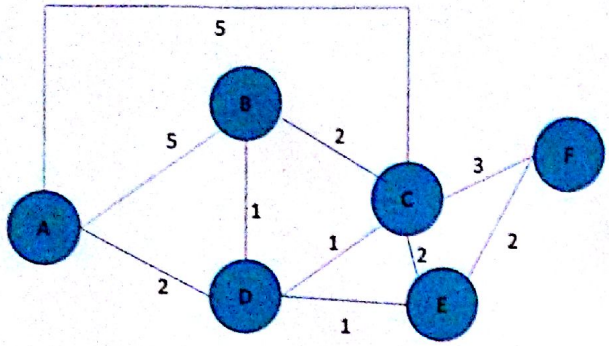
Helsinki University of Technology
S-38.2188

Exam 1
4.12.2014

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 considering the links between router B-C=10Km and D-C=10m are both using 1Gbs links Ethernet. (2p)



STEP	N	D(B), p(B)	D(C), p(C)	D(D), p(D)	D(E), p(E)	D(F), p(F)
1						
2						
3						
4						
5						

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

2- A server is sending an mp4 file with size 4500bytes over TCP/IP. In each link there is a TCP application that would do segmentation at TCP level. The first link is Ethernet, the second link is PPP with 512 bytes payload and last link is again Ethernet. Indicate the accumulated overhead generated across all the paths by the TCP/IP protocols after messages getting fragmented in each link. Note the 4500bytes is considered media payload that will go into the TCP/IP message. The Ethernet payload is then encapsulated into the PPP payload. (2p)

3- A TCP client wants to send 3500Bytes packet over Ethernet. Considering both client and server MSS is 2 packets. Describe the TCP handshake and highlight the value of all the fields considering SEQ number for the client when start sending data is 345. (1p)

4- Encrypted and decrypt the following message "HI" using public and private key, considering primes p=7 and q=11 and pick e=7 that is relatively prime. The encryption is done for each letter individually and decimal value of H=72 and I= 73 (1p)

5- Define the SDP messages between two mobile devices where one device supports PCM and AMR WB but the other terminal supports MP3 and AMR WB. (1p)