

## Assignment 1 (ITP203-Theory)

### Question 1

Perform the 2's complement on Binary Number (01110) and note down the result.

Question 1: (01110).

To perform 2's complement, we should pass through performing 1's complement.

$\therefore (01110) \rightarrow$  1's complement  
 $\hookrightarrow (10001)$

Then performing 2's complement:

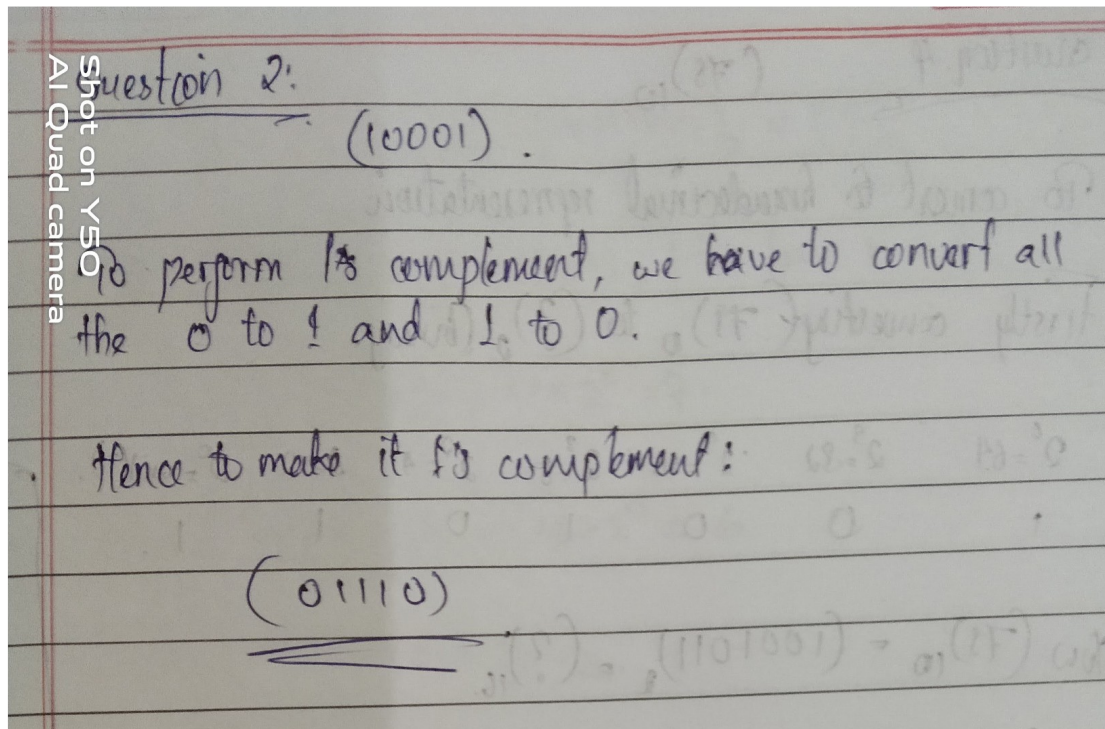
$$\begin{array}{r} 10001 \\ + 1 \\ \hline 10010 \end{array}$$

By adding 1 we accomplish performing 2's complement and the result is:

