2013

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Objective type Questions)

Answer all questions.

1. Choose the correct answer of the following :

\[ 2 \times 10 = 20 \]

(a) Time complexity of the insertion sort in best case is :

(i) \( O(n) \)

(ii) \( O(n \log n) \)

(iii) \( O(n^2) \)

(iv) \( O(\log n) \)

UK – 9/1

(Turn over)
(b) Depth first traversal of graph produces:
   (i) A spanning tree of graph
   (ii) A spanning forest of graph
   (iii) A minimal spanning tree
   (iv) None of the above

(c) Which of the following cannot be performed recursively?
   (i) Binary Search
   (ii) Quick Sort
   (iii) Depth First Search
   (iv) None of the above

(d) Number of sub-trees of a node in a tree/graph is called:
   (i) Order
   (ii) Degree
   (iii) Level
   (iv) Depth

(e) In C, array subscript begins with number?
   (i) 1
   (ii) 10

UK – 9/1 (2) Contd.
(iii) 100
(iv) 0

(f) The stack element will be accessed by:
   (i) Index
   (ii) Front
   (iii) Rear
   (iv) Top

(g) A vertex with degree one in a graph is called:
   (i) Leaf
   (ii) Pendant vertex
   (iii) End vertex
   (iv) None of these

(h) The search key must be ordered in:
   (i) Hashing
   (ii) Binary search
   (iii) Sequential search
   (iv) None of the above

(i) Hash function has a property to:
   (i) Minimize number of collisions
   (ii) Minimizes the rate of overflow
(iii) Preserves the order of key values
(iv) None of the above
(i) A collection of data and link is:
   (i) List
   (ii) Node
   (iii) Tree
   (iv) Queue

Group – B

(Long-answer Type Questions)

Answer any four questions of the following:

2. Explain tree with suitable example. List the properties of a Binary tree.

3. Explain DFS and BFS with suitable examples.

4. What is circular linked list? Compare it with Doubly Linked List through algorithms.

5. What is AVL tree? Compare it with Binary tree.

UK – 9/1 (4) Contd.
6. Write and explain bubble sort method. Give an example.

7. Why we use Queue? Explain the concept of Dequeue.

8. What are the properties of good hash function? What is linear probing?

9. (a) Create a B-tree of order 5, when the keys arrive in the following order:
    a, f, g, b, d, m, j, e, s, l, x, r, y, c

(b) Create a binary search tree when the elements arrive in the following order:
    10, 5, 20, 7, 29, 11, 23, 29, 13, 12