University of Dhaka
Institute of Information Technology
Bachelor of Science in Software Engineering (BSSE)
3rd Semester Final Examination, 2020 (Held in 2021)
CSE 311: Computer Networking

Marks: 30 **Time: 1 Hour 15 Minutes+ 15 Minutes Script Upload Time**

Professionalism Excellence Respect

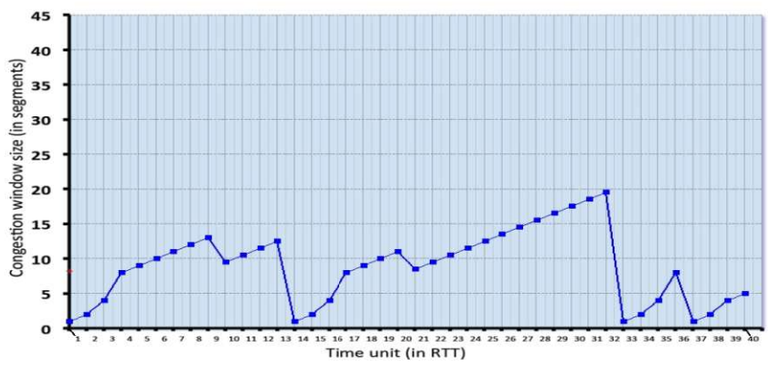
Answer all the questions. The weight of each question is mentioned at the right side

1. Let you have 10.0.0.0/23 reserved IP addresses for your customer's network. Currently you have 6 Customers whose network size are given below: **6**

Customer	No. of hosts and routers in their Network
Customer A	5
Customer B	8
Customer C	20
Customer D	72
Customer E	3
Customer F	55

Find the minimum IP subnet (Format: /n) is required for each customer. Then give the IP distribution plan to distribute IP addresses (Format: netaddress/n) to the customers. After fulfilling current costumers demand, what will remain to you for your future customers?

2. **6**



Consider the evolution of TCP's congestion window in the example above and answer the following questions. The initial value of cwnd is 1 and the initial value of ssthresh is 8.

i. Give the times at which TCP is in slow start, congestion avoidance and fast recovery at the start of a time slot, when is the flight of packets sent?

ii. Give the times at which the first packet in the sent flight of packets is lost, and indicate whether that packet loss is detected via timeout, or by triple duplicate ACKs.

iii. Give the times at which the value of ssthresh changes, and give the new value of ssthresh.

3. a) Suppose that a Web server runs in Host C on port 80. Suppose this Web server uses persistent connections, and is currently receiving requests from two different Hosts, A and B. Areall of the requests being sent through the same socket at Host C? If they are being passedthrough different sockets, do both of the sockets have port 80? Discuss and explain **3**

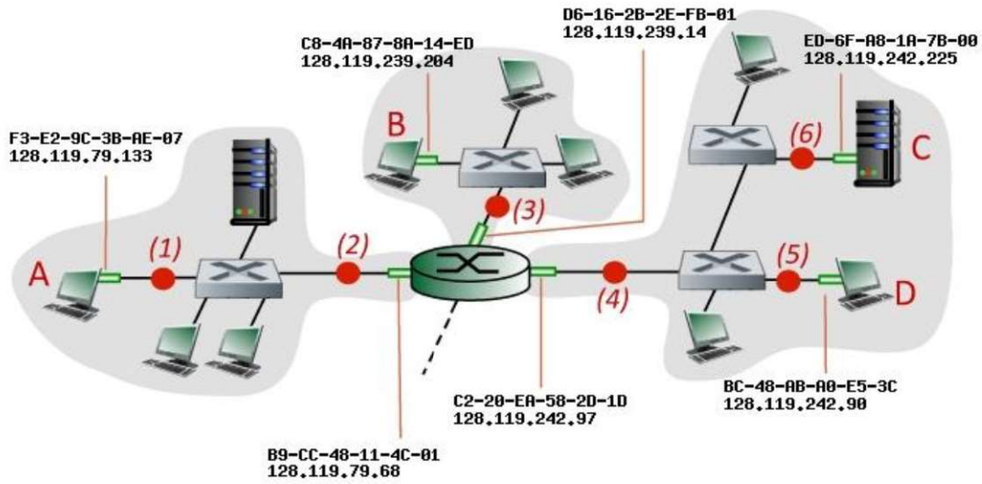
b) Suppose Host A sends two TCP segments back-to-back to Host B over a TCPconnection.The first segment has sequence number 1200; the second has sequence number 1450. **3**

i. How much data is in the first segment?

ii. Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number?

4. a) Suppose two nodes start to transmit at the same time a packet of length L over a broadcastchannel of rate R. Denote the propagation delay between the two nodes as d. Will there be a collision if $d < L/R$? Why or why not? **2**

b) **2**



Consider the figure above. The IP and MAC addresses are shown for nodes A, B, C and D, as well as for the router's interfaces. Consider an IP datagram being sent from node D to node A. Give the source and destination Ethernet addresses, as well as the source and destination addresses of the IP datagram encapsulated within the Ethernet frame at points *(5)*, *(4)*,*(2)*, and *(1)* in the figure

c) It has been said that flow control and congestion control are equivalent. Is this true for the Internet's connection-oriented service? Are the objectives of flow control and congestion control the same? **2**

5. Consider the scenario that you have brought your laptop at IIT lab and tried to connect it to IIT WLAN. After getting the Internet access, you visit http://student.eis.du.ac.bd for completing your current year admission at Dhaka University. Note that university's DNS server (ns1.du.ac.bd) is also attached to the DU campus network. Briefly identify the protocols and their purposes, used in each of the layers for accessing the URL. [Note: you can write your answer in a tabular form where column heads should be Step, Protocol Name, Protocol Layer and Purpose] **6**

GOOD LUCK!

(Please return this question paper with the answer script)