

CS & IT ENGINEERING

Computer Networks

IPv4 Header & Fragmentation

DPP -02 (Discussion Notes)



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TOPICS TO BE COVERED

01 Question

02 Discussion

Q.1

An IP router with a maximum transmission unit (MTU) of 1000 bytes has received an IP packet of size 3980 bytes with an IP header of 20 bytes. What will be the value of payload in the second last fragment in bytes.

P
W

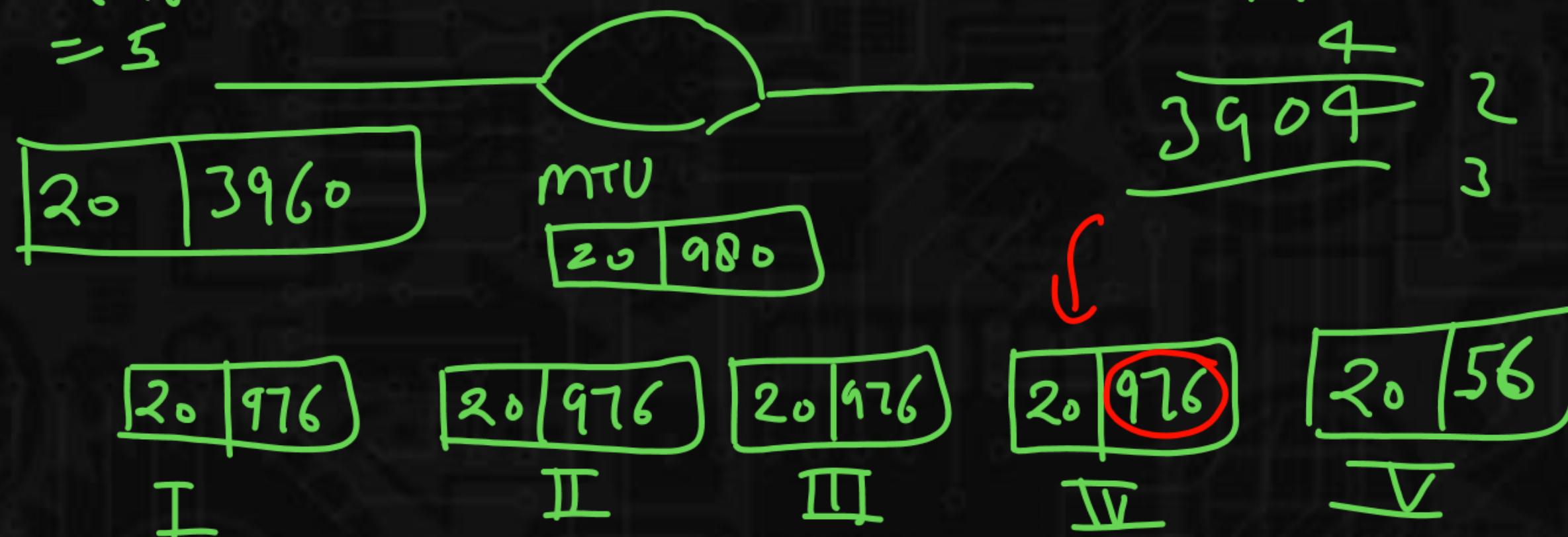
976 Bytes

[NAT]

$$\text{no. of frag.} = \left\lceil \frac{3960}{980} \right\rceil$$

= 5

MTU = 1000 bytes



Q.2

If the 'fragment offset' field in the IP header has a value of 200 then how many bytes are there before this fragment.

[MCQ]

P
W

- A. 400 bytes
- B. 800 bytes
- C. 1600 bytes
- D. 2000 bytes

Q) 976 (122)

8
 $\frac{16}{16}$

122 → 200

200×8
= 1600 bytes

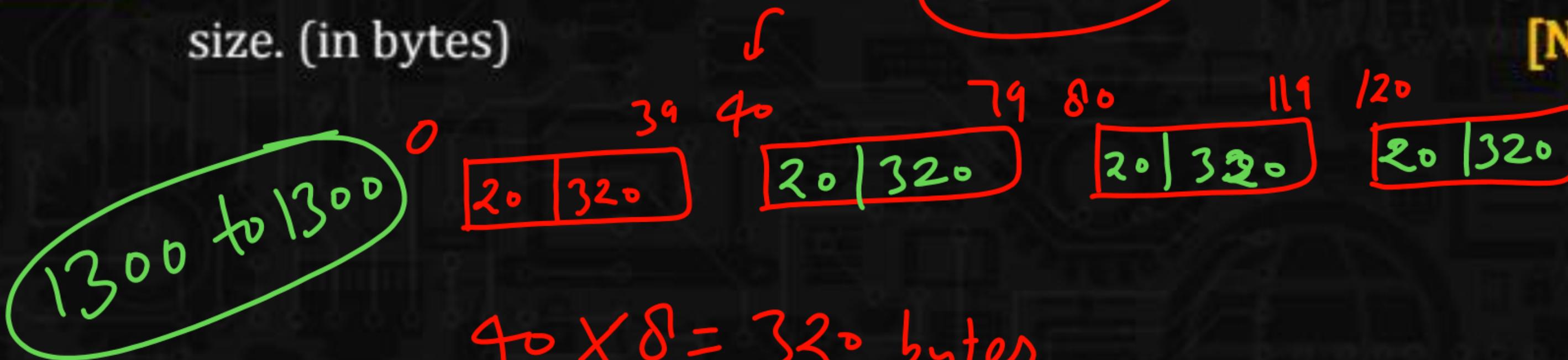
The diagram illustrates the conversion of the fragment offset from binary to decimal. The offset is shown as 122 in binary (0111 1010). A red arrow points from this binary value to the decimal value 200. Below this, a red fraction $\frac{16}{16}$ is shown, with a red circle around the 16 in the numerator. To the right, a red box contains the value 200, with a red bracket underneath it. Below the box, the calculation 200×8 is written in red, followed by the result = 1600 bytes.

