Total No. of Questions : 11] [Total No. of Printed Pages : 3

BPF–2218

M.Sc. (Final) Examination, 2022

COMPUTER SCIENCE

Paper - MCS-202

(Data Structure)

Time : 3 Hours] [*Maximum Marks : 50*

Section–A **(Marks : 2 × 10 = 20)**

Note :– Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section–B **(Marks : 3 × 5 = 15)**

Note :– Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **3** marks.

Section–C **(Marks : 5 × 3 = 15)**

Note :– Answer any *three* questions out of five (Answer limit **500** words). Each question carries **5** marks.

Section–A

1. (i) Define Algorithm.

   (ii) What do you understand by efficiency of an algorithm ?

   (iii) What is ADT ?

(iv) Which sorting is suitable for sorting cheque numbers ?

(v) Write applications of linked list.

(vi) Draw diagram of height balanced tree.

(vii) Define Primitive Operations.

(viii) Differentiate tree and graph.

(ix) Give applications of stack.

(x) Explain role of stack in recursion.

Section–B

2. Explain various time complexity notations.

Or

Give functions of a two-way linked list. Explain using a diagram of suitable example.

3. Differentiate stack and queue.

Or

Convert the following infix expressions in prefix and postfix :

(i) A – B + C/D

(ii) π * R ^ R

(iii) 12/13 * 2 + 10

4. What is the importance of Binary Search ? Why is it used ?

Or

Write a program for linear search. Give its complexity.

5. Explain the following basic terminologies of a tree :

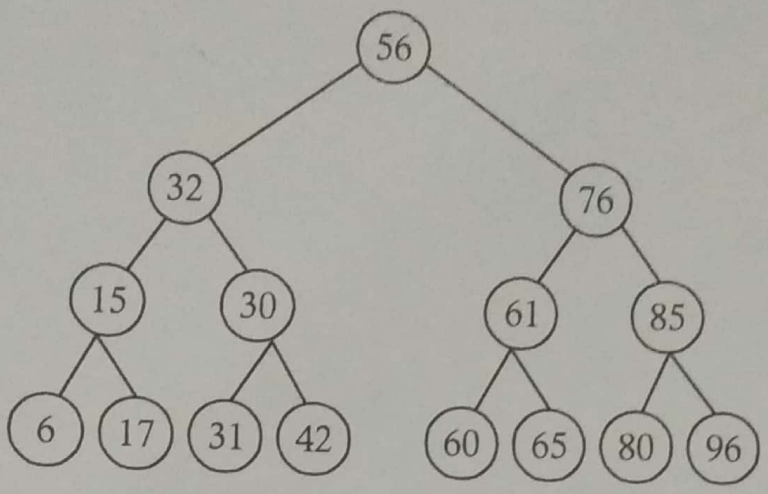
(i) Siblings

(ii) Tree traversal

(iii) Leaf node

Or

Consider the following Binary tree :



Give the sequence of nodes in the above binary tree using :

(i) Pre order

(ii) Post order

(iii) In order

6. What is Adjancy Matrix ? Give adjancy matrix of a graph as an example.

Or

Explain the following terminology of graph :

(i) Undirected graph

(ii) Weight of a graph

Section–C

7. Explain circular linked list and its operations in detail.

8. Write a program for array representation of a stack.

9. Explain Binary Search. Write a program for binary search and explain how binary search is working in that program.

10. What is a B-tree ? How is it differ from AVL tree ? Explain.

11. What is the difference between Breadth first search and depth first search ? Explain with a suitable example.