National Institute of Technology Kurukshetra
Machine Learning and Data Analytics (CSIC-221)

Time- 50min | Mid sem-1 | Max Marks -20

**All Questions are compulsory.**

**Q-1.** If X is a normal variate with a mean of 30 and Standard deviation of 5. Find the probability: (Where values of Z at 0.8 = 0.2881, 1.0 = 0.3413, 2.0 = 0.4772, 3.0 = 0.4987). **5 Marks**

a) $26 \leq X \leq 40$

b) $X \geq 45$

c) $|X-30|>5$

**Q-2.** Calculate the Mean, Median, and Mode for the given grouped data. **5 Marks**

| Marks Obtained | 25-35 | 35-45 | 45-55 | 55-65 | 65-75 | 75-85 |
|---|---|---|---|---|---|---|
| No. of Students | 7 | 31 | 33 | 17 | 11 | 1 |

**Q.3.:** Consider the following system of linear equations: **5 Marks**

$2x - 3y = 6$

$4x - y = 5$

(a) Write the system in matrix form AX=B, where A is the coefficient matrix, X is the column matrix of variables and B is the column matrix of constants.

(b) Use matrix methods to solve for x and y. What are the values of x and y?

**Q-4.** Find the Eigen values and Eigen vectors of the matrix.

$$\begin{bmatrix} 1 & 1 \\ 3 & -1 \end{bmatrix}$$