SEMESTER-1
Course: CC1/GE1
INTERNAL ASSESSMENT
Full Marks: 10

The figures in the margin indicate full marks .
Symbols and notations used here carry their usual meaning.
Candidates are required to give their answers in their own words as far as practical.

Answer all the questions with proper justification: 5x2=10

1) The equation $(x-a)^2+(x-b)^2+(x-c)^2+(x-d)^2=0$, where a, b, c, d are all real and not all equal has

   i) No real roots ii) three real roots

   iii) only one real root iv) two real roots

2) The rank of the matrix $\begin{bmatrix}1 & 1 & 2\\3 & 4 & 5\\4 & 8 & 0\end{bmatrix}$ is

   i) 1 ii) 2

   iii) 3 iv) 0

3) The order and degree of the differential equation $\frac{d^2y}{dx^2}=\sqrt[3]{1-\left(\frac{dy}{dx}\right)^4}$ are respectively

   i) 1 , 2 ii) 2, 3

   iii) 3 , 2 iv) 2, 4

4) If the equation $\alpha xy-8x+9y-12=0$ represents a pair of straight line, values of α are

   i) 1 , 6 ii) 2, 6

   iii) 3, 5 iv) 0, 6

5) Let $f(x)=\begin{cases}x^2 sin\left(\frac{1}{x}\right), & x\neq 0\\ 0, & x=0\end{cases}$, then which of the following is wrong

   i) f is continuous at $x=0$

   ii) f is derivable at $x=0$

   iii) f' is continuous at $x=0$

   iv) f' is not continuous at $x=0$