Chapter 6 Test

1. Draw the flow chart that represents the following algorithm for finding $n!$.

A: Enter the value of n.
B: Store the value of n into k.
C: Reduce the value of n by 1.
D: Multiply k by the new value of n.
E: If n is greater than 1, go to Step C; otherwise, stop.

2. Use the matrices below to answer the questions that follow.

$$A = \begin{bmatrix} -4 & 0 & 5 \end{bmatrix} \quad B = \begin{bmatrix} -2 \\ 3 \\ -7 \end{bmatrix} \quad C = \begin{bmatrix} 2 & 2 & 4 \\ 4 & 0 & 1 \\ 5 & 1 & 3 \end{bmatrix} \quad D = \begin{bmatrix} 2 & 0 & 0 \\ 3 & 1 & 0 \\ 1 & 0 & 4 \end{bmatrix}$$

(a) State the dimensions of A, B, and C.
(b) Calculate $C + D$.
(c) Calculate $C - D$.
(d) Calculate $2C$.
(e) Calculate $-3B$.
(f) Calculate AC.
(g) Calculate BC and CB.
(h) Explain why the product AC is possible but the product CA is not.
(i) Show that $A(D + C) = AD + AC$.

3. A teacher surveyed the students in a class to find out who would like to sit beside whom. The results for part of the class are shown.

Student	Would sit beside …
Ellia	Paul, Ramzia, Kaethe, Wendy
Paul	Ellia, Roger, Ramzia
Ramzia	Kaethe, Roger
Kaethe	Wendy, Ramzia
Wendy	any student
Roger	anyone but Ramzia

(a) Draw a directed graph to represent the seating preferences among this group of students.
(b) Write out the relationship matrix that describes the seating preferences for this group.
(c) Suppose the students passed a note from one to another. Use matrix methods to determine the number of different ways there are for Paul to send a note and get it back in four passes.

4. Create a task table and calculate the earliest start time. (Assume that all times are in days.) Identify the critical path in the following graph.