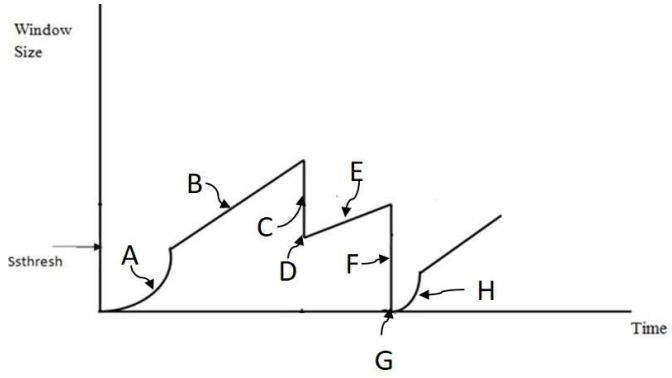
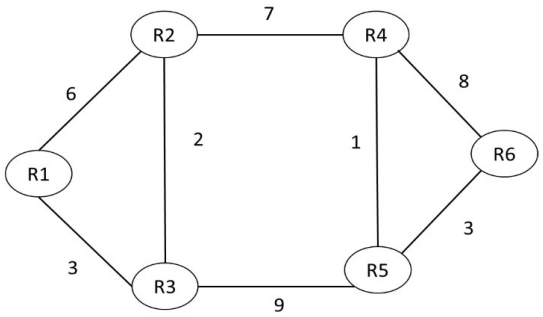
National Institute of Technology Silchar

End-Semester (UG) Examinations, December 2021

Subject Code: CS 301 Subject: Computer Network
Semester: 5th Department: CSE
Duration: 1 hour 15 minutes Total Marks: 30

Answer five questions.
Q1 to Q4 are compulsory. Choose any one from Q5 and Q6.

Q. No.	Questions	Marks	CO
1(a)	Is TCP/IP model better than OSI reference model? Justify your answer citing appropriate reasons.	3	CO1
1(b)	A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minute with each frame carrying an average of 10,000 bits. What is the throughput of this network?	3	CO1
2(a)	How the Hamming code can be used for burst error? Explain with suitable example.	3	CO3
2(b)	Explain the main components of Email system.	3	CO3
3	An IPv4 packet has been received with the header (in hex) as given below: **4B35 0734 1A74 24B0 0FA5 75FC A886 17F5 C02D B8DF 45F7 AC34 7642 F56C AC73 6763 3323 647F 29A8 B364 7452 A8FC** (i) Does the packet has any option? If yes, determine the length of option field in the packet. (ii) What are the classes of source and destination IP addresses for the packet? (iii) If the packet has to go through a network having, MTU 513 bytes then determine the total number of fragments and size of last fragment.	6	CO1
4	Different stages of TCP congestion control algorithm are marked in the diagram as A, B, C, D, E, F, G, and H. Map the following to appropriate markings in the diagram. (i) Slow start, (ii) Congestion avoidance, (iii) Additive increment, (iv) Multiplicative decrement, (v) Timeout, (vi) 3-DUPAcks  	6	CO2

5	A CIDR Block address is given 191.169.0.0/16. Allocate IP addresses for two groups of customers as specified below showing IP address ranges of each customer. Also determine how many addresses will remain unallocated. (i) Group 1 has 64 customers, each needs 128 addresses (ii) Group 2 has 128 customers, each needs 64 addresses	6	CO1
6	Consider a network with 6 routers R1 to R6 connected with links having weights as shown in the following diagram.  All the routers use the distance vector based routing algorithm to update their routing tables. Each router starts with its routing table initialized with an entry for each of the neighbours with the weight of the respective connecting link. After all the routing tables are stabilized, how many links in the network will never be used for carrying any data.	6	CO1