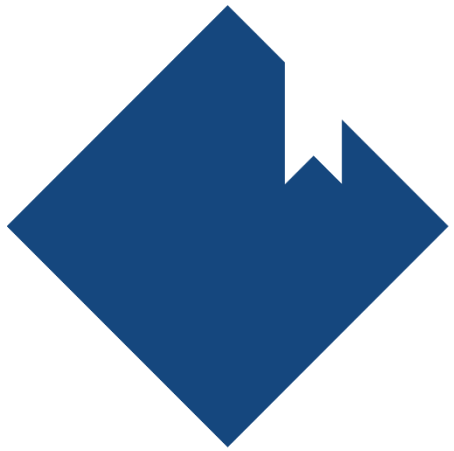


EARNEST
ACADEMY

EARNEST
ACADEMY

SUBJECT: DIGITAL COMPUTER PRINCIPLES

FACULTY NAME: JYOTHSNA S MOHAN

OCTAL TO DECIMAL

Q. Covert the following octal to decimal

a) $(17)_8 = 1*8^1 + 7*8^0 = 8+7 = 15$

b) $(4057.06)_8 = 4*8^3 + 0*8^2 + 5*8^1 + 7*8^0 + 0*8^{-1} + 6*8^{-2}$

$= 4*512 + 0 + 5*8 + 7*1 + 0 + 6*1/64$

$= 2048 + 40 + 7 + 0.0937 = 2095.0937$

Q. The decimal equivalent of the octal number 137 is….

a) 85 b)87 c) 95 d) 97

Q. The decimal equivalent of the octal number 137 is….

a) 85 b)87 c) 95 d) 97

137= 1*8^2+ 3*8+ 7*1

= 64+24+7= 95

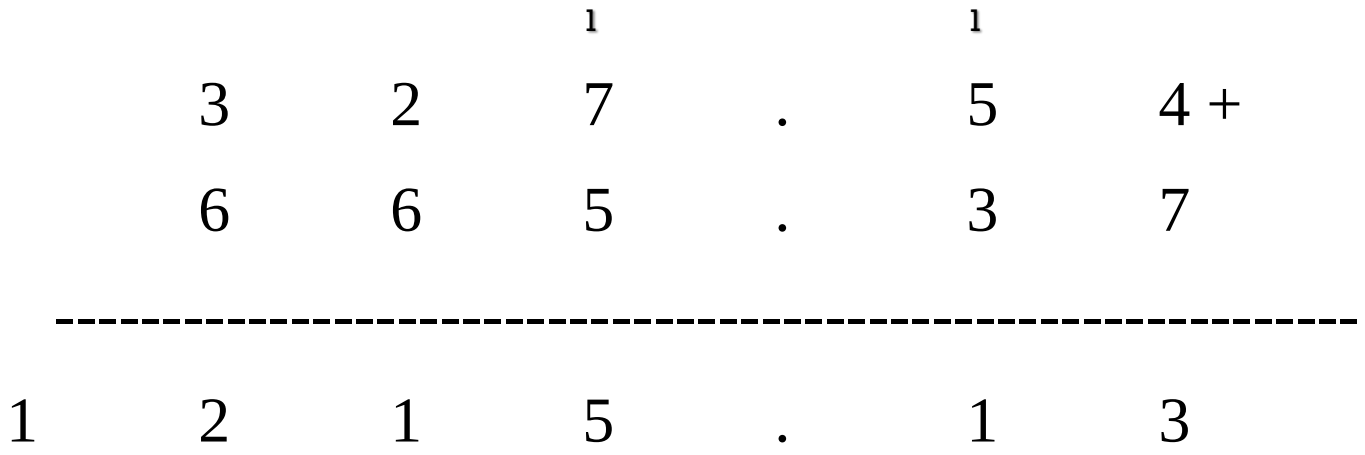
Ans: c) 95

DECIMAL TO OCTAL

- $(378.93)_{10}$

OCTAL ADDITION

1	4	3+
2	3	1
3	7	4


1 1
3 2 7 . 5 4 +
6 6 5 . 3 7
1 2 1 5 . 1 3

OCTAL SUBTRACTION

7 6 5-

4 7 3

……..

