Register Number.....

M.C.A. DEGREE EXAMINATIONS: JANUARY 2009

First Semester

P07CA104: DATA STRUCTURES

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

Answer All Questions:-

PART A (20 x 1 = 20 Marks)

1. A _____ is defined in C as an array of characters
   (a) Character (b) String (c) Integer (d) Double

2. Pop or access an item from an empty stack is called
   (a) Overflow (b) Underflow (c) divide by zero (d) LIFO

3. To remove an element from an empty queue is called
   (a) Overflow (b) Underflow (c) FIFO (d) Front

4. To keep an extra node at the front of a list is called
   (a) Node (b)List header (c) Doubly linked list (d) Empty node

5. Each element of a binary tree is called
   (a) Root (b) Tree (c) Node (d) Right subtree

6. A tree in which the subtrees of each node form an ordered set is called as
   (a) Forest (b) Leaf (c) Ordered tree (d) Root

7. The maximum level of any leaf in the binary tree is called as
   (a) Strictly binary tree (b) Depth of a binary tree
   (c) Complete binary tree (d) Root

8. Huffman Algorithm is used in
   (a) Data Compression (b) Cryptography (c) Stenography (d) Networking

9. A_____is one in which successive elements are selected in order and placed into their proper sorted positions.
   (a) Bubble sort (b) Selection sort (c) Quick sort (d) Merge sort

10. _____is the process of combining two or more sorted files into a third sorted file.
    (a) Radix sort (b) Quick sort (c) Merge sort (d) Selection sort

11. A table is a group of elements, each of which is called a _____
    (a) File (b) Record (c) Key (d) internal key

12. A balanced order-n multiway search tree in which each non-root node contains at least (n-1)/2 keys is called a _____
(a) n-(n-1) tree (b) B-tee (c)B-tree of order n (d) Multiway search tree

13. A node n is _____ to an arc x if n is one of the two nodes in the ordered pair of nodes that
constitute x.
(a) Degree (b) Indegree (c) Relation (d) Incident

14. The two-dimensional array g.arcs[][].adj is called an _____
(a)Matrix (b) Array (c) Adjacency matrix (d) Multidimensional Array

15. The matrix path is often called the_____ of the matrix *adj*
(a) path matrix of length 2 (b) transitive closure (c) Boolean product (d) outdegree

16. The term allocated node is used to refer to either a header or a list node of a multilinked structure
representing a _____
(a) arc node (b) list nodes (c) graph (d) graph nodes

17. An abstract data type, a list is simply a sequence of objects called _____
(a) objects (b)elements (c) members (d) values

18. Under _____method each node has an additional count field that keeps a count of the number of
pointers to that node.
(a) garbage collection (b) reference count (c) collection (d) compaction

19. The first phase of the garbage collection is _____
(a)collection phase (b) marking phase (c) First phase (d) reference count

20. System storage management routines such as garbage collection are execution almost all the
time is called
(a) thrashing (b)hashing (c)dfs (d)bfs

PART B (5 x 16 = 80 Marks)

21. (a) i) Implement the push and pop operations in C (8)

ii) Convert the following infix expression to its postfix expression (8)

((A - (B + C)) * D) $ (E + F)

(OR)

21. (b) Implement LIST ADT by using the following representations

i) Doubly linked list (8)

ii) Circularly linked list (8)

22. (a) i) Define binary tree (2)

ii) Define an almost complete binary tree (2)

iii) Convert the following expression into their binary tree representation (12)

(A + B * C) $ ((A + B) * C)

(OR)

22. (b) Describe the Huffman Algorithm in detail

23. (a) Apply bubble sort and quick sort algorithms for the following set of integers

25 57 48 37 12 92 86 33

(OR)

23. (b) Explain in detail about B-tree with example

24. (a) i) Define graph (2)

ii) Define indegree and outdegree (4)

iii) Write short notes on Warshall's Algorithm (10)

(OR)

24. (b) Describe the following

i) Linked representation of graphs (8)

ii) Dijkstra's Algorithm (8)

25. (a) i) Define garbage collection. Write an algorithm for garbage collection (8)

ii) Explain in detail about reference count method (8)

(OR)

25. (b) What is meant by storage compaction? Discuss the different techniques to implement it

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