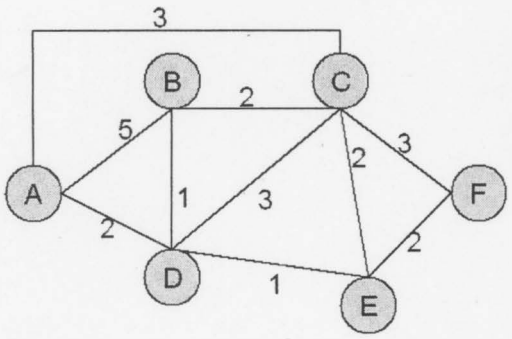
Helsinki University of Technology
S-38.2188

Exam 1
12.12.2013

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 Dijskstra'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	∞	∞
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 5000bytes 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 = 4 MB (Megabytes). Assume the data is carried in TCP segments. How many packets are needed if the link layer is Ethernet? (2p)

4- A network is serving 3 media streams using RTP/RTCP from internal address range starting on 192.168.0.1 and port 3345. The network is using a NAT that offers public IP address 128.119.40.86 and does the mapping from internal address into the public address starting from port 4000. What would be the translation table between LAN and WAN (2p).