Total No. of Questions—**12**] [Total No. of Printed Pages—**4+1**

Seat No.	

[4657]-75

S.E. (Computer) (Second Semester) EXAMINATION, 2014

DATA STRUCTURES

(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

N.B. **:—** (*i*) Answer *three* questions from Section I and *three* questions from Section II.

(*ii*) Answers to the two Sections should be written in separate answer-books.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Figures to the right indicate full marks.

(*v*) Assume suitable data, if necessary.

SECTION I

1. (*a*) What is binary tree ? What is a binary search tree ? How is it different from a basic tree ? Explain with figures. [8]

(*b*) What is binary tree traversal ? Write recursive function for any *two* traversal algorithms. [8]

(*c*) Write any *four* applications of binary trees. [2]

P.T.O.

Or

2. (*a*) Construct Huffman tree based on the following character weights :

E = 15 T = 12 A = 10 O = 08 R = 07 N = 06 S = 05

U = 05 I = 04 D = 04 M = 03 C = 03 G = 02 K = 02

Also give Huffman code assignment at each node. [8]

(*b*) What is binary tree traversal ? Write Pseudo code for inorder traversal of the threaded binary tree. [10]

3. (*a*) What is minimum spanning tree ? Find out minimum spanning tree for the given graph step-by-step. (Refer Fig. 1) [8]

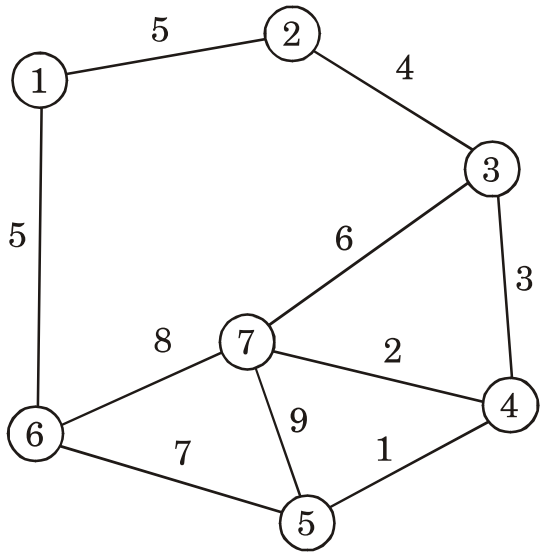

Fig. 1

(*b*) What are graph storage structures ? Explain in detail. [8]

Or

4. (*a*) Write algorithm for Breadth First Traversal of the graph and give suitable example for the same. [8]

(*b*) Write Dijkstra's Algorithm for finding shortest path and explain it with example. [8]

5. (*a*) What is bucket hashing ? Explain with example. [8]

(*b*) Explain with example LL, LR, RR, RL rotation for AVL tree. [8]

Or

6. (*a*) What is hash function ? What are characteristics of a good hash function ? Explain any *two* hash function. [8]

(*b*) (*i*) What is AVL tree ? Explain with *one* example. [4]

(*ii*) Explain static and dynamic tree tables. [4]

SECTION II

7. (*a*) Explain in brief MAX heap and MIN heap. Write a step-by-step solution to create a MAX heap for given list of elements {35 75 30 85 40 45 65}. [10]

(*b*) What is B tree ? Explain the process for deleting a particular value from B tree. [8]

Or

8. (*a*) Write stepwise solution to sort above data (Q. 7 (*a*)) using heapsort. Write complexity of heapsort. [10]

(*b*) What is multiway tree ? State need of multiway trees. Explain B+ tree in brief. [8]

9. (*a*) (*i*) What is file ? Explain types of files. [4]

(*ii*) Explain different primitive operations on a file. [4]

(*b*) Write short notes on inverted and cellular partition. [8]

Or

10. (*a*) Explain in detail sequential file organization and direct file organisation. [8]

(*b*) What is a indexing ? Write *one* advantage of indexing and write types of indexing. [8]

11. (*a*) (*i*) Differentiate between structures and classes. [4]

(*ii*) What is STL ? What are the components of STL ? [4]

(*b*) Write a 'C++' program using STL to perform sorting of given array of integers using bubble sort technique. [8]

Or

12. (*a*) Explain the following terms : [2×4=8]

(*i*) Containers

(*ii*) Iterations

(*iii*) Algorithms

(*iv*) Generic programming.

(*b*) Give the implementation of a queue using list in a STL with respect to : [8]

(*i*) Insertion of an element

(*ii*) Deletion of an element.