Nirma University

Institute of Technology

Semester End Examination (IR/RPR) / SPE, February - 2022

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

2CS502 Computer Networks

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

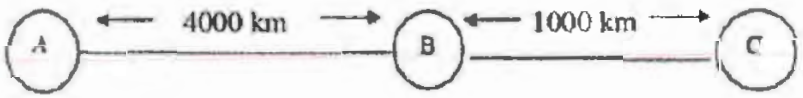
Instructions:

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) CO2 BL6 In the following figure, frames are generated at node A and sent to node C through node B. Determine the minimum transmission rate required between nodes B and C so that the buffers at node B are not flooded, based on the following information: **(6)**

- The data rate between A and B is 100 kbps.
- The propagation delay is 5 μsec/km for both lines
- There are full-duplex, error-free lines between the nodes.
- All data frames are 1000 bits long; ACK frames are separate frames of negligible length.
- Between A and B, a sliding window protocol is used, with a window size of 3 (three).
- Between B and C, stop and wait is used.



OR

A) CO2 BL4 Write a pseudocode for bidirectional stop-and-wait data link layer protocol for reliable channel along with the explanation. **(6)**

B) CO1 BL4 In stop-and-wait ARQ, a station A sends 1000 bits packet to station B with 10,000 kbps. After sending a packet how much time computer will be ideal if size of ACK is 2 bit and RTT is 1 sec? **(4)**

C) CO1 BL5 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) CO2 BL6 How does a router ensure that each virtual circuit passing through the router gets its allocated fraction of bandwidth? **(4)**

Q.2 **[16]**

A) CO2 BL3 How does the binary exponential back-off algorithm work? Discuss the motive behind the algorithm design. **(6)**

B) CO3 BL3	Differentiate between iterative and recursive query mechanism of DNS with suitable examples.	**(6)**

OR

B) CO4 BL3	Which protocol is used for communication between web server and web client in Internet? Write an example sequence of message exchanges between web server and web client.	**(6)**
C) CO1 BL4	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) CO3 BL3	If the server crashes in-between a stop-and-wait transport layer connection and quickly reboots, what are the possible strategies for the client and server to resume the connection? Analyze whether the proposed strategies will be successful or lead to incorrect working of the protocol in different scenario.	**(6)**
B) CO2 BL6	An organization is given the network id 10.16.0.0/16. 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) CO3 BL4	Why do protocols put a limit on maximum frame/packet size in packet switched networks?	**(4)**