2 7 2

6-4 (6+8-7)

EARNEST ACADEMY

2	0	.	1	4	-
1	6	.	4	7	

0	1		4	5
1-1	(7-6)		(8+0-4)	(8+4-7)

7’S & 8’S COMPLEMENT

EARNEST ACADEMY

- 7’s complement - Subtract each digit form 7
- 8’s complement = 7’s complement+ 1

Q. Find 7's complement & 8's complement

4015

7	7	7	7		
4	0	1	5		
3	7	6	2	+	7's Complement
			1		
3	7	6	3		8's complement

Q. Find 7’s complement & 8’s complement 0f 2057.206

Ans : 7’s complement= 5720.671

8’s complement= 5720.672

HEXADECIMAL NUMBER SYSTEM

EARNEST ACADEMY

- It is also a positional (or weighted) number system.
- 16 symbols- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Requires only 4 bits to represent value of any digit

Representation of Hexadecimal Number

Hex digit & Decimal value	A = 10	B = 11	C = 12	D = 13	E = 14	F = 15
Binary	1010	1011	1100	1101	1110	1111

- Since base= 16= 2^4 , every 4 bit group of binary can be represented by an hexa decimal digit.

BINARY TO HEXADECIMAL

(1010101101001)2

= (1 0101 0110 1001)2

= (0001 0101 0110 1001)2

= (1 5 6 9)16

= (1569)16

(001100101.110111)2

=(0 0110 0101 . 1101 1100)2

= (0110 0101 . 1101 1100)2

= (6 5 . D C)16

= (65.DC)16

Q. Convert 01011111011.011111 to hexadecimal

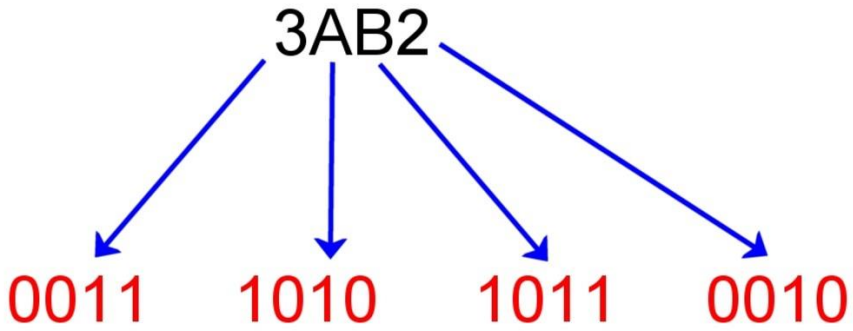
- Q. Convert 01011111011.011111 to hexadecimal

010	1111	1011	.	0111	11
0010	1111	1011	.	0111	1100
2	F	B	.	7	C

HEXADECIMAL TO BINARY

EARNEST ACADEMY

Converting Hex to Binary



$3AB2_{16} = 11101010110010_2$

The hexadecimal equivalent of the binary integer number 110101101 is:

Q. The hexadecimal equivalent of the binary integer number 110101101 is:

a) D24 b) 1BD c) 1AE d) 1AD

Q. The hexadecimal equivalent of the binary integer number 110101101 is:

a) D24 b) 1BD c) 1AE d) 1AD

1 1010 1101=1AD

- In this number system, the successive positions to the left of the hexadecimal point having weights of 16^0, 16^1, 16^2, $16^3$and so on
- The successive positions to the right of the hexadecimal point having weights of 16^{-1}, 16^{-2}, $16^{-3}$and so on
- The decimal value of any hexadecimal number can be determined using sum of product of each digit with its positional value

