JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Accelerated Semester

MID TERM EXAMINATION- 2026

B.Tech-VI Semester (CSE/IT)

COURSE CODE (CREDITS): 20B1WCI732 (02) MAX. MARKS: 50

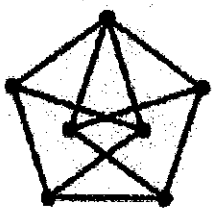
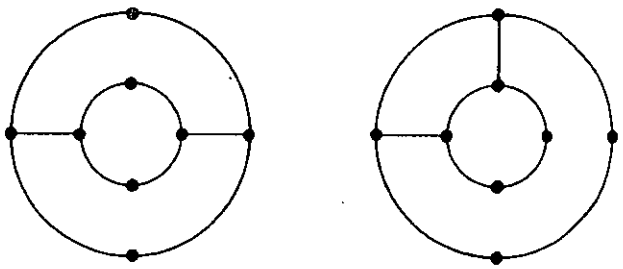
COURSE NAME: From Graph to knowledge Graph

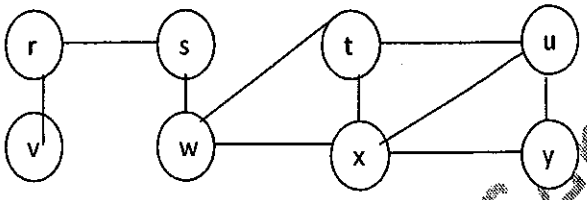
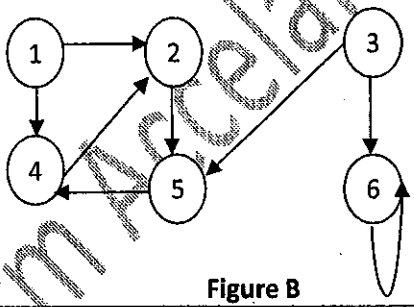
COURSE INSTRUCTORS: Ravindara Bhatt MAX. TIME: 2 Hours

Note:*(a)All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Calculator is not allowed

Q.No	Question	CO	Marks
Q1	Give an efficient algorithm to count the total number of paths in a directed acyclic graph. Analyze your algorithm.	1	5
Q2	Show that the chromatic number of a graph equals the maximum of the chromatic numbers of its components.	2	5
Q3	Compute the clique number, the independence number, and the chromatic number of the graph below. 	2	5
Q4	Draw all simple graphs with one, two and three vertices.	1	5
Q5	Are the two graphs given below isomorphic? Why? 	1	5

Q6	Suggest the method for determining the total number of spanning trees of a connected graph without actually listing them. OR Prove that a connected graph G remains connected after removing an edge e_i from G, if and only if e_i is in some circuit in G.	1	5
Q7	Run Breadth First Search (BFS) on the undirected graph of Figure A, using vertex u as the source.  **Figure A** **OR** Write the pseudo code for Depth first Search (DFS). Show how depth-first search works on the graph of Figure B (Take vertex 1 as the starting vertex).  **Figure B**	1	5
Q8	Prove or disprove: a) Every subgraph of a planar graph is planar. b) Every subgraph of a nonplanar graph is nonplanar. OR Prove or disprove: Every tree has atmost one perfect matching.	2	5
Q9	Give an example of a stable matching with two men and two women in which there is more than one stable matching.	2	5
Q10	Prove that every connected graph has a spanning tree.	1	5