

Nirma University

Institute of Technology

Semester End Examination (RPR), May 2019
B. Tech. in Computer Engineering, Semester V
CE503 Computer Networks

Roll/
Exam No.

Supervisor's initial
with date

Time: 3 Hours

Max. Marks: 100

Instructions:

1. Attempt all questions.
2. Figures to the right indicate full marks.
3. Use section-wise separate answer book.
4. Draw neat sketches wherever necessary.
5. Assume suitable data wherever necessary and specify them.
6. **It is compulsory to write the answers of all the sub-questions of a question together.**

Section - I

Q.1

- A) Differentiate clearly between datagram and virtual circuit paradigm. [16]
CO1BL4 4
- B) Why minimum frame size is required in Ethernet? What should be the minimum frame size for 20 Mbps Ethernet with maximum cable length of 2.5 Km (with four repeaters)? 4
CO3BL5
- C) 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
CO3BL3
- D) What do you mean by 'store and forward' networking paradigm? 2
CO1BL2
- E) Give reasons for framing at data link layer. 2
CO2BL5

Q.2

- A) Write and explain pseudocode for Go Back N sliding window protocol. [18]
CO4BL6 12
- B) Discuss five key assumptions in dynamic channel allocation problem. 6
CO1BL2

OR

- B) Slotted ALOHA is one of the popular concept to handle shared media for communication. Give a comparative illustration between slotted ALOHA and static multiplexing technique. 6
CO1BL4

Q.3

A) Critically analyze different congestion control mechanisms for CO3BL4 datagram subnet. [16] 6

B) How Ethernet and WiFi differ when it comes to multiple access CO3BL4 control? 6

OR

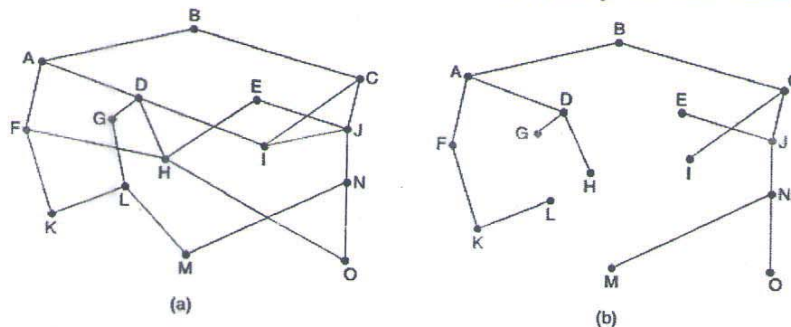
B) Explain binary exponential back-off algorithm in CSMA/CD. CO3BL5 Discuss the rationale behind the algorithm. 6

C) Differentiate: i) Broadcast v/s Point-to-point channel ii) Fixed CO1BL4 wireless v/s Mobile wireless iii) Packet switching v/s Circuit Switching iv) Feedback based flow control v/s Rate based flow control 4

Section - II

Q.4

A) How many packets are generated by a broadcast from B, using (a) CO3BL3 reverse path forwarding? (b) the sink tree? Depict your calculation. [18] 6



B) Distance vector routing is used, and the following vectors have just CO3BL3 come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the cost. 4

C) Explain how initial sequence numbers are chosen while re- CO2BL2 establishing connection at transform layer after host crash? 4

D) A host with IP address 137.23.56.23/16 sends a packet to a host CO3BL5 with IP address 137.23.67.9/16. Is the delivery of packet direct or indirect? Justify. 2

E) Datagram fragmentation and reassembly are handled by IP and are CO2BL2 invisible to TCP. Does this mean that TCP does not have to worry about data arriving in the wrong order? 2

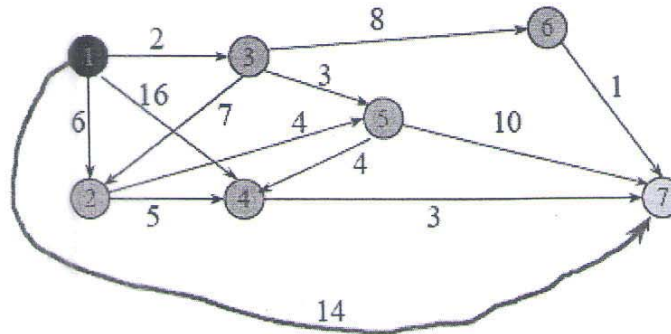
Q.5

A) Explain significance of Network Address Translation (NAT) with CO2BL2 suitable example. [16] 6

B) The CPU in a router can process 2 million packets/sec. The load CO2BL3 offered to it is 1.5 million packets/sec. If a route from source to destination contains 10 routers, how much time is spent being queued and serviced by the CPUs? 6

OR

- B)** What is the practical significance of a SINK tree in the area of CO3BL3 communication? For a network given below, generate a SINK tree considering node 1 as sink. 6



- C)** Compare and contrast leaky bucket and token bucket algorithms for CO2BL4 traffic shaping. 4

Q.6

[16]

- A)** Which protocol is used for communication between web server and CO3BL2 web client in Internet? Discuss salient features of the protocol. 6
- B)** A large number of consecutive IP address are available starting at CO3BL3 198.16.0.0. Suppose that four organizations, A, B, C, and D, request 4000, 2000, 4000, and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation. 6

OR

- B)** An ISP is granted a block of addresses starting with 10.121.0.0/16. CO3BL3 The ISP wants to distribute these addresses to :- 6
1. Group A requiring 128 addresses
 2. Group B requiring 16 addresses
 3. Group C requiring 4 addresses

Design the sub-blocks and give the slash notation for each sub-block. Find out how many addresses are still available after allocation.

- C)** What is tunneling? Demonstrate scenarios where tunneling should CO2BL3 be used. 4