NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA
MID - TERM EXAMINATION, Autumn-2017
B.Tech. 7th Semester

Subject code: CS-421 **Subject Name: Computer Networks** Dept. Code: **CS**
No. of pages: 01 Full Marks: 30 Duration: 2 ***Hours***

All questions carry equal marks
All parts of a question should be answered at one place.

Q.No.	Particulars	Marks
1.(a)	Calculate the total time required to transfer a 1.5MB file in the following cases, assuming a RTT of 80 ms, a frame size of 1KB data, and an initial 2 X RTT of handshaking before data is sent. (i) The BW is 10 Mbps, and the data frame can be sent continuously. (ii) The BW is 10 Mbps, but after we finish sending each data frame we must wait one RTT before sending the next. (iii) The link allows infinitely fast transmit, but limits bandwidth such that only 20 frames can be sent per RTT.	2+2+2
2.(a)	With suitable reasons justify why the MAC protocols for IEEE 802. 3/802.4 / 802.5 networks are not suitable for IEEE 802.11 standard networks?	4+2
(b)	On a 10Mbps network, how long it takes to transmit each bit of data?	
3.(a)	What is token based protocol? Write the functioning of the IEEE 802.5 protocol with neat diagrams. Mention proper comments to your explanation. Include all possible cases of its maintenance as well.	3+3
(b)	Explain the working principle of sliding window flow control protocol with suitable example.	
4. (a)	Consider a link of 1.5 Mbps with the RTT of the frame is 45ms. If the sender can send only one frame per RTT, then find the percentage of link utilization. Assume the size of the frame to be 1KB. (Hint: The end-to-end throughput over a network= Transfer size / Transfer time)	3+3
(b)	With a neat diagram explain the working principle of Selective repeat error control protocol?	
5. (a)	If a user waits for 100sec to transfer a file of size 5MB in a network whose RTT is 100msec, find the network capacity?	3+3
(b)	With neat diagrams discuss the typical problems associated with wireless communication? How does a collision avoidance protocol works in wireless environment. Give suitable example with neat sketch?	