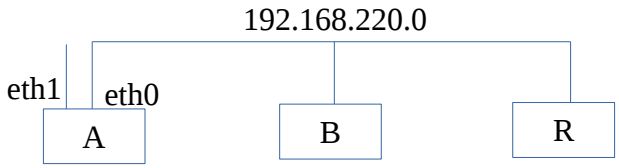
1. Answer the following: **(10 Marks)**

a) Given below is the sequence of IP datagrams received with the relevant fields as given. The reassembly timer of a datagram is started when the first fragment reaches the destination and is of the duration 100ms. The arrival times of the datagrams are also given in the table below. Explain what happens with each datagram received. If reassembly is required, state the time when the reassembly is completed, assuming that it takes negligible amount of time to do reassembly.

| Source IP address | Identification | Fragment Offset | MF | Total Length | Time of Arrival |
|---|---|---|---|---|---|
| 172.16.88.90 | 1 | 0 | 1 | 1500 | 10ms |
| 172.16.88.90 | 2 | 580 | 0 | 64 | 20ms |
| 172.16.88.90 | 1 | 1480 | 0 | 50 | 90ms |
| 172.16.88.90 | 1 | 0 | 1 | 1500 | 100ms |
| 172.16.88.90 | 4 | 1480 | 1 | 1500 | 70ms |
| 172.16.88.90 | 4 | 0 | 1 | 1500 | 80ms |
| 172.16.88.90 | 4 | 2960 | 0 | 60 | 180ms |

a) A network topology is as given below. The IP addresses of the machines are as follows: A's eth0 interface – 192.168.220.1, A's eth1 interface – 192.168.220.2, B – 192.168.220.3, R – 192.168.220.4. We find that R and B are able to ping each other but we are unable to ping A from B or R. It is found, on checking, that the interface cards of A are working fine and so also are the cables and switch ports. So, why is A unreachable?

**(5M)**




1. Given the routing table as shown in Table 1, which entry is matched for the following destination addresses: (5 Marks)

(a) 202.41.85.64
(b) 172.16.8.1
(c) 171.16.88.12
(d) 200.1.88.172
(e) 83.66.14.4

| Dest. NW | Netmask | GW | I/F |
|---|---|---|---|
| 172.16.0.0 | 255.255.0.0 | direct | eth0 |
| 200.1.88.0 | 255.255.255.0 | 12.4.9.2 | eth3 |
| 83.66.8.0 | 255.255.248.0 | direct | eth6 |
| 172.16.88.0 | 255.255.255.0 | direct | eth1 |
| 172.16.88.12 | 255.255.255.255 | direct | eth5 |
| 83.66.11.0 | 255.255.255.0 | 37.59.12.89 | eth4 |
| 200.1.88.128 | 255.255.255.128 | direct | eth2 |

A network topology with IP addresses of the hosts and routers is as shown in Fig. below. Assume that every host uses the router to its right as its default router and that the DF bit is set by every host by default. What are all the ICMP messages that are generated for each of the following ping commands? (Hint: Consider both the original and reply messages)

(a) Ping 200.200.1.2 from 128.1.0.1 with TTL=2.

(b) Ping 130.18.0.3 from 100.100.1.0 with TTL=16.