Roll No. _____

NATIONAL UNIVERSITY OF MODERN LANGUAGES ISLAMABAD
DEPARTMENT OF SOFTWARE ENGINEERING
Mid Term Examination – Spring 2022 – BSSE- 3rd (Afternoon)

Course Title: Linear Algebra
Total Mark= 10 Mark : Due Date: May 15, 2022

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Question#1 (CLO-1)

a) Suppose the coefficient matrix of a system of linear equations has a pivot position in every row. Explain with examples why the system is consistent.
b) Determine existence and uniquness of the linear system given by

$$Ax = b \; with \; A = \begin{bmatrix} 1 & c \\ a & 3 \end{bmatrix}, b = \begin{bmatrix} 1 \\ h \end{bmatrix},$$

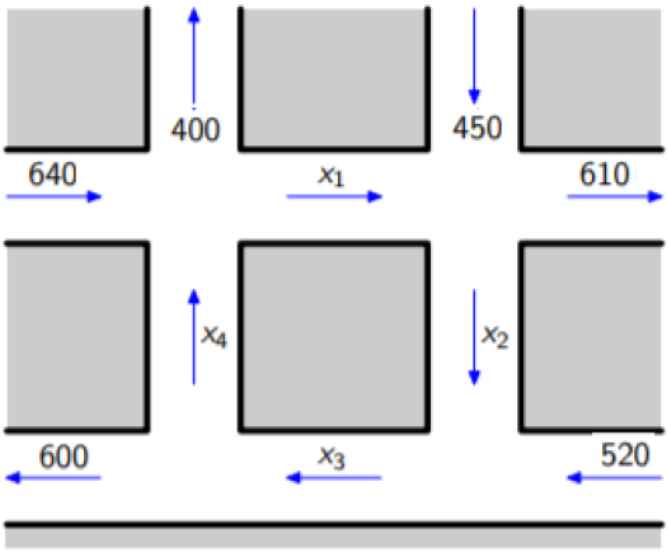
where *h* is general constant and a and c represents 3rd and 4th digits of your roll number.
Note: If any of the 3rd or 4th digit is zero than consider 2nd digit of your roll number.

c) Solve the above linear system using Gauss-Jorden method.
d) Find nontrivial solution (if exist) of the corresponding homogenous system $A\boldsymbol{x}=\mathbf{0}$.
e) Determine if columns of *A* are linear independent. Justify your answer.

(1*5=5 Marks)

Question#2 (CLO-2)

Find the general flow pattern of the network shown in the figure. Assumning that the flows are all non negatives, what is the smallest possible values for the unknown?



(5 Marks)

Good Luck