Practical 4A

Aim -

Prims Algorithm

Code

```
import java.io.*;
import
java.lang.*;
import
java.util.*; class
Prims {
  private static final int V = 5;
  int minKey(int key[], Boolean mstSet[]){
    int min = Integer.MAX_VALUE, min_index =
    -1; for (int v = 0; v < V; v++)
      if (mstSet[v] == false && key[v] <
        min) { min = key[v];
        min_index = v;
      }
    return min_index;
  }
  void printMST(int parent[], int graph[][])
  {
    System.out.println("Edge \tWeight");
    for (int i = 1; i < V; i++)
       System.out.println(parent[i] + " - " + i
                          + "\t"
                + graph[i][parent[i]]);
  }
  void primMST(int graph[][])
  {
    int parent[] = new
    int[V]; int key[] = new
    int[V];
    Boolean mstSet[] = new Boolean[V];
    for (int i = 0; i < V; i++) {
      key[i] = Integer.MAX_VALUE;
      mstSet[i] = false;
```

```
    }
    key[0] = 0;
```

```
    parent[0] = -1;
    for (int count = 0; count < V - 1;
      count++) { int u = minKey(key,
      mstSet);
      mstSet[u] = true;
      for (int v = 0; v < V; v++)
        if (graph[u][v] != 0 && mstSet[v] ==
          false && graph[u][v] < key[v]) {
          parent[v] = u;
          key[v] =
          graph[u][v];
        }
    }
    printMST(parent, graph);
  }
  public static void main(String[] args)
  {
    Prims t = new Prims();
    int graph[][] = new int[][] { { 0, 2, 0, 6, 0 },
                    { 2, 0, 3, 8, 5 },
                    { 0, 3, 0, 0, 7 },
                    { 6, 8, 0, 0, 9 },
                    { 0, 5, 7, 9, 0 } };
    t.primMST(graph);
  }
}
```

Output

Edge	Weight
0 - 1	2
1 - 2	3
0 - 3	6
1 - 4	5