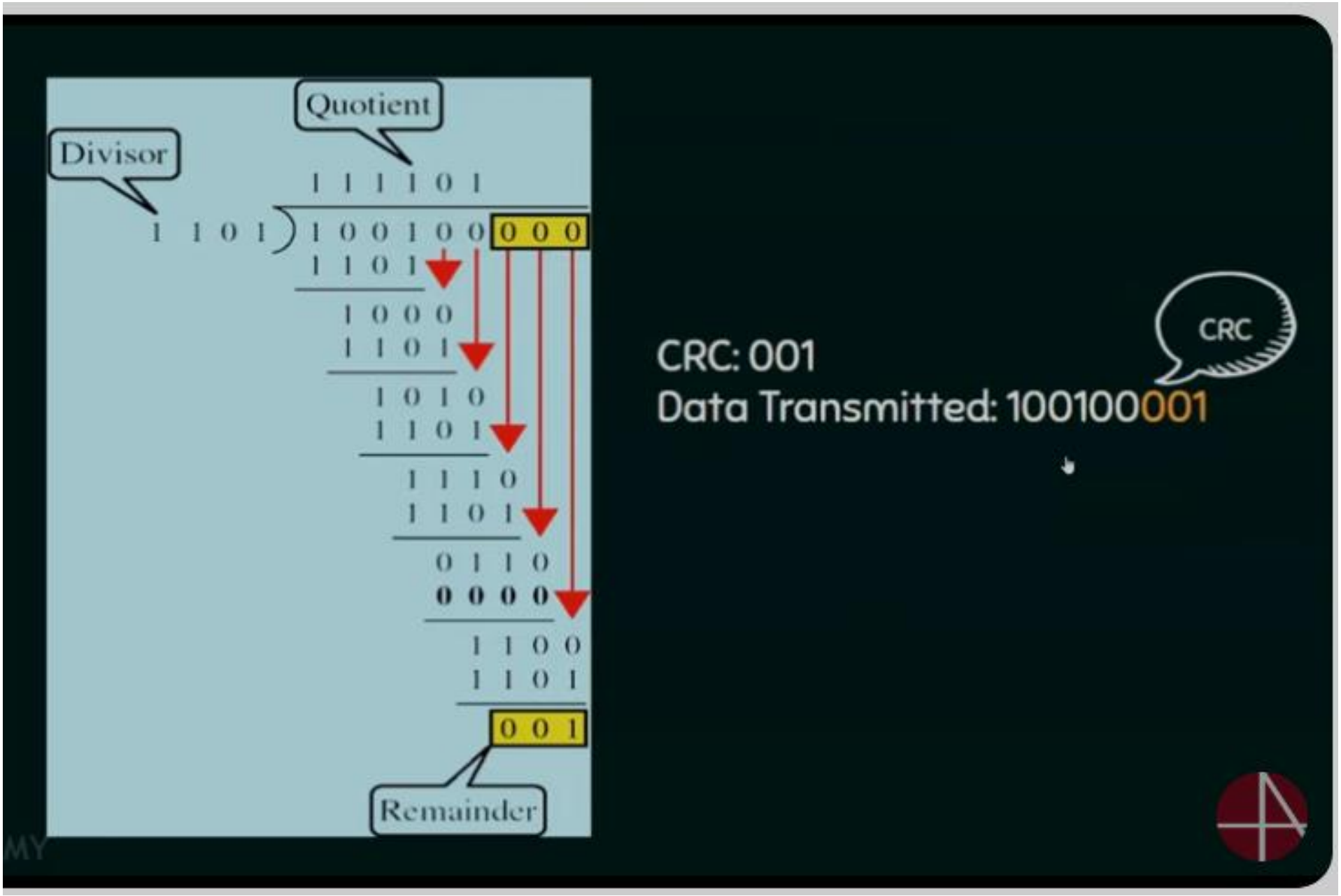
CRC Generation at sender side

1. Find the length of the divisor 'L'.
2. Append 'L-1' bits to the original message.
3. Perform binary division operation.
4. Remainder of the division = CRC.

Note:

The CRC must be of L-1 bits.

A	B	A XOR B
0	0	0
0	1	1
1	0	1
1	1	0


Quotient
Divisor
1 1 1 1 0 1
1 1 0 1) 1 0 0 1 0 0 0 0 0
1 1 0 1
1 0 0 0
1 1 0 1
1 0 1 0
1 1 0 1
1 1 1 0
1 1 0 1
0 1 1 0
0 0 0 0
1 1 0 0
1 1 0 1
0 0 1
Remainder
CRC
CRC: 001
Data Transmitted: 100100001

QUESTION

The message 11001001 is to be transmitted using CRC polynomial x^3+1 to protect it from errors. The message that should be transmitted is:

[GATE CS 2007]

A. 11001001000
B. 11001001011
C. 11001010
D. 110010010011

NESO ACADEMY

Option B) 11001001011.

