

Sai Ram K

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Part - C.

Q.1]

Data word = 1010011110

Divisor = 10111

$$\begin{array}{r}
 \text{10111} \overline{) 10100111100000} \\
 \underline{10111} \downarrow \\
 00111 \downarrow \\
 \underline{00000} \downarrow \\
 01111 \downarrow \\
 \underline{00000} \downarrow \\
 11111 \downarrow \\
 \underline{10111} \downarrow \\
 10001 \downarrow \\
 \underline{10111} \downarrow \\
 01100 \downarrow \\
 \underline{00000} \downarrow \\
 11000 \downarrow \\
 \underline{10111} \downarrow \\
 11110 \downarrow \\
 \underline{10111} \downarrow \\
 10010 \downarrow \\
 \underline{10111} \downarrow \\
 01010 \downarrow \\
 \underline{00000} \downarrow \\
 1010
 \end{array}$$

Final code word = 10100111101010

b) Error at bit 7

Sender's side = 1010011101010

Error at bit 7.

In this case ~~we~~ we have 1 at bit 7.

* Lets make it 0.

∴ 10100101101010

Proceeding we get

$$\begin{array}{r}
 \text{10111} \overline{) 10100101100000} \\
 \underline{10111} \downarrow \\
 01111 \downarrow \\
 \underline{00000} \downarrow \\
 11110 \downarrow \\
 \underline{10111} \downarrow \\
 10011 \downarrow \\
 \underline{10111} \downarrow \\
 01001 \downarrow \\
 \underline{0} \downarrow \\
 10010 \downarrow \\
 \underline{10111} \downarrow \\
 01010 \downarrow \\
 \underline{0} \downarrow \\
 10100 \downarrow \\
 \underline{10111} \downarrow \\
 0011 \downarrow \\
 \underline{0} \downarrow \\
 11100 \downarrow \\
 \underline{10111} \downarrow \\
 1011
 \end{array}$$

∴ Codeword = 10100101101011 → not expected.

* As we can see that CRC obtained = 1011
which isn't the same as sender's CRC = 1010
it leads to an error.