Assignment VI

MA 242

Due on 31^{th} July

Note:- This assignment will be evaluated out of 20 points.
Important:- 31^{th} is the firm deadline for submitting this assignment. No assignments will be accepted after 31^{th}.

1. (5 points) If $p(t) = c_0 + c_1 t + c_2 t^2 + ... + c_n t^n$, then $p(A)$ is defined to be the matrix formed by replacing t by A such that

$$p(A) = c_0 I + c_1 A + c_2 A^2 + ... + c_n A^n.$$

   Show that if λ is an eigenvalue of A then one eigenvalue of $p(A)$ is $p(\lambda)$.

2. (5 points) Suppose $A = PDP^{-1}$ where P is $2X2$ and $D = \begin{bmatrix} 2 & 0 \\ 0 & 7 \end{bmatrix}$. Let $B = 5I - 3A + A^2$. Show that B is diagonalizable.

3. (5 points) Let $\{v_1, ..., v_n\}$ be an orthonormal set. Verify the following equality.

$$\|x\| = \sqrt{\mid c_1 \mid^2 + \mid c_2 \mid^2 + ... + \mid c_n \mid^2}$$

   If x = $c_1 v_1$ + $c_2 v_2$ +...+ $c_n v_n$.

4. (5 points) If A is similar to B then we know that **DetA** = **DetB**, but what can we say about the reverse statement, that is does **DetA** = **DetB** imply that A is similar to B?