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Roll no :- P20-0108

Assignment No :- 02

Course :- DLD

Question # 1
Complete the table

Decimal	BCD	Hexa	octal
98	01100010	62	142
152 ~~698~~	10011000	98	230
1467	101101111011 ~~1010010111011~~	5BB	2673
48 43981	1010010111001101	ABCD	125712 5

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Question #2

"Multiply in 2's Complement form".

(b) 219 by 15.

⇒ 219 = 1 1 0 1 1 0 1 1
15 = 1 1 1 1

```
        1 1 0 1 1 0 1 1
   ×    0 0 0 0 0 1 1 1 1
   _____
        1 1 0 1 1 0 1 1
      1 1 0 1 1 0 1 1 x
    1 1 0 1 1 0 1 1 x x
  1 1 0 1 1 0 1 1 x x x
   _____
  1 1 0 0 1 1 0 1 0 1 0 1
```

1 1 0 0 1 1 0 1 0 1 0 1 → Answer.

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Question # 2

(a) 01101010 by 11110001

Soln

taking 2's Complement of 11110001
which is equal to 00001111

∴

$$
\begin{array}{r}
0110101 0 \\
\times\ 0000 1111 \\
\hline
0\ 11\ 0\ 1\ 0\ 1\ 0\ \\
0\ 1\ 10\ 1\ 0\ 1\ 0\ \times \\
0\ 1\ 1\ 0\ 1\ 0\ 1\ 0\ \times\ \times \\
0\ 1\ 1\ 0\ 1\ 0\ 1\ 0\ \times\ \times\ \times \\
\hline
\end{array}
$$

$$\boxed{1\ 1\ 0\ 0\ 0\ 1\ 1\ 0\ 1\ 1\ 0}$$ Answer

$$\boxed{0\ 0\ 1\ 1\ 1\ 0\ 0\ 1\ 0\ 1\ 0}$$

↓

Answer

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Question # 3
Divide in 2's Complement form.

(a) 1000 1000 by 0010 0010

Sol^n,

∴ 0010 0010 ⇒ 2's complement of this is
"1101 1110".

Now,

```
  1 00 0 1 0 0 0
+ 1 1 0 1 1  1 1 0
_____
x 0 1 1 0 0  1 1 0
+ 1 1 0 1 1  1 1 0
_____
x 0 1 0 0 0 0 0 0
+ 1 1 0 1 1  1 1 0
_____
x 0 0 1 0 0 0 1 0
+ 1 1 0 1 1  1 1 0
_____
x 0 0 0 0 0 0 0 0
```

```
0000
 + 1
_____
000 1
 + 1
_____
00 1 0
 + 1
_____
00 1 1
 + 1
_____
0 1 0 0    Answer
```

0 1 0 0 → Answer

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Question # 3
Part (b)

-145 = 10010001

3 = 00000101 → 3's complement = 11111011

```
  10010001
+ 01111011
```
discard → 1 00001100
```
+ 11111011
```
Discard ← 1 00001111
```
  11111011
```
Discard ← 1 00000110
```
+ 11111011
```
Discard ← 1 01111101
```
+ 11111011
```
Discard ← 1 01111000
```
+ 11111011
```
Discard ← 1 01110011
```
+ 11111011
```
Discard ← 1 01101110
```
+ 11111011
```
Discard ← 1 01101001

Quotients 0000
```
+ 1
```
0001
```
+ 1
```
0010
```
+ 1
```
0011
```
+ 1
```
0100
```
+ 1
```
0101
```
+ 0001
```
0110
```
+ 1
```
0111
```
+ 1
```
1000

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```
      0 1 1 0 1   0 0 1        1 0 0 0
   +  1 1 1 1 1   0 1 1        + 1
DISC 0-1  0 1 1 0 0   1 0 0     1 0 0 1
      1 1 1 1 1   0 1 1        + 1
Discard ← 1  0 1 0 1 1   1 1   1 0 1 0
            1 1 1 1 1   0 1 1    + 1
Discard ← 1  0 1 0 1   0 1 0   1 0 1 1
            1 1 1 1   0 1 1      + 1
         1  0 1 0 1   0 1 0 1   1 1 0 0
            1 1 1 1   0 1 1      + 1
         1  0 1 0 1 0 0 0 0 0   1 1 0 1
            1 1 1 1   0 1 1      + 1
         1  0 1 0 0 1 0 1 1     1 1 1 0
            1 1 1 1   0 1 1      + 1
         1  0 1 0 0 0 0 1 0 0   1 1 1 1
          + 1 1 1 1 1   0 1 1    + 1
         1  0 0 0 0 0 0 1       1 0 0 0
            1 1 1 1 1   0 1 1    + 1
         1  0 0 1 1 1   0 0     1 0 0 1
            1 1 1 1 1   0 1 1    + 1
         1  0 0 1 1 0 1 1 1     1 0 0 1 0
            1 1 1 1   0 1 1      + 1
         1  0 0 1 1   0 0 1 0   1 0 0 1 1
            1 1 1 1   0 1 1      + 1
         1  0 0 0 1 0 1   0 1   1 0 1 0 0
```

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```
      1  1  1  1  1
      0  0  1  0  1  1  0  1        10100
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  1  0  1  0  0  0        10101
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  1  0  0  0  1  1        1011 0
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  1  1  1  1  0        1011 1
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  1  1  0  0  1        1100 0
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  1  0  1  0  0        11001
      1  1  1  0  1  1  0  1  1        + 1
  1) 0  0  0  0  0  1  1  1  1      11010
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  0  0  1  0  1  0      11011
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  0  0  1  0  1        1110 0
      1  1  1  1  1  0  1  1          + 1
  1) 0  0  0  0  0  0  0  0  0    [1110]
```

[111101] → Answer

Question #4

Perform following

(a) $(ABC)_{16} + (1A3)_{16}$ (b)

Soln.

∵ A = 1010
   B = 1011
   C = 1100

∵   1010 1011 1100
  + 0001 10 100011
  ─────────────────
   110001011111

    C   5   F

⇒ [C5F] ⇒ $(C5F)_{16}$ Answer

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ⓑ $(F1)_{16} - (A6)_{16}$

Soln..

$$\overset{0}{F} \quad \overset{16}{1}+ \qquad \Rightarrow 17 \rightarrow \text{Rough}$$
$$-A \quad 6 \qquad \qquad \underline{-66}$$
$$\boxed{4 \qquad B} \;\text{Ans}. \qquad 11$$

$$\Rightarrow \boxed{4B_{16}} \rightarrow \text{Answer}$$

ⓒ $(110)_{10} - (84)_{10} = (?)_2$

$$= 110 = 64 + 32 + 8 + 4 + 2$$
$$110 = 1 \quad 1 \quad 0 \quad 1 \quad 1 \quad 10$$
$$84 = 64 + 16 + 4$$
$$84 = 1 \; 0 \; 1 \; 0 \; 1 \; 0 \; 0$$
$$= -84 = 0 \; 1 \; 0 \; 1 \; 1 \; 0 \; 0$$
$$\Rightarrow 1 \; 1 \; 0 \; 1 \; 1 \; 1 \; 0$$
$$+ \; 0 \; 1 \; 0 \; 1 \; 1 \; 0 \; 0$$
$$\overline{\quad 1 0 0 1 1 0 1 \; 0}$$

Discard

$$= \boxed{0 0 1 1 0 1 0} \rightarrow \text{Answer}.$$