**Foundations of Discrete Mathematics**
**COT 2104**
**Chapter 10 (Answer Review)**

1. A walk in a graph is a trail in which all edges are distinct.
   a. True
   b. False x

2. A path is a walk in which all vertices are distinct.
   a. True x
   b. False

3. A trail is a path.
   a. True
   b. False x

4. A path is a trail.
   a. True x
   b. False

5. A cycle is a special type of circuit.
   a. True x
   b. False

6. A cycle is a circuit with no repeated edges.
   a. True
   b. False x

7. An Eulerian circuit is a cycle.
   a. True
   b. False x

8. All edges in a circuit must be distinct.
   a. True x
   b. False

9. A subgraph of a connected graph must be connected.
   a. True
   b. False x

10.     $K_8$ is Eulerian.
   a. True
   b. False x

11. $K_{8,10}$ is Eulerian.
    a. True x
    b. False

12. A pseudograph that possesses an Eulerian trail has exactly two odd vertices.
    a. True x
    b. False

13. A Hamiltonian cycle is a circuit.
    a. True x
    b. False

14. $K_8$ is Hamiltonian.
    a. True x
    b. False

15. $K_{8,10}$ is Hamiltonian.
    a. True x
    b. False

16. A graph with more than one component cannot be Hamiltonian x
    a. True
    b. False

17. A graph that contains a proper cycle cannot be Hamiltonian.
    a. True x
    b. False

18. The matrix A is the adjacency matrix of a graph.
    $$A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$
    a. True x
    b. False

19. The matrix A is the adjacency matrix of a graph.
    $$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$$
    a. True x
    b. False

20. If a graph G has adjacency the matrix A, there are two walks from v1 back to itself that include two edges.
    a. True x
    b. False

$$A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 0 \\ 1 & 0 & 0 \end{bmatrix}$$

21. In a weighted graph, it is possible that some edges might have weight 0.
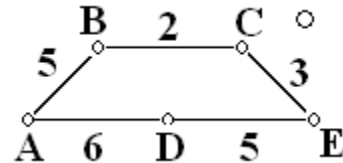    a. True x
    b. False

22. The Traveling Salesman Problem is the problem of finding a maximum Hamiltonian cycle in a weighted (Hamiltonian) graph.
    a. True x
    b. False
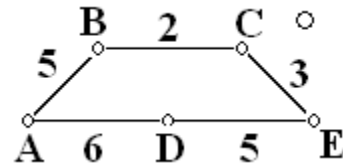
23. In the weighted graph the shortest path between A and E is ADE.
    a. True
    b. False x

24. In the weighted graph the shortest path between C and D is CED.
    a. True x
    b. False

25. Dijkstra's algorithm (original version), when used to find a shortest path from vertex A to vertex E, terminates if E is assigned a label.
    a. True x
    b. False

26. Dijkstra's algorithm (improved version), when used to find a shortest path from vertex A to vertex E, terminates if E is assigned a label.
    a. True x
    b. False