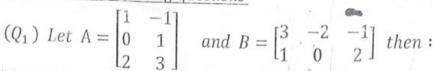
Hadhramout Univ. IT department

Test In Linear Algebra Date: 28-12-20 Time: 90min

Name:

A siles

Answer all the following questions



(a) What the size of A . 3x

(b) Find B^T

$$B^{\mathsf{T}} = \begin{bmatrix} 3 & 1 \\ -2 & 0 \\ -1 & 2 \end{bmatrix}$$

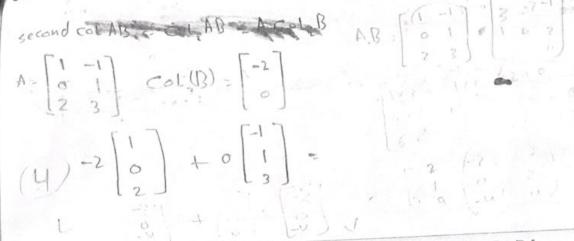
3 1 2 2

(c) Compute $A - 3B^{T}$ $_{3B}^{T} = 3\begin{bmatrix} 3 & 1 \\ -2 & 0 \end{bmatrix} = \begin{bmatrix} 9 & 3 \\ -4 & 0 \end{bmatrix}$ $A - 3B^{T} = \begin{bmatrix} 1 & -1 \\ 0 & 1 \\ 2 & 3 \end{bmatrix} - \begin{bmatrix} 9 & 3 \\ -6 & 0 \\ -3 & 6 \end{bmatrix} = \begin{bmatrix} 1 & -1 \\ 0 & 1 \\ 2 & 3 \end{bmatrix} + \begin{bmatrix} -9 & -3 \\ 6 & 0 \\ 3 & -6 \end{bmatrix} = \begin{bmatrix} -8 & -4 \\ 6 & 0 \\ 5 & -3 \end{bmatrix}$

(d) Compute the (3,2)-entry of AB.

$$\begin{bmatrix} 2 & 3 \end{bmatrix} \cdot \begin{bmatrix} -2 \\ 0 \end{bmatrix} = \begin{bmatrix} 2 \times -2 + 3 \times 0 \end{bmatrix}$$

columns of A.



 (Q_2) Show that If A and B are symmetric matrix and AB=BA, then AB is symmetric.

Then AB Issymmetric.

$$(Q_3)$$
 Let $A = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & 1 \\ 1 & -2 & -3 \end{bmatrix}$ find a symmetric matrix S and $\mbox{\em K}$

askew symmetric matrix K , such that A=S+K .

askew symmetric matrix
$$K$$
, such that while: $S = \frac{1}{2} \left(A^T + A \right) / A^T = \begin{bmatrix} 2 & 1 \\ -1 & 4 & -2 \\ 3 & 1 & -3 \end{bmatrix}$

Solution

Good Luck





HADHRAMOUT UNIVERSITY COLLEGE OF COMPUTERS & INFORMATION TECHNOLOGY FINAL EXAMINATION

Academic year: 2020- 2021 Day and Date: Wednesday 3/2/2021 Examiner: Ahlam Omer BinBadr

Time allowed:2hours

Exam Semester: I Level: 2 Department: IT Subject: Linear Algebra

Solve the following questions

(Q1) (mark 45)

(a) Let
$$A = \begin{bmatrix} 1 & 1 \\ 0 & 2 \\ 3 & 1 \end{bmatrix}$$
, $B = \begin{bmatrix} 2 & 5 \\ 4 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then

(1) Find $A^T + B$

(2) Find if possible AB and CB^T

(3) Express the second column of AB as a linear combination of the column of A.

(4) Find C^{-1}

A (col(B)

(b) Let
$$A = \begin{bmatrix} 1 & 2 & 4 \\ 3 & 1 & 6 \\ k & 3 & 2 \end{bmatrix}$$

(1) Find |A|

(2) Find all values of (k) so that A is singular.

(Q2) (30 mark)

(a) Solve the following system using Guass-Jordan method

$$x + 2y + 3z = 9$$

$$2x - y + z = 8$$

$$3x - z = 3$$

(b) Find all values of (a) for which the system z = 4 z = 4 z = 4 z = 4 z = 4 z = 5 z = 5

$$2x + y + 3z = 5$$

$$-3x - 3y + (a^2 - 5a)z = a - 8$$

as (a) on solution, (b)unique solution, and(c) infinite many solution.

Follow ->

(Q3) (mark25)

(a) Prove of the following

(1) If A and B are symmetric matrix, then AB - BA is a skew-symmetric matrix.

(2) If u and v be two solution of the non-homogenous system Ax = B, then u-v is a solution to the homogenous Ax=0.

(b) Let
$$\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 3$$
 find $\begin{vmatrix} a_1 & a_2 & a_3 \\ -2b_1 & -2b_2 & -2b_3 \\ 3a_1 - c_1 & 3a_2 - c_2 & 3a_3 - c_3 \end{vmatrix}$

Good Luck