MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) A tree is
A) any graph that is connected and every edge is a bridge.
B) any graph that has no circuits.
C) any graph with one component.
D) any graph that has no bridges.
E) None of the above

2) Graph 1 is connected and has no circuits. Graph 2 is such that for any pair of vertices in the graph there is one and only one path joining them.
A) Graph 1 cannot be a tree; Graph 2 cannot be a tree.
B) Graph 1 must be a tree; Graph 2 may or may not be a tree.
C) Graph 1 must be a tree; Graph 2 must be a tree.
D) Graph 1 must be a tree; Graph 2 cannot be a tree.
E) None of the above

3) Suppose T is a tree with 21 vertices. Then
A) T has one bridge.
B) T has no bridges.
C) T can have any number of bridges.
D) T has 20 bridges.
E) None of the above

4) How many spanning trees does the following graph have?

A) 1
B) 2
C) 3
D) 4
E) None of the above
5) In Figure 7.10, using Kruskal's algorithm, which edge should we choose first?

A) $AB$
B) $EG$
C) $BE$
D) $AG$
E) None of the above

6) In Figure 7.10, using Kruskal's algorithm, which edge should we choose third?

A) $EF$
B) $AG$
C) $BG$
D) $EG$
E) None of the above

7) In Figure 7.10, using Kruskal's algorithm, which edge should we choose last?

A) None of the above
B) $AB$
C) $AC$
D) $CD$
E) $BC$

8) In figure 7.10, which of the following edges of the given graph are not part of the minimum spanning tree?

A) $AC$
B) $EF$
C) $AG$
D) $BG$
E) None of the above
9) In Figure 7.10, the total weight of the minimum spanning tree is
A) 36.
B) 42.
C) 55.
D) 95.
E) None of the above

10) Which of the following statements is true about Kruskal’s algorithm.
A) It is an inefficient algorithm, and it never gives the minimum spanning tree.
B) It is an efficient algorithm, and it always gives the minimum spanning tree.
C) It is an efficient algorithm, but it doesn’t always give the minimum spanning tree.
D) It is an inefficient algorithm, but it always gives the minimum spanning tree.
E) None of the above

Figure 8.1
For the following question(s), refer to the digraph below.

11) In Figure 8.1, which of the following is not a path from vertex E to vertex B in the digraph?
A) E, B, C, B
B) E, D, B
C) E, A, B
D) E, A, C, B
E) All of the above are paths from A to E.

12) The critical path algorithm is
A) an approximate and inefficient algorithm.
B) an optimal and efficient algorithm.
C) an approximate and efficient algorithm.
D) an optimal and inefficient algorithm.
E) None of the above
Situation 8.3
Suppose you have the following project digraph. (The numbers in parenthesis represent hours.)

13) In Situation 8.3, what is the number of tasks in this project?
   A) 7
   B) 11
   C) 6
   D) 9
   E) None of the above

14) In Situation 8.3, what is the number of direct precedence relations in this project?
   A) 6
   B) 7
   C) 11
   D) 9
   E) None of the above

15) In Situation 8.3, the length of the critical path from A is
   A) 14 hours.
   B) 5 hours.
   C) 6 hours.
   D) 11 hours.
   E) None of the above

16) In Situation 8.3, the length of the critical path of this project digraph is
   A) 11 hours.
   B) 14 hours.
   C) 12 hours.
   D) 16 hours.
   E) None of the above
17) In Situation 8.3, if we use the priority list $F, E, A, D, B, G, C$ and the priority-list model to schedule this project with two processors, we should start by assigning

A) task $B$ to one processor, task $E$ to the other one.

B) task $A$ to one processor, task $C$ to the other one.

C) task $A$ to one processor, task $B$ to the other one.

D) task $B$ to one processor, task $C$ to the other one.

E) None of the above

18) In Situation 8.3, if we use the priority list $F, E, A, D, B, G, C$ and the priority-list model to schedule this project with two processors, the project completion time is

A) 21 hours.

B) 19 hours.

C) 20 hours.

D) 18 hours.

E) None of the above

19) In Situation 8.3, using the critical path algorithm to schedule this project with two processors, the project completion time is

A) 20 hours.

B) 17 hours.

C) 18 hours.

D) 19 hours.

E) None of the above

20) In Situation 8.3, using the critical path algorithm to schedule this project with three processors, the project completion time is

A) 11 hours.

B) 12 hours.

C) 13 hours.

D) 14 hours.

E) None of the above
Answer Key, Practice Exam #3

1) Answer: A
2) Answer: C
3) Answer: D
4) Answer: C
5) Answer: C
6) Answer: A
7) Answer: C
8) Answer: D
9) Answer: C
10) Answer: B
11) Answer: A
12) Answer: C
13) Answer: A
14) Answer: A
15) Answer: D
16) Answer: B
17) Answer: C
18) Answer: A
19) Answer: C
20) Answer: D