Assignment ① Page ①

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Assignment 1. DLD.

Q1) What is the weight of 7 in 1799_{10}?

Solution

Ans Weight of 7 in 1799 is 700.

Q2) Give the value of each digit in $(5436)_{10}$?

solution.

$(5 \times 10^3) + (4 \times 10^2) + (3 \times 10^1) + (6 \times 10^0)$

$500 + 400 + 30 + 6$.

Value of 5 is = 500

value of 4 is = 400

value of 3 is = 30

value of 6 is = 6.

Q3) Convert the following

$(11111111)_2 = (?)_{10}$

$\Rightarrow (1\times10^7) + (1\times10^6) + (1\times10^5) + (1\times10^4) + (1\times10^3) + (1\times10^2) + (1\times10^1) + (1\times10^0)$

$\Rightarrow 128+64+32+16+8+4+2+1$

$(255)_{10}$ Answer.

(B) $(127)_{10} = (?)_2$

Solution Using Repeated division by 2

2	127
2	63 – 1
2	31 – 1
2	15 – 1
2	7 – 1
2	3 – 1
	1 – 1

$(127)_{10} = (1111111)_2$

(C) $(10000000.1010)_2 = (?)_{10}$

$(1\times2^7) + (1\times2^{-1}) + (1\times2^{-3})$

$= 128 + 0.5 + 0.125$

$= (128.625)_{10}$ Ans.

e. $(4D7F)_{16} = (?)_{10}$

$(4\times16^3) + (13\times16^2) + (7\times16^1) + (15\times16^0)$

$= 16384 + 3328 + 112 + 5$

$= (19839)_{10}$ Ans

Assignment (1) Page (3)

(f) $(128)_{10} = (?)_{16}$

16 | 128
8 - 0

$(128)_{10} = (80)_{16}$

(g) $(3A6F)_{16} = (?)_2$

Solution — Using Hexa binary table.

3 A 6 F
0011 1010 0110 1111

$(0011\,1010\,0110\,1111)_2$ Answ

(h) $(1100000\,1111\,0010\,1)_2 = (?)_{16}$

1100 0011 1110 0101
C 3 E 5

$\Rightarrow (C3E5)_{16}$

(i) $(6173)_8 = (?)_{10}$

$(6 \times 8^3) + (1 \times 8^2) + (7 \times 8^1) + (3 \times 8^0)$
$3072 + 64 + 56 + 3$

$= (3195)_{10}$ Ans

(i) $(169)_{10} = (?)_8$

8	169
8	21 — 1
	2 — 5

$(251)_8$ Ans

(K) $(340)_8 = (?)_2$

3 7 4 0

011 111 100 000

$(011\ 111100000)_2$ Ans

(L) $(1010110001011111)_2 = (?)_8$

001 010 110 001 011 111

1 2 6 1 3 2.

$(126132)_8$ Ans.

(M) $(7503)_8 = (?)_{16}$

7 5 0 3

111 101 000 011

Now using group of 4

1110 0100 0011

F 4 3

$= (F43)_{16}$.

Assignment (1) Page (5)

(N) $(2A7D)_{16} = (?)_8$

using hexa binary table.

2	A	7	D
0010	1010	0111	1101

Now using group of 3

000	010	101	001	111	101
0	2	5	1	7	5

$(25175)_8$. Ans.

(O) $(-12)_{10} = (?)_2$ using 2nd complement

2	12
2	6 - 0
2	3 - 0
	1 - 1

$(1100)_2$.

Now take 2nd Complement.

0000 1100

~~0000 1100~~ 2nd Complement.

1111 0100 Answer.

(P) $(11111111)_2 = \pm (?)_{10}$ 2nd Compl

$(1\times2^6) + (1\times2^5) + (1\times2^4) + (1\times2^3) + (1\times2^2) + (1\times2^1) + (1\times2^0)$

$= 64 + 32 + 16 + 8 + 4 + 2 + 1$

$= 127$

Since the sign bit is 1 so

$= (-127)_{10}$ Ans.

(R) $(156)_{10} = (?)_{BCD}$

Solution

1 5 6

0001 0101 0110

$(0001\ 0101\ 0110)_{BCD}$

(R) $100000111\ 0000\ BCD = (?)_{10}$

1000 0111 0000

8 7 0

$(870)_{10}$ Ans.

