2008

(December)

BACHELOR OF COMPUTER APPLICATIONS

(Data Structures Using 'C')

Course No : 301

(PART - A : OBJECTIVES)

(Marks : 25)

I. Choose the correct answer from the given : (1x10=10)

1. If an array is used as a function argument, the array is passed :

    (a) by value

    (b) call by name

    (c) by reference

    (d)none of the above

2. Which of the data structure is needed to convert infix notations to postfix notations?

    (a) Queue   (b) stack   (c) linear list   (d) tree

3. The following sequence of operations performed on a stack push(1), push(2), pop,push(1), push(2), pop, pop, pop, push(2), pop. The sequence of popped out values are :

    (a) 2,2,1,1,2   (b) 2,2,1,2,2   (c) 2,1,2,2,1   (d) 2,1,2,2,2

4. A linear list in which elements can be added or removed at either end but not in the middle is known as :

    (a)Queue   (b) dqueue   (c) stack   (d) priority queue

(Turn Over)

5. Link of linked list in C is of type :

   (a) Unsigned integer   (b) Pointer to integer

   (c) Pointer to structure   (d) None of these

6. Average case time complexity of the heap sort algorithm is more than:

   (a) $O(N \log_2 N)$ (b) $O(N \log N)$

   (c) $O(N^2)$ (d) $O(N^1)$

7. Name the sort in which array to be sorted is partitioned again and again in such a way that all elements less than or equal to partition element appear before it and those which are greater appear after it.

   (a) Merge sort   (b) Quick sort

   (c) Selection sort   (d) Radix sort

8. The number of edges in a tree with n nodes is:

   (a) n-1   (b) n

   (c) n+1   (d) none of these.

9. In this sort file is divided into subfiles which are to be independently sorted and then merged-

   (a) Quick sort   (b) heap sort

   (c) bubble sort   (d) none of these

10. Which of the following is true to the threaded binary tree

    (a) Left threaded binary tree   (c) two-way threaded binary tree

    (b) Right threaded binary tree   (d) all of the above

II.   State whether the following statement is true or false: (1x5=5)

1. int p(char *a[]) is a function that accepts as an argument which is a pointer to a character array and returns an integer.   (T/F)

2. In a threaded binary tree the left or right link of a node is always a thread link.   (T/F)

3. The level of the root node of any tree is 1.   (T/F)

4. A binary search of an ordered set of elements in an array is always faster than a sequential search of the elements.   (T/F)

5. In linked list the successive element need not occupy contiguous space in memory.   (T/F)

III. Answer the following questions: (2x5=10)

1. Define almost complete binary tree.

2. What are the benefits of using liked list over an array?

3. What is primitive and non-primitive data structure?

Give an example each.

4. What is merit and demerits of mergesort?

5. What is a null pointer?

2008

(December)

BACHELOR OF COMPUTER APPLICATIONS

(Data Structures Using C)

Paper No. - 301 (Revised)

PART B: DESCRIPTIVE
MARK : 50

Answer the following questions:

Explain the concept of Dynamic Memory allocation. How does it differ from Static Memory allocation? Mention the differences of malloc() and calloc(). (6)

Or

What is an array of pointer? Write a program to illustrate an array of pointer. (6)

Write a C program/algorithm to implement stack using array and perform following operations: (8)
(a) push   (b) pop   (c) display

Or

Write a C program/algorithm to implement a circular queue of integers using an array and to perform following operations on: (8)
(a) insert   (b) delete   (c) display

3. What are the different types of Queues? Explain any two in details. (6)

Or

Write the prefix and postfix form of the following infix expressions:

(a) ((A+B*C-(D-E))$(F+G) (3)

(b) A$B*C-D+E/F/(G+H) (3)

4. Write a program/function to insert and delete an element after a given node in a singly linked list. (7)

Or

Write a C function to insert and delete a node from the front end in case of doubly linked list.

(7)

5. Show the steps sorting of the following elements by using heap sort: (6)

   25, 57, 48, 37, 12, 92, 86, and 33.

Or

Write a C function to implement simple insertion sort.

(6)

6. Suppose the following sequences list nodes of a binary tree pre-order and in-order, respectively:

   Pre-order :   A B C E I F J D G H K L

   In-order :   E I C F J B G D K H L A

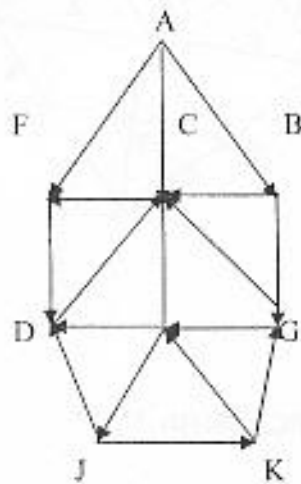   Draw the diagram of the tree. Each step must be written

   clearly. (7)

Or

What is binary tree? Mention different types of binary trees and explain two of them clearly. (7)

Suppose the following eight numbers are inserted in order into an empty binary search tree T. 50, 33, 44, 22, 77, 35, 60. Draw the tree T.   (5)

Or

What will be the Depth first Search of the following graph if the **starting vertex will be J**.   (5)
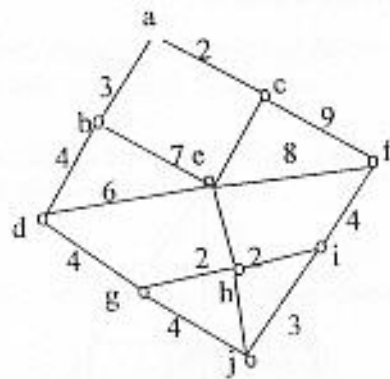
Explain one way and two ways threading of binary trees.

(5)

Or

Find the minimum spanning tree by using Prim's algorithm.

(5)