

**Due: 3:00pm on April 29, 2010**

Math 166 Section: \_\_\_\_\_

Row: \_\_\_\_\_

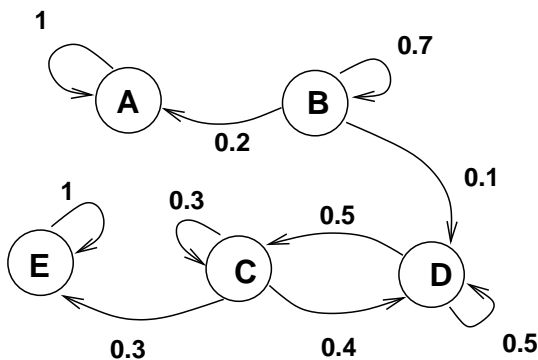
**This assignment is due by 3:00pm on April 29, 2010** You can turn it in to me in class or drop it by the office, **Blocker 640D**. Be sure that you follow the homework rules, they can be found on your syllabus. Please work the problems in the order that they are listed.

1. (2 points) Use the following transition matrix for these questions.

$$T = \begin{matrix} & \begin{matrix} A & B & C \end{matrix} \\ \begin{matrix} A \\ B \\ C \end{matrix} & \begin{bmatrix} 0.2 & 0.1 & 0.5 \\ 0.5 & 0.8 & 0.1 \\ 0.3 & 0.1 & 0.4 \end{bmatrix} \end{matrix}$$

Give the equations that you would use to find the steady state of this transition matrix.

2. (5 points) Use the transition diagram to answer the following.



- (a) Does the transition diagram represent an absorbing Markov process?  
**If yes, then do the following.**
- (b) Give the transition matrix in standard form. Be sure to label the states.
- (c) Give the limiting matrix.
- (d) What percent of the time if you start in state B will you be absorbed into state E?
- (e) Give the fundamental matrix.
3. (4 points) Use the following transition matrix for these questions.
- $$T = \begin{matrix} & \begin{matrix} C & D & A & B \end{matrix} \\ \begin{matrix} C \\ D \\ A \\ B \end{matrix} & \begin{bmatrix} 1 & 0 & 0.1 & 0.2 \\ 0 & 1 & 0.2 & 0.2 \\ 0 & 0 & 0.1 & 0.2 \\ 0 & 0 & 0.6 & 0.4 \end{bmatrix} \end{matrix}$$
- (a) Give the limiting matrix. (round numbers to 3 decimal places)
- (b) Give the fundamental matrix. (round numbers to 3 decimal places)
- (c) What is the expected number of iterations of the Markov process (until you end up in an absorbed state) if you start in state A?
- (d) If you start in state B, what is the expected number of times that you will be in state B until entering an absorbing state?