DLD + DSD

* Pre-Assesment:-

Question 1:

Part a) 215.46875

→ Intger part:.

11010111 = 215

011010111 (9-bits)

→ fractional part:

0.46875 × 2 =	0	.9375
0.9375 × 2 =	1	.875
0.875 × 2 =	1	.75
0.75 × 2 =	1	.5
0.5 × 2 =	1	.0

2	215
2	107-1
2	53-1
2	26-1
2	13-0
2	6-1
2	3-0
	1-1

0.46875 = 01111

= 0111100 (7-bits)

complete Binary notation:

0110_10111 . 0111100

2's complement:.

Since, it is already a +ve number we don't need to calculate its 2's complinent.

Part (b):- -128.96875

→ Integer part:-

$128 = 10000000 \rightarrow$ 011000000 (9-bits)

2	128
2	64 - 0
2	32 - 0
2	16 - 0
2	8 - 0
2	4 - 0
2	2 - 0
	1 - 0

→ fractional part:-

$0.96875 \times 2 = 1.9375$
$0.9375 \times 2 = 1.875$
$0.875 \times 2 = 1.75$
$0.75 \times 2 = 1.5$
$0.5 \times 2 = 1.0$
$0 \times 2 = 0$

$0.96875 = 11111$
$= 111100$ (7-bits)

complete binary for (128.96875):

$= 10000000.1111100$

-128.96875 in 2's complement form:-

01000000.1111100

(e)

0101000.011

→ Integer part:-

$2^0 \times 0 + 2^5 \times 1 + 2^4 \times 0 + 2^3 \times 1 + 2^2 \times 0 + 2^1 \times 0 + 2^0 \times 0$

$= 32 + 0 + 8 + 0 = 40$

→ Fractional part:-

$.011 = 0 \times 2^{-1} + 1 \times 2^{-2} + 1 \times 2^{-3}$

$= 0.25 + 0.125$

$= 0.375$

Hence, the answer is

Integer . fractional

40.375

(d) 1100001.101

1st bit indicates a negative number.

Integer part

$(1100001) \xrightarrow{\text{2's compliment}} 0111111 \rightarrow 31$

The fractional part is $0.^{6}25$

Hence, the final number is

-31.25

(c) $(FA21.302)_{16} \rightarrow$ (octal)?

1111 1010 0010 0001 . 0011 0000 0010

we get

175041.1402