CS 640 Introduction to Computer Networks

Quiz 6

Write your name on the exam. Write something for every question. Students who do not write something for everything lose out over students who write down wild guesses. You will get some points if you attempt a solution but nothing for a blank sheet of paper. Write something down, even wild guesses. Problems take long to read but can be answered concisely.

Question	Maximum	Score
1	2	
2	18	
Total	20	

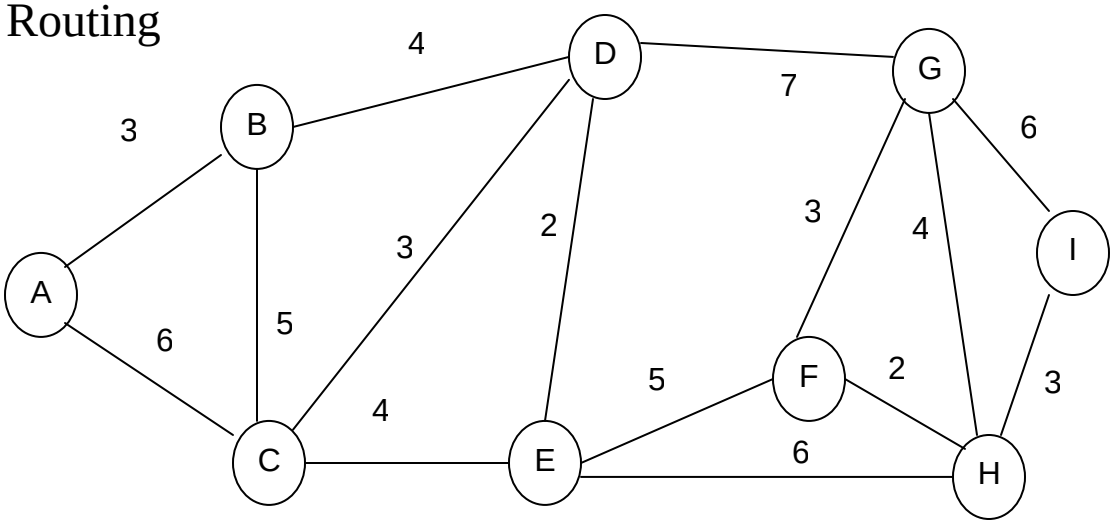
Question 1 – Control and data plane

Is forwarding in the IP control or data plane? What is its correspondent in the other plane?

Forwarding (deciding where to send a packet by doing a lookup in the forwarding table) is in the data plane and its correspondent in the control plane is routing (building the forwarding tables).

Question 2 – Routing

This figure shows the topology of an ISP's backbone. The ISP uses a link state IGP with weights for the links as shown. If the cost of two paths is the same, the IGP uses a random "coin flip" to break the tie.



a) What are the shortest paths from C to H, B to G, and A to I?

$C \rightarrow E \rightarrow H$
$B \rightarrow D \rightarrow G$
$A \rightarrow B \rightarrow D \rightarrow E \rightarrow H \rightarrow I$

b) Due to a bug, router E's link state database got corrupted. It "thinks" that the distance from G to I is 1 instead of 6, from G to F is 1 instead of 3, from G to D 1 instead of 7, and from G to H 1 instead of 4. Packets from A to some destinations will be affected by this bug. List all those destinations and how the path of the packets is affected (only for packets entering the network at A).

Packets to F, H, and I are affected. They loop between D and E as D forwards the to E according to the correct shortest path and E forwards them to E according to the incorrect shortest path it computes based on the corrupted link state information.

c) Routers A and H both receive through BGP routing advertisements for prefix x/y. Which path will packets for prefix x/y entering at C take through the network for the following three cases of BGP advertisements? Assume the ISP has a simple BGP policy.

Advertisement received by A	Advertisement received by H	Path from C to x/y
Prefix x/y, ASPATH = 2 8 6	Prefix x/y, ASPATH = 2 8 6	$C \rightarrow A \rightarrow$...
Prefix x/y, ASPATH = 2 8 6	Prefix x/y, ASPATH = 2 7 6	C $\rightarrow A \rightarrow$...
Prefix x/y, ASPATH = 2 8 6	Prefix x/y, ASPATH = 2 6	C $\rightarrow E \rightarrow H \rightarrow$...