***Q1. Convert the given binary number 10101100 to its decimal equivalent.***

***Solution:***

(1 \* 128) + (0 \* 64) + (1 \* 32) + (0 \* 16) + (1 \* 8) + (1 \* 4) + (0 \* 2) + (0 \* 1)

= 128 + 0 + 32 + 0 + 8 + 4 + 0 + 0

= 180

***Q2. Convert the given binary number 10101100 to its Hexadecimal equivalent.***

***Solution:***

Grouping into sets of four (with leading zero): 1010 1100

Now, let's convert each group of four binary digits to its hexadecimal equivalent:

1010 in binary is equivalent to A in hexadecimal.

1100 in binary is equivalent to C in hexadecimal.

So, the hexadecimal equivalent of the binary number 10101100 is AC.

***Q3. Convert the given binary number 10101100 to its Octal equivalent.***

***Solution:***

Step 1: Write down the binary number

(010101100)2

Group all the digits in sets of three starting from the LSB (far right). Add zeros to the left of the last digit if there aren't enough digits to make a set of three.

010 101 100

Step 2: Use the table below to convert each set of three into an octal digit. In this case,

010=2, 101=5, 100=4.

So, the number 254 is the octal equivalent to 10101100 in binary.