Paper 7, TDC Part-3
Chapter– 3, Number Systems and Codes
Electronics
Hexadecimal Number System-2

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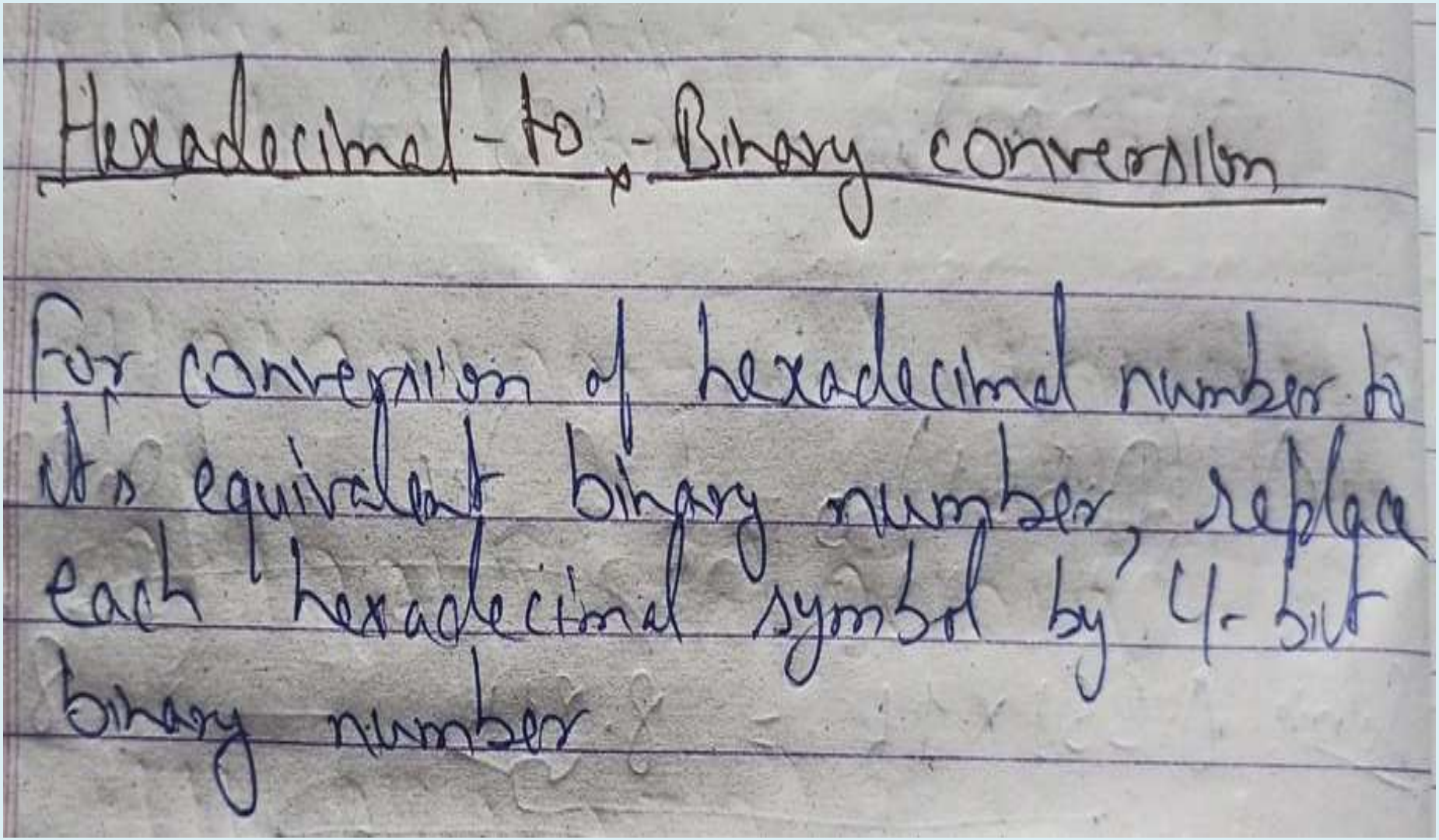
Number Systems and Codes



