1. The number of vertices of odd degree in an undirected graph is ———

   A. odd

   B. even

   C. prime

   D. multiple of 3

   ANSWER: B

2. A graph in which there is exactly one edge between each pair of distinct vertices is called a ———

   A. complete graph

   B. wheel graph

   C. path graph

   D. complete bipartite graph

   ANSWER: A

3. For which of the following degree sequences the graph exists.

   A. 1, 1, 1, 1, 1

   B. 2, 2, 2, 1, 2

   C. 2, 2, 2, 2, 2

   D. 4, 4, 4, 3, 4

   ANSWER: C

4. The number of edges in a bipartite graph with n vertices is atmost ———-

   A. $\frac{n^2}{2}$

B. $\frac{n^2}{4}$

C. $\frac{n^2}{6}$

D. $\frac{n^2}{8}$

ANSWER: B

5. A connected graph contains an Euler circuit if and only if each of its vertices is of ——— degree.

   A. prime

   B. multiple of 4

   C. odd

   D. even

   ANSWER: D

6. A connected graph without any circuit is called a ————-

   A. tree

   B. subgraph

   C. eulerian graph

   D. hamiltonian graph

   ANSWER: A

7. An undirected graph is a tree if and only if there is a ——— simple path between every pair of vertices.

   A. no

   B. finite

   C. infinite

   D. unique

   ANSWER: D

8. A maximum number of edges in a simple disconnected graph G with n vertices and k components is

   A. $\frac{(n-k)(n-k+1)}{2}$

   B. $\frac{(n+k)(n-k+1)}{2}$

C. $\frac{(n-k)(n+k+1)}{2}$

D. $\frac{(n+k)(n+k+1)}{2}$

ANSWER: A

9. A connected graph contains an Euler path, if and only if it has exactly two vertices of ———

   A. even degree

   B. odd degree

   C. degree, multiple of 3

   D. degree, multiple of 5

   ANSWER: B

10. A tree with 50 vertices has ——— edges.

    A. 47

    B. 48

    C. 49

    D. 50

    ANSWER: C

11. If every internal vertex of a rooted tree has exactly two children, then the tree is called a ———

    A. full binary tree

    B. binary tree

    C. spanning tree

    D. full m ary tree

    ANSWER: A

12. The process of traversing T_1 first inorder and then visiting the root R and

containing the traversal of T_2 in inorder T_3 in inorder until T_n is traversal in inorder is called ———

A. preorder traversal

B. postorder traversal

C. inorder traversal

D. preorder and inorder traversal

ANSWER: C

13. Every vertex which is reachable from a vertex v is called ———— of v

A. leaf

B. root

C. children

D. descendent

ANSWER: D

14. A path of a graph G is called a ———— path if it includes each vertex of G exactly once.

A. hamiltonian

B. konisberg

C. eulerian

D. open

ANSWER: A

15. The number of edges in a complete graph with 8 vertices is

A. 25

B. 26

C. 27

D. 28

ANSWER: D

16. A circuit of a graph G is called ——— circuit, if it includes each edge of G exactly one.

A. an Eulerian

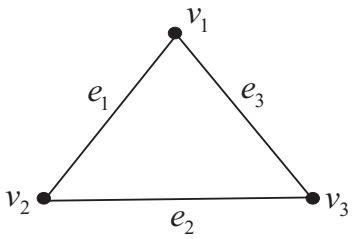
B. hamiltonian

C. strongly connected

D. weekly connected

ANSWER: A

17. The incidence matrix for the following graph is



A. $\begin{pmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{pmatrix}$

B. $\begin{pmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{pmatrix}$

C. $\begin{pmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{pmatrix}$

D. $\begin{pmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 0 \end{pmatrix}$

ANSWER: C

18. If V_1 contains 4 vertices and V_2 contains 3 vertices, then the number of edges in a complete bipartite graph is

A. 11

B. 12

C. 13

D. 14

ANSWER: B