NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA
END - SEM EXAMINATION, Autumn-2018
B.Tech. 7th Semester

Subject code: CS-421 **Subject Name: Computer Networks** Dept. Code: **CS**
No. of pages: 01 Full Marks: 50 Duration: 3 hrs

Answer all the questions.

1.	**Answer the following questions for any IP packet:**	2 X 10
(i)	Calculate the HLEN value of if the total length is 1200 bytes, 1176 of which is data from the upper layer.	
(ii)	An IP fragment has arrived whose offset value is 100. How many bytes of data were originally sent by the source before the data in this fragment?	
(iii)	A datagram is carrying 1024 bytes of data. If there is no option information, what is the value of HLEN field? What is the value of total length field?	
(iv)	Given a fragmented datagram with an offset of 120, How can you determine the first and the last byte number?	
(v)	Which fields of the IP header change from router to router?	
(vi)	The value of HLEN is 10. How many options bytes are present?	
(vii)	The value of the TLEN field in a packet is 36 and the value of HLEN is 10. How many bytes of data is the packet carrying?	
(viii)	If a 5000 bytes message is to be transmitted over a network of MTU 1500, then mention the IP headers of the fragments created? (Suitable assumptions can be taken if required)	
(ix)	With a neat sketch, mention the different components of IP. Indicate the connectivity among the components clearly?	
(x)	Mention the fields of the IP header neatly?	
2.	The IP address of a host in an organization is 100.100.100.100. Answer the following question:	2 X 5
(i)	What is the class of addressing used by the organization?	
(ii)	What is the mask of the organization, if it has 1000 sub-networks?	
(iii)	Mention 5 valid subnet addresses of the organization?	
(iv)	Mention 5 broadcast addresses of the organization?	
(v)	Mention 5 valid IP addresses of the organization?	
3. (i)	Discuss how the priority of the data packets are updated and handled in a multi hop coordinated protocol in wireless communication? What is the difference in its functionality with respect to DPRMA?	5 X 2
(ii)	What is a silly window syndrome? What is the cause of its occurrence? Mention at least two solutions to avoid the syndrome?	
4.	**Answer any four of the followings:**	2.5 X 4
(i)	Mention the steps followed in details during the data transmission through various layers of the TCP/IP transmission model, if 1000 bytes of message is created at the application layer and the data has to be transmitted over a network of MTU 200 bytes. Show the transformation of the data units in different layers. Consider minimum header size when required and indicate the process through a neat diagram for both the sender and receiver side?	
(ii)	What is congestion? How does TCP handle the congestion?	
(iii)	An intermediate router with IP address 150.45.23.12 and Ethernet physical address 2345AB4F67CD has received a packet from a source with IP address 135.50.90.200 and Ethernet address as AAAAACCC997F for a host destination with IP address 150.45.15.10 and Ethernet physical address AABBA24F67CD. Show the entries in the ARP request packet sent by the router. Show the entries in the ARP packet sent in response to the above back to the source. Name the entries for which the values are not known.	
(iv)	How a DNS operates? Differentiate between FQDN and PQDN?	
(v)	Mention the steps involved in the Link state routing algorithm? It helps to avoid the looping problem. Justify?	