C

Reg. No. :

Question Paper Code : 53202

B.E./B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Computer Science and Engineering

15UCS302 -DATA STRUCTURES

(Regulation 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   CO2- U
   search tree?

   (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   CO4- App
   function h(k) = k mod 10 and linear probing will result in the hash
   given below?

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)

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

<div align="center">Or</div>

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

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

<div align="center">Or</div>

(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   CO5- App   (16)
the following Graph and trace the algorithm.

<div align="center">Or</div>
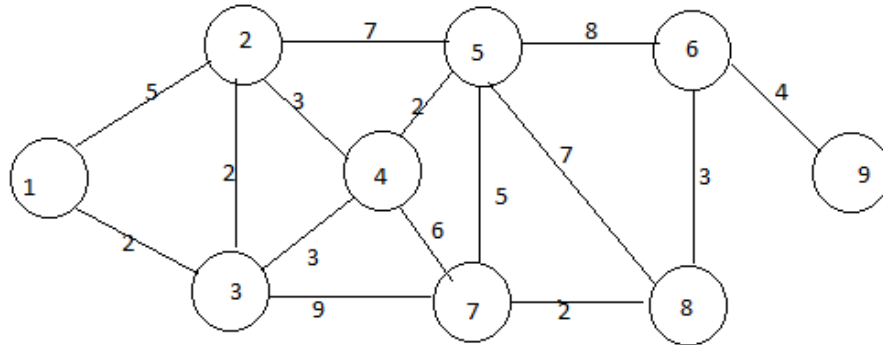
(b) Explain Dilkstra's single source shortest path problem with neat   CO5- App   (16)
example.

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