Register Number.....

B.E. DEGREE EXAMINATIONS: APRIL /MAY 2009

Third Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U07EC302 Data Structures

Time: Three Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (20 × 1 = 20 Marks)

1. Find the frequency count for the following piece of code.

```
Sum=0;
For (i=0;i<=n;i++)
Sum=sum+a[i];
```

a) 3n+3 b) 2n+2 c) 3n+2 d) 2n+3

2. What are the factors that determine the efficiency of the program?
   a) Time b) Space c) Time & Space d) Processor
3. How to define omega notation?
   a) f{n)= O (g)n)) b) f(n)= Ω (g(n)) c) f(n) = Oh(g(n)) d) f(n)= Φ (g(n))
4. The amount of space required by the data is called
   a) Space complexity b) Time complexity
   c) Best case complexity d) Worst case complexity
5. Linear collection of data elements is called as
   a) Nodes b) Data items c) Fields d) Records
6. Stack is
   a) FILO b) LILO c) FIFO d) Array
7. Linked List is mainly used in
   a) Polynomial b) Evaluation of Expressions
   c) Transformation of Infix to postfix d) Transformation of postfix to infix
8. What is the answer for the following expressions?

   P = 6 5 2 3 + * +

   a) 31 b) 25 c) 150 d) 120
9. Tree is a
   a) Linear Data Structure b) Non-Linear Data Structure
   c) linked Data Structure d) Array
10. How to represent the preorder traversal?
    a) Root Left Right b) Left Root Right c) Left Right Root d) Root Right Left

11. Balance factor is

a) h_L-h_R b) h_R-h_L c) h_L+h_R d) h_L

12. The Hash function returns the same addresses for more than one record is called as

a) Collision b) Doubling c) Duplication d) Garbage Collection

13. The data resides in the main memory of the computer is called

a) External Sorting b) Internal Sorting c) Bubble Sort d) Quick Sort

14. The elements are inserted at their appropriate place is called as

a) Insertion sort b) Bubble sort c) Radix sort d) Quick sort

15. Which tree is used in heap sort?

a) Binary Tree b) Binary Search Tree c) AVL Tree d) AVL Search Tree

16. Which sort is used u\in external sorting algorithm?

a) Merge sort b) Bubble sort c) Radix sort d) Quick sort

17. If an undirected graph of n vertices consists of n(n-1)/ 2 number of edges then it called as

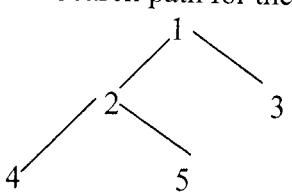
a) Complete graph b) Sub graph c) Connected graph d) Weighted graph

18. In which algorithm pair of vertices with minimum weight is to be chosen?

a) Prim's algorithm b) Kruskal's algorithm

c) Dijikstra's algorithm d) Single source algorithm

19. Find the Depth First Search path for the following figure.



a) 12453 b) 12435 c) 12345 d) 12534

20. Graph is a Set of

a) Vertices b) edges c) vertices and edges d) trees

PART B (5 x 16 = 80 Marks)

21. a) What is top-down design? Is 'C' language a top-down design? Justify your answer.

(OR)

b) Discuss in detail about the implementation of algorithms.

22. a) Write an algorithm for transformation of infix to postfix expression and explain with the given example.

$$Q= ((A + B) * D) \uparrow (E - F)$$

(OR)

b) Write an Insertion and deletion Algorithm for doubly Linked List. Explain with an example.

23. a) What is BST? Write an insertion algorithm and explain with given example.

10, 7, 15, 9, 5, 12, 18

(OR)

b) Define AVL trees and explain insertion algorithm with given example.

3, 2, 1, 4, 5, 6, 7

24. a) i) Sort the following numbers using Bubble Sort. 70,20, 20, 50, 60,10, 40.(8)

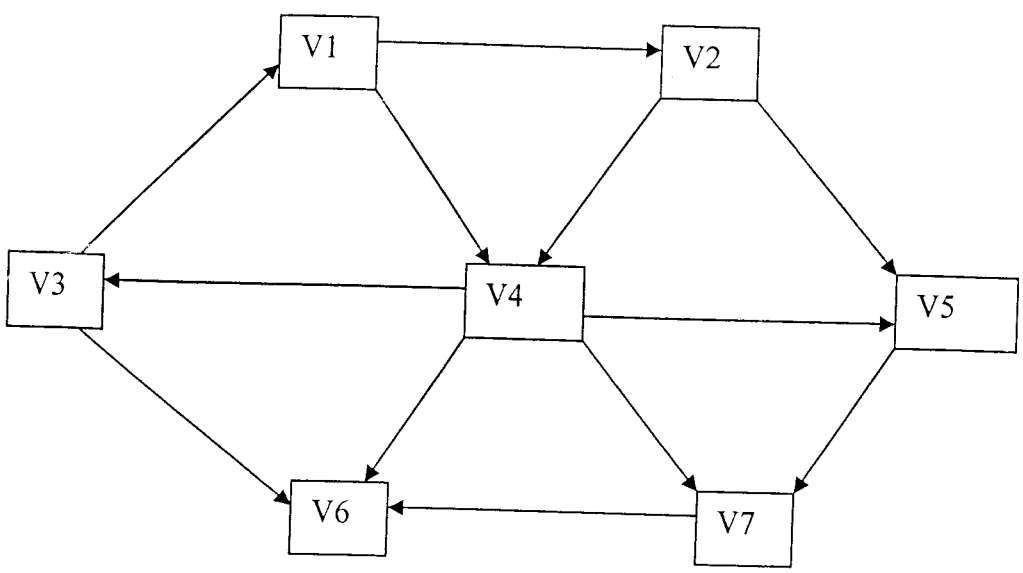
ii) Write an Algorithm for Insertion sort with example. (8)

(OR)

b) Write an algorithm for Quick Sort and explain with given example.

42, 23, 74, 11, 65, 58, 94, 36, 99, 87

25. a) Find the shortest path form V1 to all other vertices for the following graph.



The weights are V1 to V2 =2 V1 to V4 = 1 V2 to V4 = 3 V2 to V5 = 10
V3 to V1 = 4 V3 to V6 = 5 V4 to V5 = 2 V4 to V6 = 8
V4 to V7 = 4 V5 to V7 = 6 V7 to V6 = 1 V4 to V3 = 2

(OR)

b) Explain with an example of graph traversals

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