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

Seat No.	

[4757]-186

S.E. (Computer) (Second Semester) EXAMINATION, 2015

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*) Write a pseudo code c/c++ to delete a node from binary search tree. [6]

(*b*) Explain binary tree traversal, with suitable example. [6]

(*c*) Explain *three* applications of binary tree. [6]

Or

2. (*a*) Explain Huffman's code with suitable example. [6]

(*b*) Write an ADT for BST. [4]

(*c*) Write the pseudo c/c++ code of inorder threaded binary tree. [8]

P.T.O.

3. (*a*) What are graph storage structures ? [4]

(*b*) Explain the graph traversal techniques with suitable example. [8]

(*c*) What is minimum spanning tree ? Write *three* applications of this. [4]

Or

4. (*a*) Explain topological sorting with suitable example. [8]

(*b*) Write step-by-step solution using Kruskal's algorithm for finding out minimum spanning tree of the given graph. [8]

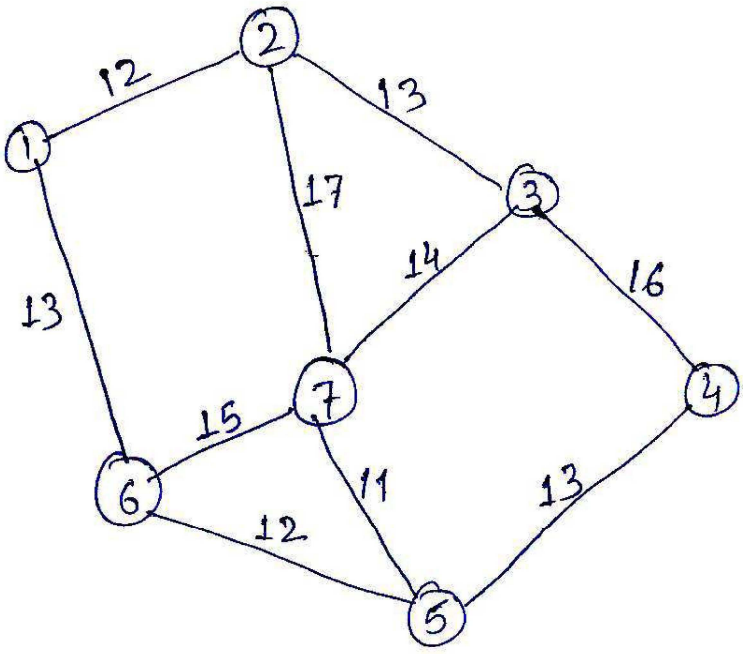

Fig. : Given Graph for Finding MST.

5. (*a*) What is AVL tree ? Explain, what are its transformation. [8]

(*b*) What is hash function ? What are characteristics of a good hash function ? Explain any *two* hash functions with suitable example. [8]

Or

6. (*a*) What is collision ? Explain any *one* collision resolution technique with suitable example. [8]

(*b*) Create an AVL tree for the following data : [8]

30, 31, 32, 23, 22, 28, 24, 29, 26, 27, 34, 36.

SECTION II

7. (*a*) What is heap ? Explain max and min heap and write its any *two* applications. [8]

(*b*) Explain the steps to be build a tree of order 5 for the following data : [10]

78, 21, 14, 11, 97, 85, 74, 63, 45,
42, 57, 20, 16, 19, 32, 30, 31.

Or

8. (*a*) Sort the following data in ascending order using heap sort : [8]

6, 5, 3, 1, 8, 7, 2, 4.

(*b*) Write a pseudo code c/c++ to insert the node in B-tree. Explain with suitable example. [10]

9. (*a*) What is directed file organisation ? Write its *two* advantages and *two* disadvantages. [8]

(*b*) What are *four* differences in between sequential and random access file ? [8]

Or

10. (*a*) What are external storage devices ? Explain in brief any *four*. [8]

(*b*) What are different types of indices ? [4]

(*c*) What is file ? Explain the types of file. [4]

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

(*i*) ADT

(*ii*) Classes and Objects

(*iii*) Generic Programming

(*iv*) Template class.

(*b*) What is iterator and container ? Explain different types of iterators in brief. [8]

Or

12. (*a*) Write a program in c/c++ to implement stack using STL. [8]

(*b*) Write the implementation of queue using list in STL : [8]

(*i*) Insertion of an element

(*ii*) Deletion of an element.