Q.3

The fragment offset are given as 0, 40, 80, 120. IP header is given as 20 bytes all fragments are of **equal size**. Calculate the packet size. (in bytes)

P
W

[NAT]



$$40 \times 8 = 320 \text{ bytes}$$

~~$$4 \times 20 + 4 \times 320 =$$~~

$$20 + 1280 = 1300 \text{ bytes}$$

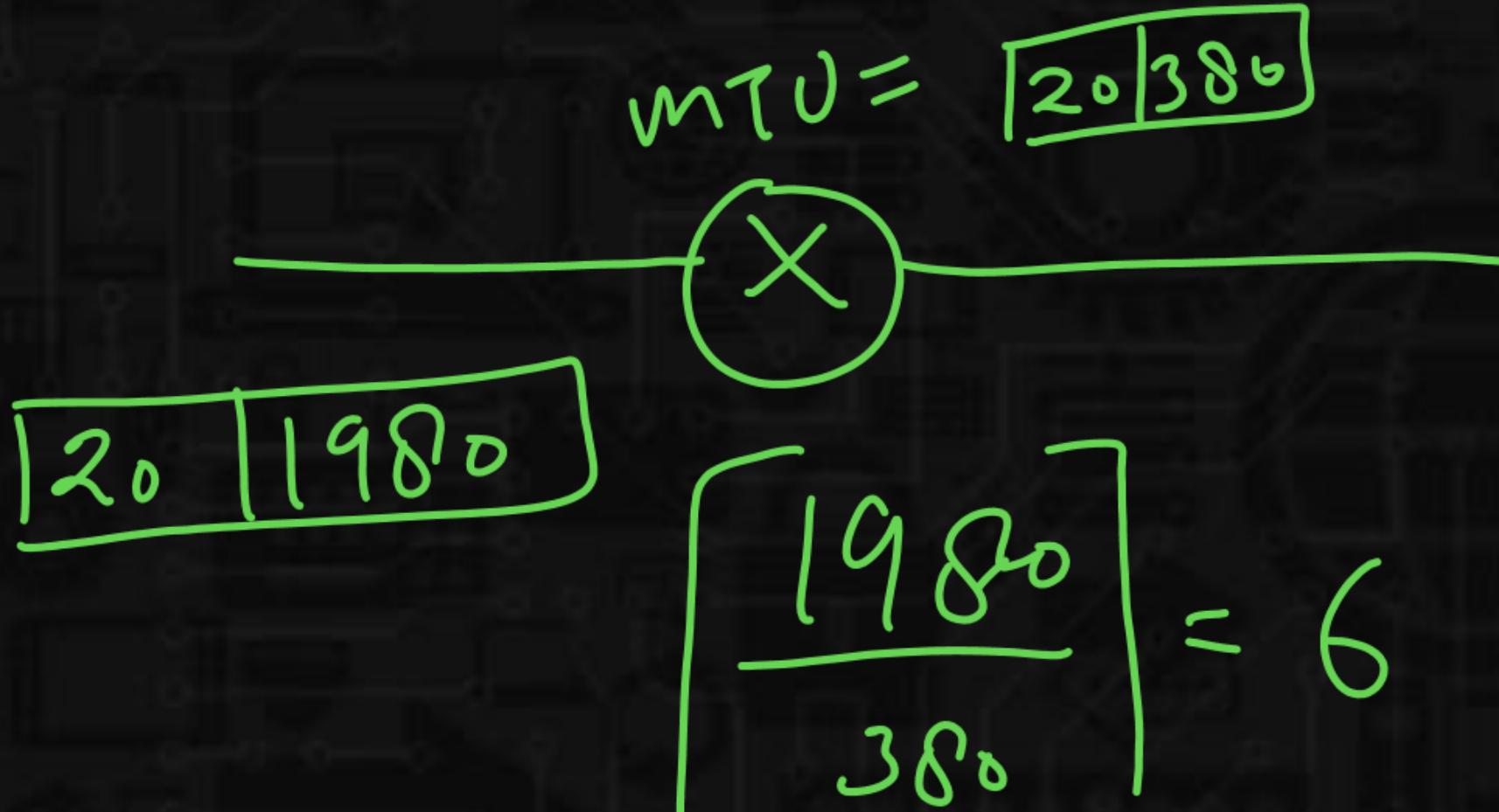
Q.4

An IP datagram of size 2000 bytes arrives at a router. The router than forward this packet on a link with MTU 400 bytes. If the IP header is of size 20 bytes then in how many fragments the packet will get divided?

P
W

[MCQ]

- A. 5
- B. 6
- C. 7
- D. 8



Q.5

In a IP **datagram** a **TCP segments** is present header length field of IP datagram is **5** total length of IP datagram is 1000 byte. Header length field in TCP header is **7**, then what is the size of TCP **data** present in the datagram. (**in bytes**)

P
W

[MCQ]

- A. 988
- B. 952
- C. 964
- D. 900



$$NH = 5 \times 4 = 20$$

$$TH = 7 \times 4 = 28$$

$$\begin{aligned}TCP\ data &= 1000 - 48 \\&= \underline{\underline{952\ Bytes}}.\end{aligned}$$

