

Code: 20CS3402

II B.Tech - II Semester – Regular Examinations – JULY 2022**ADVANCED DATA STRUCTURES
(COMPUTER SCIENCE & ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

UNIT – I

1. a) What is meant by hashing? Why do you need it? 4 M
b) Construct the hash table using Quadratic probing for the input: 31, 21, 75, 32, 20, 57, 45, 87, 66, 70, 89, 12, 7, 9, 56, 88. The hash function given is $h(k) = k \text{ mod } 13$. 10 M

OR

2. a) Explain the rehashing concept with example. 4 M
b) Apply the separate chaining and construct the hash table for the values 77, 17, 22, 15, 18, 37, 8, 97, 12, 31, 89, 76, 11, 6, 10, 45. The hash function given is $h(k) = k \text{ mod } 10$. 10 M

UNIT – II

3. a) Outline an algorithm to insert an element in max heap. Trace the algorithm for the following elements? 1, 2, 3, 4, 5, 6, 7, 8. 8 M
b) Justify your answer for creating the heap for above data; will it fall in best case or worst case? 6 M

OR

4. a) Explain heap operations and show the heap implementation steps using arrays. 8 M
 b) Differentiate between Binomial queue and priority queue. 6 M

UNIT-III

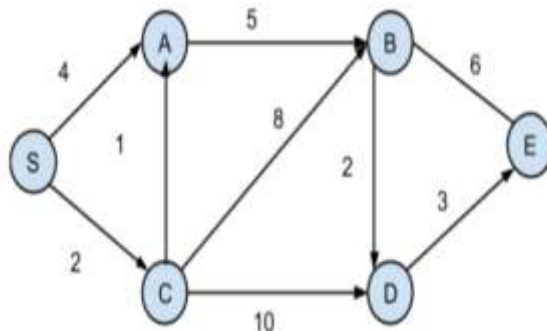
5. a) Define red black tree and discuss the properties of red black tree. 6 M
 b) Construct an AVL Tree for the list 8, 9, 11, 6, 5, 7, 10 by using successive insertion. Illustrate the step by step process. 8 M

OR

6. a) What is an AVL tree? Explain the need for rotation of AVL trees. 6 M
 b) Explain three possible cases for inserting a node in the 2-3 Trees? Construct 2-3 Tree with the following data 50, 20,60,90,40,100,10. 8 M

UNIT – IV

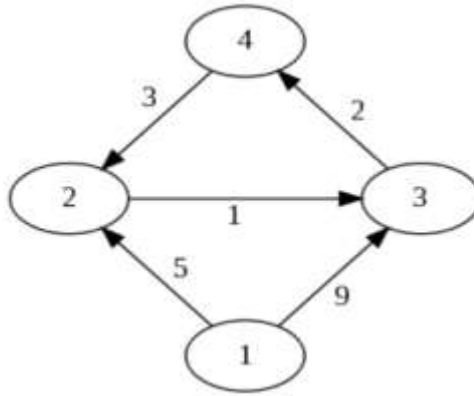
7. a) Illustrate the topological sort for an example graph. 7 M
 b) Apply Dijkstra's algorithm and find the shortest paths from the source to all vertices for the following graph



7 M

OR

8. a) Compare and contrast the Dijkstra's algorithm and Bellman ford algorithm. 7 M
- b) Apply the All pair shortest path algorithm on the give graph.



7 M

UNIT – V

9. a) Make use of Naïve string matching algorithm and give the step by step process for finding the given pattern from Text.
Text = "AABAACAADAABAABA"
pattern = "AABA" 7 M
- b) Analyze the simple union and find algorithm with an example. 7 M

OR

10. a) Explain the Rabin–Karp algorithm with an example. 7 M
- b) How a disjoint set is represented in memory. Explain the makeset(), findset() and union operations on disjoint set. 7 M