CS6015: Linear Algebra and Random Processes
Quiz - 1
Course Instructor : Prashanth L.A.
Date : Aug-16, 2017   **Duration** : 30 minutes

Name of the student :
Roll No :

INSTRUCTIONS: Answers should be given with proper justification. Please use rough sheets for any calculations *if necessary.* Please **DO NOT** submit the rough sheets. Please DO NOT use pencil for writing the answers.

Assume standard data whenever you feel that the given data is insufficient.
However, please do quote your assumptions explicitly.

1. True or False? Answer any five. $(2 + 2 + 2 + 2 + 2$ marks)

   Note: 2 marks for the correct answer and -1 for the wrong answer.

   (a) A is invertible if $A + A^2 = I$.

   (b) $I - A$ is invertible if $A^3 = 0$.

   (c) If u, v, w are linearly independent, then $u + v, v + w, w + u$ are linearly independent.

   (d) $\begin{bmatrix} 2 \\ -11 \\ 3 \end{bmatrix}$ is a linear combination of $\begin{bmatrix} 0 \\ -1 \\ 5 \end{bmatrix}$ and $\begin{bmatrix} -1 \\ 4 \\ 9 \end{bmatrix}$.

   (e) If A and B are matrices and A is invertible, then $A^{-1}BA = B$.

   (f) It is possible for a linear system of equations to have exactly four (different) solutions.

2. Express $\begin{bmatrix} 1 & -5 & 2 \\ 0 & 1 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ as a product of elementary matrices.   (10 marks)