G 1259 (Pages : 2) Reg. No.....

Name.....

SAINTGITS COLLEGE OF ENGINEERING LIBRARY KOTTAYAM

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electronics and Communication Engineering

EC 010 6060 L01—DATA STRUCTURES AND ALGORITHMS (Elective I) (EC)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Differentiate between a linear data structure and a non-linear data structure.
2. Explain the term connected graph. Give an example.
3. What is a heap data structure ? Give an example.
4. Analyse the best, worst and average case of a linear search algorithm.
5. Explain traveling salesman problem.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Write an algorithm to delete an element from a queue represented using :
   (i) array representation ;
   (ii) linked list representation.
7. Discuss the following terms related to a binary search tree with proper examples :
   (a) Complete binary tree ;
   (b) Full binary tree ;
   (c) Height of a binary tree.
8. Discuss bubble sorting algorithm. Illustrate its working with an example.
9. Explain dynamic programming strategy for problem solving. Give an example for a problem that can be solved using dynamic programming.
10. Analyse merge sort algorithm.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Discuss an algorithm to multiply *two* polynomials represented using linked lists.

Or

12. Discuss an algorithm to implement insertion and deletion operation in a stack represented using double linked list.

13. Illustrate with the help of an example, graph traversal using Breadth First Search.

Or

14. Discuss the deletion and insertion operations in a binary search tree.

15. Discuss quick sort algorithm. Illustrate its working with the help of an example.

Or

16. Discuss merge sort algorithm. Illustrate its working with the help of an example.

17. Explain brute force, greedy and divide and conquer methods of problem solving.

Or

18. Explain the importance of complexity analysis in algorithm development.

19. Discuss in detail about the class of NP-complete problems.

Or

20. Analyse the performance of binary search, insertion sort and heap sort.

(5 × 12 = 60 marks)

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