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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T-1, EXAMINATION- September-2019

B.Tech. I Semester (BI/BT)

COURSE CODE: 18B11MA112/10B11MA112 (Backlog)

MAX. MARKS: 15

COURSE NAME: BASIC MATHEMATICS-I

COURSE CREDITS: 04

MAX. TIME: 1:00 Hrs.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Quest (1) If $A = \begin{bmatrix} 2 & 4 & -1 \\ -1 & 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 2 & 1 \end{bmatrix}$ verify that $(AB)^T = B^T A^T$. [3] [CO-1]

Quest (2) Prove that [3] [CO-1]

$$\begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ x^3 & y^3 & z^3 \end{vmatrix} = xyz(x-y)(y-z)(z-x)$$

Quest (3) BY using matrix inverse method, find all integer values of λ for which the system of equations

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

$$2x - \lambda y - 3z = 2$$

$$x + 2y + \lambda z = 3$$

has unique solution. Find the solution for $\lambda = 0$.

[4] [CO-1]

Quest (4) Find the Direction Cosines of the line passing through the two points $(3, 5, -4)$ and

$(-5, -5, 2)$

[2] [CO-2]

Quest (5) Show that matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$ is Nilpotent matrix. Also find its Nilpotent index.

[3] [CO-1]