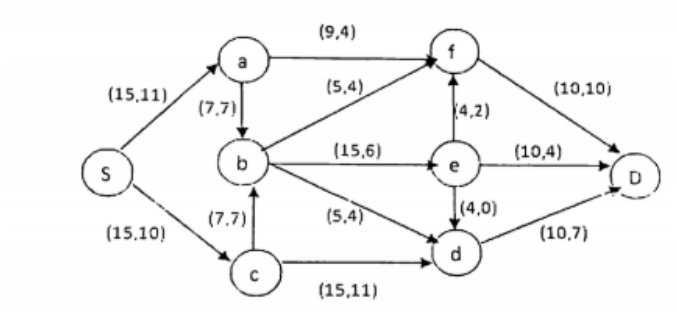
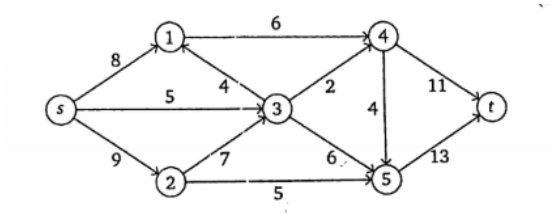
1. What is S-D cut? For the following network flow find the maximal flow from S to D.



asked in 2075

2. Define Eular circuit with suitable example. Find the maximal flow s to t from the given network flow.



asked in 2076

3. Distinguish between binary tree and spanning tree with suitable examples.
asked in 2068

4. Define cut vertices and cut edges.
asked in 2071

5. Show that an undirected graph has an even number of vertices of odd degree.
asked in 2072

6. Consider Kn, the complete graph on n vertices. What is the degree of each vertex?
asked in 2068

7. Distinguish between multi graph and pseudo graph with suitable examples.
asked in 2069

8. Suppose that a planar simple graph has 20 vertices, each of degree 3. Into how many region does a representation of this planar graph split the plane?
asked in 2071

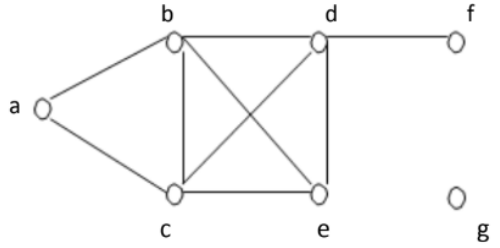
9. What is minimum spanning tree?
asked in 2072

10. What is bipartite graph?
asked in 2073

11. Define the complete graph Kn on n vertices and the complete bipartile graph Km,n with suitable examples.
asked in 2065

12. How many edges are there in graph with 10 vertices each of degree six?
asked in 2066

13. Verify the Handshaking theorem in the figure.



asked in 2067

14. What is chromatic number of a graph?
asked in 2070

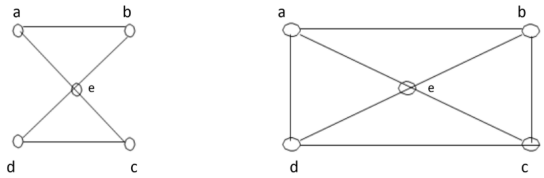
14. What is minimal cut?
asked in 2071

15. Define saturated edge in a transport network.
asked in 2072

16. What is decision tree?
asked in 2073

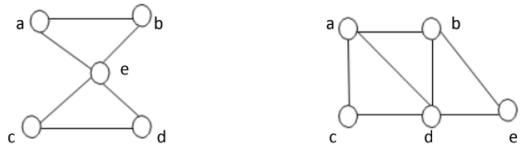
17. Distinguish between multigraph and pseudograph with suitable examples.
asked in 2074

18. Which of the undirected graphs in the following figure have an Euler circuit? Explain.



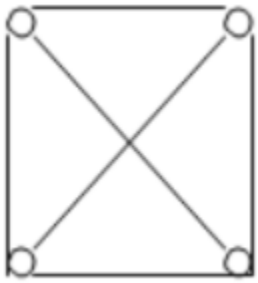
asked in 2065

19. Which of the undirected graphs in the following have an Euler path?



asked in 2066

20. Is the graph K4 planar? How?



asked in 2067

21. Distinguish between undirected and directed graphs with illustrations.
asked in 2069

22. What is spanning tree?
asked in 2070

23. Define saturated and unsaturated edge?
asked in 2073

24. What is the chromatic number of the complete bipartile graph Km,n , where m and n are positive integers?
asked in 2065

25. Determine the chromatic number Kn.
asked in 2066

26. Determine the chromatic number Kn.
asked in 2067

27. What is the chromatic number of the complete bipartite graph, where m and n are positive integers?
asked in 2068

28. State max-flow min-cut theorem.
asked in 2070

29. What is regular graph ?
asked in 2074

30. Define reflexive closure and symmetric closure. Find the remainder when 4x2 - x + 3 is divided by x + 2 using remainder theorem.
asked in 2076

