MULTIPLICATION and DIVISION

Multiplication in different base

i) $2^{2}3^{2}45 \times 5 \rightarrow 1725$

$25 / 10$: $2 \rightarrow Q$, $5 \rightarrow R$

2) 727×43

2181

$2908x$

31261

3) $(11010)_2 \times (11)_2$

111010

$11010x$

1001110

4) $(2^{1}2^{1}1^{1}2^{1}0^{2})_3 \times (2)_3$

$(12201111)_3$

$4 / 3$: $1 \rightarrow Q$, $1 \rightarrow R$

$5 / 3$: $1 \rightarrow Q$, $2 \rightarrow R$

5) $(7214)_8 \times (5)_8$

	4	4
	2	7
	4	4

20 / 8 — 2 / 4

10 / 8 — 1 / 2

36 / 8 — 4 / 4

6) $(4A6C)_{16} \times (\quad)_{16}$

	9	4	D	8

A → 10
B → 11
C → 12
D → 13
E → 14
F → 15

12 / 2 — 24 / 1 — 16 — 8

20 / 16 — 1 / 4

5 × 2 = 10 − 8 = 12

5 × 4 = 20 − 8 = 12 — 20 / 8 — 2 / 4

$(5)_8 \overline{)(764)_8} \; 144$

5

26
24

24
24

0

Division direct is complicated

* Better Convert both to decimal divide and get back to decimal

Un Signed Number Vs Signed Number

Number

Un Signed Number

→ without +ve or -ve sign has only magnitude

→ In nature we need unsigned number

→ All bits are used to represent magnitude

Ex:- 3 bits → (largest & smallest no)

(0, ..., 7)

→ Range 0 to $2^n - 1$

n → no. bits.

n = 3

0 to $2^3 - 1$

(0 to 7)

→ Ex:- 432

Signed Number

Signed No

+ve -ve

followed by mag

profit & loss, temp scale needs signed nos

If 'n' bits number one bit represents the sign bit, rest n-1 bits store magnitude

For uniform process (MSB) bits sign.

0 → +ve

1 → -ve

n

0 . . . .

↓

sign

3 Methods to represent sign

1) Sign magnitude 1's Comp 2's Comp

Ex:- -2, -43