Assignment = 3   1001973002

Q=1 Describe how your forwarding table determines
the appropriate link interface for
datagrams with destination addresses.

```
11001000  10010001 01010001  01010101
11100001  D1000000 11000011  00111100
11100001  10000000 00010001  01110111
```

↳ For address 11001000 10010001 01010001 01010101
it does not match any of the longest
prefix address. So it's link ~~address~~
interface will be 3

↳ For address 11100001 01000000 11000011 00111100
it does ~~no~~ match with the longest prefix
address of 1110000. So, it's link interface
will be 2.

↳ For address 11100001 10000000 00010001 01110111
it does not match any of the longest prefix
address. So, its link interface will be 3.

Q=2 The three network addresses that satisfies
these constraints are:

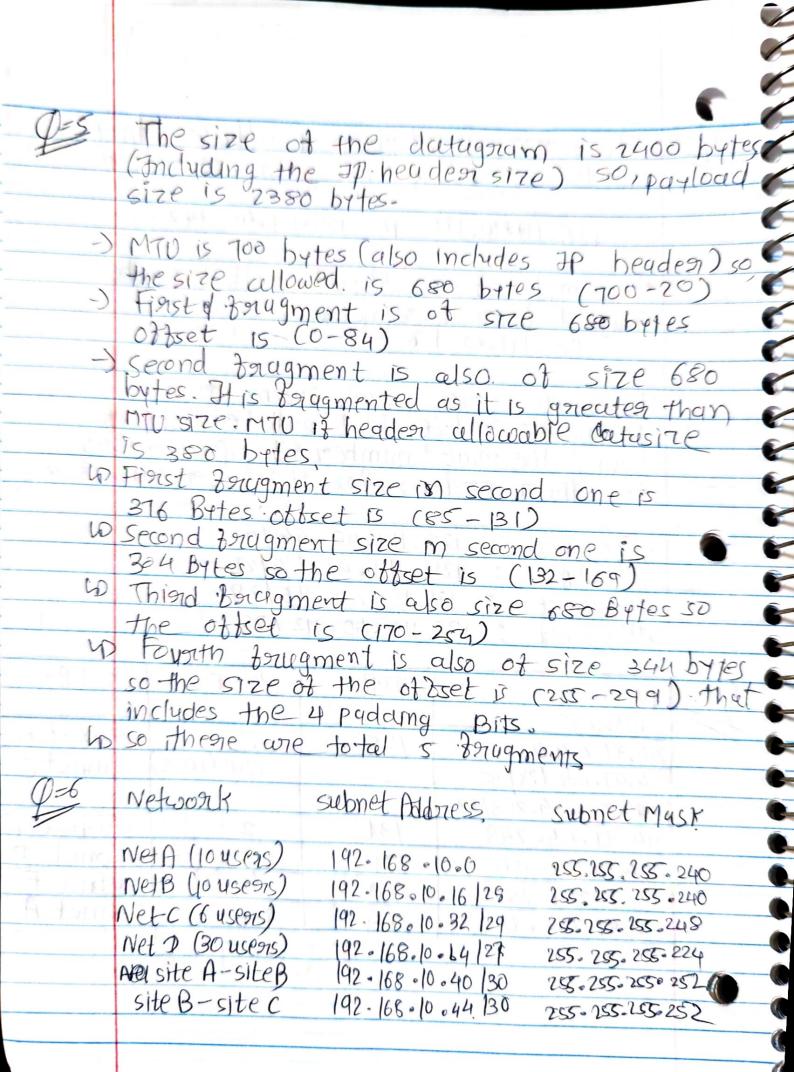↳ 223.1.17.128 /26
223.1.17.0 /25
~~223.17.~~
223.1.17.192 /28

Q-3 The range of eligible IP addresses that can be assigned to the given network is

128.119.40.128 to 128.119.40.192

An example of one IP address that can be assigned from this network is
128.119.40.156

To create four subsets from
128.119.40.64/26 block with each block having the same number of IP addresses then their prefixes for the four subsets are.

1st subnet : 128.119.40.64/28
2nd subnet : 128.119.40.80/28
3rd subnet : 128.119.40.96/28
4th subnet : 128.119.40.112/28

Q-4

Network Address	CIPR	HOST	Used By
214.97.254.0	/25	128	subnet B
214.97.254.128/25 + 214.97.254.248/29	—	120=(128-8)	subnet C
214.97.254.248	/31	2	subnet E
214.97.254.250	/31	2	subnet D
214.97.254.252	/30	4	subnet F
214.97.255.0	/24	256	subnet A

Q=5

The size of the datagram is 2400 bytes (including the JP header size) so, payload size is 2380 bytes.

-) MTU is 700 bytes (also includes JP header) so, the size allowed is 680 bytes (700-20)
-) First fragment is of size 680 bytes. offset is (0-84)
-) Second fragment is also of size 680 bytes. It is fragmented as it is greater than MTU size. MTU it header allocable datasize is 380 bytes.

↳ First fragment size in second one is 376 Bytes. offset is (85-131)
↳ Second fragment size in second one is 304 Bytes so the offset is (132-169)
↳ Third fragment is also size 680 Bytes so the offset is (170-254)
↳ Fourth fragment is also of size 344 bytes so the size of the offset is (255-299). that includes the 4 padding Bits.
↳ so there are total 5 fragments

Q=6

Network	subnet Address	subnet Mask
NetA (10 users)	192.168.10.0	255.255.255.240
NetB (40 users)	192.168.10.16/28	255.255.255.240
NetC (6 users)	192.168.10.32/29	255.255.255.248
Net D (30 users)	192.168.10.64/27	255.255.255.224
Net site A-siteB	192.168.10.40/30	255.255.255.252
site B-site c	192.168.10.44/30	255.255.255.252

172.1.4.0/25
172.1.4.128/25
172.1.5.0/24
172.1.6.0/24
172.1.7.0/24

ᐤ To determine the summary route on router R2, determine the number of highest-order (leftmost) bits that match in all the addresses. To obtain the summary route, I followed these steps.

ᐤ STEP 1 : convert the addresses to binary format and align them in a list.

172.1.4.0/25	172.1. 00000100.00000000
172.1.4.128/25	172.1. 00000100.10000000
172.1.5.0/24	172.1. 00000101.00000000
172.1.6.0/24	172.1. 00000110.00000000
172.1.7.0/24	172.1. 00000111.00000000

ᐤ STEP 2 : Locate the bit where the common pattern of digits ends.
We see that the 6th bit starting from the leftmost bit of the left byte (which is 1) is same in all 5 IPs.

ᐤ STEP 3 : The summary route number will be represented by the first IP address in the block, followed by a slash, followed by the number of common bits.

↳ Counting the number of common bits,
    we got 22.
↳ First IP is 172.1.4.0
↳ The summary route will be 172.1.4.0/22