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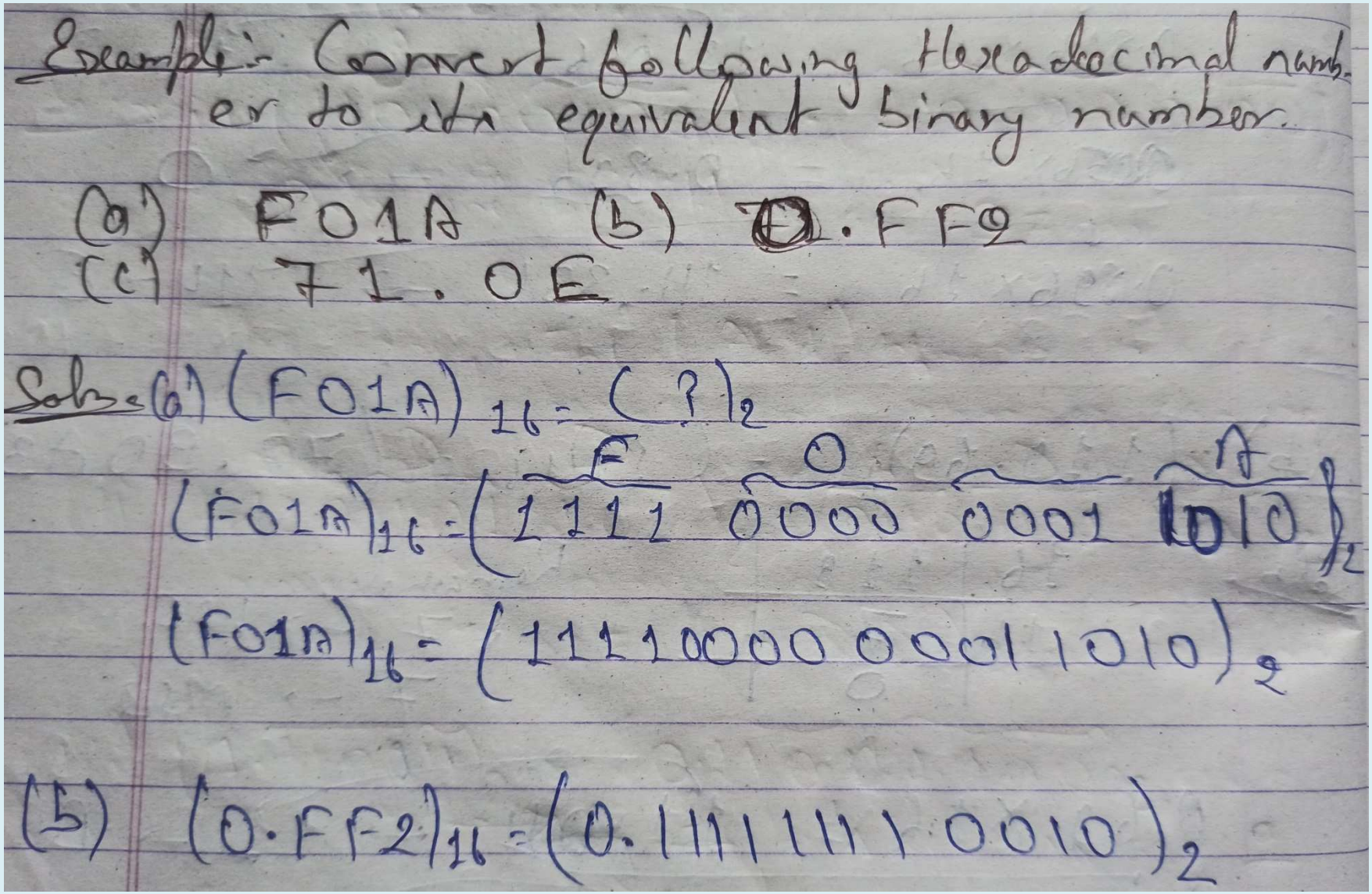

Number Systems and Codes

(c) $(71.0E)_{16} = (01110001.00001110)_2$

Binary-to-Hexadecimal Number conversion

To convert any binary number to its equivalent binary number is done by converting group of 4-bit binary number to it's equivalent hexadecimal number

Process for grouping :->

(a) For integer part.

grouping of bits

-> Start from Right to Left i.e. (LSB to MSB)

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(a) For integer part.
grouping of bits
→ Start from Right to left i.e. (LSB to MSB)

→ In case at last 4-bit there is less than 4-bit then add as much zero as required to form group.

(b) For fractional part.

→ Start making groups of 4 bits from bits after radix point i.e. move towards left to right for fractional part.

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→ If at last there are not 4-bits for group then add as much zero's as required to form group of 4 bits.

Example: Convert following binary numbers to its equivalent hexadecimal number.

(a) 1101001100 (b) 1101101101

(c) 0.110011 (d) 0.10101

(e) 111.01

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(e) 111.01

Solution (i) $(111.01)_2 = (0001\,1010.0100)_2$

Only one bit left so add 3 zero's)

$= (1A4)_{16}$

(ii) $(110110111101)_2 = (0110\,1101\,1101)_2$

$= (6DD)_{16}$

(iii) $(0.11001)_2 = (0.11001000)_2$

2 bits left so add 2 zero's to form group.

