Reg. No. : | | | | | | | | | | | |

T 3163

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Second Semester

(Regulation 2004)

Computer Science and Engineering

CS 1151 — DATA STRUCTURES

(Common to Information Technology)

(Common to B.E. (Part-Time) – First Semester – Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What do you mean by Top Down Design?

2. Write about program verification.

3. Define ADT and give an example.

4. List few applications of stack.

5. Convert the following infix expression into prefix and postfix notations $a * b - c - d + e * f - g/h * i$.

6. Explain hashing function.

7. Write the time complexities of quick sorting method.

8. Differentiate insertion and shell sort.

9. Define NP hard and NP complete problems.

10. Explain topological sorting on graphs.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With an example, explain how will you measure the efficiency of an algorithm. (8)

(ii) Analyze the linear search algorithm with an example. (8)

Or

(b) Explain the various aspects of problem solving in detail. Also discuss pros and cons of each. (16)

12. (a) (i) Write suitable routines to perform insertion and deletion operations in a linked queue. (12)

(ii) Write a suitable C routine to remove and return the top element of the stack using Array implementation. (4)

Or

(b) Write suitable ADT operations to perform insertion and deletion in a doubly linked list. (16)

13. (a) (i) Explain the various hashing techniques with suitable examples. (10)

(ii) When will collisions arise? Discuss. (6)

Or

(b) Write suitable ADT's to perform the following operations in an AVL Tree.

(i) Insert a node. (8)

(ii) Delete a node. (8)

14. (a) Write ADT operations for Heap Sort. Also simulate the following numbers using Heap Sort. What is the time complexity? (16)

35 45 25 11 6 85 17 38 102 178

Or

(b) (i) Explain Merge sort with an example. (8)

(ii) Explain External sorting. (8)

15. (a) Write suitable ADT' operation for shortest path problem. Show the simulation of shortest path with an example graph. (16)

Or

(b) (i) How do you construct a minimum cost spanning tree with Prim's algorithm? (8)

(ii) Explain depth first search on a graph with necessary data structures. (8)