CRC Generation at sender side

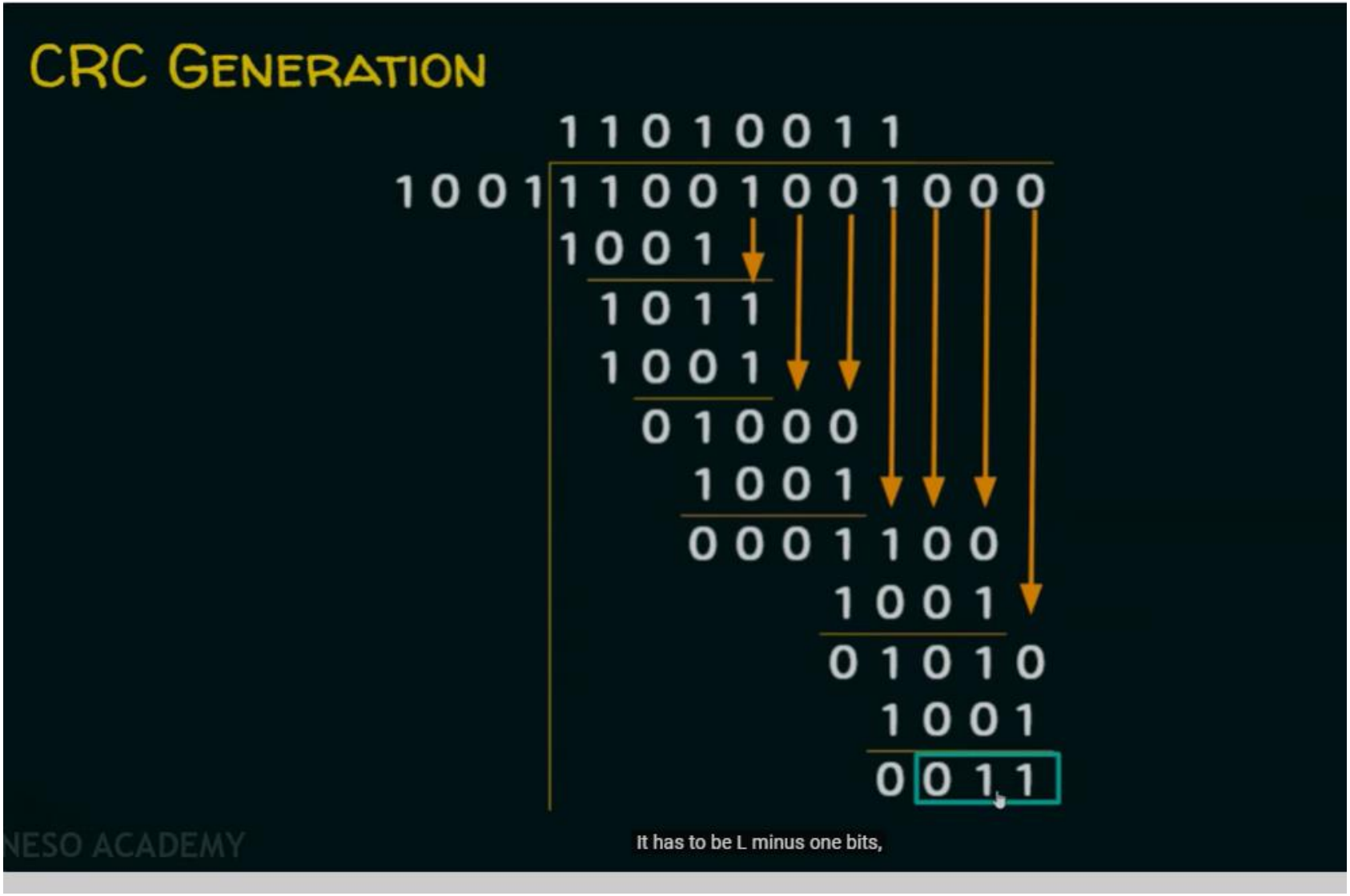
1. Find the length of the divisor 'L'.
2. Append 'L-1' bits to the original message.
3. Perform binary division operation.
4. Remainder of the division = CRC.
5. Message to be transmitted = Message + CRC

Note:

The CRC must be of L-1 bits.

A	B	A XOR B
0	0	0
0	1	1
1	0	1
1	1	0

We have basically five steps for solving this problem.


CRC GENERATION
1 1 0 1 0 0 1 1
1 0 0 1 1 1 0 0 1 0 0 1 0 0 0
1 0 0 1
1 0 1 1
1 0 0 1
0 1 0 0 0
1 0 0 1
0 0 0 1 1 0 0
1 0 0 1
0 1 0 1 0
1 0 0 1
0 0 1 1
NESO ACADEMY
It has to be L minus one bits,

Message to be transmitted

Message to be transmitted = Original Message + CRC

Message to be transmitted = 11001001 011

So, we know the message to be transmitted is 11001001011.