College of Engineering, Pune

An Autonomous Institute of the Government of Maharashtra

End–Semester Examination-November 2013

CT 413 Elective I- Algorithm and Complexity

Class: - BTech (Information Technology)

Year: - 2013-2014 **Semester: - I**

Duration: - 3 hr **Max. Marks: - 60**

Instructions:

1. *All the Questions are compulsory*
2. *Assume suitable data whenever necessary*
3. *Draw neat figures wherever required*
4. *Figures to right indicate full marks*

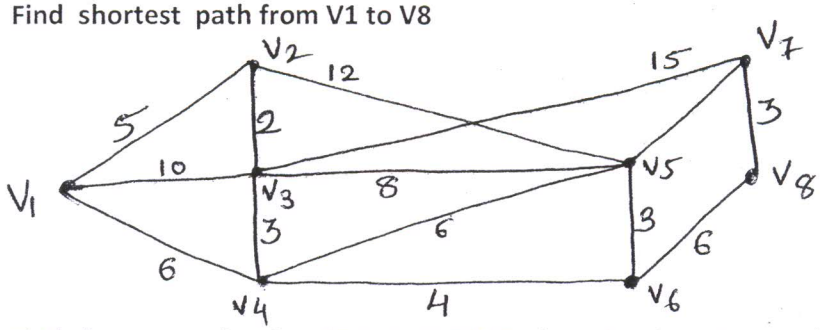
Q.1 Find the LCS from the given two sequence of characters. [6]

A. P={A,B,C,D,B,A,C,D,F} Q={C,B,A,F}

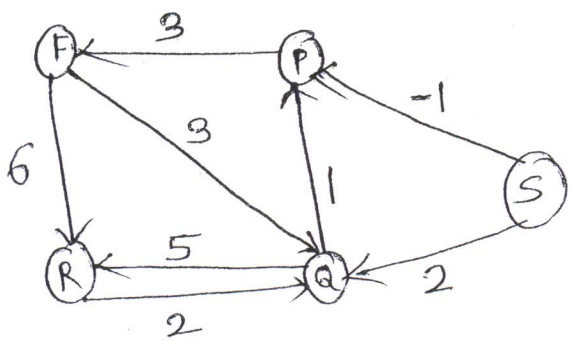
B. P={1,0,0,1,0,1,0,1} Q={0,1,0,1,1,0,1,1,0}

Q.2 Find an optimal solution for the Knapsack Instances [5]
n=7,M=15,(P1,P2,P3,.....P7)=(10,5,15,7,6,18,3)&(w1,w2,...w7)=(2,3,5,7,1,4,1)

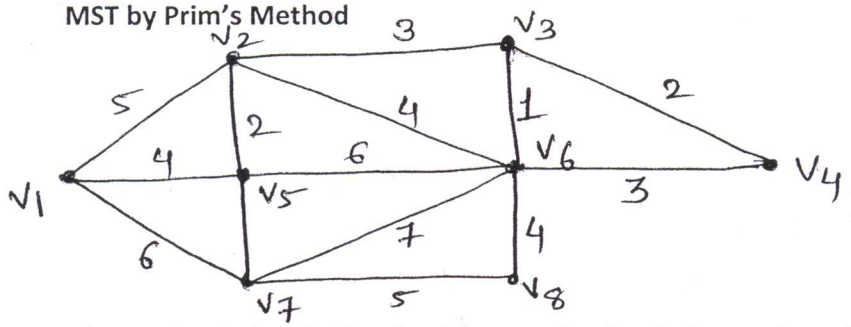
Q.3 Find shortest path from V1 to V8 [5]



Q.4 Find shortest path using BELLMAN-FORD algorithm from S to F of the following Fig. [5]

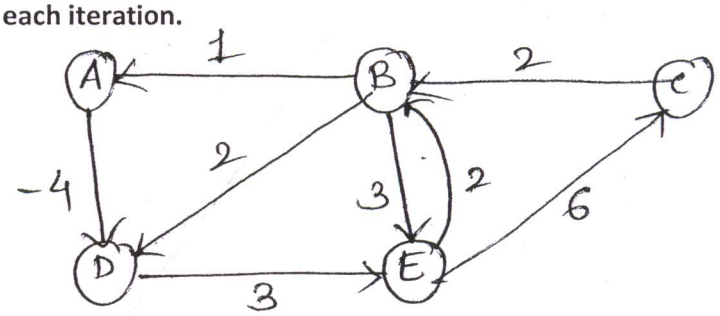


Q.5 For the graph shown below obtain the following [6]
MST by Kruskal's Method
MST by Prim's Method



Q.6 Discuss Kruskal and Prim algorithms and write their pseudo codes. [5]

Q.7 Apply Floyd-warshall algorithm for constructing shortest path.Show the matrix D^(k) that results each iteration. [6]



Q.8 Show the comparisions the naive string matcher makes for the pattern p=0001 in the text T=000010001010001 [6]
Explain pseudo code for Naive string Matching Algorithm.

Q.9 Compute the prefix function Π for the pattern ababbabbabbababbabb [5]
When the alphabet is Σ={a,b}

Q.10 [3]

A. Consider the Recurrence
T(n)=14T(n/2)+n^2
T(n)=9T(n/3)+n
Find the asymptotic bound. [3]

A. B. Consider the Recurrence
T(n)=T(n/3)+T(2n/3)+n
Obtain the asymptotic bound using recursion tree Method

Q.11 Consider inserting the keys 10,22,31,4,15,28,17,88 & 59 into hash table of length m=11 using open addressing with the primary hash function h'(k)=k mod m. Illustrate the result of inserting these keys using linear probing,using quadratic probing with c1=1 and c2=3 and usind double hashing with h2(k)=1+(k mod(m-1)) [5]