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Digital logic:

ex: Tube light, traffic light

Number System:

1) $(\quad)_{2,3,4,5,\ldots}$
↳ radix

2 → Radix → Binary
3 → " → ternary
4 → " → quaternary
8 → " → octal
10 → " → decimal
16 → " → Hexadecimal

Conversion:

1) Decimal to other base system:-

$(619)_{10} \rightarrow (X)_8$

619/8	8	R
77/8	77	3
9|8	9	5
1|8	1	1
	0	1

$(1153)_8 = (619)_{10}$

$(534)_{10} \rightarrow (x)_2$

2	534	0	
2	267	1	
2	133	1	
2	66	0	
2	33	1	
2	16	0	
2	8	0	
2	4	0	
2	2	0	
2	1	1	
	0		

$(1000010110)_2 = (534)_{10}$

Q 1) $(544)_{10} \rightarrow (\quad)_4$

2) $(8743)_{10} \rightarrow (\quad)_8$

3) $(4576)_{10} \rightarrow (\quad)_3$

other base system to decimal system:

1) $(1153)_8 \rightarrow (x)_{10}$

3 2 1 0

$3 \times 8^0 + 5 \times 8^1 + 1 \times 8^2 + 1 \times 8^3$

Value X Radix ^ Weightage

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1) $(1153)_8 \rightarrow (x)_{10}$

we value x Radix

$(1153)_8 \rightarrow 3\times8^0 + 5\times8^1 + 1\times8^2 + 1\times8^3$

3210 $\Rightarrow 3 + 40 + 64 + 512$

$\Rightarrow (619)_{10}$

2) $(542)_6 \rightarrow (x)_{10}$

210
111

$\Rightarrow 2\times6^0 + 4\times6^1 + 5\times6^2$

$\Rightarrow 2 + 24 + 180$

$\Rightarrow (226)_{10}$

36
5

Q 1) $(5743)_8 \rightarrow (x)_{10}$

2) $(6832)_8 \rightarrow (x)_{10}$

3) $(EA532)_{16} \rightarrow (x)_{10}$

4) $(2312)_4 \rightarrow (x)_{10}$

$()_{16} \rightarrow (0\text{-}15)$

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Octal Number System :- $()_8 \Rightarrow_3 (0\text{-}7)_8$

0 -	0	0	0
1 -	0	0	1
2 -	0	1	0
3 -	0	1	1
4 -	1	0	0
5 -	1	0	1
6 -	1	1	0
7 -	1	1	1

0 -	0	0	0
1 -	0	0	1
2 -	0	1	0
3 -	0	1	1
4 -	1	0	0
5 -	1	0	1
6 -	1	1	0
7 -	1	1	1

Hexadecimal number System - $(0\text{-}15)_{16}$

0 -	0	0	0	0
1 -	0	0	0	1
2 -	0	0	1	0
3 -	0	0	1	1
4 -	0	1	0	0
5 -	0	1	0	1
6 -	0	1	1	0
7 -	0	1	1	1
8 -	1	0	0	0
9 -	1	0	0	1
A - 10 -	1	0	1	0
B - 11 -	1	0	1	1
C - 12 -	1	1	0	0
D - 13 -	1	1	0	1
E - 14 -	1	1	1	0
F - 15 -	1	1	1	1

10

1 0

$()_{16} \rightarrow ()_2$

$\downarrow_2$

Binary to octal :-

$(\ )_2 \to (\ )_8$

↓

2^3

$(\ )_2 \to (\ )_8$

↓

$8 \Rightarrow 2^3 \to 8$

$(\ )_2 \to (\ )_8$

↓

2^3

$(001011110110)_2 \to (\ )_8$ $\quad (\ )_{16}$

↓ 2^3 $\quad$ ↓ 2^4

1 3 6 6

0000 0 0 01110 00

$(\ )_2 \to (\ )_{32}$

↓

2^5

$(001011110110)_2$

1 3 6 6

$(1366)_8$

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$(\ )_2 \rightarrow (\ )_{32}$
↓
2^{5}

0. 0 0 0 0
0 0 0 0 1

$(1100\,11011)_2 \rightarrow (\ )_{32}$
2 8 ↓ 2^5

$(28)_{32}$ Ans

$(\ )_2 \rightarrow (\ )_{16}$
2^{4}

$(\ )_2 \rightarrow (\ )_{10} \rightarrow (\ )_{16}$

$(\ )_4 \rightarrow (\ )_8$

$(\ )_4 \rightarrow (\ )_{10} \rightarrow (\ )_8$

Q 1) $(4324)_5 \rightarrow (x)_8$
2) $(5326)_7 \rightarrow (\ )_{16}$
3) $(6423)_9 \rightarrow (\ )_{10}$
4) $(423)_5 \rightarrow (\ )_5$