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$= (0.\overline{58})_{16}$

(iv) $(0.\overline{1010\ 1})_2 = (0.\overline{1010\ 1000})_2$

$= (0.\overline{A8})_{16}$

* Conversion from Hexadecimal to Octal number.

Conversion of Hexadecimal to Octal number can be done by converting hexadecimal to binary or decimal number, then again converting this binary or decimal number to octal number.

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Conversion of Hexadecimal to Octal number can be done by converting hexadecimal to binary or decimal number, then again converting this binary or decimal number to octal number. Using conversion with help of binary number will be simple.

Example: Convert following hexadecimal number to its equivalent octal number

(a) $(F01)$ (b) $0.1A2$ (c) $98.1C$

Sol (a) $(F01)_{16} = (\ ?\ )_8$

Direction of grouping ⟵

$(F01)_{16} = (1111\ 0000\ 0001)_2$

$(F01)_{16} = (7401)_8$

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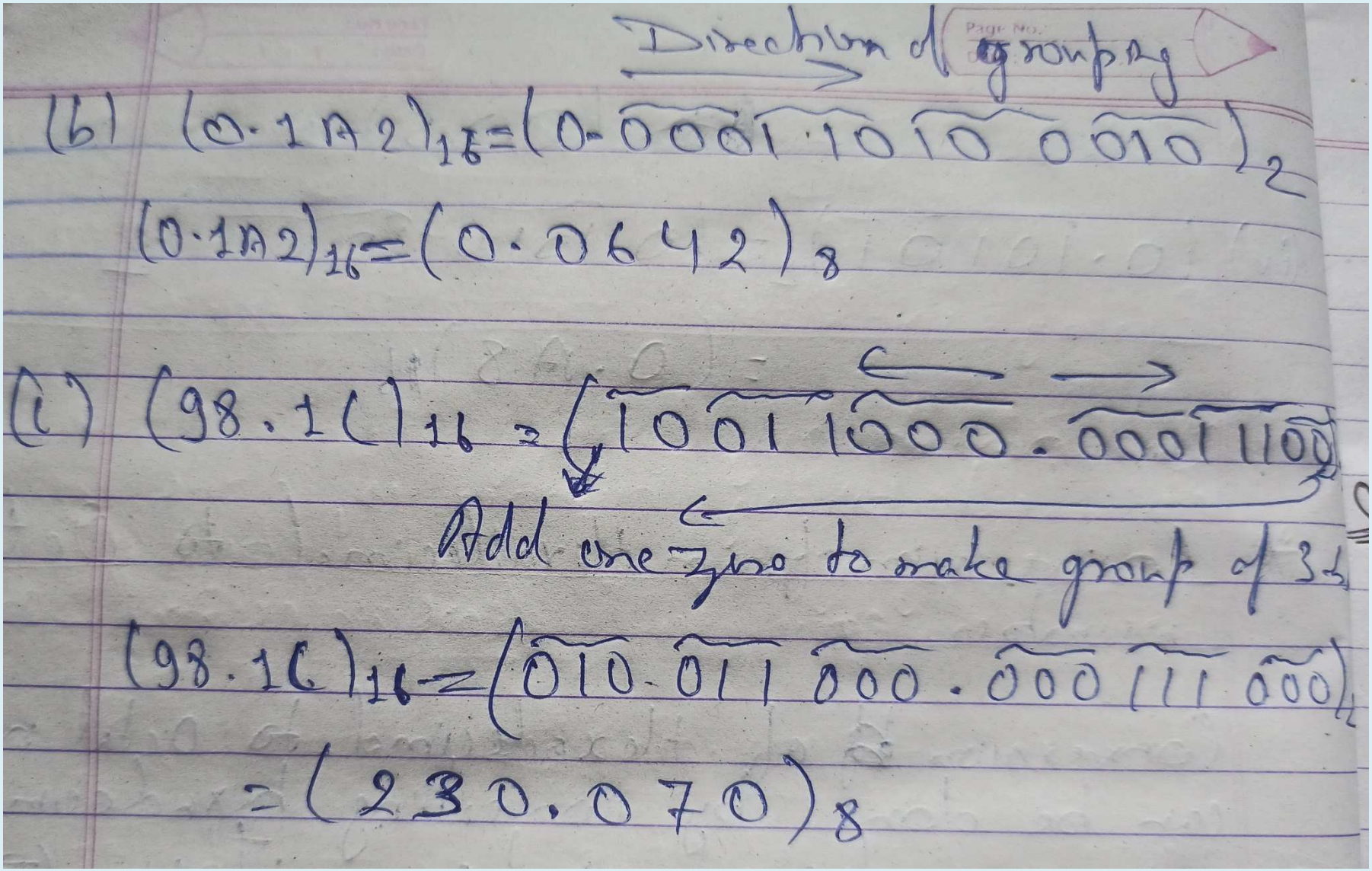

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Conversion from Octal to Hexadecimal Number system.

