ITS 323 – QUIZ 4 (CS) ANSWERS

First name: _____ Last name: _____

ID: _____ Total Marks: _____
out of 10

Question 1 [6 marks]

True or False:

a) PDH, SDH and SONET are network technologies that use Synchronous Time Division Multiplexing T / F

b) Frame Relay and the Internet Protocol both use virtual circuit packet switching. T / F

c) Datagram packet switching requires a header to be added to each packet; virtual circuit packet switching *does not* add a header to each packet. T / F

d) Packets may arrive out of order in datagram packet switching networks. T / F

e) If the network is overloaded, a connection may be blocked in a circuit switched network; but in a datagram packet switched network, overload leads to higher packet delay. T / F

f) Random routing generates less overhead than flooding, but will not always send a packet over the path with least number of hops. T / F

Answers

True – All three use Synchronous TDM.

False – Although Frame Relay uses virtual circuit packet switching, IP does not (it uses datagram packet switching).

False – Both packet switching techniques add a header to each packet so the packet switches can identify where to send the packet

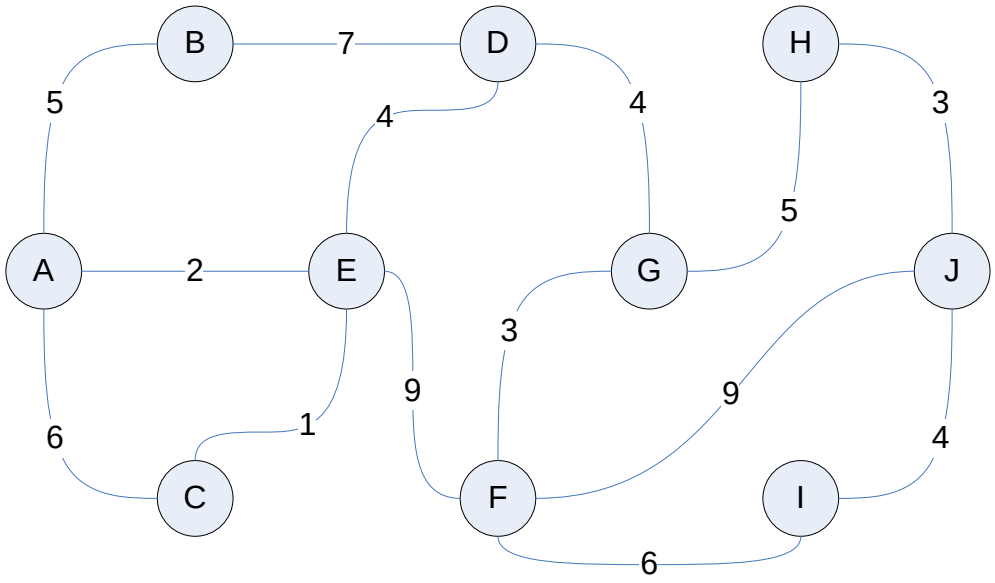
True – As packets may take different paths, in general it is possible for the first packet to arrive later than the second packet (out of order).

True – In circuit switching dedicated resources are needed for a connection – if they are not available (due to overload) then the connection may not be setup. In datagram packet switching, packets are sent without a connection setup – in the event of overload, queues may grow at switches/routers, leading to higher packet delay.

True – Random routing selects neighbour nodes to randomly send to, which means only one neighbour is sent to, not all neighbours (as in flooding). Hence less overhead. But a random route will not always be the least or shortest hop path.

Question 2 [4 marks]

Consider the network below. For each link a cost is shown. Assume the links are bi-directional, and the costs are identical in both directions.



The following routing table is created from a routing algorithm for the entire network.

		From Node									
		A	B	C	D	E	F	G	H	I	J
To Node	A	-	A	E	E	A	E	D	G	F	H
	B	B	-	A	B	A	G	D	G	F	H
	C	E	A	-	E	C	E	D	G	F	H
	D	E	D	E	-	D	G	D	G	F	H
	E	E	A	E	E	-	E	D	G	F	H
	F	E	D	E	G	F	-	F	G	F	F
	G	E	D	E	G	D	G	-	G	F	H
	H	E	D	E	G	D	G	H	-	J	H
	I	E	D	E	G	F	I	F	J	-	I
	J	E	D	E	G	F	J	H	J	J	-

a) What path is taken to send a packet from E to J [1.5 mark]?

Path: _____

b) What routing algorithm was used to create the data in the routing table (circle one) [1 mark]:

   a. Dijsktra's
   b. Bellman-Ford

c. None of the above

c) Explain your answer to part (b). [1.5 mark]

Answer

a. From E to J, the routing table says E sends to node F. Then node F sends to node J. Hence the path is E – F – J.

b. None of the above.

c. The path E – F – J has a path cost of 18. The least cost path from E to J is E – D – G – H – J with a cost of 16. Hence the routing table does not use the least cost path. Both Dijkstra and Bellman Ford select the least cost paths, and hence were not used to create the routing table.