CS425: Computer Networks
Homework-3

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Solution

Question 1

The value of the upper layer protocol field is `ICMP(0x01)`.

Question 2

There are `20 bytes` in the header length. There are `36 bytes` in the payload of the IP datagram. The number of payload bytes are those bytes left from the total bytes when the `Header length` bytes get used up. So, here the total length is of `56 bytes` and the header length is `20 bytes` hence the payload bytes are left `36 bytes`.

Question 3

This IP datagram has not been fragmented. Since, for the `Fragment offset=0` and the `More fragments` bit is set to 0.

Question 4

The value of identification field is `0x8b2(32946)`. The value of TTL field is `1`.

Question 5

Yes, the mentioned packet is fragmented.

Question 6

The packet has `fragment offset = 0` and the `more fragments` bit is set meaning that there is more fragments after this.

Question 7

The `fragment offset` field of the packet is `0` and this indicates that this is the first fragment and not any latter fragment since it would have any non-zero offset in those cases.

Question 8

The `fragment offset` field for the given packet is an non-zero value indicating that this is not the first fragment.

Question 9

No, there are no more fragments after this and this is the last fragment. The `more fragments` bit of the flags to set to `0` which is an indicative of the fact that there are no more upcoming fragments and this is the last fragment.

Question 10

Following fields have changed in the IP header between the first and second fragment:

1. `Total Length` has changed from `1500` in the first one, to `520` in the second one.
2. `Flags` have been changed from `0x02` in the first fragment, to `0x00` in the second fragment. Basically, the `more fragments` bit has changed
3. `Fragment Offset` has changed from being `0` for the first fragment to being `1480` for the second fragment.
4. `Header Checksum` has changed from being `0xda69` in the first one to being `0xfd84` in the second one.