Code No. 2269

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I-Semester (Main) Examination, November / December 2012

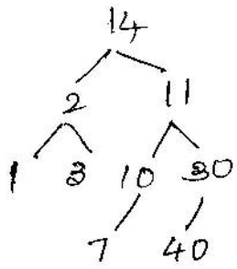
Subject : Data Structures

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Differentiate performance analysis and performance measurement.
2. Define abstract data type (ADT)
3. What are different techniques for handling collisions in hash table?
4. Write the pseudocode for selection sort using templates.
5. Write function to check whether a circular queue is fulle or not.
6. Write a recursive function to reverse a linked list.
7. Write the post fix form for the following infix expression
   A &&B || C|| ! (E > F).
   Assuming C++ precedence
8. Define a Max heap with an example.
9. What is the advantage of using a dummy header in circular linked list?
10. For the following tree, what is the order of nodes visited using post order traversal.



PART – B (5x10=50 Marks)

11.(a) Compute the best and worst case step count analysis for the following function:

```
int sequential search (int *a, const int n, const int x)
{ int i;
 for (i=0; i < n && a[i]! = x; i++);
 if (i= =n) return – 1;
 else return i ;
 }
```

(b) Write a complete C++ program to perform addition of two polynomials.

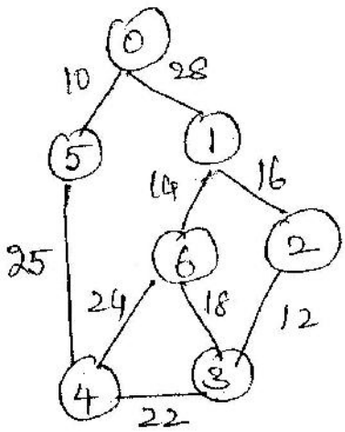
12.(a) Write C++ code to implement following operations on queue (use linked representation).
(i) Delete (ii) Insert

(b) Write C++ code to implement stack as an abstract data type using templates.

13. Let 'x' be a pointer to an arbitrary node in a chain. Write a C++ function to delete this node from the chain. If x==first, then first should be reset to the new first node in the chain.

14.(a) Write C++ code to delete a node form a binary search tree.

(b) Apply Kruskals algorithm for the following graph and depict. different stages?



15.(a) Given the following list of numbers
18 15 9 36 54 16 7
Construct a minimum heap. Use heap sort algorithm to sort them

(b) Summarize the asymptotic complexity of different sorting methods and justify why quick sort outperforms the other sort methods for large values of 'n'.

16.(a) Write a C++ function to delete the pair with key 'k' from a hash table that uses linear probing.

(b) Differentiate weak and strong collision resistance.

17. Write short notes on :
(a) Secure Hash functions
(b) Asymptotic Notation
(c) AVL Trees

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