Dr. Shiva Kant Mishra
Dept. of Physics
H.D. Jain College, Ara

M.Sc. Sem II
Paper - MPHY CC-7
Electronics I

Hexadecimal Addition & Subtraction

FEBRUARY 2024
M T W T F S S M T W T F S S
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29

2024 Monday JANUARY 22

Ex-1 Add $1AB_{16}$ and $67B_{16}$.

Sol:- Column X:

$8 + B = 8 + 11_{10}$

$= 19_{10}$

$= 16 + 3$

$= 13_{16}$

(Sum of 3, carry of 1)

Sum of 3, carry of 1

Columns

	Z	Y	X
	1	A	8
+	6	7	B
	8	2	3

$1 + A + 7 = 1 + 10_{10} + 7$

$= 18_{10}$

$= 16 + 2$

$= 12_{16}$

(Sum of 2, carry of 1)

Sum of 2 Carry of 1

Column Z: $1 + 1 + 6 = 8$

(Sum of 8, no carry).

Therefore, $1AB_{16} + 67B_{16} = 823_{16}$

Ex-2 Subtract 3A8 from 1273 in hexadecimal system.

In Columns, W;

Borrow on 1 from X = 16

Add 3

Total 19

Subtract 8

Difference 11 = B

Columns

	Z	Y	X	W
	1	2	7	3
−		3	A	8
		E	C	B

Therefore result is ECB

Column X :		Column Y	
Number at X	= 6	Number at Y	= 1
Borrow 1 from Y	= 16	Borrow 1 from Z	= 16
Total	= 22	Total	= 17
Subtract	= 10 (= A)	Subtract	= 3
Difference	= 12 = C	Difference	= 14 = E

Ex-3 Subtract $2A_{16}$ from 84_{16} :

Y	X		
8	4	Number at Column X =	4
−2	A	Borrow 1 from Y	= 16
Result 5	A_{16}	Total	= 20
		Subtract A	= 10
		Difference	= 10 = A

Some examples of the Octal Number System :

The Octal System is formed by grouping bits in group of 3, starting at the binary Point. Refer to Table Number System. The highest digit in Octal System is 7. There is no 8's or 9's. Following example will make it clear :

1) Convert 111110111110101_2 to octal.

Divide into groups of Three 11 111 011 110 101

express each group in decimal 3 7 3 6 5

Therefore, $111110111110101_2 = 37365_8$

2) Convert 7423_8 to binary

Copy the Octal Number 7 4 2 3

Convert each into binary 111 100 010 011

Therefore $7423_8 = 111100010011_2$

FEBRUARY 2024

M	T	W	T	F	S	S	M	T	W	T	F	S	S
			1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29										

3) Convert 56_{10} to octal system:

8	56	R
8	7	– 0
8	0	– 7

Therefore $(56)_{10} = (70)_8$

4) Convert as follows: $(ABCD)_{16} = \ldots (10) = \ldots (8)$
we have already shown
$(ABCD)_{16} = (43981)_{10}$

and

8	43981	– R
8	5497	– 5
8	687	– 1
8	85	– 7
8	10	– 5
8	1	– 2
	0	– 1

So that $(ABCD)_{16} = (125715)_8$.