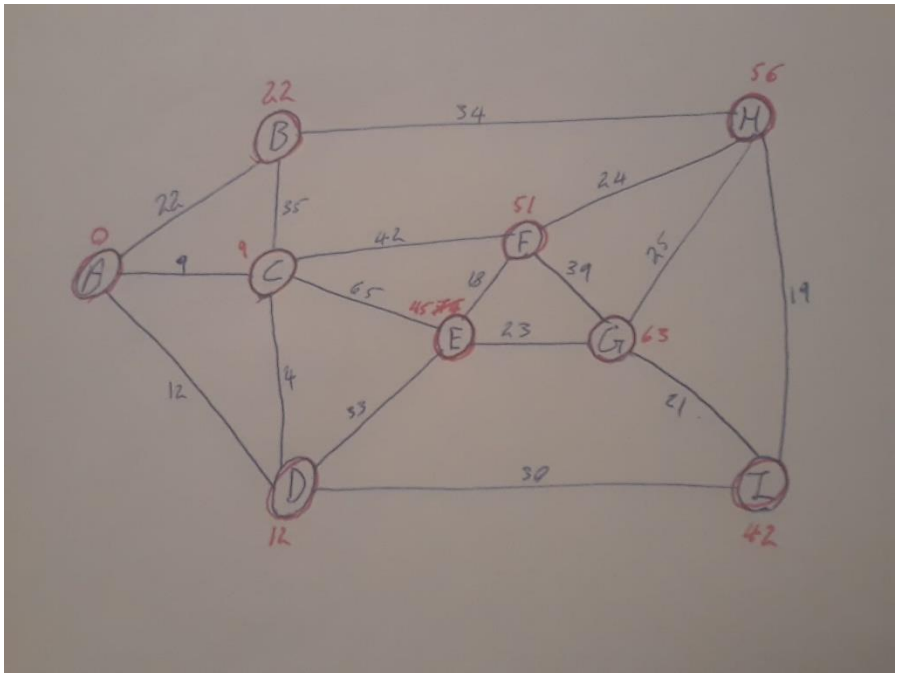
W3D6

1,

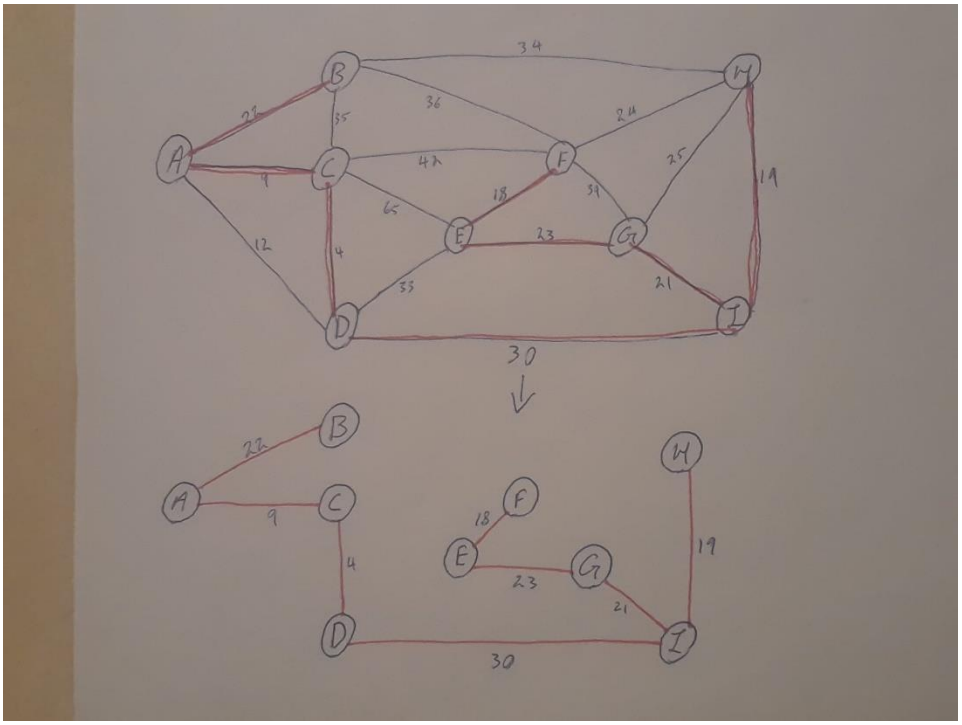
	A	B	C	D	E	F	G	H	I
A	0	22	9	12	0	0	0	0	0
B	22	0	35	0	0	36	0	34	0
C	9	35	0	4	65	42	0	0	0
D	12	0	4	0	33	0	0	0	30
E	0	0	65	33	0	18	23	0	0
F	0	36	42	0	18	0	39	24	0
G	0	0	0	0	23	39	0	25	21
H	0	34	0	0	0	24	25	0	19
I	0	0	0	30	0	0	21	19	0

2,



3, Time complexity is O(mlogn).

4,



5,Time complexity is O(ElogE) where E is number of edges .

6,

	P	Q	T	S	R	U
P	0	1	7	6	0	0
Q	0	0	0	4	1	0
T	0	0	0	3	0	2
S	0	0	3	0	2	2
R	0	0	0	2	0	1
U	0	0	0	0	0	0

7,

D[P]=0

D[Q]=min{D[p]+ wt(P,Q)|(P,Q) elemnt of E}

=min{0+1}=1

D[R]=min{D[Q]+ wt(Q,R)|(Q,R) elemnt of E}

=min{1+1}=2

D[S]=min{ D[p]+ wt(P,S) , D[Q]+wt(Q,S), D[R]+wt(R,S) | (P,S),(Q,S),(R,S) elemnt of E}

=min{0+6,1+4,2+2}=4

D[T]=min{D[p]+ wt(P,T) , D[S]+wt(S,T) | (S,T) (P,T) elemnt of E}

=min{0+7,4+3}=7

D[U]=min{ D[R]+ wt(R,U) , D[S]+wt(S,U), D[T]+wt(T,U) | (R,U),(S,U),(T,U) elemnt of E}

=min{2+1,4+2,7+2}=3

8.Time complexity is O(m+n) where n is number of nodes and m is number of edges

9.yes by using Dijkstra's algorithm the shortest path is {(P,Q),(Q,R),(R,U)} which is 3

10,

step 1

A[P]=0

B[P]={}

Put P in X

Step2

X={P}

Find the minimum of the following

d[Q]=d[P]+wt(P,Q)=0+1=1 ←

d[S]=d[P]+wt(P,S)=0+6=6

d[T]=d[P]+wt(P,T)=0+7=7

Add Q to X

Step 3 X={P,Q}

Find minimum of the following

d[S]= d[P]+wt(P,S)=0+6=6

d[T]=d[P]+wt(P,T)=0+7=7

d[S]=d[Q]+wt(P,S)=1+4=5

d[R]=d[Q]+wt(Q,R)=1+1=2 ←

Add R to X

Step 4

X={P,Q,R}

Find the minimum of the following

d[S]= d[P]+wt(P,S)=0+6=6

d[S]=d[Q]+wt(P,S)=1+4=5

d[T]=d[P]+wt(P,T)=0+7=7

d[S]=d[R]+wt(R,S)=2+2=4

d[U]=d[R]+wt(R,U)=2+1=3 ←

Add U to X

X={P,Q,R,U}

The targeted vertex is U so shortest way is P,Q,R,U with length 3.