The conversion of Octal number into it's equivalent hexadecimal number can be done by first converting octal number to binary or decimal number, then converting binary or decimal number to its equivalent hexadecimal number.

Using Binary conversion technique is simple.

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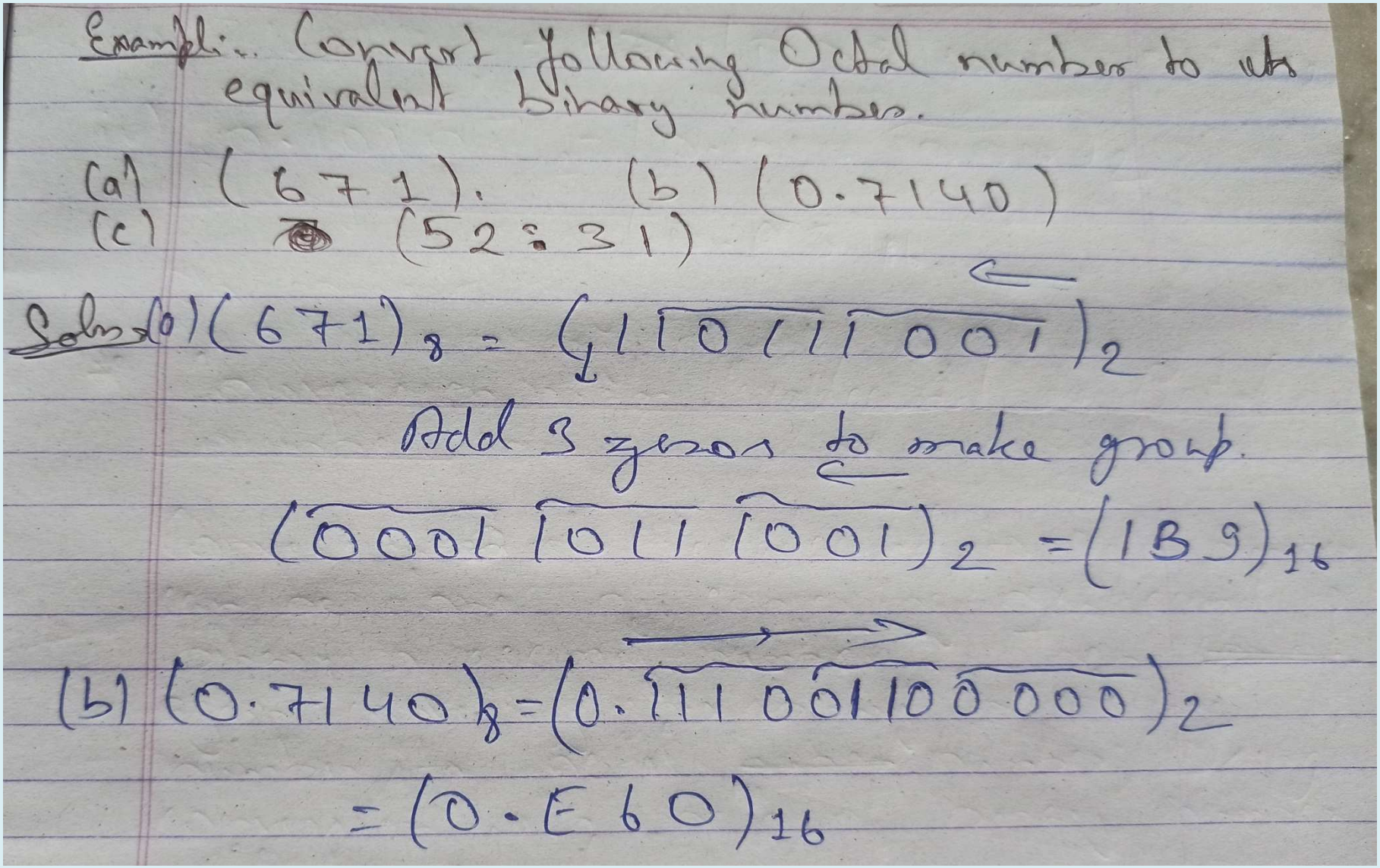

Thank You