Dr. Neelkanth

JAYPEE UNIVERSITY OF INFORMATRION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- September-2017

B.Tech Ist Semester (BI/BT)

COURSE CODE: 10B11MA112 MAX. MARKS: 15

COURSE NAME: Basic Mathematics I

COURSE CREDITS: 04 MAX. TIME: 1 Hr

Note: All questions are compulsory. Marks are indicated in square bracket against each question. Carrying of mobile phone and ***any type of calculator*** *during examinations will be treated as case of unfair means.*

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

Q2.If $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$ *and* $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$,verify that $(AB)' = B'A'$ [3]

Q3.Solve the system of equations using matrix method. [3]

$$2x + y + z = 1$$

$$x - 2y - z = \frac{3}{2}$$

$$3y - 5z = 9$$

Q4.Solve the following system of homogenous equations using Cramer's rule. [3]

$$x + y - 2z = 0$$

$$2x + y - 3z = 0$$

$$5x + 4y - 9z = 0$$

Q5.If $\vec{a} = 5\hat{\imath} - \hat{\jmath} - 3\hat{k}$ *and* $\hat{b} = \hat{\imath} + 3\hat{\jmath} - 5\hat{k}$

(a) Show that $(\vec{a} + \vec{b})$ and $(\vec{a} - \vec{b})$ are orthogonal. [2]

(b) Find $(\vec{a} + \vec{b})$ X $(\vec{a} - \vec{b})$ [2]

MA-1, BT