Data Structures_CA-2_MCQ_2024-25

Total Time: **60 Mins**   Marks: **30**

Note to the students:-
1) All the Questions are compulsory.
2) The form will be closed at the time specified for the end of examination.
3) Do make sure you are submitting the form in-time.

* Indicates required question

1. Email *

2. Email *

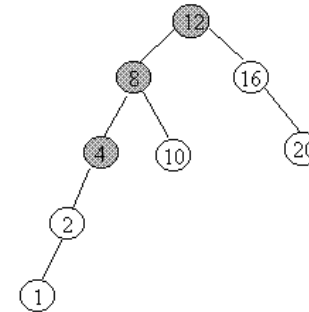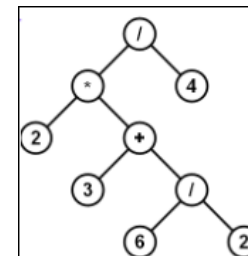3. Name of Student *

4. Roll Number *

5. What is the Balance Factor of node 8 *
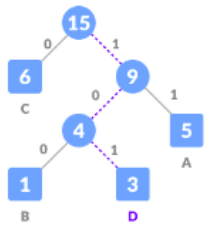

Mark only one oval.

- ◯ 3
- ✔ 2
- ◯ 1
- ◯ -2

6. Deduce the Postfix Expression for the given Expression Tree *

Mark only one oval.

- ✔ 2 3 6 2 / + * 4 /
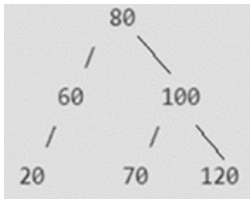- ◯ 2 3 + 6 2 / * 4 /
- ◯ 2 3 6 2 / * + 4 /
- ◯ 2 3 6 2 + / * 4 /

7. How many bits are required to code the message : "DAD". Given the Huffman *
Tree

Mark only one oval.

- ( ) 6
- ( ) 7
- (✓) 8
- ( ) 9

8. For the BST below, write postorder and preorder traversal sequence *

Mark only one oval.

- (✓) Postorder: 20,60,70,120,100,80 Preorder: 80,60,20,100,70,120
- ( ) Postorder: 20,60,70,100,120,80 Preorder: 80,60,20,100,70,120
- ( ) Postorder: 20,60,70,120,100,80 Preorder: 80,60,20,70,100,120
- ( ) Postorder: 20,60,70,120,80,100 Preorder: 80,60,20,,70,120,100

9. What is the maximum height of any AVL-tree with 7 nodes? Assume that the *
height of a tree with a single node is 0.

Mark only one oval.

- (✓) 3
- ( ) 4
- ( ) 5
- ( ) 6

10. Application of Hashing *

Mark only one oval.

- ( ) expression evaluation
- ( ) Memory Management
- ( ) CPU Scheduling
- (✓) Message Digest

11. The minimum number of children a non-root node in a B-tree can have is: *

Mark only one oval.

- (✓) m/2
- ( ) (m/2)-1
- ( ) m
- ( ) 1

12. What is the worst-case time complexity of binary search? *

Mark only one oval.

- (✓) O(log n)
- ( ) O(n)
- ( ) O(n log n)
- ( ) O(1)

13. Which of the following is a collision resolution technique in hashing? *

Mark only one oval.

○ Binary search

✓ Linear probing

○ Quick sort

○ Merge sort

14. In hashing, the load factor is defined as: *

Mark only one oval.

✓ Number of keys divided by the table size

○ Table size divided by the number of keys

○ Number of collisions

○ Number of probes

15. Consider a hash table of size 11 that uses open addressing with linear probing. *
Let h(k) = k mod 11 be the hash function used. A sequence of records with
keys : 43 36 92 87 11 4 71 13 is inserted into an initially empty hash table, the
bins of which are indexed from zero to ten. What is the index of the bin into
which the last record is inserted?
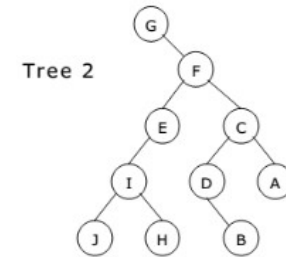
Mark only one oval.

✓ 2

○ 4

○ 6

○ 8

16. Which traversals of tree 1 and tree 2, will produce the same sequence of node *
names?

Tree 2

Tree 1
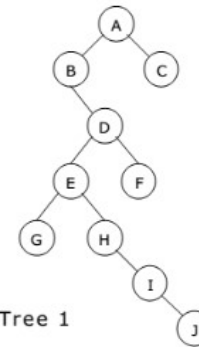
Mark only one oval.

○ Preorder, Postorder

○ Postorder, Postorder

✓ Postorder, Inorder

○ Inorder, Inorder

17. What is the hash function used in multiplication method? *

Mark only one oval.

✓ h(k) = floor(m(kA mod 1))

○ b) h(k) = ceil(m(kA mod 1))

○ c) h(k) = floor(kA mod m)

○ d) h(k) = ceil(kA mod m)

18. In Huffman encoding, what does the depth of a node represent? *

Mark only one oval.

