MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

(B.TECH CSE) (V Semester)

Assignment-2

COURSE CODE: ETCS-301

COURSE TITLE: ALGORITHM ANALYSIS AND DESIGN

Q1: Prove that the greedy algorithm HUFFMAN CODES is correct.

Q2: Define Matroids.

Q3 Prove all maximal independent subsets in a matroid have the same size.

Q4: Solve the task scheduling problem & also find the penalty.

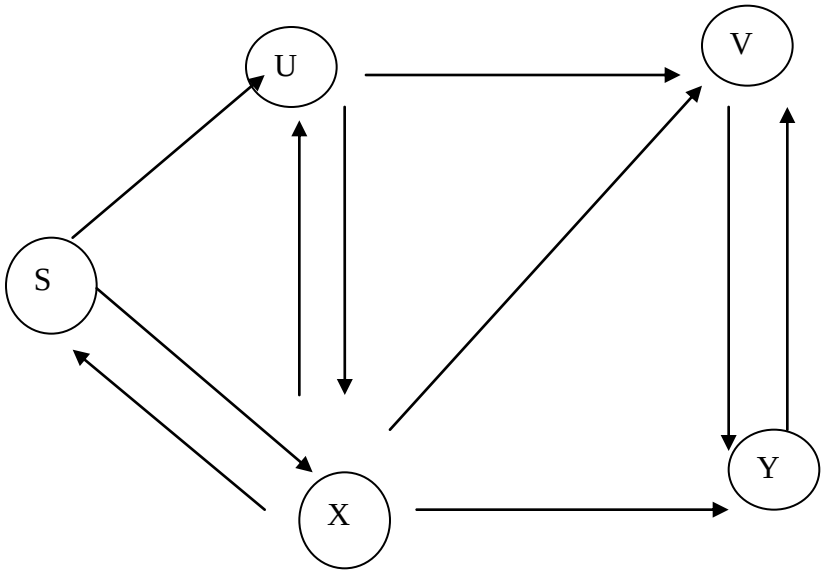
Ai	1	2	3	4	5	6
Di	4	5	2	4	6	2
Pi	30	40	50	70	80	60

Q5: Find the shortest path matrix for the graph whose weight matrix is given

$$D=\begin{pmatrix} 0 & 3 & 8 & 0 & -4 \\ 0 & 0 & 0 & 1 & 7 \\ 0 & 4 & 0 & 0 & 0 \\ 2 & 0 & -5 & 0 & 0 \\ 0 & 0 & 0 & 6 & 0 \end{pmatrix}$$

Q 6:Find the shortest path using Bellman Ford Algorithm for the following graph taking S as source

Distances are as follows:
SU:10
SX:5
XS:7
XY:2
XV:9
XU:3
YV:4
VY:6
UV:1
UX:2



Discuss what happens when the distance XU changes to -3.

Q7: Show that clique problem is NP –complete.