(S) $(1001010)_2 = (?)$ grey code

1 → +0 → +0 → +1 → +0 → +1 → +0

1 1 0 1 1 1 1

(11 0111) grey code

(T) $(10101111)_{grey} = (?)_2$

1 +0 +1 +0 +1 +1 +1 +1

1 1 0 0 1 0 1 0

$(11001010)_2$ Ans

Assignment ① Page ②

(iv) 01000000 = (?) Ascii-code

$(1 \times 2^6) + (1 \times 2^0)$

64 + 1

$(65)_{10}$ = A Ascii character.

(v) $(01100000)_2$ = (? Ascii capital.

$(1 \times 2^6) + (1 \times 2^5)$

64 + 32

$(96)_{10}$ = (') Ascii-capital

(vi) (111000) = (? 111000) Even parity.

sol- for even parity.

111000 = (1111000)

The number of 1 is must be even.

(0110)' = (? 10110) odd parity.

1011101 = (11011101) odd parity.

The nubers of 1 must be odd.

Assignment ① Page ⑧

Q4. Calculate each of the following.

(A) 11110011 + 01011111

```
  11110011
  01011111
①01010010
```

$(01010010)_2$ Ans

(B) 10000000 − 01111111

```
  01111111
  10000001   2nd Co.
```

Now

```
  10000000
  10000001
①00000001
```

Disc

$(00000001)_2$

(C) $(1100)_2 \times (1100)_2$

```
   11
 × 1100
   00
  00
+ 111
  11
10010000
```

Ans.

Assignment ① Page ④

(d) $(1100)_2 \div (10)_2$.

$$
\begin{array}{r|l}
10 & 1100 \\
 & 110 \\
\hline
 & 10 \\
 & 100 \\
 & 10 \\
\hline
 & 00 \\
 & 00 \\
\hline
 & \times
\end{array}
$$

$(110)_2$ Ans.

(e) $(01111111)_2 - (00000111)_2$

00000111
11111001 2nd Co—

Now.

01111111
11111001
01111000

(01111000) Ans.

(b) 01101010 × 11110001

11110001
00001111 2nd

Now Multiply

(6)

```
        0000 1111
      - 0110 1010
        ---------
        0000 0000
      + 0000 1111 x
        ---------
        0000 1111 xx
      + 0000 1111 xxx
        ---------
        0000 1111 xxxx
      + 0000 1111 xxxxx
        ---------
        0000 1111 xxxxxx
      + 0000 0000 xxxxxx
        ---------
        0000 1111 0110
```

1100011010
0011100101 2nd Co.

(11100101 0) Ans.

(7) $(10001000)_2 \div (00100010)_2$

Take 2nd Compl

00100010
11011110 2nd Co

Quotient = 00000000

10001000
11011110
① 01100110

Quotient = 00000001

01100110
11011110
dis ① 00111100

Assignment 01 Page (11)

Quotient = 00000010

```
  00100100
  11011110
----------
① 00100010
```

Quotient = 00000100

```
  00100010
  11011110
----------
  00000000
```

Answer 00000100 Answer.

(h) $FC_{16} + AE_{16}$

Solution

```
  F C
  A E
-----
1 A A
```

(1AA) Answer

(i) $(F1)_{16} - (A6)_{16}$ using 2nd Comp.

```
  A    6
 1010  0110
 10100110
 01011010
```

2nd Comp

```
  1111 1100
  01011010
----------
① 01010110
```

```
  F    C
 1111  1100
```

Assignment ① Page (13)

0101 0110
↓ ↓
5 6

52 Answer.

05) Apply module-2 to $(1100)_2 + (1011)_2$.

```
 1100
 1011
 ----
 0111
```
Answer.

06) Apply CRC to the data bits 10110010 using general code 1010

D = 10110010
Cn = 1010
D' = 11010110000

```
11010110000
1010
----
1110
1010
----
1000
1010
----
 1011
 1010
 ----
  1000
  1010
  ----
   100 - non-zero
```

Hence remainder is not zero lets do it again and add remainder to the data

Assignment ① Page (13)

```
11010011010100
1010
 1110
 1010
  1000
  1010
   1011
   1010
    1010
    1010
       0   CRC.
```

Hence 11010011010 is transmitted CRC

6) Assume that the code produced in Q-5 an error occurs in the most significant bit during transmission. Apply CRC to detect the error.

Sol — D' = 01010011010100

C = 100

```
01010011010100
1010
 1111
 1010
  1010
  1010
     0110      1000
     1010      1010
     1100        10 → hence error
     1000           is detected
     1101           because remainder
     1010           must be zero.
     1110
     1010
```