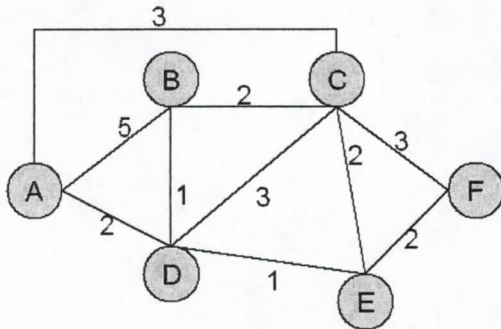


Student Number: \_\_\_\_\_

Signature: \_\_\_\_\_

The exam accounts for 70% and exercises account for 30% of the course grade. Thus, the exam accounts for maximum of 7 points.

- 1- Fill in the routing table above according to Dijkstra's algorithm (1p)



Step	N	D(B) p(B)	D(C) p(C)	D(D) p(D)	D(E) p(E)	D(F) p(F)
0	A	5,A	3,A	2,A	$\infty$	$\infty$
1	A,D					
2						
3						
4						
5						

D(v)= cost of the path from the source to destination v that has currently as of this iteration of the algorithm, the least cost  
 p(v) =previous node, neighbor of v along the current least-cost path from the source to v  
 N= the set of nodes whose least-cost path from the source is definitely known

- 2- A server is sending an mp3 file with size 15000bytes over TCP/IP. The first link is Ethernet, the second link is PPP with payload 512bytes and last link is again Ethernet. Indicate the overhead generated across the path by the TCP/IP protocols after messages getting fragmented in each link. Note the 5000bytes is considered media payload that will go into the TCP/IP message that will be fragmented into the Ethernet packets. The Ethernet payload is then encapsulated into the PPP payload. (2p)
- 3- User is downloading a video file mp4 file size = 12 MB (Megabytes). Assume the data is carried in TCP segments. How many packets are needed if the link layer is Ethernet with jumbo frames? (2p)
- 4- Indicate what is SIP and indicate the messages between two users that want to establish a voice call where user one supports PCM at 8000samples/second and AMR WB but the other user supports MP3 and AMR WB(2p).