

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**

**Test-1 Examination-September 2016**

**B.Tech. 1st Semester (BT/BI)**

Course Code: 10B11MA112

Max. Marks: 15

Course Name: Basic Mathematics I

Course Credit: 4

Max. Time: 1 Hr

Note: All questions are compulsory; carrying of mobile phones and any type of calculator will be treated as the case of unfair means.

Q1.(a) Construct a 4 X 3 matrix  $A = [a_{ij}]$  whose elements are given by  $a_{ij} = \frac{i-j}{i+j}$  [2]

(b) If matrix  $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ , find  $A^2 - 4A - 5I$  [3]

Q2.(a) If  $[1 \ 1 \ x] \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = 0$ , find  $x$  [2]

(b) If matrix  $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ , find  $A^{-1}$ , also show that  $A \cdot A^{-1} = I$  [3]

Q3. Classify the given system of equations as consistent or inconsistent. If consistent then solve it by Cramer's rule. [5]

$$2x + 5y - z = 9$$

$$3x - 3y + 2z = 7$$

$$2x - 4y + 3z = 1$$