

I SEMESTER M.TECH. (CSE/CSIS)

PROCTORED ONLINE EXAMINATIONS, February 2022

Advanced Data Structures and Algorithms [CSE 5152]

REVISED CREDIT SYSTEM (07/02/2022)

Time: 75 Minutes

MAX. MARKS: 20

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ♦ Missing data, if any, may be suitably assumed.
- Write the answers on sheets of paper preferably on one side, scan all the sheets into a single pdf file, upload, Turn in /Hand in.
- Write your name, Registration number and put your signature on all the sheets

PART B

1A) Distinguish between aggregate and accounting methods to find an amortized cost for the sequence of operations. Find the amortized costs in case of push(S,k), Pop(S) and Multipop(S, k) operations on stack S using both the methods.

3M

4M

1B) (i) Construct a Binomial heap by inserting the following keys in order,

16, 24, 32, 35, 58, 62, 9, 50, 14, 66, 12 by clearly showing all the steps

- (ii) Extract the minimum node from the above binomial heap constructed in Qn 1B (i) in detail
- 1C) Delete the node 36 from the Fibonacci heap shown in figure 1C and find the consolidated Fibonacci heap after deletion. Clearly write all stages



2M

2B) Write the general procedure of Johnson's algorithm and apply the algorithm to find shortest path between every pair of vertices for the graph shown in Figure 2B. Clearly write all stages



Figure 2B.

4M

2C) Calculate the maximum flow from source to sink in the network shown in figure 2C using Ford-Fulkerson algorithm by clearly showing all the steps.



Figure 2C.

4M