

- (c) Write an algorithm for insertion of a node in binary search tree using linked list representation. 6

Unit IV

7. (a) Sort the following list using Insertion Sort.

44, 33, 11, 55, 77, 90, 40, 60 8

- (b) What is Hashing ? Discuss any two Hash functions. What is collision resolution ?

7

8. (a) Write a C program that implement selection sort. 6

- (b) Give any two representations of graph. Give algorithm for DPS. Demonstrate DPS using suitable example. 9

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B.Tech. EXAMINATION, 2024

(Third Semester)

(C Scheme) (Main & Re-appear)

(CSE, ECE)

CSE201C

DATA STRUCTURE AND ALGORITHMS

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. How binary search is different from linear search ? Explain. Write a complete C program to implement binary search on given data 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99 for the item 40. Discuss the complexity of binary search. 15
2. Define algorithm. What are the properties of an algorithm ? Describe the different notations used to describe the asymptotic running time of an algorithm. 15

Unit II

3. (a) Write algorithm for PUSH and POP operations when an array is implemented as a stack. 7
- (b) Transform the following expression into its equivalent Postfix expression using stack. 4
$$A + (B * C - (D / E \uparrow F) * G) * H$$

- (c) Evaluate the following Postfix expression 2, 3, 10, +, *, 8, 2, /, -. 4

4. (a) Why an operation to check 'stack overflow' is not implemented on linked stack ? Explain. 5
- (b) What is stack ? Is stack a linear or nonlinear data structure ? Explain. 5
- (c) What are D-queues ? Explain with the help of an example. 5

Unit III

5. (a) Differentiate between linked list and an array. 5
- (b) Write a function in C to add a node 'before' a node and count the number of nodes in doubly linked list. 10
6. (a) What do you mean by complete binary tree ? Draw one such tree. 4
- (b) How does an AVL tree differ from binary search tree ? Also explain how AVL trees are represented in memory. 5