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Question Paper Code : X20391

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
AND APRIL/MAY 2021
Third Semester
Computer Science and Engineering
CS 6301 – PROGRAMMING AND DATA STRUCTURES – II
(Common to Information Technology)
(Regulations 2013)
(Also Common to PTCS 6301 – Programming and Data Structures – II for B.E. Part-Time – Computer Science and Engineering – Second Semester – Regulations 2014)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. List the features of Object Oriented C++ Programming.
2. Mention the advantages of using member functions.
3. How does a C string differs from a C++ type string ?
4. Distinguish the term overloading and overriding.
5. What is an abstract class ?
6. What is a function adaptor ?
7. What are the various operations that can be performed on B-trees ?
8. What are Splay trees ?
9. Define Graph data structure.
10. State the use of Floyd Warshall Algorithm.

PART – B **(5×13=65 Marks)**

11. a) i) Describe the different mechanisms for accessing data members and member functions in a class with a suitable example. **(9)**

ii) Explain the role of 'this' pointer. **(4)**

(OR)

b) What is a constructor ? Explain the different types of constructors with suitable examples. **(13)**

12. a) Describe in detail dynamic memory allocation in C++ with examples. **(13)**

(OR)

b) Explain the types of inheritance in detail. **(13)**

13. a) i) Define STL. Explain its key components and types. **(5)**

ii) Write C++ code using function template to sort the items of an array. **(8)**

(OR)

b) i) Write C++ file handling routine to copy one content of file into another file. **(7)**

ii) Explain the use of exception handling in C++ with suitable example. **(6)**

14. a) i) Define AVL tree and starting with an empty AVL search tree, insert the following elements in the given order : 35, 45, 65, 55, 75, 15, 25. **(7)**

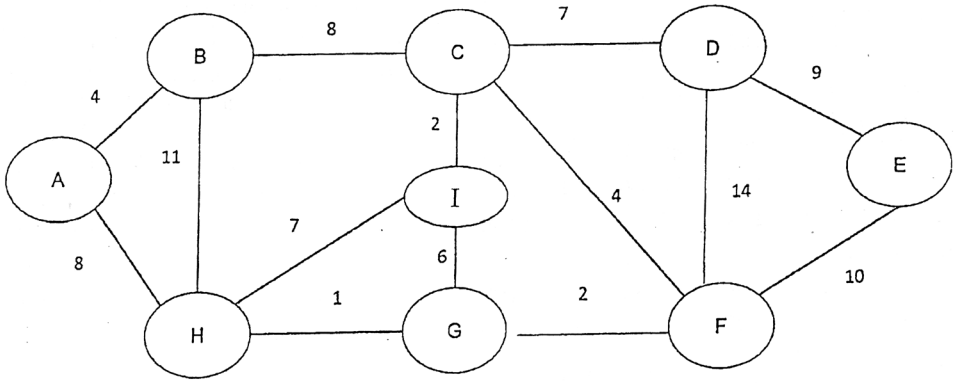
ii) Explain the AVL rotations with a suitable example. **(6)**

(OR)

b) Illustrate the construction of Binomial Heaps and its operations with a suitable example. **(13)**

15. a) i) Write procedure of Dijikstra's Algorithm. **(4)**

ii) Consider the given graph. Determine the shortest distance to all other nodes using Dijikstra's algorithm, starting at the vertex A. **(9)**



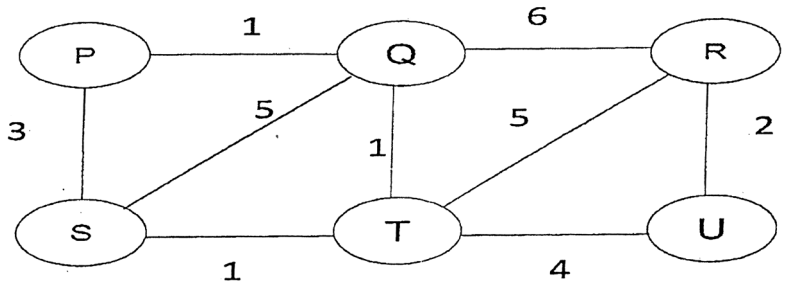
Dijikstra's Algorithm

(OR)

b) i) Define Minimum Spanning Tree (MST). **(2)**

ii) For the given graph, use Kruskal's algorithm to determine the MST. **(8)**

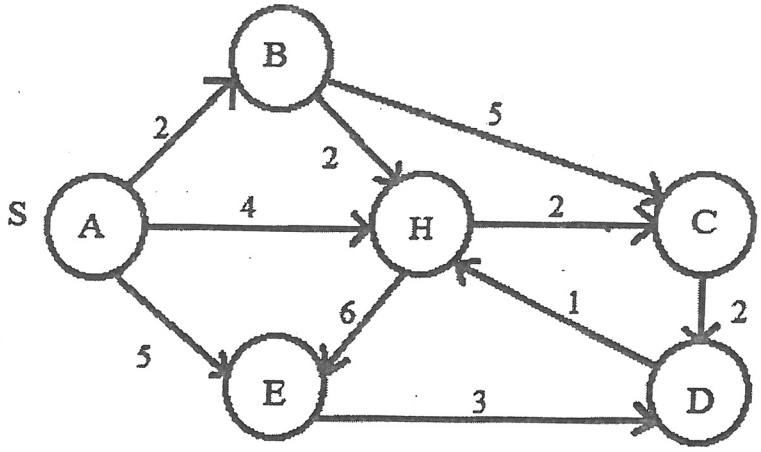
iii) Evaluate the cost of MST. Write procedure(s). **(3)**



Prim's Algorithm

PART – C **(1×15=15 Marks)**

16. a) Using Dijikstra's algorithm, find the shortest path from the source node A. **(15)**



(OR)

b) Write a C++ generic function with multiple parameters that performs recursive binary search on a linear array. **(15)**