Subject :	SEHH2238 : Computer Networking
Lab/Tutorial :	**Session 8 : IP Protocol & Routing**

1. Can the value of the header length field in an IPv4 packet be less than 5? When is it exactly 5?

2. An IP fragment has arrived with an offset value of 100. How many bytes of data were originally sent by the source before the data in this segment?

3. A datagram (/fragment) has arrived with an offset value of 300 and the payload size is 100 bytes. What are the number (position) of the first byte and the last byte with respect to the original data?

4. An IP datagram has arrived with the following partial information in the header (in hexadecimal) :

   45000054 00030000 2006 …

   a) What is the header size?
   b) Are there any options in the packet?
   c) What is the size of the data?
   d) Is the packet fragmented?
   e) How many more routers can the packet travel to?
   f) What is the protocol number of the payload being carried by the packet?

5. Consider sending a 4000-byte datagram into a link that has an MTU of 400 bytes. Suppose the original datagram is stamped with the identification number 422 and there is no optional field in the header. How many fragments are generated? What is the size of each fragment? What are the values of the ID, fragment flag and offset in each fragment?

6. Why is an ARP query sent with a broadcast frame? Why is an ARP response sent within a frame with a specific destination MAC address?

7. In the following network, how many entries are there in the IP routing table of A assuming that each network has 100 computers.