

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2015

B.Tech (CSE&IT) VII Semester

COURSE CODE: 10B1WCI733

MAX. MARKS: 15

COURSE NAME: Graph Algorithms and Applications

COURSE CREDITS: 3

MAX. TIME: 1 HR

*Note: Attempt all questions.***1. [1 * 5 = 5 Marks]**

- a. Prove or disprove: A graph with n vertices, $(n - 1)$ edges and no circuits is connected.
- b. Can you construct a graph if you are given all its spanning tree? How?
- c. Draw a graph in which an Euler line is also a Hamiltonian circuit.
- d. Prove or disprove: Any two simple connected graphs with n vertices, all of degree two, are isomorphic.
- e. The number of labeled trees with n vertices ($n \geq 2$) is ____.

2. [2 + 2 + 1 Marks]

- a. Prove or disprove: Every tournament has a king.
- b. Prove or disprove: An edge is a cut-edge if and only if it belongs to no-cycle.
- c. Determine the values of m and n such that $K_{m,n}$ is Eulerian.

3. [2.5 + 2.5 Marks]

- a. Let T be a minimum-weight spanning tree in a weighted connected graph G . Prove that T omits some heaviest edge from every cycle in G .
- b. Give a simple example of a directed graph with negative-weight edges for which Dijkstra's algorithm produces incorrect answers.