NEW

2016

BCA

2nd Semester Examination

DATA STRUCTURE

PAPER—1202

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. *1* and any *four* from the rest.

1. Answer any *five* questions from the following : 5×2

(a) What is hashing? Name any two hashing function. 1+1

(b) Whats are the drawbacks of doubly linked list over single liked list? 2

(c) Write down the two Application of queue. 2

(d) In which Condition a queue is to be empty. Give an Example. 2

(e) In which conditions an element cannot be inserted in circular queue. 2

(f) What will be the corrosponding binary tree representation of expression A + B * C. 2

(g) What is non linear data structure ? Give example. 1+1

(h) Write down difference between Malloc ( ) and Calloc ( ). 2

Answer any *four* questions from following : 15×4

2. (a) How linked list over comes all the disadvantages of array ? 3

(b) Write an algorithm to add a new node after the specified location of nodes in linked list. 3

(c) Write an algoritum to remove the specified node from the doubly linked list. 4

(d) How circular linked list over come the short comings of linger linked list ? 2

(e) Write an algorithm to add a new element at the end of circular linked list. 3

3. (a) How circular queues solve the limitations of a queue ? 2

(b) Write an algoritum to delete an element from circular queue. 3

(c) How to add an element to the queue which have some element using linked list ? 2

(d) Suppose the following sequences list the nodes of binary tree T in preorder and inorder respectively.

Preorder : A B D E G H C F

In-order : D B G E H A C F 4

Draw the binary tree.

(e) What is Deque ? Why it is used ? How to Count total number of elements in deque ? 1+1+2

4. (a) What is top in a Stack? Write down the uses of top in a stack. 1+2

(b) There are changes in stack if an element pops from the stack which may be NULL or may not be NULL. Write an algo of pop operation from a stack using as a linked list. 3

(c) Transform the following infix expression into equivalent postfix expression;

Infix Expression : 4 $ 2 * 3 – 3 + 8/4 (1 + 1). 4

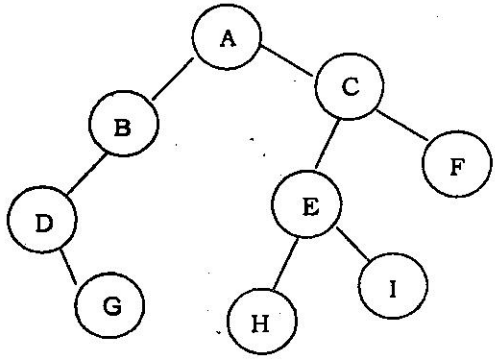
(d) Write down two Applications of stacks. 2

(e) What is the definition of degree of a node? Give an example. 1+1

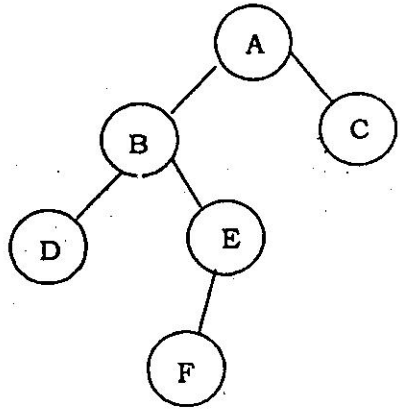
5. (a) What is a complete binary tree? What is its depth? Give an example. 2+2

(b) Write an algorithm to traverse a binary search tree in inorder fashion. 3

(c) Write down listing of nodes using preorder and post order traversal of the following binary tree. 2+2



(d) What is AVL Tree ? Is the following tree is AVL Tree or not ? Give explanation. 1+3



6. (a) How linear search differ from Binary search method ? 3

(b) What is the difference between internal sorting and external sorting ? 3

(c) Consider list (50, 40, 20, 60, 80, 100, 45, 70, 105). What is sorted list it the list is sorted using quick sort technique ? Explain every step. 9

7. (a) What is array ? Why it is used ? 1+2

(b) Write an algoritum of marge sort technique. 5

(c) Write a function of transpose of a matrix. 3

(d) What is Arrange of pointers ? 2

(e) What is the address of a [1] [3] element in Row major arrangement ? The array is a [4] [3] and base address is 500 and data type of array is integer. 2

[Internal Assessment — 30]