ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE – 27

M.SC BDA – I SEMESTER

MID-SEMESTER TEST – AUGUST 2016

BDA 1316: Linear Algebra & Linear Programming

Time: 1 1/2hrs **Max marks:35**

Answer any FIVE of the following

1. Define the following terms with appropriate examples (1 X 7 Marks)
   a. Matrix
   b. Vector
   c. Diagonal matrix
   d. Symmetric matrix
   e. Upper and Lower Triangular Matrix
   f. Scalar Matrix

2. Illustrate scaling and rotation for the given matrixes? Take scaling factor as 1.25 and $\theta = 130^0$ (7 Marks)

$$A = \begin{pmatrix} 4 & 12 & 12 \\ 3 & 15 & 8 \\ 5 & 14 & 6 \end{pmatrix}$$

3. Find the Inverse of the following matrix (7 Marks)

$$A = \begin{pmatrix} 4 & 3 & 2 \\ 3 & 4 & 5 \\ 5 & 4 & 6 \end{pmatrix}$$

4. Solve the following system using Gauss Jordan operation elimination method(7 Marks)

$$x + 2y - 3z = 2, \quad 6x + 3y - 9z = 6, \quad 7x + 14y - 21z = 13$$

5. Solve the following system of linear equations (7 Marks)

$$4y + z = 2, 2x + 6y - 2z = 3, \; 4x + 8y - 5z = 4$$

6. a) What are Eigen value and Eigen vectors? Explain it's significant in big data analytics?

   b) Explain positive definite and positive semi definite matrixes. (2 X 3.5 Marks)

7. Find the Eigen vector for the following matrix? (7 Marks)

$$A = \begin{pmatrix} 3 & 1 & 1 \\ 6 & 3 & 8 \\ 7 & 1 & 5 \end{pmatrix}$$