



INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, NAGPUR
Department of Computer Sciences and Engineering
Sessional-II Mid Semester Examination
July-Nov 2022

CSL302: Computer Networks

Course coordinator: Dr. Nishat Afshan Ansari

Duration: 1:00 Hr

Date: 04/10/22

Max. Marks: 15

Time: 03:00 pm to 4:00 pm

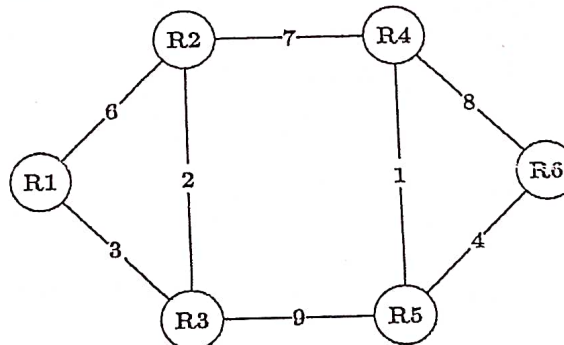
Important Instructions:

- All questions are compulsory.
- Assume suitable data wherever necessary.

- Q1(A) Suppose nodes A and B are on a 10Mbps Ethernet segment and the propagation delay between the two nodes is 225 microseconds. Suppose A and B send frames at the same time, the frames collide, and then A and B choose different values of k for back-off, say for A ($k=0$) and B ($k=1$) in the CSMA/CD algorithm. During retransmission of A and B, whether their frames collide or not? Give justification of your answer. [3] CO1, CO3
- Q1(B) Write the functionalities of the network layer. How does it handle heterogeneous networks? [2]
- Q2 Consider two neighbours, Alice and Bob. Each has wireless IPv4 routers with integrated NAT. Each neighbour connects their laptop to their own wireless router, and each uses appropriate utilities to examine the IP address of each laptop. They realise the laptops have the same IP address. [2+ CO1, 2+ CO2, 1] CO3, CO4
- (i) How is that possible?
- (ii) The wide-spread deployment of IPv6 would remove the need for the NAT devices. Justify your answer.
- (iii) an IPv6 user might want to continue using their NAT. Justify your answer.

OR

Consider a network with six routers R1 to R6 connected with links having weights as shown in the following diagram. Suppose Distance Vector Routing is used, how many links in the given network will never be used for carrying any data. If the unused link in the given network is replaced by load 2 and the distance vector algorithm is used to stabilize all the routing tables. Then how many links will never be used for carrying any data.



- Q3 An IP router with a Maximum Transmission Unit (MTU) of 1600 bytes has received an IP datagram of size 4400 bytes which includes 20 bytes header. Compute the values of the MF and offset fields in the header of each IP fragment generated by the router for this packet. Also give the count of data bytes in each IP fragment. [5] CO3