Indian Institute of Information Technology-Allahabad

Computer Networks

B. Tech. (IT) 4th Semester, Section B

C2 Review Test (April, 2021)

Time: 2 Hours 30 Mins **MM 100**

Note: All questions are compulsory.

1.

a. Write the prototype of accept, connect and select system calls and explain the meaning of various parameters used in the calls? **(10 Marks)**

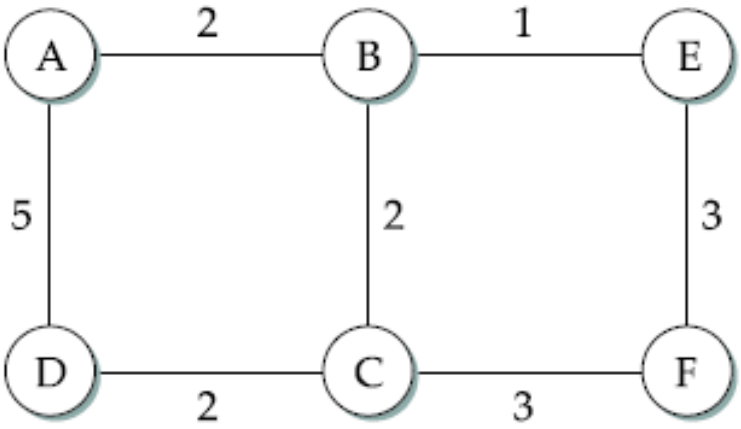
b. Explain the relationship between the accept system call and the connect system call when establishing connection-oriented TCP sockets on a UNIX system? **(5 Marks)**

c. Explain the use of select system call in the implementation of non-blocking chat application? **(5 Marks)**

2.

a. What are problems of Distance Vector Routing Algorithm and How link state algorithm addresses / provide solutions to these problems? **(10 Marks)**

b. Explain working of link state routing algorithm on the following network. Elaborate the details of steps used in the algorithm to compute the routing table of node D. **(10 Marks)**



3. Assume that you are given a full block of IP addresses (from 192.168.0.0 to 192.168.255.255). You are required to subnet this block into at least 5 subnets each able to support a maximum number of hosts.

a. What subnet mask should be used to solve the above problem? **(5 Marks)**

b. Give the start and the end IP address of each subnet. **(5 Marks)**

4. In the TCP/IP protocol suite,

a. What is the purpose of port numbers, why are they necessary? Why ports can only be in the range 0 – 65535. **(4 Marks)**

b. Describe the advantages and disadvantages of connection-oriented versus connectionless transport protocols. **(4 Marks)**

c. What are the three (3) primary functions which the "Network Layer" of the TCP/IP architecture? **(6 Marks)**

d. Give details about the class of IP addresses? How can one determine the class of IP address? How Net Id can be extracted from a given IP address say 193.25.14.57. **(6 Marks)**

5.

a. Discuss the header format of TCP protocol and explain significance of different fields present in the header? Also give the significance of flags available in the TCP header? **(10 Marks)**

b. How TCP implements congestion control? Explain different algorithms used by TCP protocol to provide congestion control? **(10 Marks)**

c. You are hired to design a reliable byte-stream protocol that uses a sliding window (like TCP). This protocol will run over a 100-Mbps network. The RTT of the network is 100 ms, and the maximum segment lifetime is 60 seconds. How many bits would you include in the AdvertisedWindow and SequenceNum fields of your protocol header? **(10 Marks)**

**********End of Paper**********