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Question Paper Code:53202

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Computer Science Engineering

15UCS302 -DATA STRUCTURES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. 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
2. What are the worst case and average case complexities of a binary search tree? CO2- R
(a) $O(n)$, $O(n)$ (b) $O(\log n)$, $O(\log n)$ (c) $O(\log n)$, $O(n)$ (d) $O(n)$, $O(\log n)$
3. In a max-heap, element with the greatest key is always in _____. CO3- R
(a) Leaf node (b) First node of left sub tree
(c) Root node (d) First node of right sub tree
4. What is a hash function? CO4- R
(a) A function has allocated memory to keys
(b) A function that computes the location of the key in the array
(c) A function that creates an array
(d) A function that creates a storage
5. What is the number of edges present in a complete graph having n vertices? CO5- R
(a) $(n*(n+1))/2$ (b) $(n*(n-1))/2$
(c) n (d) Information given is insufficient

PART – B (5 x 3= 15Marks)

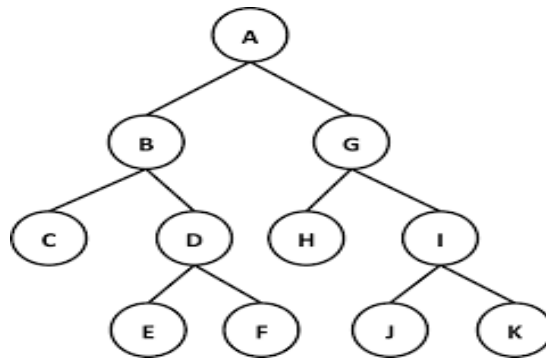
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|----------------------------------------------------------------|---------|
| 6. Define height and depth of tree. | CO1- R |
| 7. List the various processor performed in binary search tree. | CO2- R |
| 8. Define Huffman tree. | CO3-App |
| 9. Discuss the need for extendible hashing. | CO4- R |
| 10. Differentiate in degree and out degree in graph. | CO5- R |

PART – C (5 x 16= 80Marks)

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| 11. (a) (i) Explain different methods of binary tree representation. | CO1- U | (12) |
| (ii) Write short notes on leaf and Non- leaf nodes. | CO1- U | (4) |

Or

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| (b) (i) Give the in order, preorder and post order sequences for the given tree. | CO1- App | (8) |
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| (ii) Summarize the concept of threaded binary tree. | CO1-U | (8) |
| 12. (a) Illustrate the operations of binary search tree with an example. | CO2-U | (16) |
| Or | | |
| (b) Define balance factor. Explain the types of rotations in AVL tree with suitable example. | CO2-U | (16) |
| 13. (a) Describe about heap trees with an example. | CO3-U | (16) |

Or

- (b) i) Build a Huffman tree from the following frequency table: CO3 App (10)

A	.20
B	.04
C	.07
D	.11
E	.32
F	.06
G	.05
H	.15

- (ii) Write short notes on game tree CO3- U (6)

14. (a) What is meant by hashing and rehashing? Explain how hash clashes are resolved by CO4- U (16)

(i) Open addressing method

(ii) Hash table reordering method

Or

- (b) (i) Draw the 11-item hash table resulting from hashing the keys 12,44,13,88,23,94,11,39,20,16 and 5 using the hash function $h(i) = (2i+5) \bmod 11$. CO4- App (8)

(ii) Load the keys 23,13,21,14,7,8 and 15 in a hash table of size 7 using separate chaining with a hash function $h(\text{key}) = \text{key} \% 7$. CO4- App (8)

15. (a) Define minimum spanning tree. Explain any two algorithms for finding the minimum spanning tree with an example. CO5- App (16)

Or

- (b) Find out the shortest path from vertex '0' to all other vertices CO5- App (16)
using Dijkstra's shortest path algorithm.

