Advanced Data Structures and Algorithms

M.Tech. IT (Sem. I)

C2 Review Test (13th Dec. 2021)

Time: 1 Hour **Marks: 15**

1. (**a**). An adjacency matrix is given for a directed graph. Write a procedure to generate DFS sequence from the matrix. Specify how a visited node is handled in the procedure. [**2+1 = 3 Marks**]

   (**b**). In DFS implementation, each visited node is given a value named "dfsno". How is this number useful to determine the back edges in the dfs spanning forest? [**2 Marks**]

2. Write a note why Floyd's algorithm works- explain on the basis of path generated/visited for intermediate nodes. [**3 Marks**]

3. Illustrate how the augmenting path extracts a matching/maximal matching in an undirected graph. [**2 Marks**]

4. A cycle of length three is defined as a "triangle" in a graph. How can a triangle be determined in any graph? Write the procedure and estimate its time complexity. [**1+2+2=5 Marks**]

[**End of the Paper**]