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Reg. No. : | | | | | | | | | | |

Question Paper Code : 53202

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

Third Semester

Computer Science and Engineering

15UCS302 -DATA STRUCTURES

(Regulations 2015)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The maximum number of nodes in a binary tree of height h is CO1- R

   (a) h-1 2+1 (b) h+1 2– 1 (c) h*1 2-1 (d) h-1 2-1

2. What are the worst case and average case complexities of a binary search tree? CO2- U

   (a) O(n), O(n) (b) O(logn), O(logn) (c) O(logn), O(n) (d) O(n), O(logn)

3. Heap can be used as _____ CO3- R

   (a) Priority queue (b) Stack

   (c) A decreasing order array (d) None of the mentioned

4. How many key values encountered collision using the hash function h(k) = k mod 10 and linear probing will result in the hash given below? CO4- App

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

   (a) 2 (b) 3 (c) 4 (d) 5

5. Given an undirected graph G with V vertices and E edges, the sum of the degrees of all vertices is CO5- R

(a) E (b) 2E (c) V (d) 2V

PART – B (5 x 3= 15Marks)

6. Define the following terminologies in a tree CO1- U

(a) Siblings,Parent

(b) Depth,Path

(c) Height,Degree

7. Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree? CO2- App

8. Define Decision Tree. CO3- R

9. What is open addressing? List the common collision resolution strategies. CO4- R

10. Define Shortest path problem. Give examples. CO5- U

PART – C (5 x 16= 80Marks)

11. (a) Define Binary Tree. Construct Binary tree from the in-order and pre order traversal given and find the pre order traversal from the Binary tree. CO1- App (16)

Inorder:H D I J E K B A L F M C N G O

Postorder: H I D J E B L M F N O G C A

Or

(b) Explain the concepts of on threaded binary tree in detail. CO1- App (16)

12. (a) Construct AVL Tree for the following data CO2- App (16)
1,2,3,4,8,7,6,5,11,10,12.

Or

(b) Explain the B-Tree with example CO2- App (16)

13. (a) Explain Insertion in Deap and construct deap for the following elements. 14,8,78,2,85,68. CO3- U (16)

Or

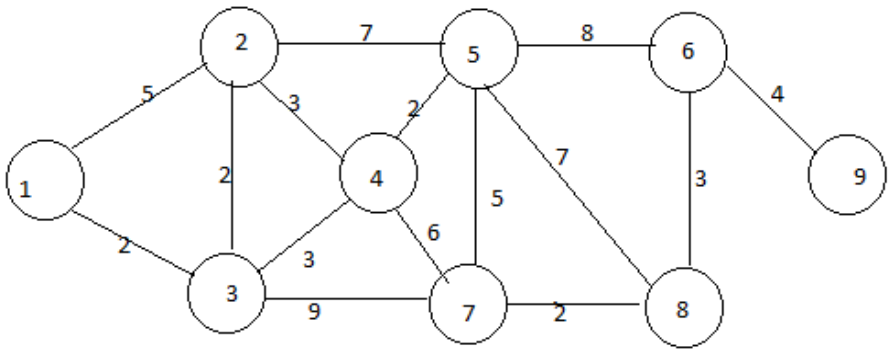
(b) Discuss about Game tree with suitable example. CO3- U (16)

14. (a) What is hashing? Explain open addressing and separate chaining methods of collision resolution techniques with examples. CO4- U (16)

Or

(b) Explain in detail about extendible hashing and its Applications. CO4- U (16)

15. (a) Find the minimum spanning tree using Kruskal's algorithm for the following Graph and trace the algorithm. CO5- App (16)



Or

(b) Explain Dilkstra's single source shortest path problem with neat example. CO5- App (16)

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