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| Theorem | Question | Page No |
| 1.1 | A Graph with at least two vertices is bipartite if and only if it contains no odd cycles | 9 |
| 1.2 | Given a graph with finite number of edges, the sum of the degrees of vertices is twice the number of edges. Consequently, the number of vertices of a graph with odd degree even. | 13 |
| 1.3 | Let f be a mapping that defines isomorphism of the graph G1=(V1,E1) to the graph G2=(V2,E2).Then isomorphism preserves the degree of vertices.  Let vEV1,then deg(v)=deg(f(v)). | 20 |
| 1.4 | Given a Graph G, any u-v walk contains a u-v path | 23 |
| 1.5 | A closed walk of odd length contains a cycle | 23 |
| 1.6 | A closed walk of odd length contains a cycle | 27 |
| 1.7 | A connected graph G contains an Eulerian tour if and only if there are either no odd vertices or two odd vertices | 34 |
| 1.8 | If in a graph G the degree of each of its vertex is at least 2 then G contains cycle | 36 |
| 1.9 | For any connected graph G, the following statements are equivalent  1)G is Eulerian  2)Every vertex has an even degree  3)The set of edges of G can be partitioned into cycles | 36 |
| 1.10 | Every Hamiltonian graph is 2-connected | 42 |
| 1.11 | If G is a Hamiltonian, then for every non-empty proper subset Vs of V(G),w(G-Vs)<=|Vs|,where w(H) denotes the number of components in any graph H | 42 |
| 1.12 | Given a graph with n>= 3 vertices, if for all pair of vertices either deg(u)+deg(v)>=n or u and v are adjacent then the graph has a Hamilton circuit(**Ore’s Theorem**) | 42 |
| 1.13 | Any graph with n>=3 vertices and a minimum degree at least n/2 has a Hamilton cycle(**Dirac’s Theorem**) | 42 |
| 1.14 | An undirected graph I a tree if and only if there exits a unique simple path between any two of its vertices | 51 |
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| 1.16 | A tree with n vertices has (n-1)edges | 52 |
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| 1.18 | A graph is a tree if and only if it is minimally connected | 53 |
| 1.19 | A Graph G with n vertices, (n-1) edges and no cycles is connected | 53 |
| 1.20 | A tree with at least two vertices has at least two pendant vertices | 53 |
| 1.21 | A full m-ary tree with I internal vertices contains (n=mi+1) vertices | 54 |