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Question Paper Code : 53202

B.E./B.Tech. DEGREE EXAMINATION, SEP 2020

Third Semester

Computer Science and Engineering

15UCS302 -DATA STRUCTURES

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any Six of the following Questions)

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. The number of edges from the root to the node is called _____ of the tree. CO1- U
(a) Height (b) Depth (c) Length (d) Branch
3. In a max-heap, element with the greatest key is always in _____. CO2- R
(a) Leaf node (b) First node of left sub tree
(c) Root node (d) First node of right sub tree
4. What are the worst case and average case complexities of a binary search tree? CO2- U
(a) $O(n), O(n)$ (b) $O(\log n), O(\log n)$ (c) $O(\log n), O(n)$ (d) $O(n), O(\log n)$
5. Heap can be used as _____. CO3- R
(a) Priority queue (b) Stack
(c) A decreasing order array (d) None of the mentioned
6. The minimum number of elements in a heap of height h is CO3- R
(a) 2^{h+1} (b) 2^h (c) $2^h - 1$ (d) 2^{h-1}
7. Assuming a heap is complete, how many levels deep is a heap containing N nodes guaranteed to be? CO3- R
(a) $\log(N)$ (b) $N\log(n)$ (c) $\log(1/N)$ (d) $\log(N^2)$

8. If several elements are competing for the same bucket in the hash table, what is it called? CO4- U
 (a) Diffusion (b) Replication (c) Termination (d) Collison

9. How many key values encountered collision using the hash function $h(k) = k \text{ mod } 10$ 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
10. A technique for direct search is CO4- R
 (a) Binary Search (b) Linear Search (c) Tree Search (d) Hashing

PART – B (3 x 8 = 24 Marks)

(Answer any Three of the following Questions)

11. Explain the concepts of on threaded binary tree in detail. CO1-U (8)
12. Write routines for single and double rotations in AVL tree. CO2-U (8)
13. Explain decision trees in detail. CO3- U (8)
14. With example explain in detail the various collision resolution strategies. CO4- U (8)
15. Explain the various hashing techniques in detail. CO4-U (8)