31. Define Eular path and Hamilton path with examples. Draw the Hasse diagram for the divisible relation on the set { 1, 2, 5, 8, 16, 32} and find the maximal, minimal, greatest and least element if exist.
asked in 2075

32. Define Eular path and Hamilton path. Give examples of both Eular and Hamilton path.
asked in 2076

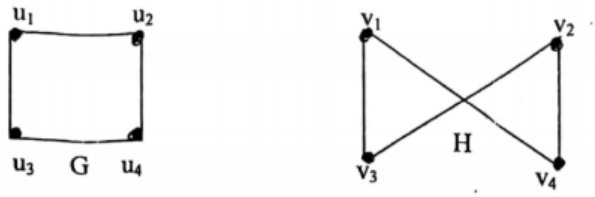
33. What is minimum spannung tree? Explain Kruskal's algorithm for finding minimum spanning tree.
asked in 2076

34. Show that K3,3 is not planar?
asked in 2071

34. What is graph isomorphism? What are the different invariants of graph isomorphism?
asked in 2072

35. What is planar graph? Show that K3,3 is non-planar.
asked in 2073

36. When does the two simple graphs G1 = m(V1, E1) and G2(V2, E2) are isomorphic. Show that the graph G = (V, E) and H = (W, F) displayed in the following figure are isomorphic.



asked in 2074

37. Show that the graphs in the following figure are not isomorphic.

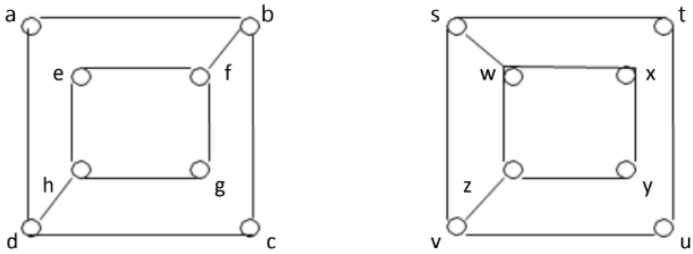
What can you say about the complexity of graph isomorphism algorithms in terms of complexity?
asked in 2065

38. Prove that an undirected graph is a tree if and only if there is a unique simple path between any two of its vertices.
asked in 2066

39. Define spanning tree and minimum spanning tree. Mention the conditions for two graphs for being isomorphic with an example.
asked in 2075

40. List any two applications of graph coloring theorem. Prove that "A tree with n vertices has n-1 edges"
asked in 2076

41. Determine whether the graphs shown in the following figure are isomorphic.



What can you say about the graph isomorphism algorithms in terms of efficiency?
asked in 2067

42. Discuss adjacency matrix representation of a graph with suitable example.
asked in 2070

43. Show that a tree with n vertices has n-1 edges.
asked in 2071

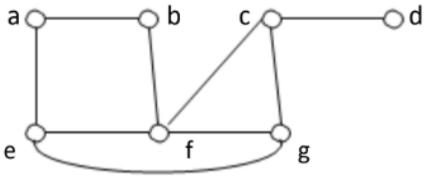
44. Discuss adjacency matrix representation of graph with example.
asked in 2072

45. Prove that “a tree with n vertices has n-1 edges”.
asked in 2073

46. Define rooted tree. Show that a full m-ary tree with i internal vertices contains n = mi + 1 vertices.
asked in 2074

47. Prove that an undirected graph is a tree if there is a unique simple path between any two of its vertices.
asked in 2065

48. Find a spanning tree of the simple graph in the following graph, if it exists.



Can there be more possibilities?
asked in 2066

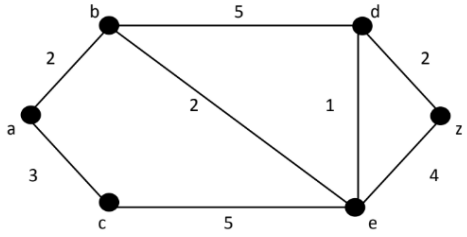
49. Prove that a tree with n-vertices has n-1 edges.
asked in 2067

50. Show that the maximum number of vertices in a binary tree of height n is $2n+1 - 1$.
OR
Draw all possible unordered trees on the set {a, b, c}.
asked in 2068

51. Define isomorphism. Given an example to show that the graphs are not isomorphic.
asked in 2069

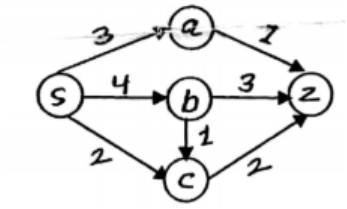
52. Prove that “a simple graph is connected if and only if it has a spanning tree”.
asked in 2070