HEXADECIMAL TO DECIMAL

$(1F)_{16} = 1*16^1 + F*16^0$

$= 1*16^1 + 15*16^0$

$= 16 + 15$

$= 31$

OR

1F= 0001 1111= 16 + 8 +4+2+1= 31

Q. Convert $(5\ C\ 7.5)_{16}$ to decimal

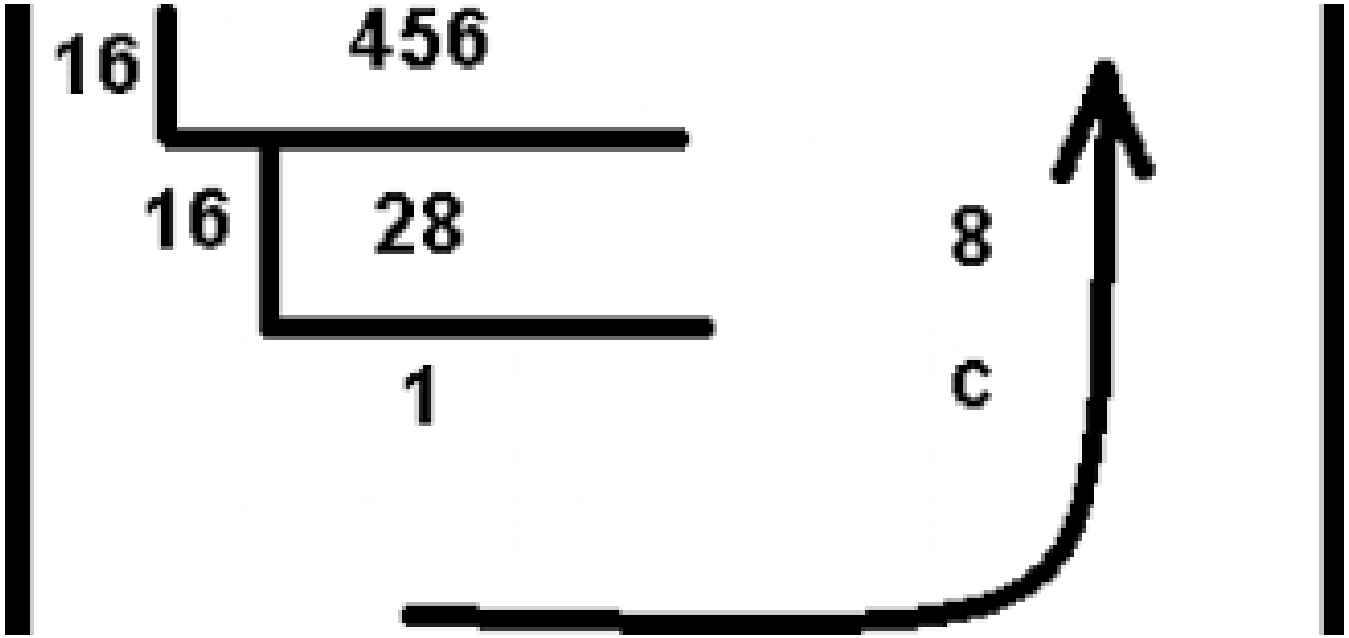
$$(5\ C\ 7.5)_{16} = 5*16\ \hat{}\ 2 + C*16\hat{}1 + 7*16\hat{}0 + 5*16\hat{}-1$$

$$= 5*256 + 12*16 + 7 + 5/16$$

$$= 1280 + 192 + 7 + .31 = 1479.31$$

DECIMAL TO HEXADECIMAL

Q. Convert 456 to hexadecimal



1C8

Q. Convert 49056 to hexadecimal

- Q. Convert 49056 to hexadecimal

Ans= $(BFA0)_{16}$

Q. Convert 2598.675 to hex

Q. Convert 2598.675 to hex

HEXADECIMAL ADDITION

23+16

2 3+

1 6

---

3 9

58+22

5 8 +

2 2

---

7 A

2B+84

2 B +

8 4

……

A F

DF+AC

D F +

A C

---

1 8 (1+13+10) B (15+12-16=11)

Ans: 18B

Q. 2A7C.30D + 8D9.E8B =

2A7C.30D + 8D9.E8B

	2	A	7	C	.	3	0	D +
		8	D	9	.	E	8	B
---	---	---	---	---	---	---	---	---
	3	3	5	6	.	1	9	8

HEXADECIMAL SUBTRACTION

Q. B08E.A1-78D6.3B =

		16				16	
	B	0	8	E	.	A	1	-
	7	8	D	6	.	3	B	
---	---	---	---	---	---	---	---	---
	3	7	B	8	.	6	6	

15’S &16’S COMPLEMENT

Q. 76

F F –

7 6

……..

8 9 + 15’S COMPLEMENT

1

……

8 A 16’S COMPLEMENT

Q. The hexadecimal representation of $(657)_8$ is…

a) 1AF b) D78 c) D71 d) 32F

Q. The hexadecimal representation of $(657)_8$ is…

a) 1AF b) D78 c) D71 d) 32F

657= (110 101 $111)_2$= (1 1010 $1111)_2$=1 A F

Q. $(1217)_8$ is equivalent to

a) $(1217)_{16}$ b) $(028F)_{16}$ c) $(2297)_{16}$ d) $(0B17)_{16}$

Q. $(1217)_8$ is equivalent to

a) $(1217)_{16}$ b) $(028F)_{16}$ c) $(2297)_{16}$ d) $(0B17)_{16}$

$(1217)_8 = (001\ 010\ 001\ 111)_2 = (0010\ \ 1000\ \ 1111)_2 = (28F)_{16}$

Ans: b