7 a. Explain and design Prim's algorithm and apply it for the given graph in Fig.Q7(a) to find minimum cost spanning tree. **(10 Marks)**

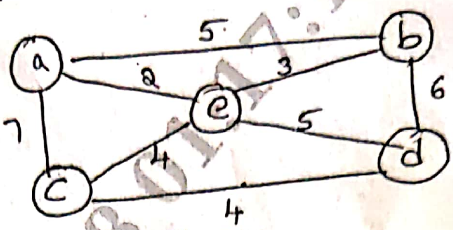

Fig.Q7(a)

b. Construct a Huffman code for the following data :

Character	A	B	C	D	-
Probability	0.4	0.1	0.2	0.15	0.15

Encode the test ABACABAD
and decode 100010111001010. **(10 Marks)**

8 Write short notes on :
a. Sum of subset problem
b. Decision tree
c. n-Queens problem
d. Master Theorem **(20 Marks)**

* * * * *

8 a. What is asymptotic notation? List and explain the asymptotic notations. **(10 Marks)**

b. List the steps involved in analyzing the time efficiency of recursive algorithm. Explain the tower of Hanoi problem and analyze its efficiency. **(10 Marks)**

9 a. Write an algorithm for merge sort and find its time complexity of merge sort. **(10 Marks)**

b. Write an algorithm to sort given n elements using bubble sort and obtain an expression for number of times basic operation is executed. **(05 Marks)**

c. Obtain the topological ordering of the given graph by using the source removal method. (Refer Fig.Q.9(c)). **(05 Marks)**

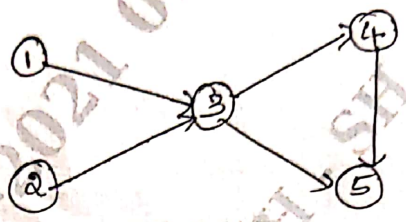

Fig.Q.9(c)

10 a. Write a Prim's algorithm. Apply this algorithm to the following graph to construct minimum spanning tree. (Refer Fig.Q.10(a)). **(10 Marks)**

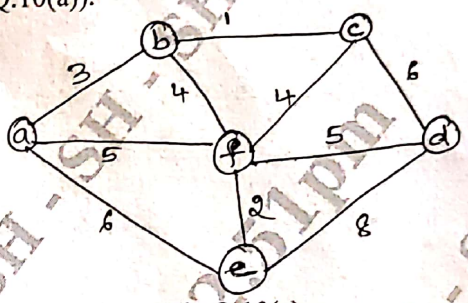

Fig.Q.10(a)

b. Obtain the shortest distance and shortest path from "a" node to all other nodes in a graph. (Refer Fig.Q.10(b)). **(10 Marks)**

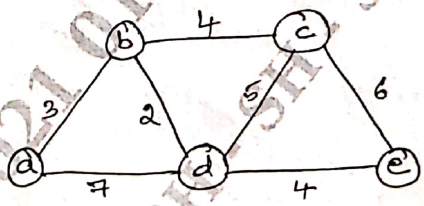

Fig.Q.10(b)

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