

Roll No. :

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 ?

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- (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) $\pi * R ^ R$
 - (iii) $12/13 * 2 + 10$
4. What is the importance of Binary Search ? Why is it used ?

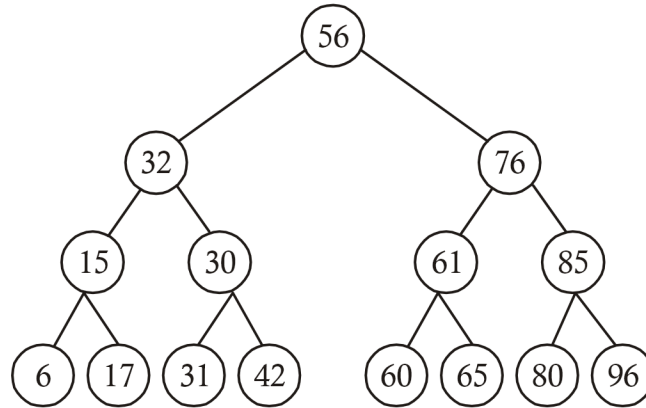
Or

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.