53. What is shortest path problem? Find the length of a shortest path between a and z in the given weighted
graph.



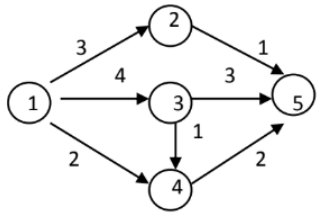
asked in 2071

54. Find the maximum flow in the network shown in the figure.



asked in 2074

55. Find a maximum flow in the network shown in figure

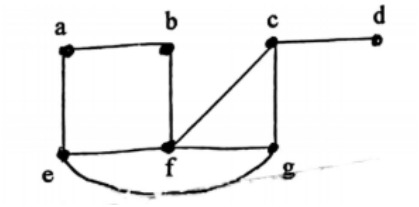


asked in 2068

56. Discuss the algorithm for constructing Euler circuit with suitable example.
asked in 2072

57. Describe Dijkstra's algorithm for finding the shortest path in a weighted graph between two vertices with suitable example.
asked in 2073

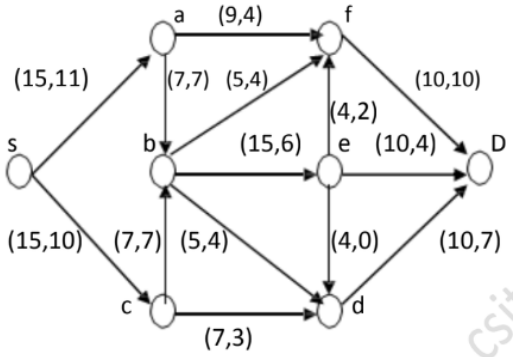
58. What do you mean by spanning tree? Find a spanning tree of the simple graph G shown in figure.



A graph is connected if and only if it has a spanning tree.
OR
Prove that an undirected graph is a tree if and only if there is a unique simple path between any two of its vertices.
asked in 2074

59. Explain the concept of network flows and max-flow min-cut theorem with suitable examples.
asked in 2065

60. State and prove the Max-flow and Min-cut theorem.
OR
Find a maximum flow for the network in the figure below.



asked in 2066

70. Explain the concept of network flows and max-flow min-cut theorem with suitable examples.
OR
Define Euler circuit and Euler path with suitable examples. Give the multi-graph model of the two of Koenigsberg state a necessary and sufficient condition for Euler circuit in connection to your definitions and models.
asked in 2067

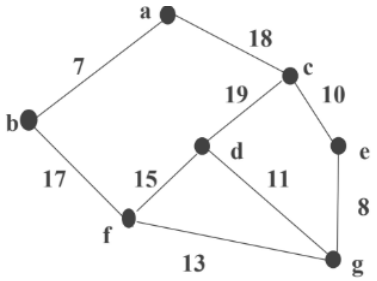
71. Prove that a symmetric connected relation has a undirected spanning tree.
OR
Give a simple condition on the weights of a graph that will guarantee that there is a unique maximal spanning tree for the graph.
asked in 2068

72. A phrase structure grammar g is defined to be a 4-tuple (V, S, v0 |→), where V=(vo, w, a, b, c}, S={a, b, c}, vo |→ aw, w |→ bbw, w |→ c. Derive a sentence of L(G), the language of this grammar.
OR
Prove that an undirected graph is a tree if and only if there is a unique simple path between any two of its vertices.
asked in 2069

73. Define an Euler circuit and Euler path in an undirected graph. How can it be determined whether an undirected graph has an Euler circuit and an Euler path? Explain with suitable example.
asked in 2070

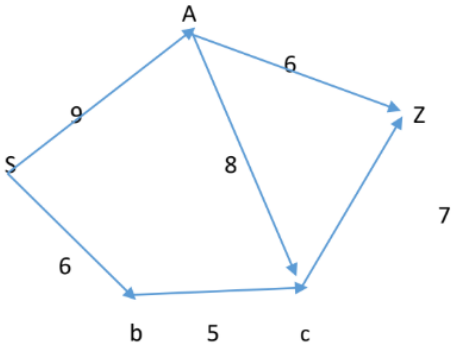
74. An undirected graph is a tree if and only if there is a unique simple path between any two of its vertices.
asked in 2071

75. Discuss Kruskal's algorithm for constructing a minimum spanning tree. Use this algorithm to find minimum spanning tree in the graph given below.