10010

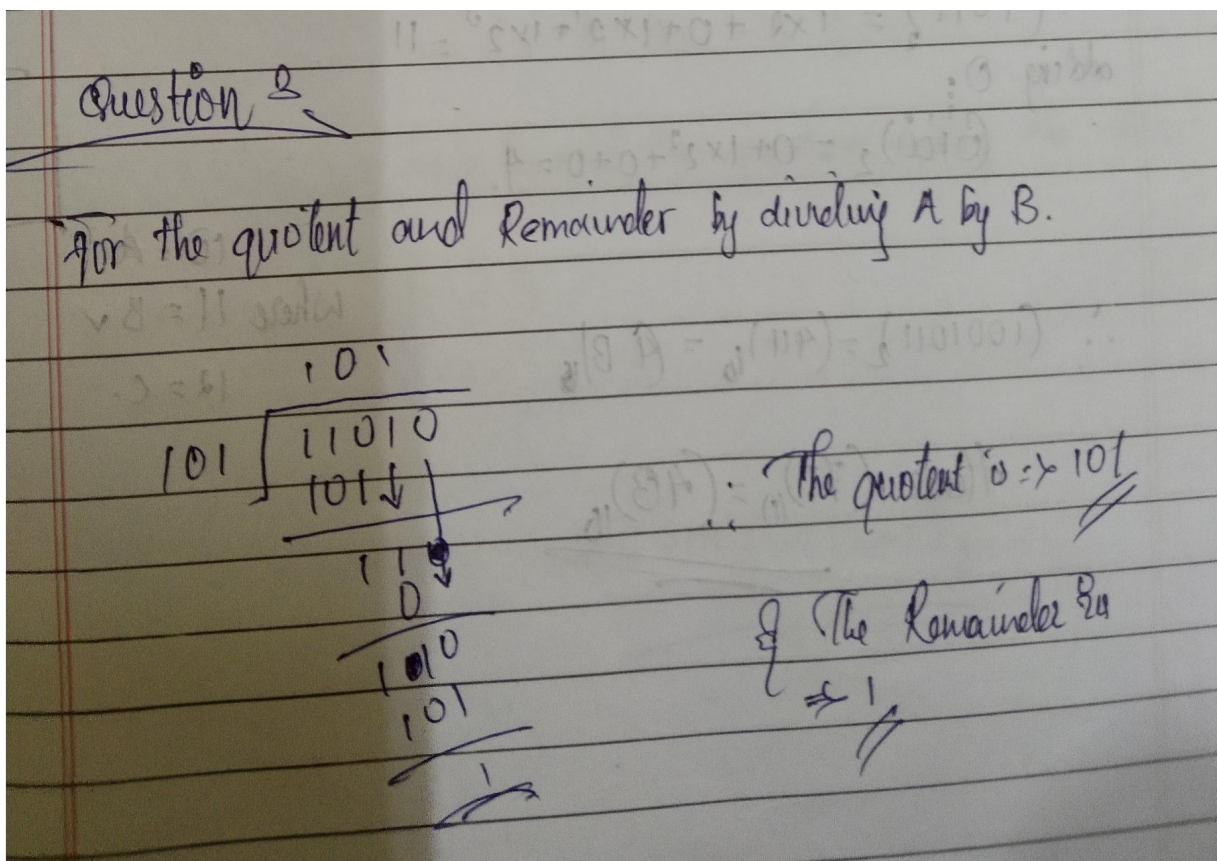
### Question 2

Perform the 1's complement on (10001).



### Question 3

You have  $A = 11010$  and  $B = 101$ . Divide A by B and find the Quotient and Remainder.





#### Question 4

Convert  $(75)_{10}$  into Hexadecimal representation?

Question 4  $(75)_{10}$

To convert to hexadecimal representation

Firstly converting  $(75)_{10}$  to  $(?)_2$  (binary).

$2^6 = 64$      $2^5 = 32$      $2^4 = 16$      $2^3 = 8$      $2^2 = 4$      $2^1 = 2$      $2^0 = \text{und}(1)$   
 $\quad \quad \quad 1 \quad \quad \quad 0 \quad \quad \quad 0 \quad \quad \quad 1 \quad \quad \quad 0 \quad \quad \quad 1 \quad \quad \quad 1$

Now  $(75)_{10} = (1001011)_2 = (?)_{16}$

$(1011)_2 = 1 \times 2^3 + 0 + 1 \times 2^1 + 1 \times 2^0 = 11$   
 adding 0:  
 $(0100)_2 = 0 + 1 \times 2^2 + 0 + 0 = 4$

$\therefore (1001011)_2 = (411)_{16} = (AB)_{16}$   
 where  $11 = B$  ✓  
 $12 = C$

Hence  $(75)_{10} = (AB)_{16}$

$$\begin{array}{r}
 75 \\
 - 64 \\
 \hline
 11 \\
 - 8 \\
 \hline
 3 \\
 - 2 \\
 \hline
 1 \\
 - 1 \\
 \hline
 0
 \end{array}$$

Question 5

$$(776)_8 + (010110111)_2 = (?)_8.$$

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Question 5:

$$(776)_8 + (010110111)_2 = (?)_8$$

Converting base 2  $[(010110111)_2]$  to base 8 =  $(?)_8$ .

$$(111)_2 = 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 = 7.$$

$$\begin{array}{r} 1 \\ 8 \overline{) 13} \\ \underline{8} \\ 5 \end{array}$$

$$(110)_2 = 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 6.$$

$$\begin{array}{r} 1 \\ 8 \overline{) 14} \\ \underline{8} \\ 6 \end{array}$$

$$(010)_2 = 0 + 1 \times 2^1 + 0 = 2.$$

$$\begin{array}{r} 1 \\ 8 \overline{) 10} \\ \underline{8} \\ 2 \end{array}$$

$$(010110111)_2 = (267)_8 \dots \text{eqn (1)}$$

Now we have to add the question using the above eqn (1).

$$\begin{array}{r} 1 \quad 1 \\ (776) \\ (267)_8 \\ \hline 1265 \end{array}$$

$$\therefore (776)_8 + (010110111)_2 = (1265)_8$$

### Question 6

WAP in C using While-Loop/Do-While Loop to find a Fibonacci series of “N” number of terms.

```
#include <stdio.h>

int main(){
    int N, i, a, b, c;
    printf("Number for Fibonacci series: ");
    scanf("%d", &N);

    i=1;
    a=0;
    b=1;

    while(i<=N){
        printf("%d\n", a);
        c = a + b;
        a = b;
        b = c;
        i++;
    }
    return 0;
}
```

### Question 7

WAP in C using While-Loop/Do-While Loop to find if a number (any digit) is Armstrong Number.

```
#include <stdio.h>
int main()
{
    int num, original, rem, sum = 0;

    printf("Enter a three-digit Number: ");
    scanf("%d", &num);

    original = num;

    while(original != 0){
        rem = original%10;
        sum =sum + rem*rem*rem;
        original=original/ 10;
    }

    if(sum == num)
        printf("%d is an Armstrong number.",num);

    else
        printf("%d is not an Armstrong number.",num);
}
```

```
printf("\n");
```

```
return 0;
```

```
}
```