NP - 164

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)**

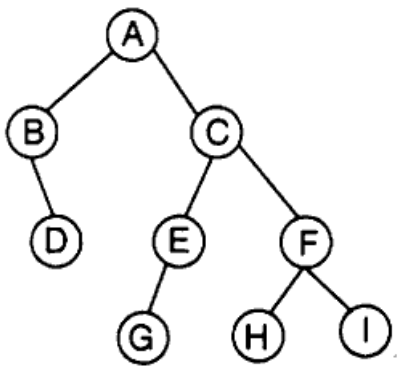
1) How to measure the complexity of an algorithm ?
2) What is an Abstract Data type ? Give an example.

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=**

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.



P.T.O.

11) Write an Algorithm for Insertion sort. Give the analysis for Insertion sort.

12) Write a note on.
   a) Adjacency Matrix
   b) 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. 2/2

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 % / *

2/2