

CBCS SCHEME

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18SM45

Fourth Semester B.Tech. Degree Examination, July/August 2022 Data Structures and Programming

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Discuss an array as an Abstract Data Type (ADT). (08 Marks)
- b. Write a 'C' program to create a two dimensional array at run time. (06 Marks)
- c. Define self referential structures. Explain with an example. (06 Marks)

OR

- 2 a. Define data structure. Explain the classification of data structures. (06 Marks)
- b. Explain the three types of structures used for storing strings. Explain with example. (06 Marks)
- c. Explain the representation of linear arrays in memory. Write a program and explain how an array limit value and an array element address are printed. (08 Marks)

Module-2

- 3 a. What is stack? Discuss the stack operations including ADT specification. Explain the implementation of ADT by using a one dimensional array. (10 Marks)
- b. Explain circular queues using dynamically allocated arrays. Write a function to insert an element to a circular queue using dynamically allocated array and give the code for queuefull operation. (10 Marks)

OR

- 4 a. What is recursion? Write a 'C' program using recursive function to find the sequence of fibonacci number and print fibonacci series. (10 Marks)
- b. Write a function to evaluate a postfix expression and explain with an example. (10 Marks)

Module-3

- 5 a. What do you mean by linked list? Explain the implementation of linked list and memory allocation. (10 Marks)
- b. Explain insertion into a linked list and deletion from a linked list using example. (10 Marks)

OR

- 6 a. Explain linked stacks and queues briefly. (10 Marks)
- b. Discuss polynomial representation in C and also write a program to perform addition of two polynomials. (10 Marks)

Module-4

- 7 a. Give a definition for a tree with an example and also discuss the representation of trees. (10 Marks)
- b. Explain inorder and preorder traversal of a binary tree. (10 Marks)

OR

- 8 a. Define a binary search tree. Write a function to insert a dictionary pair into a binary search tree and explain briefly. (10 Marks)
b. Explain threaded binary trees. Discuss the rules to construct the threads and write a function to find the inorder successor of a node. (10 Marks)

Module-5

- 9 a. Describe adjacency matrix and adjacency lists to perform on the graph. (10 Marks)
b. Write a function that implements insertion into a sorted list and discuss the analysis of insertion sort. (10 Marks)

OR

- 10 a. Define hash table. Discuss the different hash functions used in static hashing. (10 Marks)
b. Briefly discuss file attributes and basic file operations. (10 Marks)

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