King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math-513 Semester-142 QUIZ III

NAME: S.No. ID:

Maximum Marks: 20 Section: Time Allowed: 45 minutes

(1) (06) Use Gauss-Jordan elimination method to find inverse of $A = \begin{pmatrix} 2 & 0 & 1 \\ -2 & 3 & 4 \\ -5 & 5 & 6 \end{pmatrix}$

Q:2 (6 points) Let $A = \begin{pmatrix} 1 & -2 & 2 \\ -2 & 1 & -2 \\ 2 & -2 & 1 \end{pmatrix}$

(a) Find the eigenvalues of A

(b)Find eigenvectors corresponding to eigenvalues,

Q:3 (8 points) Use the matrix exponential to find the general solution of the following system of first-order linear ordinary differential equations

$x' = x + y + 2z + t$

$y' = -x + 3y + 4z + 1$

$z' = 2z + e^t.$

(Hint: Set of fundamental solutions is $S = \{e^{2t},\ te^{2t},\ t^2e^{2t}\}$)

(Do not evaluate the integral)