S.No. : 461

BCA 3201 R

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 31114 Roll No.

BCA Examination 2021-22

(Even Semester)

BASICS OF DATA STRUCTURE USING 'C'

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

   (a) What is Data Structure?

   (b) Define queue in data structure.

   (c) What do you understand by recursion?

   (d) What is Algorithm?

   (e) List various types of linked list.

   (f) Write the condition for full circular queue.

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(g) Explain binary search tree.

(h) What do you understand by Bubble Sort?

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) What is Sparse Matrix? Write a program for array representation of sparse matrix.

(b) Explain circular queue. Write a program for implementation of circular queue using array.

(c) Explain singly linked list with suitable example.

(d) Write a program to perform searching operation using binary search.

SECTION – C

Note :– Attempt all questions from this section.

10×4=40

3. Attempt any two parts of the following :

(a) (i) Differentiate linear and non-linear data structure.

(ii) Discuss the advantages and disadvantages of linked list over array.

(b) Define the following terms in brief :

(i) Time complexity

(ii) Asymptotic notation

(c) Write a program to find transpose of given matrix.

4. Attempt any two parts of the following :

(a) Convert A + (B * C – (D/E – F) * G) * H into postfix form showing stack status after every step in tabular form.

(b) (i) Differentiate between iteration and recursion.

(ii) Write the recursive solution for tower of Hanoi problem.

(c) Discuss array and linked representation of queue data structure. What is dequeue?

5. Attempt any two parts of the following :

(a) What is doubly linked list? Explain how an element can be deleted from doubly linked list using C program.

(b) Explain single circular linked list with example.

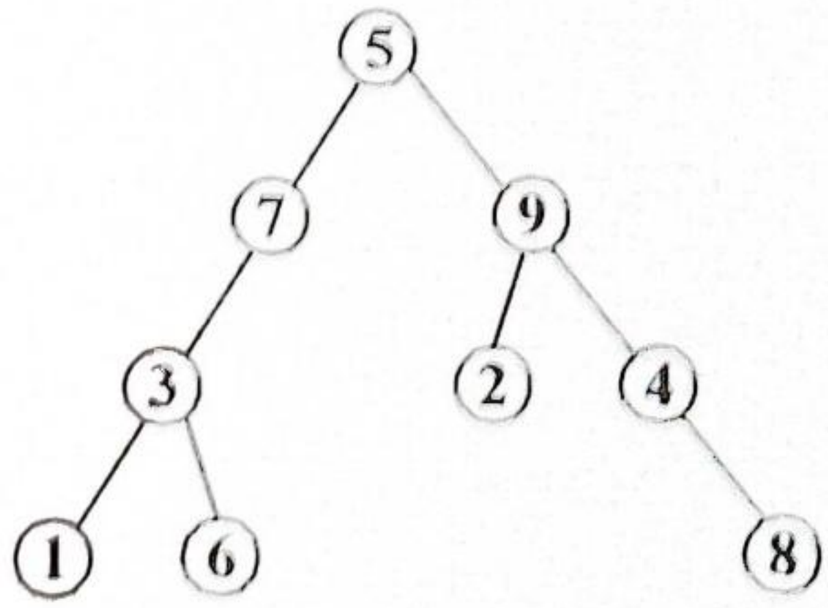
(c) Write an algorithm for creating a singly linked list and inserting node in it (Beginning, Middle End).

6. Attempt any two parts of the following :

(a) What do you mean by merge sort? How it occurs? Explain with example.

(b) Explain binary tree along with its type. What is complete binary tree? Explain with example.

(c) Write down the inorder, preorder and postorder traversal of the following tree :



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