Center Code:033

Enrolment No._____ Student sign:-_____

GUJARAT TECHNOLOGICAL UNIVERSITY

Mahatma Gandhi Institute of Tech. Education & Research Center, Navsari

B. E. F. Y. (SEM – II) MID SEMESTER EXAMINATION - MARCH 2009

Subject:_____Mathematics_II_____

Date:___23/03/2009_____ Time: 105 Minutes Max. Marks: 40

Q:1 Total 12marks

[A] verify Cauchy Schwarz inequality and triangle inequality for Norm (4)

[B] Find eigan value and eigan vector for A= . (4)

Hence write only eigan values for ,

[C] Define Rank of matrix and find rank of (4)

Q:2 Total:14 Marks

[A] Solve (5)

by Gauss elimination and back substitution

[B] Solve the given homogeneous system of linear equation by any method. (5)

[C] Check given set is vector space under given operations. If it is not vector space list all axioms that fails to hold. (4)

The set of all $2\times 2 matrices\ of\ te\ form \begin{bmatrix} a & 1 \\ 1 & b \end{bmatrix}$ with standard matrix addition and scalar multiplication.

OR

Total:14 Marks.

Q:2

[A] Solve the following system of linear equation by using Gauss Jordan elimination (5)

$$\begin{aligned} 2x_1 + 2x_2 - x_3 \qquad\qquad &= 0 \\ -x_1 - x_2 + 2x_3 - 3x_4 + x_5 &= 0 \\ x_1 + x_2 - 2x_3 \qquad - x_5 &= 0 \\ x_3 + x_4 + x_5 &= 0 \end{aligned}$$

[B] Solve the given homogeneous system of linear equation by any method. (5)

[C] Check the given set is vector space under given operations. If it is not vector space list all axioms that fails to hold. (4)

The set of all pairs of real numbers of the form(1,x) with operation (1,y)+(1,y')=(1,y+y') and k(1,y)=(1,ky)

Q:3 Total :14Marks

[A] Find the inverse of the matrix$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 3 \\ 1 & 0 & 8 \end{bmatrix}$ (5)

[B] Whether the following system is consistent or not .Verify by Rank. (5)

$$x - y + 2z = 3$$
$$x + 2y + 3z = 5$$
$$3x - 4y - 5z = -13$$

[C] 1.Let W be the set of matrices of the form $\begin{pmatrix} 0 & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{pmatrix}$ under standard addition and scalar multiplication. Is this subspace of M_{32} (4)

2.Let W be the set of all vectors of form (a,3a,2a)under standard addition and scalar multiplication. Is this subspace of R^3?

OR

Q:3 Total:14 Marks.

[A] Solve the linear system of equation by using A^{-1} (5)

$$x_1 + 2x_2 + 3x_3 = 5$$
$$2x_1 + 5x_2 + 3x_3 = 3$$
$$x_1 + 8x_3 = 17$$

[B] Find the eigan value and eigan vectors of the matrix (5)

$$\begin{bmatrix} 4 & 2 & -2 \\ -5 & 3 & 2 \\ -2 & 4 & 1 \end{bmatrix}$$

[C] 1.Let W be the set of matrices of the form$\begin{bmatrix} 2 & a_{12} \\ 0 & a_{22} \end{bmatrix}$ under the standard addition and scalar multiplication .Is this subspace of M_{22} (4)

2.Let W be the set of all vectors for the form (a,1,0) under standard addition and scalar multiplication. Is this sub space of R^3?