



I Semester B.C.A. Degree Examination, May 2022
(NEP - 2021-22 and Onwards)
COMPUTER SCIENCE
Paper - 1.3 : Data Structures

Time : 2½ Hours

Max. Marks : 60

Instruction : Answer all Sections.

PART - A

I. Answer any 4 of the following :

(4×2=8)

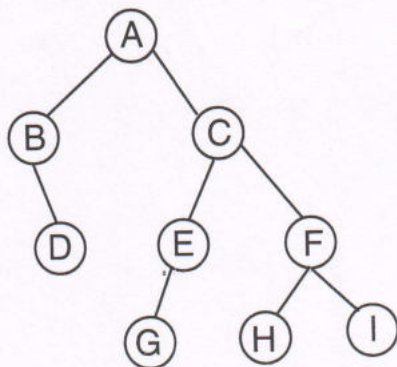
- 1) How to measure the complexity of an algorithm ?
- 2) What is an Abstract Data type ? Give an example.
- 3) Explain overflow and underflow conditions in stack.
- 4) What is a Binary Search Tree ? Give an example.
- 5) Mention any two types of Graphs.
- 6) What do you mean by Chaining in Collision Resolution ?

PART - B

II. Answer any 4 of the following :

(4×5=20)

- 7) Define sparse matrix. Write a C program to check whether given matrix is SPARSE or NOT.
- 8) Write an algorithm for ENQUEUE and DEQUEUE operations.
- 9) What is Recursion ? Write a program to print Fibonacci series using Recursive function.
- 10) Write Pre-order, In-order, Post-order, Traversal for the given Tree.





- 11) Write an Algorithm for Insertion sort. Give the analysis for Insertion sort.
- 12) Write a note on.
- Adjacency Matrix
 - Adjacency list.

PART - C

III. Answer **any 4** of the following :

(4×8=32)

- 13) a) Explain different Asymptotic Notations. 5
- b) Write an algorithm to insert an element into an array. 3
- 14) a) Mention and explain the types of linked lists in brief. 4
- b) Explain Towers of Hanoi problem with an algorithm. 4
- 15) a) Convert the following infix notation expression to postfix notation. 5
 $(a + b | c * d) - f + e$
- b) Explain underflow and overflow with respect to Queues. 3
- 16) Explain heap sort method for the given set of elements. 8
- | | | | | | | | |
|----|----|----|---|----|----|----|----|
| 18 | 32 | 14 | 9 | 45 | 06 | 55 | 16 |
|----|----|----|---|----|----|----|----|
- 17) a) Define Hashing. Explain Hash Table and Hash function with an example. 6
- b) List any two Probing Methods. 2
- 18) Construct binary tree. Given inorder and Post order traversals. 8
 Inorder : $6 + 2 * 3/9 \% 2$
 Post order : $62 + 392 \% / *$

