

①

Q No 1

Complete the table.

Decimal	BCD	Hexa	Octa
98	011000010	62	142
158	100110000	98	230
1467	10110111011	5BB	2673
43981	101010111001101	A B C D	1257125

Q No #2

(a) 01101010 by 11110001

Sol:-

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

$$\begin{array}{r} 01101010 \\ \times 00001111 \\ \hline 01101010 \\ 01101010x \\ 01101010xx \\ 01101010xxx \\ \hline 11000110110 \end{array}$$

00111001010

Answer.

### Question #2

"Multiply in 2's complement form"

b. (b) 219 by 15

$$\Rightarrow 219 = 11011011$$

$$15 = 1111$$

$$\begin{array}{r} 11011011 \\ \times 00001111 \\ \hline 11011011 \\ 11011011 \times \\ 11011011 \times \times \\ \hline 11011011 \times \times \times \end{array}$$

$$110011010101$$

110011010101

Answer.

10001000 by 00100010

Sol:-

$00100010 \Rightarrow$  2's complement of this  
is "11011110".

Now.

$$\begin{array}{r}
 10001000 \\
 + 11011110 \\
 \hline
 101100110 \\
 + 11011110 \\
 \hline
 101000100 \\
 + 11011110 \\
 \hline
 1001000010 \\
 + 11011110 \\
 \hline
 1000000000
 \end{array}$$

$$\begin{array}{r}
 0000 \\
 + 1 \\
 \hline
 0001 \\
 + 1 \\
 \hline
 0010 \\
 + 1 \\
 \hline
 0011 \\
 + 1 \\
 \hline
 0100
 \end{array}$$

0100 Answer.

Question #3 Part (b)

(4)

$$-145 = 10010001$$

$$S = 00000101 \Rightarrow 2^7 \text{ complement is } \\ 11111011$$

$$\begin{array}{r} 10010001 \\ + 11111011 \\ \hline 10001100 \\ + 11111011 \\ \hline \end{array}$$

dividend: 10000111  
 $\div 11111011$   
 $\overline{-10000010}$   
 $+ 11111011$   
 $\overline{10111101}$   
 $+ 11111011$   
 $\overline{101111000}$

dividend: 101111000  
 $+ 11111011$   
 $\overline{1011110011}$   
 $+ 11111011$   
 $\overline{01101110}$   
 $+ 11111011$   
 $\overline{01101001}$

$$\text{Quotient} = 0000$$

$$\begin{array}{r} +1 \\ \hline 0001 \\ +1 \\ \hline 0010 \\ +1 \\ \hline 0011 \\ +1 \\ \hline 0100 \\ +1 \\ \hline 0101 \\ +0001 \\ \hline 0110 \\ +1 \\ \hline 0111 \\ +1 \\ \hline 1000 \end{array}$$

(5)

$$\begin{array}{r} 01101001 \\ + 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{01100100} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0101011111} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0101011010} \\ + 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0101010101} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0101010000} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{010001011} \\ + 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{01000110} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{010000001} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{00111100} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{00110111} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{000110010} \\ - 11111011 \\ \hline \end{array}$$

$$\begin{array}{r} 1000 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1001 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1010 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1011 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1100 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1101 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1110 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1111 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 10000 \\ + 1 \\ \hline \end{array}$$

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

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

$$\begin{array}{r} 10011 \\ + 1 \\ \hline \end{array}$$

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

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

$$\begin{array}{r} 10000 \\ + 1 \\ \hline \end{array}$$

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

$$\begin{array}{r} 10011 \\ + 1 \\ \hline \end{array}$$

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

$$\begin{array}{r} 10100 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 10100 \\ + 1 \\ \hline \end{array}$$

001011010  
001011010

00101101  
11111011

+1

100101000  
11111011

10101

+1

100100011  
11111011

10110

+1

100011110  
11111011

10011

+1

100011001

11111011

11000

+1

100010100

11111011

11001

+1

100001111

11111011

11010

+1

100001010

11111011

11011

+1

100000101

11111011

11100

+1

100000000

11101

11101

Answer

Q No 4 Perform following:

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

Sol-

$$A = 1010$$

$$B = 1011$$

$$C = 1100$$

$$\begin{array}{r} 101010111100 \\ + 000110100011 \\ \hline 11000101111 \\ \text{C S F} \end{array}$$

$\Rightarrow$  **CSF**  $\Rightarrow (CSF)_{16}$

(b)  $(F1)_{16} - (AB)_{16}$ .

Sol-

$$\begin{array}{r} 1011 \\ 1101 \\ - 0101 \\ \hline 0101 \\ \text{F} \quad 1 \\ - A \quad B \\ 4 \quad 6 \end{array}$$

$$\begin{array}{r} 7F \\ - 66 \\ \hline 11 \end{array}$$

**$(4B)_{16}$**  Answer

$$(c) (110)_{10} + (84)_{10}$$

$$= 110 = 64 + 32 + 8 + 4 + 2.$$

$$110 = 1101110$$

$$84 = 64 + 16 + 4,$$

$$84 = 1010100$$

$$110 - 84 = 0101100$$

$$\Rightarrow 1101110$$

$$\begin{array}{r} + 0101100 \\ \hline \end{array}$$

~~discard 1~~ 0011010

$$\boxed{\therefore 0011010}$$

Answer.