

**B.E. DEGREE EXAMINATIONS: NOVEMBER 2009**

Third Semester

**ELECTRONICS AND COMMUNICATION ENGINEERING**

U07EC302: Data Structures

hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

out of memory may occur due to

- (a) no-recursive function call (b) recursive function call  
 (c) use of more global variable (d) none of these

Algorithm is made up of 2 modules M1, M2. If order of M1 is  $f(n)$  and M2 is  $g(n)$  then the order of the algorithm is

- (a)  $\max(f(n),g(n))$  (b)  $\min(f(n),g(n))$  (c)  $f(n)+g(n)$  (d)  $f(n)*g(n)$

Time required to insert an element in a stack with linked implementation is

- (a)  $O(1)$  (b)  $O(\log_2 n)$  (c)  $O(n)$  (d)  $O(n \log_2 n)$

Radix lists are not suitable for

- (a) Insertion sort (b) Binary search  
 (c) Radix sort (d) Polynomial manipulation

Number of nodes in a complete binary tree of level 5 is

- (a) 15 (b) 25 (c) 63 (d) 71

Worst case height of AVL tree with  $n$  node is:

- (a)  $2 \log n$  (b)  $n \log(n+1)$  (c)  $1.44 \log(n+2)$  (d)  $1.44 n \log n$

Which of the following sort method is stable?

- (a) Insertion sort (b) Merge sort (c) Shell sort (d) Heap sort

Which sort uses

- (a) divide and conquer strategy (b) back tracking approach  
 (c) heuristic search (d) greedy approach

A vertex of degree one is called as

- (a) pentant (b) isolated vertex  
 (c) null vertex (d) coloured vertex

Minimum number of edges in a connected cycle graph on  $n$  vertices is

- (a)  $n-1$  (b)  $n$  (c)  $n+1$  (d) none of the above

PART B (10 x 2 = 20 Marks)

1. What do you mean by ADT?

12. Write a procedure to exchange the values of a variable
13. Give postfix form for  $A*B+C/D$
14. What do you mean by Circular Queue?
15. Define the terms
  - i) Degree of a tree
  - ii) forest
16. What is Overflow chaining?
17. Write an algorithm for Insertion sort
18. What is sorting? List the different types of sorting techniques.
19. What are the ways to represent a Graph?
20. Write short notes on Topological sorting.

**PART C (5 x 14 = 70 Marks)**

21. (a) Explain in detail about Top-Down Design.

**(OR)**

  - (b) (i) Describe about problem solving aspect. (8)
  - (ii) Explain in detail about efficiency of algorithms. (6)
22. (a) (i) Explain in detail about Linked list. (9)  
(ii) Write an algorithm to add two polynomials using Linked List. (5)

**(OR)**

  - (b) Explain in detail about Queue.
23. (a) (i) Write an algorithm to insert a node in the Binary Tree. (8)  
(ii) Write an algorithm to find the dept of a Binary Tree. (6)

**(OR)**

  - (b) (i) Write an algorithm to implement Binary Tree Traversals. (9)
  - (ii) Write short notes on collision resolution strategies. (5)
24. (a) Explain in detail about Quicksort Algorithm and perform Algorithm analysis.

**(OR)**

  - (b) Explain in detail about HeapSort Algorithm.
25. (a) Explain in detail about Graph Traversal Algorithms.

**(OR)**

  - (b) Explain in detail about Dijkstra's Algorithm.

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