- ( ) Frequency of the character
- (✓) Length of the encoding
- ( ) Weight of the node
- ( ) Character it encodes

19. In a binary search tree, which of the following is true? *

Mark only one oval.

- ( ) Left child's key is greater than parent's key
- ( ) Right child's key is less than parent's key
- (✓) Left child's key is less than parent's key
- ( ) All children have smaller keys than the root

20. In a binary search tree (BST), which traversal gives the nodes in non-decreasing order? *
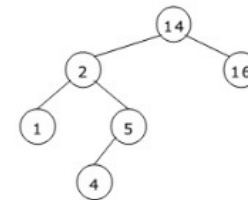
Mark only one oval.

- (✓) In-order
- ( ) Pre-order
- ( ) Post-order
- ( ) Level-order

21. In binary search, if the middle element is greater than the key, the search continues in the: *

Mark only one oval.

- ( ) Right half of the array
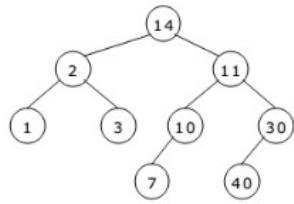- (✓) Left half of the array
- ( ) Both halves
- ( ) Entire array

22. For the binary search tree shown in figure below, Suppose we remove the root, replacing it with an inorder successor. What will be the new root? *

Mark only one oval.

- ( ) 1
- ( ) 2
- ( ) 4
- ( ) 5
- (✓) 16

23. For the figure shown below, which statement is correct? *

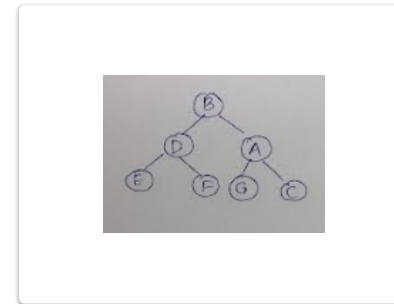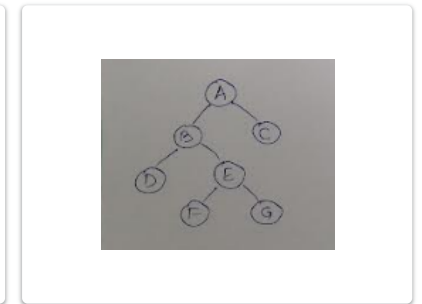*Mark only one oval.*

- ✓ The tree is neither complete nor full.
- The tree is complete but not full.
- The tree is full but not complete.
- The tree is both full and complete.

24. Identify the Tree derived from the following Inorder and Postorder traversals - *
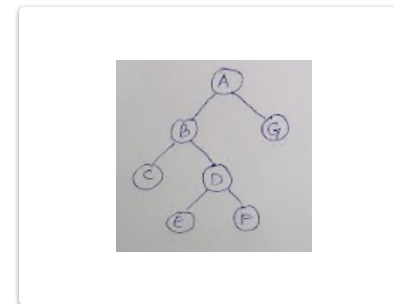Inorder : DBFEGAC and Postorder : DFGEBCA
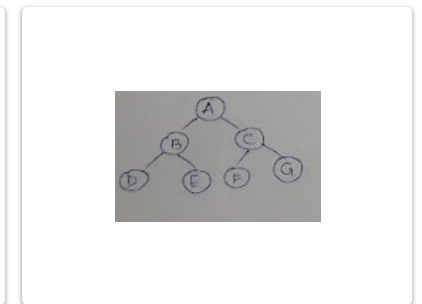
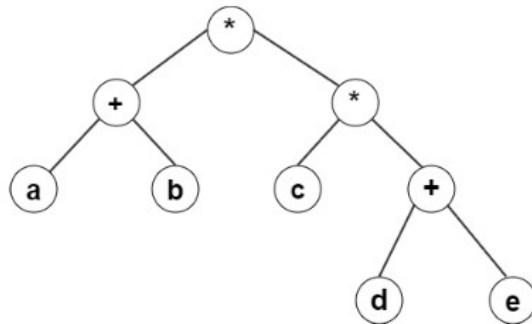*Mark only one oval.*

- image

- ✓ ImagE

- imaGe

- iMage

25. What is the postfix expression for the following expression tree? *

Mark only one oval.

- abcde++**
- ✔ ab+cde+**
- abc+de+**
- abcd+*e+*

26. Create a B Tree of order 5 using following values: 3, 7, 9, 23, 45, 1, 5, 14, 25, * 24, 13, 11, 8, 19, 4, 31, 35, 56. Finally, if root is at level 0, which values are at level 1

Mark only one oval.

- 5, 8, 19, 24
- ✔ 5, 9, 24, 35
- 19, 24, 5, 13
- 5, 14, 19, 24

27. Select all correct properties of a Hash Function *

Select all correct options. Selecting any incorrect option will lead to Zero points/marks.

Check all that apply.

- ☐ Hash function must generate unique address for each key.
- ☐ Hash functions must start with # (hash tag)
- ☐ Given the same address hash function should generate the same key each time.
- ✔ Hash function should be quick to compute.