Nirma University

Institute of Technology

Supplementary Examination (SPE), June - 2022

B. Tech. in Computer Science and Engineering, Semester-V

2CS502 Computer Networks

Time: 2 Hours **Max. Marks: 50**

Instructions:

1. Attempt all questions.
2. Figures to the right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Assume suitable data wherever necessary and specify them.
5. **Sub-questions of each of the three questions must be written together.**

Q.1 Do as Directed. **[18]**

A) CO1 BL2 Explain the need of pipe-lining at data link layer. Derive the equation representing line utilization in case pipe-lining is used. **(6)**

OR

A) CO1 BL6 Write a pseudocode for bidirectional stop-and-wait data link layer protocol for reliable channel along with the explanation. **(6)**

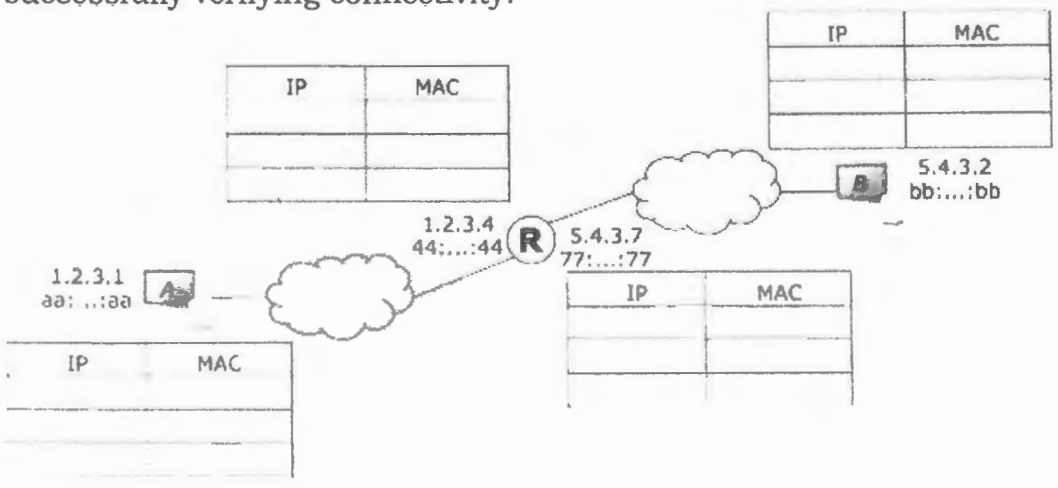
B) CO2 BL3 Suppose that an 11Mbps 802.11b LAN is transmitting 64 bytes frames back-to-back over a radio channel with bit error rate of 10^{-7}. How many frames per second will be damaged on average? **(4)**

C) CO1 BL4 Differentiate: i) Broadcast v/s Point-to-point channel ii) Fixed wireless v/s Mobile wireless iii) Packet switching v/s Circuit Switching iv) Feedback based flow control v/s Rate based flow control **(4)**

D) CO3 BL3 How does a router allocate bandwidth to different transport layer flows to avoid congestion using Max-min fairness? **(4)**

Q.2 **[16]**

A) CO3 BL6 The diagram below shows two subnets connected by a router (R). For each host and router port, the IP address and MAC address (abbreviated) are shown. Initially the ARP tables of the hosts and router are empty. Suppose A sends a ICMP echo request to B to test connectivity. Show the contents of the ARP tables after the successfully verifying connectivity. **(6)**



B) CO2 BL2 Describe the working of Domain Name System in iterative and recursive mode with appropriate example. **(6)**

OR

B) CO4 BL6 Which protocol is used for communication between web server and web client in Internet? Discuss salient features of the protocol. **(6)**

C) CO2 BL6 What kind of MAC algorithm is suitable at low load and high load condition in network? Propose some mechanism which works adaptively in the two extreme network conditions. **(4)**

Q.3 **[16]**

A) CO2 BL2 Explain how initial sequence numbers are chosen while re-establishing connection at transform layer after host crash? What is forbidden region and how is it ensured that no next sequence number is in forbidden region? **(6)**

B) CO2 BL6 An organization is given the network id 198.16.128.0/17. Suppose that four departments A, B, C, and D request 1024, 2048, 8192, and 4096 addresses respectively and in that order. For each of these, give the first IP address assigned, the last IP address assigned and the network id in the w.x.y.z/s notation. **(6)**

C) CO2 BL5 Justify the requirement of minimum frame length in IEEE 802.3. **(4)**