University of Balamand
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MATH 211 Linear Agebra, **Quiz**
Date : 23-06-2021, **Duration :** 60 min including submission

Question 1:(20 points)
Use the Gauss jordan reduction method to solve the following system

$$\begin{cases} x + 2\,y + 3\,z + 4\,t\ = 10 \\ 2\,x + 3\,y + 4\,z + t\ = 10 \\ 3\,x + 4\,y + 1\,z + 2\,t = 10 \\ 4\,x + 1\,y + 2\,z + 3\,t = 10 \end{cases}$$

Question 2:(20 points)

Given $A = \begin{bmatrix} -1 & 1 & 1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{bmatrix}$. Show that A is invertible (non singular) and find A^{-1}

Question 3:(20points) Given the following matrix

$$A = \begin{bmatrix} 1 & 1 & 1 \\ m & 1 & m \\ 1 & m & m \end{bmatrix}$$

1. Find the rank of A following the values of m
2. Deduce that the following system has a unique solution and determine it

$$\begin{cases} x + y + z\ = 3 \\ 2x + y + 2z = 2 \\ x + 2y + 2z = 1 \end{cases}$$

Question 4:(20 points)

1. Find the rank of the following matrix $A = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \\ 4 & 5 & 6 & 7 \end{pmatrix}$.

2. Given $B = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 0 & 1 & 7 \\ 3 & 1 & -1 & 2 \\ 4 & 2 & 3 & 1 \end{pmatrix}$. Find $\det{(B)}$ then deduce $\det\left[4\,(2B)^{-1}\,B\right]$.