UNIT-1

* Introduction to digital computer :—

* Digital computer :—

→ A computer that performs calculation and logic operation with quantities represented as digits usually in the binary number system.

→ In these types of computer, input is discrete rather than continous, consisting of combination of number letters and other characters represented internally in binary notation.

* Analog computer :—

→ It comes from the greek words which means establishing similarities between two quantities.

→ It represents data by measurable quantities as Voltage rather that by number,

→ In these type of computer arithmetical and logical operation are combined using signal amplifier.

* Difference between Digital & Analog computer

Digital computer	Analog computer
i) Its maintenance cost is low	i) It is Maintenance cost high
ii) It's processing speed is ~~low~~ high.	ii) It is processing speed is low as compared to digital computer
iii) It is portable in nature	iii) It is large in size consume large space
iv) It consume More power supply	iv) It consume less power supply
v) Digital hardware is flexible in implement	v) Analog hardware are not flexible

UNIT-2

** Binary Number codes and Arithmetic Numbering System :—

* Binary Number :—

→ Binary Number is a number expressed in binary numeral System which represents numeric values using two different symbols 0 & 1.

→ It is used internally by almost all modern computers computer based devices each binary digit is referred to as a bit.

Q* Conversion :—

Decimal to binary Number $(42)_{10}$.

42|2	21	0
21|2	10	1
10|2	5	0
2|2	5	0
1|2	0	1

$(42)_{10} = (10010)_2$ Ans

Q Decimal no. to binary no. 73 to binary

73|2	36	1
36|2	18	0
18|2	9	0
9|2	4	1
4|2	2	0
2|2	1	0
1|2	0	1

$(73)_{10} = (1001001)_2$ Ans

Q $(81.635)_{10} = (1010001.101100)_2$

81/2	40	1
40/2	20	0
20/2	10	0
10/2	5	0
05/2	2	1
02/2	1	0
01/2	0	1

.635×2	1.270	1
.270×2	0.54	0
.54×2	1.08	1
.08×2	0.16	1
.16×2	0.32	0
.32×2	0.64	0

Qw $(0.81250)_{10} = (0.1101)_2$

0.8125×2	1.6250	1
1.6250×2	1.250	1
1.250×2	0.50	0
0.5×2	1.00	1

Note The process will be continue loop the Seven (7) Stolo.

Q Decimal to octal

$(63)_{10} = (77)_8$

63|8 = 7 7

7|8 = 0 7

Q $(256)_{10}$ $(400)_8$

256|8	32	0
32|8	4	0
4|8	0	4

Q $(1024)_{10} = (2000)_8$

1024|8	128	0
128|8	16	0
16|8	2	0
2|8	0	2

Q Conversion of decimal to octal for each

$(0.96)_{10} = (75341)_8$.

0.96×8	7.68	7
0.68×8	5.44	5
0.44×8	3.52	3
0.52×8	4.12	4
0.12×8	0.96	1

Q $(110.01)_{10}$ $(156.00507)_8$

$110 \mid 8$	13	6
$13 \mid 8$	1	5
$1 \mid 8$	0	1

0.01×8	0.08	0
0.08×8	0.64	0
0.64×8	5.12	5
0.12×8	0.96	0
0.96×8	7.68	7

Note the process will continue to 5 steps

* Floating Point Number Representation –

1. A Number which has both an integer part as well as fractional part is called real or floating point –
   eg – 856.35, 65.5 (FPDN)
   1111.01 : 0101. 10 (BFPN).

2. In floating point representation a second register is used to store the Number that specify the position of decimal fractional part on the number stored in the first register.

Note :–

Register :–
temporary storage device which holds the Number temporarily for calculation purpose.

3. the real Number 875.99 can also be written as 8.7599 10^2.
   of point shifts to wordside left than exponent to wordside right then exponent is Negative.

4. The floating point representation of no. are stored the computer in the scientific representation, thus in a computer floating part no. are representation in two part namely Mantissa part and exponencential part, indicates the position of decimal in the no.
   eg – 365.234 10^{-4}

Sign	Mantissa	Sign	exponent
0	365.23	1	4

1011.1* 2^8

Sign	Mantissa	Sign	exponent
0	11011	0	8

thus real no. in floating point also is esentation is represented on
$n = m * r^e$.

N = floating point or real Number
M = Mantissa
r = radise point / base
e = exponent.

Subtraction :—

$0.4935 * 10^5$
$0.39 * 10^3$

$49.35 * 10^3$
$0.39 * 10^3$
$48.96 * 10^3$

Multiplication :—

$(0.486 * 10^3) * (26.5 * 10^6) = (0.486 * 26.5 * 10^9]$

Division :—