NEW

2015

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) Define non-linear data structure.

(b) What is complete binary tree ?

(c) What is Abstract Data Type ?

(d) Define Big O notation.

(e) What is priority queue ?

(f) What is dynamic memory allocation ?

(g) What are the application of trees ?

2. (a) What are the advantages of array over linked list ?

(b) Write down the algorithm deleting last node from a single linked list.

(c) Why is circular linked list needed over single linked list ?

(d) Write down a C function to reverse a single linked list.

2+6+1+6

3. (a) Write two functions to implement two basic operations of stack.

(b) What is queue? What are the various operations associated with queue?

(c) Convert postfix to infix :

4 2 $ 3 * 3 - 84/11+/+

6+5+4

4. (a) Write down the disadvantage of Binary Search.

(b) Write down a function to insert nodes in a BST.

(c) What do you mean by hash function ? Explain with some examples.

(d) Draw the expression tree for $E = (3x-y) * (5a+b)^4$.

2+5+(2+3)+3

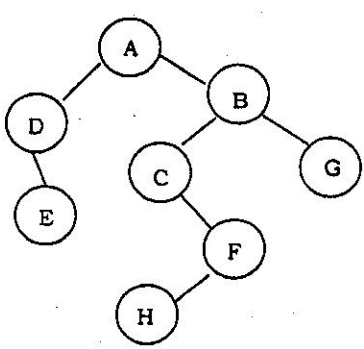
5. (a) Write a function to display all the elements of a circular linked list.

(b) Write down the condition to check the overflow condition in a circular queue.

(c) What is Deque ? Give an example of a Deque.

(d) What is priority Queue? Define a node in a priority Queue using structure in C language.

6. (a) Write down listing of nodes using in-order, pre-order and post-order traversal on the following tree :



(b) Why tree is called as a non-linear data structure ?

(c) What is AVL tree ?

(d) Write an algorithm to delete the maximum element from the list.

6+2+2+5

7. (a) What are the basic differences of graph over tree ?

(b) Write down the algorithm to implement insertion sort.

(c) Why the time complexity of binary search is lower than linear search ?

(d) Define the following terms :

(i) depth of a tree ;

(ii) Full binary tree.

2+6+4+3

[Internal Assessment — 30]