

PART – A
UNIT 1
BASIC CONCEPTS

1. What is a pointer variable? Can we have multiple pointer to a variable? Explain Lvalue and Rvalue expression. (June / July08),(dec 2010), (may/jun 2010),(dec09/jan10)
2. Give atleast 2 differences between : i. Static memory allocation and dynamic memory allocation.
ii. Malloc() and calloc(). (June / July08), (dec 2010)
3. i) Write a C program using pass by reference method to swap 2 characters.
ii) Give any 2 advantages and disadvantages of using pointers. (June / July08)
4. What is an algorithm? Briefly explain the criteria that an algorithm must satisfy.(dec 2011)
5. Write a recursive function to implement binary search.(dec 2011)
6. What is the output of the following code?

```
Int num[5]= { 3,4,6,2,1};  
Int *p=num;  
Int *q= num+2;  
Int *r =&num[1];  
Printf(“%d%d”,num[2],*(num+2));  
Printf(“%d%d”, *p,*(p+1));  
Printf(“%d%d”, *q,*(q+1));  
Printf(“%d%d”, *r,*(r+1)); (dec 2010)
```

UNIT 2
ARRAYS and STRUCTURES

1. How does a structure differ from an union? Mention any 2 uses of structure. What is a bit field? Why are bit fields used with structures? (June / July08),(dec 2010), (may/jun 2010)

UNIT 3
STACKS AND QUEUES

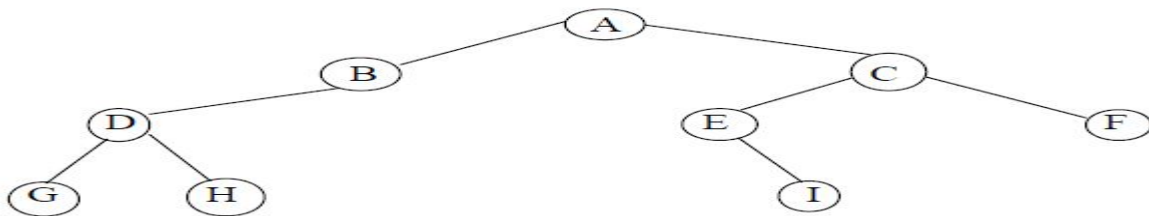
1. How do you define a data structure? How is stack a data structure? Give a C program to construct a stack of integers and perform all the necessary operations on it. (June / July08), (dec 2011), (dec 2010), (may/jun 2010), (dec09/jan10)
2. Write an algorithm to convert a valid infix expression to a postfix expression. Also evaluate the following suffix expression for the values: A=1 B=2 C=3.
AB+C-BA+C\$- (dec 2011),(June / July08), (dec 2010), (may/jun 2010), (dec09/jan10)
3. What is the advantage of circular queue over ordinary queue? Mention any 2 applications of queues. Write an algorithm CQINSERT for static implementation of circular queue. (June / July08),(dec 2010)
4. Explain the working of a simple queue. (may/jun 2010)

UNIT 4
LINKED LISTS

1. List out any two applications of linked list and any two advantages of doubly linked list over singly linked list. (June / July08)(dce 2011)
2. Write a C program to simulate an ordinary queue using a singly linked list. (June / July08), (dec 2011), (dec 2010)
3. Give an algorithm to insert a node at a specified position for a given singly linked list. (June / July08), may/jun 2010)
4. Write a C program to create a linked list and interchange the elements to the list at position m and n and display contents of the list before and after interchanging the elements. (June / July08)
5. Briefly explain the structures of different types of linked lists. Write a c function to count number of elements present in a singly linked list.(dec 2010)
6. Write a c program to perform the following operations on doubly linked list : i) insert a node ii) delete a node. (dec 2010)
7. Write short note on circular lists.(dec 2010)

PART – B
Unit 5
TREES – 1

1. Define the following:
 - i) Binary tree
 - ii) Complete binary tree
 - iii) Almost complete binary tree
 - iv) Binary search tree
 - v) Depth of a tree (June / July08),(dec 2010),(may/jun 2010), (dec09/jan10)
2. Given the following graph, write the inorder, preorder and postorder traversals. (June / July08)



3. In brief describe any 4 applications of trees. (June / July08)
4. Construct a binary tree from the traversal order given below:
PREORDER = A B D E F C G H L J K
INORDER = D B F E A G C L J H K (June / July08)
5. Construct a binary tree for : $((6+(3-2)*5)^2+3)$.(June / July08)
6. What is threaded binary tree? Explain right in and left in threaded binary trees. (June / July08), (dec 2010)

7. (dec 2011)

With reference to the Fig.Q5(a), answer the following:

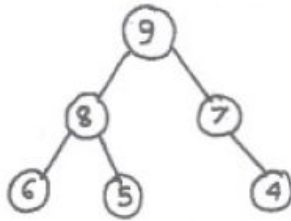


Fig.Q5(a)

- i) Is it a binary tree?
- ii) Is it a complete tree?
- iii) Give the preorder traversal.
- iv) Give the inorder traversal.
- v) Give the postorder traversal
- vi) Give the list notation (using pairs of round brackets).
- vii) Where will be the left child of node 4 pointing to, if it is converted to a threaded b-tree?
- viii) Is it a max heap?

8. Write c function for the following tree traversals: i)inorder ii)preorder iii)postorder(dec 2010)

Unit 6 TREES – 2, GRAPHS

1. Explain the following with an example: i) forest ii) graph iii) winner tree .(dec 2011)
2. Describe the binary search tree with an example. Write a iterative function to search for a key value in a binary search tree. .(dec 2011)

UNIT 7 PRIORITY QUEUES

1. What is binomial heap? Explain the steps involved in the deletion of min element from a binomial heap.(dec 2011)
2. Define Fibonacci heap. Briefly explain the different types. .(dec 2011)
- 3.Explain priority queue?(dec09/jan10)

UNIT-8 EFFICIENT BINARY SEARCH TREES

1. Describe the following with an eg: i) height balanced trees ii) optimal bst.(dec 2011)
2. Explain the Red-black tree. State its properties .(dec 2011)
3. What is splay tree? Briefly explain the different types of splay trees. .(dec 2011)