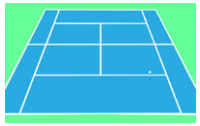
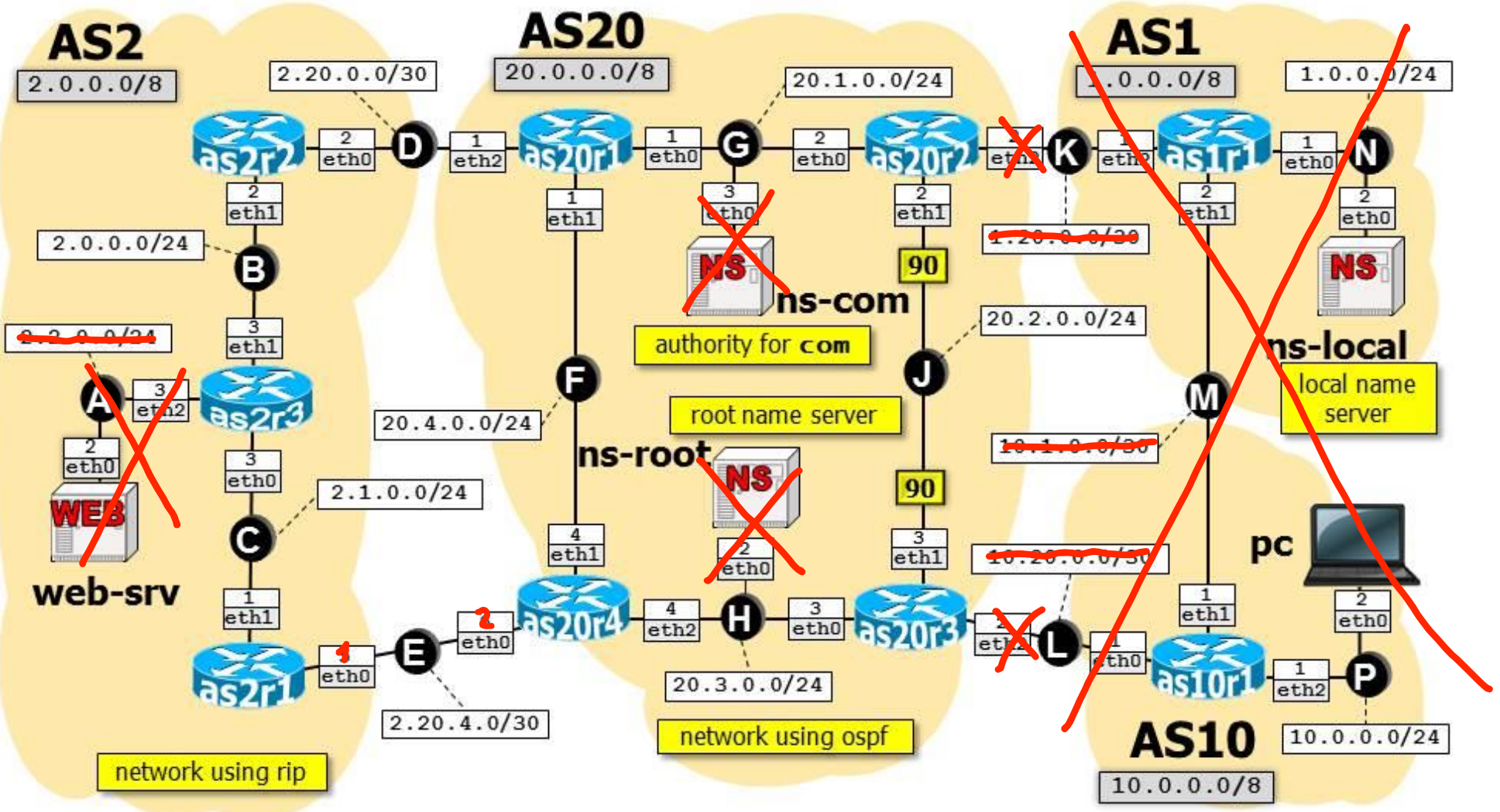
ICN – Examination date: 01 Jul 2016 – "Tennis"



Available time: 120 minutes.



Using Netkit, implement the network depicted in the figure and described below.

- ☐ Remember to set up a default route on all the end systems.
- ☐ Routing within AS2 is implemented by using RIP.
  - as2r2 injects in RIP all the routes learned via BGP.
- ☐ Routing within AS20 is implemented by using OSPF.
  - All the interfaces belong to area 0.0.0.0.
  - Border routers inject BGP-learned routes into OSPF (do not worry about redistributing eBGP only: OSPF will automatically take care of this).
  - Some interfaces are assigned the OSPF costs specified in the picture. All the other interfaces have the default cost.
- ☐ Inter-domain routing is implemented by using BGP, which is set up as follows:
  - AS1, AS2, AS10 and AS20 also announce their own internal subnets, in gray.
  - All peering LANs are announced in BGP. No routers announce the default route 0.0.0.0/0.
  - Border routers in AS20 establish iBGP peerings with each other. Pick the IP addresses of network interfaces consistently with OSPF routing in order to establish such peerings.
  - AS2 prefers announcements received from link D, instead of those received from link E.
  - AS2 announces to AS20 its own routes in such a way that AS20 prefers announcements received from link E, instead of those received from link D.
  - as10r1 prefers announcements received from AS1 instead of those sent by AS20.
- ☐ A DNS is available on the network, set up as follows:
  - ns-local is the local name server for pc.
  - ns-root is the root name server.
  - ns-com is the authority for zone com.
  - The only relevant DNS name is web.com, which is associated with IP address 2.2.0.2.
- ☐ web-srv is a Web server running apache, which serves a private web page for the "guest" user, accessible by using the URL http://web.com/~guest/.

Goals: IP routing must comply with the above requirements. In particular:
- packets from pc to 2.2.0.2 must traverse links P, M, K, G, F, E, C, A;
- packets from 2.2.0.2 to pc must traverse link A, B, D, F, H, L, P.

It must be possible to access the Web page http://web.com/~guest/ from pc.