asked in 2072

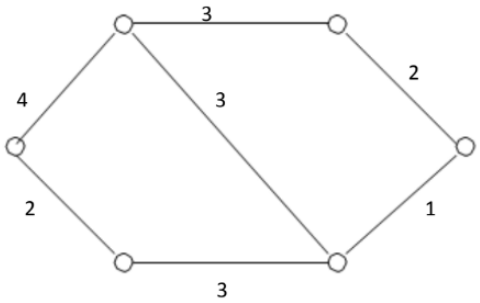
76. Find all S-D cuts in the following transport network. What is the value of a maximal flow?



asked in 2073

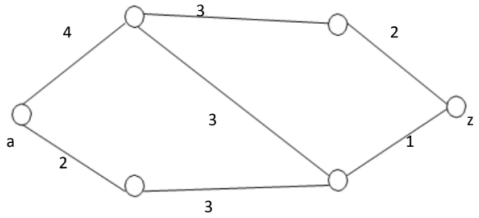
77. Explain the concept of network flows and max-flow min-cut theorem with suitable examples.
asked in 2074

78. Define Euler and Hamiltonian circuits and paths with examples illustrating the existence and nonexistence of them.
OR
Discuss the shortest path algorithm of Dijkstra for finding the shortest path between two vertices. Use this algorithm to find the length of the shortest path between a and z in the following weighted graph?



Give the idea of travelling salesman problem and the difficulties of solving it.
asked in 2065

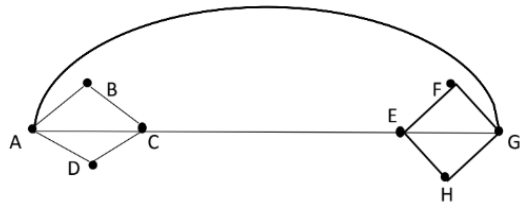
79. Define Hamiltonian paths and circuits with suitable examples for the existence and nonexistence. Show that has a Hamilton circuit whenever .
OR
Write the shortest path algorithm of Dijkstra for finding the shortest path between two vertices. What is the length of shortest path between a and z in the weighted graph in the following figure?



Apply the stated algorithm for finding the solution.
asked in 2066

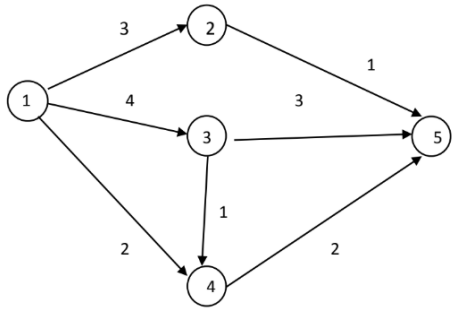
80. Discuss the Algorithm of Dijkstra for finding the shortest path in a weighted graph between two vertices with suitable example. Moreover, explain the travelling salesman problem and the efficiency of algorithm for solving this problem.
asked in 2067

81. Use Fleury's algorithm to construct an Euler circuit for the following graph.



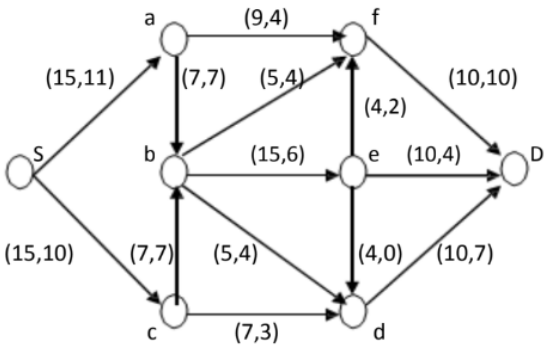
OR
Explain the concept of network flows and max-flow min- cut with suitable examples.
asked in 2068

82. Explain the concept of network flows and Max-flow Min-cut theorem with suitable examples.
OR
Find a maximum flow in the network shown in the figure.



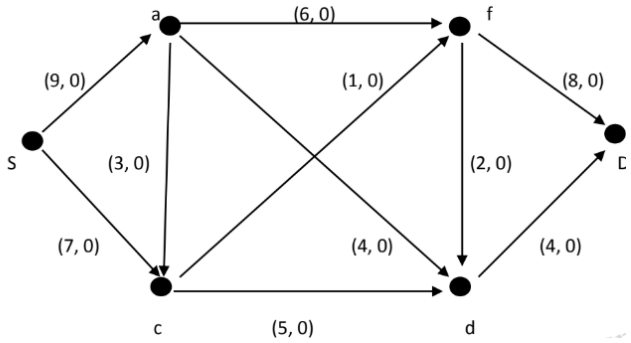
asked in 2069

83. Define maximal flow and minimal cut and state and prove min-cut max-flow theorem.
OR
Find a maximal flow for the network shown in the figure below:



asked in 2070

84. Find a maximal flow for the network shown in the figure below:



asked in 2071

85. State and prove Max-Flow Min-Cut theorem.
asked in 2072