G 1485

B.TECH. DEGREE EXAMINATION, MAY 2016

Sixth Semester

Branch : Electronics and Communication Engineering

EC 010 606 L01—DATA STRUCTURES AND ALGORITHMS (Elective I) (EC)

(New Scheme—2010 Admission onwards)
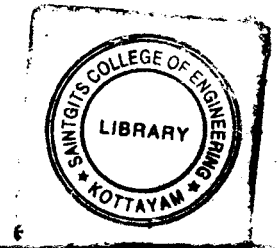
Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. What is a linked list ? Why a linked list is called dynamic data structure ?

2. Define a binary search tree.

3. Give an algorithm for sequential search.

5. What is NP completeness ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain how a polynomial is represented using arrays.

7. Distinguish between trees and graphs.

8. Explain insertion sort algorithm.

9. Explain Greedy approach for designing algorithms.

10. Differentiate class P and NP problems.

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 marks.

11. Explain the following operations on a doubly linked list :

    (a) Inserting a node at the beginning.

    (b) Inserting a node at the end.

    (c) Deleting a node from the beginning.

    (d) Deleting a node from the end.

    Or

12. Explain the implementation of stack and queue using arrays. Explain how insertions and deletions are performed on stacks and queues.

13. Give an algorithm to delete an element from a Binary Search tree.

    Or

14. Explain the different graph traversal algorithms with examples.

15. Explain the algorithms for :

    (a) Selection sort.

    (b) Merge sort.

    Or

16. Explain the algorithms for :

    (a) Heap sort.

    (b) Radix sort.

17. How do you measure the efficiency of an algorithm ? What is meant by best, average and worst case complexity of an algorithm ? Explain with an example.

    Or

18. Explain the following algorithmic techniques with examples :

    (a) Greedy approach.

    (b) Divide and conquer approach.

19. Give Quick sort algorithm. Explain the working of the algorithm with an example. Prove that the worst case time complexity of the algorithm is O (n^2).

    Or

20. Explain Travelling salesman problem. Suggest a method to solve this problem. Is it NP ?

    $(5 \times 12 = 60$ marks$)$