Math 254 Fall 2012 Exam 11

Please read the following directions:
Please print your name in the space provided, using large letters, as "First LAST". Books, notes, calculators, and other aids are not permitted on this exam. Please write legibly, with plenty of white space. Please put your answers in the designated areas. Show all necessary work in your solutions; if you are unsure, show it. Cross out work you do not wish graded; incorrect work can lower your grade. All problems are worth 5-10 points; your total will be scaled to the standard 100 point scale. You have approximately 30 minutes.

Extra credit may be earned by handing in revised work in class on Friday 12/7; for details see the syllabus. You will find this exam on the instructor's webpage soon.

1. Carefully state the definition of "dependent". Give two examples from $P_2(t)$.

The remaining problems all concern the matrix $A = \begin{bmatrix} 0 & -1 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$.
Hint: all answers can be expressed as integers.

2. Find the characteristic polynomial $\Delta_A(t)$ of A.

3. Find all the eigenvalues of A.

4. For each eigenvalue of A, find a maximal independent set of eigenvectors.

5. For each eigenvalue of A, give its algebraic and geometric multiplicity. What is the Jordan form of A?