ADICHUNCHANAGIRI UNIVERSITY

18CS33

Third Semester BE Degree Examination March 2021
(CBCS Scheme)

Time: 3 Hours

Max Marks: 100 marks

Sub: Data Structures Using C

Q P Code: 60303

Instructions: 1. Answer **five full** questions.
2. Choose one full question from each module.
3. Your answer should be specific to the questions asked.
4. write the same question numbers as they appear in this question paper.
5. Write Legibly

Module – 1

1 a Define data structures. Explain primitive and non-primitive data structure with example — 10 marks

b Define dynamic memory allocation. List and explain types of DMA — 10 marks

Or

2 a Define pointers. Differentiate between structures and unions — 10 marks

b Write an algorithm to add two sparse matrices A and C represented as above to obtain D = A + C. How much time does your algorithm take? — 10 marks

Module – 2

3 a Write the postfix form for the following infix expression — 10 marks

i) (A + B) * D + E/ (F + A *D) + C

ii) ((A/(B** C)) + (D* E)) - (A * C)

b Define circular queue. Write a C function to insert an element and to display an element from circular queue. — 10 marks

Or

4 a Define Fibonacci sequence with example, write a C function to perform factorial of a given number — 10 marks

b List stack application — 2 marks

c What is priority queue , explain tower of Hanoi problem with example — 8 marks

Module – 3

5 a Define linked list. How do you represent linked list in memory, explain briefly — 10 marks

b Write a program to implement sparse matrix in C — 10 marks

Or

6 a Write a C program to implement doubly linked list with insert front, delete front and display operations. — 11 marks

b What is garbage collection? Show the function to implement stacks using single linked list. — 9 marks

PTO

Module – 4

7 a Define the following with neat sketch 10 marks

I. Binary tree

II. Complete binary tree

III. Almost complete binary tree

IV. level of a tree

b Write a C programme to implement binary search tree. 10 marks

Or

8 a List application of trees 5 marks

b Draw the binary search tree for following 15 marks

13 4 7 3 17 21 15 19 2 23.

And show the inorder, postorder and preorder for same data.

Module – 5

9 a Write a C function to implement depth first search with example 10 marks

b Define files. explain opening and closing of files and input and output operations. 10 marks

Or

10 a Define hashing. Explain static and dynamic hashing, give example. 10 marks

b Define the following with neat diagram 10 marks

i. Complete graph

ii. Adjacency list representation of graphs.

iii. Cyclic and acyclic graph

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