Indian Institute of Information Technology, Sri City, Chittoor
End Semester Examination
Advanced Data Structures and Algorithms – Part B

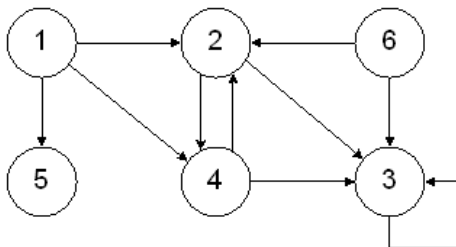### SET - 2

Maximum Marks: 15

Time Duration: 70 min

Date: 22 Nov 2021

Instructions:

1. This is a closed book exam.

      A. You should not refer to books, notes or online resources.

      B. You should not discuss questions or answers with anyone (including outsiders)

      C. You should have your camera and microphone ON at all times and no headphones

2. Write the solutions clearly and legibly in A4 sheets, **using pen (NOT pencil)** and at the end of the exam you should submit the scanned copy of your solutions as explained by the faculty

3. The name of the scanned copy should be **Roll No + '_' + Set No+'_'+ADSA.pdf (e.g. S20200010XYZ_Set1_ADSA.pdf).**

4. Write your name, roll no. and set number on each page of the answer sheets.

5. All questions are compulsory. Answer questions in brief and to the point only.

6. Each question carry equal marks (5 mark each)

7. Follow all other instructions given by the faculty during the exam

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1. Consider the following graph:

a) Assume that vertex 2 is the source vertex and run the DFS algorithm on the graph. Assume that in case of a conflict, the algorithm always explores nodes in the increasing order of index.
b) Show the stack state at every stage
c) What is the maximum stack depth possible if the algorithm starts from vertex 2.

2. Explain how to solve the 0/1 knapsack problem for the given inputs and generate a memoistion table.

- knapsack capacity = 5 kg,

Item	1	2	3	5	6
Value	20	10	20	10	30
Wieght	5	3	2	5	1

3. For the given adjacency matrix draw the graph and find shortest path to all other vertices from vertex "A" using Dijkstra's algorithm, provide step by step calculation.

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    S A B C D
S [ 0 9 0 5 0 ]
A [ 9 0 1 2 0 ]
B [ 0 1 0 9 6 ]
C [ 5 2 9 0 4 ]
D [ 0 0 6 4 0 ]
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