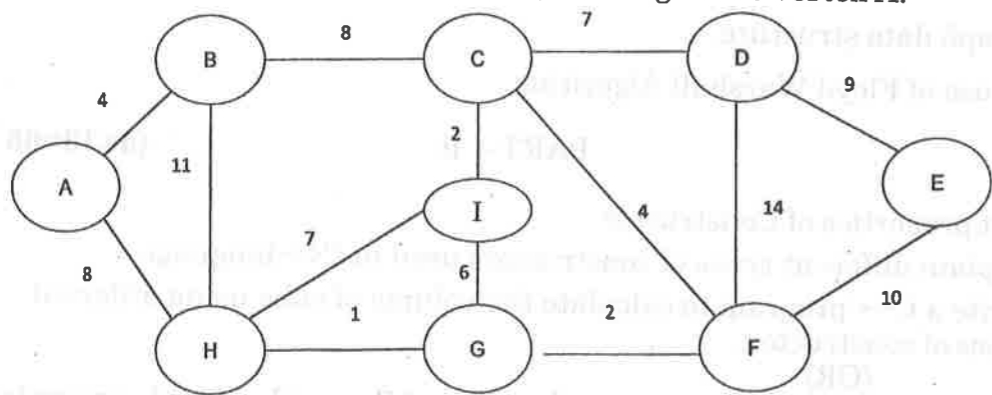


12. a) i) Demonstrate the use of function overloading in C++. (3)
 ii) List rules for operator overloading in C++. (3)
 iii) Write C++ program to overload + operator. (7)
 (OR)
- b) Write a C++ program to create a class **Employee** and include two derived classes called **Manager** and **Clerk**. Add appropriate data members and member functions and explain the concept of inheritance using this example. Assume Clerk and Manager have different pay schemes. Write suitable member functions to calculate pay of each employee of type Clerk and Manager. (3+3+3+4)
13. a) i) Write the uses of Exception handling. (2)
 ii) Explain different keywords used in Exception handling. (3)
 iii) Demonstrate the use of exception handling in C++ language. (8)
 (OR)
- b) i) Write C++ file handling routine to copy one content of file into another file. (6)
 ii) Demonstrate the use of Runtime polymorphism in C++ language. (7)
14. a) i) Define Balance Factor of AVL Tree. (2)
 ii) Insert the following keys into empty AVL tree one by one 44, 30, 76, 16, 39, 37. (8)
 iii) Write procedure for single and/or double rotations. (3)
 (OR)
- b) i) Write the properties of B-tree. (2)
 ii) Construct B-tree of order $m = 5$ for the following keys. 1 12 8 2 25 5 14 28 17 7 52 16 48 68 3 26 29 53 55 45 (8)
 iii) Delete the keys 8 and 55. State the rules for deletion. (3)
15. a) i) Write procedure of Dijkstra's Algorithm. (4)
 ii) Consider the given graph. Determine the shortest distance to all other nodes using Dijkstra's algorithm, starting at the vertex A. (9)

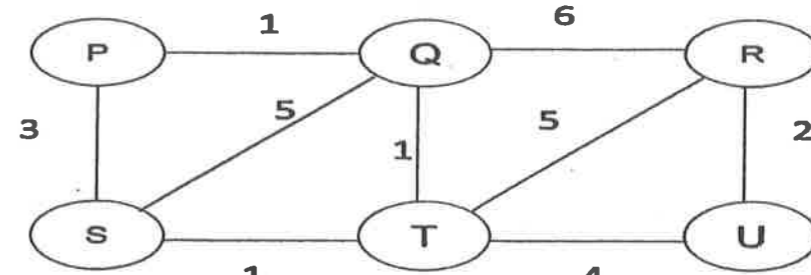


Dijkstra's Algorithm

(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) Write C++ programs.
 i) Use function template to determine maximum of two values. (7)
 ii) Use class template to implement generic methods of stack (push and pop). (8)
- OR
- b) Identify the suitable tree data structure for representing data {50, 30, 60, 40, 35, 80, 90} so that the time complexity involved in searching the key should be minimum. Try three different nonlinear data structures and give diagrammatic representation of data. The data size may grow in future and may take any value. Justify your answer with valid reasons. (5+5+5)