

ITS 323 – QUIZ 1 (CS) ANSWERS

First name: _____ Last name: _____

ID: _____

Total Marks: _____

out of 10

Question 1 [2 marks]

Name the four different types of addresses used in the Internet layered model, and for each address type, give the layer at which it is used.

Answer

Physical addresses (hardware/MAC/data link) – Data Link and/or Physical layers

Logical addresses (IP/network) – Network layer

Port addresses (transport) – Transport layer

Application addresses (specific) – Application

Question 2 [2.5 marks]

True or false (circle the correct answer, T or F):

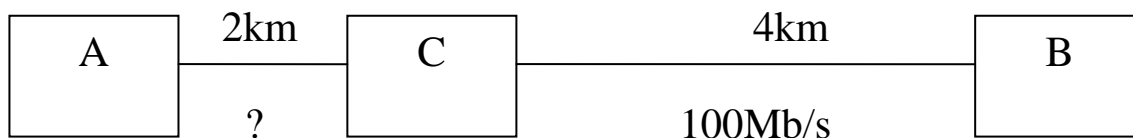
- a) Interactive voice traffic (e.g. a voice call over the Internet) generally requires a small and constant delay.
T / F
- b) A web browser, such as Firefox or Internet Explorer, would normally implement an entire TCP/IP stack (all layers).
T / F
- c) A PC or laptop computer may have one or more physical interfaces (e.g. a wired Ethernet interface and a wireless LAN interface). An Internet router will normally have only one interface.
T / F
- d) The Internet layered model includes the Network layer, Transport layer and Session layer.
T / F
- e) Most of the important protocols used in the Internet (e.g. TCP and IP) were developed by the International Organisation for Standardisation (ISO).
T / F

Answer

- a. T – delay and variances in delay make it difficult to undertake a conversation.
- b. F – Web browser implements HTTP (and other application layer protocols). It doesn't implement transport or lower layers.
- c. F – A router normally has at least 2 interfaces since a router interconnects different networks (1 interface for each network)
- d. F – The Internet layered model does not include the Session layer.
- e. F – Most Internet protocols were created by IETF (and individuals)

Question 3 [3.5 marks]

Consider the network shown below in which two cable links are used to connect A to B (via C).



Queuing delay is
10usec

If a message of size 1000 bits has to be sent from A to B with a maximum delay of 150usec, then what is the minimum data rate is required over the first link?

You can assume the transmission velocity is 2×10^8 m/s for each cable. Also assume there are no processing delays at any node, and no queuing delay at nodes A or B.

Answer

Propagation over first link = $2000 / 200000000 = 10\text{usec}$

Propagation over second link = 20usec

Transmission over second link = $1000/100000000 = 10\text{usec}$

Queuing delay = 10usec

So far the total delay is 50usec . Must be less than 150, so maximum for first link is 100usec

Transmission over first link = $100\text{usec} = 1000 / \text{rate}$

Therefore minimum rate = $1000 / 100\text{usec} = 10\text{Mb/s}$

Question 4 [2 marks]

In the Question above, if node A adds 100 bits of header to the message, and node C adds another 50 bits of header to the message it receives, then what is the throughput of the message if the maximum delay is experienced?

Answer

1000 bits of message are received within 150usec . Therefore throughput is:

$$1 \times 10^3 / 1.5 \times 10^{-4} = 1 / 1.5 \times 10^7 = 6.6 \text{ Mb/s.}$$