**Assignment - Binary numbers and Binary Addition**

Q1. Write the decimal equivalent of the binary number 10110.

Ans: Step 1: Start from right hand side for multiplying the binary number with the base of 2.

Step 2: 101102 = (1 x 24) + (0 x 23) + (1 x 22) + (1 x 21) + (0 x 20)  
 = 16 + 0 + 4 + 2 + 0,  
 = 22  
 **101102 = 2210**

Q2. Write the decimal equivalent of the binary number 110101.

Ans: Step 1: Start from right hand side for multiplying the binary number with the base of 2.

Step 2: Decimal equivalent of "1" = 1 × 2^0 = 1  
 Decimal equivalent of "0" = 0 × 2^1 = 0  
 Decimal equivalent of "1" = 1 × 2^2 = 4  
 Decimal equivalent of "0" = 0 × 2^3 = 0  
 Decimal equivalent of "1" = 1 × 2^4 = 16  
 Decimal equivalent of "1" = 1 × 2^5 = 32  
 Decimal equivalent of "110101" = 32160401  
 110101 = 53

Q3. Write the binary equivalent of the decimal number 45.

Ans:  Divide 45 by 2. Use the integer quotient obtained in this step as the dividend for the next step. Repeat the process until the quotient becomes 0.

**Dividend Remainder**

45/2 = 22 1

22/2 = 11 0

11/2 = 5 1

5/2 = 2 1

2/2 = 1 0

1/2 = 0 1

**45 in Binary:** 45₁₀ = 101101₂

Q4. Write the binary equivalent of the decimal number 60.

Ans: Divide 60 by 2. Use the integer quotient obtained in this step as the dividend for the next step. Repeat the process until the quotient becomes 0.

**Dividend Remainder**

60/2 = 30 0

30/2 = 15 0

15/2 = 7 1

7/2 = 3 1

3/2 = 1 1

1/2 = 0 1

**60 in Binary:** 60₁₀ = 111100₂

Q5. Write the binary equivalent of the decimal number 33.

Ans: Divide 33 by 2. Use the integer quotient obtained in this step as the dividend for the next step. Repeat the process until the quotient becomes 0.

**Dividend Remainder**

33/2 = 16 1

16/2 = 8 0

8/2 = 4 0

4/2 = 2 0

2/2 = 1 0

1/2 = 0 1

**33 in Binary:** 33₁₀ = 100001₂