National College of Computer Studies
(NCCS-College of IT & Management)

Final Examination (2023)

Full Marks: 10
Time: 20 minutes

Set A

BCA/Third Semester/CACS 201: Data Structures & Algorithms

Candidates are required to answer the questions in their own words as far as practicable.

Name:…….

NCCS Reg. no. :…….. **Section: ……**

Group "A"

Attempt all the questions:

1. Circle (○) the correct answer. **[10×1=10]**

i. What is the value of the postfix expression 6 3 2 4 + – *:

a) 1 b) 40 c) 74 d) -18

ii. What does 'stack underflow' refer to?

a) Accessing item from an undefined stack
b) Adding items to a full stack
c) Removing items from an empty stack
d) Index out of bounds exception

iii. The data structure required for Breadth First Traversal on a graph is?

a) Stack b) Array c) Queue d) Tree

iv. Which data structure is mainly used for implementing the recursive algorithm?

a) Stack b) Queue c) List d) Array

v. What would be the asymptotic time complexity to insert an element at the front of the linked list (head is known)?

a) O(1) b) O(n) c) O(n2) d) O(n3)

vi. Descending priority queue can be implemented using _____.

a) max heap b) min heap c) min-max heap d) trie

vii. Which of the following sorting procedures is the slowest?

a) Quick sort b) Heap sort c) Shell sort d) Bubble sort

viii. How can we define a AVL tree?

a) A tree which is binary search tree and height balanced tree.
b) A tree which is a binary search tree but unbalanced tree.
c) A tree with utmost two children
d) A tree with utmost three children

ix. Time complexity to find if there is an edge between 2 particular vertices is _____

a) O(V) b) O(E) c) O(1) d) O(V+E)

x. Which of the following algorithms are used to find the shortest path from a source node to all other nodes in a weighted graph?

a) BFS
b) Djikstra's Algorithm
c) Prims Algorithm
d) Kruskal's Algorithm

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Set B

BCA/Third Semester/CACS 201: Data Structures & Algorithms

Candidates are required to answer the questions in their own words as far as practicable.

Full Marks: 10
Time: 20 minutes

Name:…….

NCCS Reg.no :…….. **Section: ……**

Group "A"

Attempt all the questions:

1. Circle (O) the correct answer. **[10×1=10]**

i. The data structure required to check whether an expression contains balanced parenthesis is?
a) Stack b) Queue c) Array d) Tree

ii. Circular Queue is also known as _____
a) Ring Buffer b) Square Buffer c) Rectangle Buffer d) Curve Buffer

iii. In Linked List implementation, a node carries information regarding _____
a) Data b) Link c) Data and Link d) Node

iv. What differentiates a circular linked list from a normal linked list?
a) You cannot have the 'next' pointer point to null in a circular linked list
b) It is faster to traverse the circular linked list
c) You may or may not have the 'next' pointer point to null in a circular linked list
d) Head node is known in circular linked list

v. If several elements are competing for the same bucket in the hash table, what is it called?
a) Diffusion b) Replication c) Collision d) Duplication

vi. Quick sort algorithm is an example of
a) Greedy approach b) Improved binary search
c) Dynamic Programming d) Divide and conquer

vii. Where is linear searching used?
a) When the list has only a few elements
b) When performing a single search in an unordered list
c) Used all the time
d) When the list has only a few elements and When performing a single search in an unordered list.

viii. Which of the following options is not true about the Binary Search tree?
a) The value of the left child should be less than the root node
b) The value of the right child should be greater than the root node.
c) The left and right sub trees should also be a binary search tree
d) None of the above

ix. Which of the following represents the Postorder Traversal of a Binary Tree?
a) Left->Right->Root b) Left->Root->Right
c) Right->Left->Root d) Right->Root->Left

x. Time complexity to check if an edge exists between two vertices would be _____
a) O(V*V) b) O(V+E) c) O(1) d) O(E)

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