University of Sargodha

BSIT 3rd Term Exam 2015

Subject: BSIT Course : Linear Algebra Paper:MATH-3215

Time Allowed: 2:30 Hours **Maximum Marks: 80**

Objective Part Compulsory

Q.No1. Write short answers of the following questions. (16*2=32)

i. Find the angle between u and v, u = (1,-5,1) ; v = (0,0,-1).
ii. What is characteristic equation?
iii. Define Eigen Vector
iv. What are different types of distributions?
v. Define similar matrices.
vi. What are dependent vectors, give example.
vii. What is meant by reduced echelon form of matrix?
viii. Give example of augmented matrix.
ix. What are similar matrices?
x. Prove $(AB)^T = B^TA^T$
xi. Under what condition u and v vectors said to be orthogonal
xii. What are linear independent vectors?
xiii. Define Basis of a matrix?
xiv. What is mean by subspace?
xv. Find A^{-1}, $A=\begin{bmatrix}3 & 0\\10 & 4\end{bmatrix}$
xvi. Solve the matrix equation for a,b,c and d ; $\begin{bmatrix}a-b & b+a\\3d+c & 2d-c\end{bmatrix}=\begin{bmatrix}8 & 1\\7 & 6\end{bmatrix}$

Subjective Part

Attempt any four out of six questions (4*12=48)

Q.2. solve the linear system of equation by Guass- Jordan elimination.

$$x_1 + 2x_2 - 3x_3 = 6$$
$$2x_1 - x_2 + 4x_3 = 1$$
$$x_1 - x_2 + x_3 = 3$$

Q.3. Determine the values of '*a*' for which the system has non- solution, exactly one solution and infinitely many solution.

$$x + 2y - 3z = 4$$
$$3x - y + 5z = 2$$
$$4x + y + (a^2-2)z = a+4$$

Q.4. Find Eigen values and Eigen vectors all the minors and cofactors of given matrix

$$A=\begin{bmatrix}1 & -2 & 3\\6 & 7 & -1\\-3 & 1 & 4\end{bmatrix}$$

Q.5. Find the rank and nullity of the matrix

$$A=\begin{bmatrix}1 & 4 & 5 & 6\\3 & -2 & 1 & 4\\-1 & 0 & -1 & -2\\2 & 3 & 5 & 7\end{bmatrix}$$

Q.6. Find LU- decomposition of $A=\begin{bmatrix}4 & 4 & 0\\8 & 6 & 2\\-4 & -10 & 8\end{bmatrix}$

Q.7 Find A^{-1}, $A=\begin{bmatrix}4 & 4 & 0\\8 & 6 & 2\\-4 & -10 & 8\end{bmatrix}$