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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-1, EXAMINATION- October-2019
B.Tech. I Semester (BI/BT)

COURSE CODE: 18B11MA112 / 10B11MA112 (Backlog)

MAX. MARKS: 25

COURSE NAME: BASIC MATHEMATICS-I

COURSE CREDITS: 04

MAX. TIME: 1:30 Hrs.

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

Quest (1) (a) Solve the system of linear equation

[CO-1] [4+3]

$$5x - 7y + z = 11$$

$$6x - 8y - z = 15$$

$$3x + 2y - 6z = 7.$$

(b) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}$ is a matrix satisfying $AA^T = 9I$, where $I_{3 \times 3}$ is the identity matrix,

then find the values of a and b .

Quest (2) Find the equation of the line perpendicular to the line $x - 7y + 5 = 0$ and having x axis intercept 3.

[CO-2] [3]

Quest (3) Find the shortest distance between the lines

[CO-2] [4]

$$\vec{r} = (\hat{i} + 2\hat{j} + \hat{k}) + \lambda(\hat{i} - \hat{j} + \hat{k})$$

and

$$\vec{r} = (2\hat{i} - \hat{j} - \hat{k}) + \mu(2\hat{i} + \hat{j} + 2\hat{k}).$$

Quest (4) Convert the complex number $\frac{-24}{\sqrt{3}+i}$ into polar form.

[CO-3] [3]

Quest (5) Express the following expression in the form of $a + bi$

[CO-3] [3]

$$\frac{(3 - 4i)}{(4 - 2i)(1 + i)}$$

Quest (6) A travel Agent surveyed 100 people to find out how many of them had visited the cities of Melbourne and Brisbane. Thirty-one people had visited Melbourne. Twenty-six people had been to Brisbane and twelve people had visited both cities. Find the number of people who had visited

a) Melbourne or Brisbane

b) Brisbane but not Melbourne

[CO-4] [5]