Total No. of Questions : 8] [Total No. of Printed Pages :4

Paper Code : 21313

F-413

B.C.A. (Third Semester)

Examination, 2021-22

(New Course)

Paper - BCA-303-N

Data Structures Using C

Time : Three Hours] *[Maximum Marks : 70*

Note : Attempt any **five** questions. **All** questions carry equal marks.

1. (a) Define algorithm. How do you measure the complexity of algorithm? List the commonly used asymptotic notations. 7

   (b) Draw a binary tree using following traversals: 7

   Inorder : DBFEAGCLJHK

   Postorder : DFEBGLJKHCA

2. (a) Write the following infix expression in corresponding postfix expression: 7

   (i) A*B/C*D

   (ii) A/B* C+d*e-A*C

   (b) What is recursion? Write a recursive 'C language' function to print fibonacci series up to 'n' terms. 7

3. (a) Write an algorithm to implement insertion sort. Illustrate this for following list of numbers: 7

   100,15,85,25,5,40,45,35

   (b) What is binary search tree? Build binary search tree using following integers.7

   57,25,65,20,35,70,80

4. (a) Write an algorithm to insert a node in the beginning, in the end, and in between the nodes of a linked list. 7

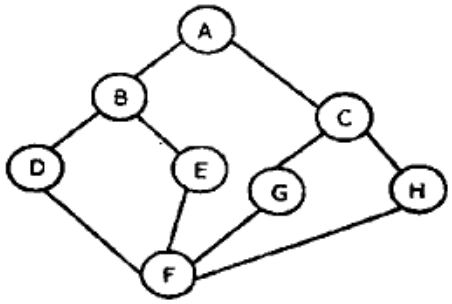
   (b) What is hashing? What are its significance and advantages? 7

5. (a) Write the algorithm for binary search. When is linear search preferred over binary search. 7

(b) Define circular queue. What is the condition when the circular queue is full when implemented using array? 7

6. (a) Write the algorithm for multiplication of two matrices. 7

(b) Differentiate between DFS and BFS. If 'A' is the starting vertex, find out the DFS & BFS traversal of following graph: 7



7. (a) Write a program to implement Bubble sort. 7

(b) Sort the following sequence using bubble sort showing all steps: 7

77,33,44,11,88,22,66,55

8. Write a short note on any **four**: 14

(a) Time space trade off.

(b) Garbage collection.

(c) Comparison of indexing & hashing.

(d) Push & pop in stack.

(e) Polynomial representation using linked list.