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

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

Answer all the questions.

1.(a)	A TCP connection is using a window size of 10,000 bytes and the previous acknowledgment number was 22001. It receives a segment that acknowledges bytes 24001. Draw a diagram to show the situation of the window before and after.	2
(b)	The value of HLEN in an IP datagram is seven. How many option bytes are present?	2
(c)	The size of the option field of an IP datagram is 20 bytes. What is the value of HLEN in binary?	2
(d)	A packet P= 7000 bytes is generated by a source S (whose ID is AHBC0019) with IP address 192.168.45.71 which is to be forwarded by routers R1. The outgoing path of R1 is connected to a network whose MTU is 1500 bytes. Mention the initial two words of the 20 byte header formats of all the fragments that will be received by the receiver, if throughput is preferred over other parameters.	2
(e)	Find the offsets of each fragments of the IP datagram mentioned in above question (d).	2
2. (a)	An intermediate router with IP address 125.45.23.12 and Ethernet physical address 2345AB4F67CD has received a packet from a source with IP address 100.50.97.123 and Ethernet address as AAAAACCC997F for a host destination with IP address 125.11.78.10 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.	5 X 2
(b)	Design a flow chart and algorithm for the functioning of the ARP. Mention proper documentation to the algorithm for clarity.	
3.	The IP address of a host in an organization is 158.75.18.100. Answer the following question:	2 X 5
(a)	What is the class of addressing used by the organization?	
(b)	What is the mask of the organization, if it has 1000 sub-networks?	
(c)	Mention 5 valid subnet addresses of the organization?	
(d)	Mention 5 broadcast addresses of the organization?	
(e)	Mention 5 valid IP addresses of the organization?	
4. (a)	Make a neat comparison of UDP vs TCP with respect to the services supported by both the protocols?	5 X 2
(b)	With a neat diagram explain the working of Bellman Ford algorithm. Mention each of the steps in detail during routing table updation and distribution.	
5. (a)	With a neat diagram, discuss the HDLC protocol with respect to its frame format.	4+3+3
(b)	What is contention? Discuss the working of a contention free protocol?	
(c)	What is Domain name system? Discuss the classifications of name space organization with suitable examples?	