Nagarjuna College of Information Technology

Shankhamul -09, Lalitpur

Pre-Board Examination 2079

Bachelor in Computer Applications **Full Marks: 60**
Course Title: Data Structure & Algorithm **Pass Marks: 30**
Code No: CACS 201 **Time: 3 hours**
Semester: III

Name: **Roll No:**

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

Group A

Objectives Questions

Attempt All Questions: **[10×1=10]**

1. Circle (O) the correct answer in the following questions

a. The time factor when determining the efficiency of algorithm is measured by
   i. Counting microseconds
   ii. Counting kilobytes of algorithm
   iii. Counting number of key operations
   iv. Counting number of statements.

b. The postfix form of A*B+C/D
   i. *AB/CD+ ii. AB*CD/+
   iii. A*BC+/D iv. ABCD+/*

c. What is the speciality about inorder traversal of BST?
   i. It traverse in random order
   ii. It traverse in decreasing order
   iii. It traverse in increasing order
   iv. None of the above

d. What is the number of disk movement in TOH with n disk?
   i. N+1 ii. 2^{n-1}
   iii 2^n -1 iv.2n+1

e. What is the complexity of binary search?
   i. O(n) ii. O(logn)
   iii O(nlogn) iv. $O(n^2)$

f. A linear queue implemented using array of size MAX gets full when
   i. front=(rear+1)%SIZE ii. Front=MAX-1
   ii. rear=front iv. rear=MAX-1

g. A linked list in which last node of the list points to first node of the list is?
   i. Singly ii. Multiple
   iii Circular iv. Doubly

h. Which of the following data structure is used in Breadth first search of graph?
   i. Stack ii. Queue
   iii. Linked List iv. None of the above

i. A binary tree is balanced if the difference between left and right sub tree of every node is not more than-----
   i. 0 ii. 2
   iii. 1 iv. 3

j. Which expressions are also regarded as Reverse polish notation?
   i. postfix ii. infix
   iii. level fix iv. prefix

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Group B

Short Answer Questions (Any Six) **[6×5=30]**

2. What is ADT? Explain STACK as an ADT.

3. Define searching. Explain binary search algorithm with example.
4. What is linked list? Write an algorithm to inset a node at the beginning and end of doubly linked list.
5. Write an algorithm to build a Huffman tree. Construct a Huffman tree for the following data item and frequency: A:22, B:5, C:11, D:19, E:2, F:11, G:25, H:5
6. Explain the partition strategy in quick sort? Trace the quick sort algorithm fort the following data: 10, 22, 31, 4, 15, 28, 17, 6.
7. Define linear queue and priority queue. Write an algorithm to perform ENQUEUE and DEQUEUE operation in linear queue.

8. What is graph? Explain adjacency matrix and incidence matrix to represent a graph in memory with example.

Group C

Long Answer Questions (Any Two) **[2×10=20]**

9. Define infix, prefix and post fix expression. Write an algorithm to convert infix to postfix and trace it to convert the following infix to postfix (A+B)* (C$D)-E /F
10. What do you mean by minimum spanning tree? Explain Kruskal's algorithm to construct MST with example.

11. What do you mean by AVL tree? Write an algorithm to construct an AVL tree. Construct an AVL tree from the following data: 3, 5, 11, 8, 4, 1, 12, 7, 2, 6