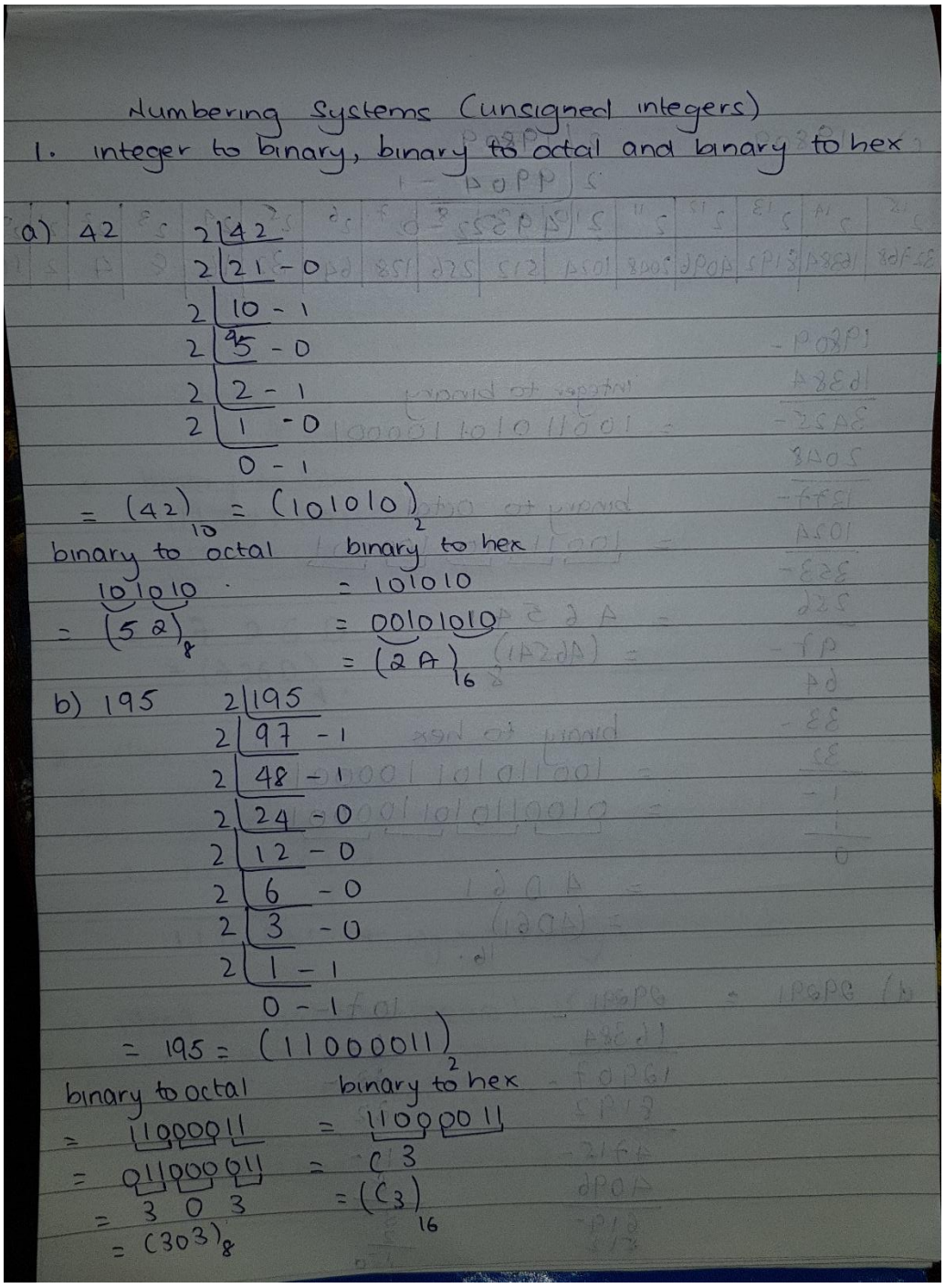
OBJECT ORIENTED PROGRAM DESIGN

WORKSHEET 11: NUMBERING SYSTEM

1. Number Systems (Unsigned Integers)



c) 19809

2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
32768	16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2	1

19809 -
16384
3425 -
2048
1377 -
1024
353 -
256
97 -
64
33 -
32
1 -
1
0

integer to binary
= 10011 0101 100001

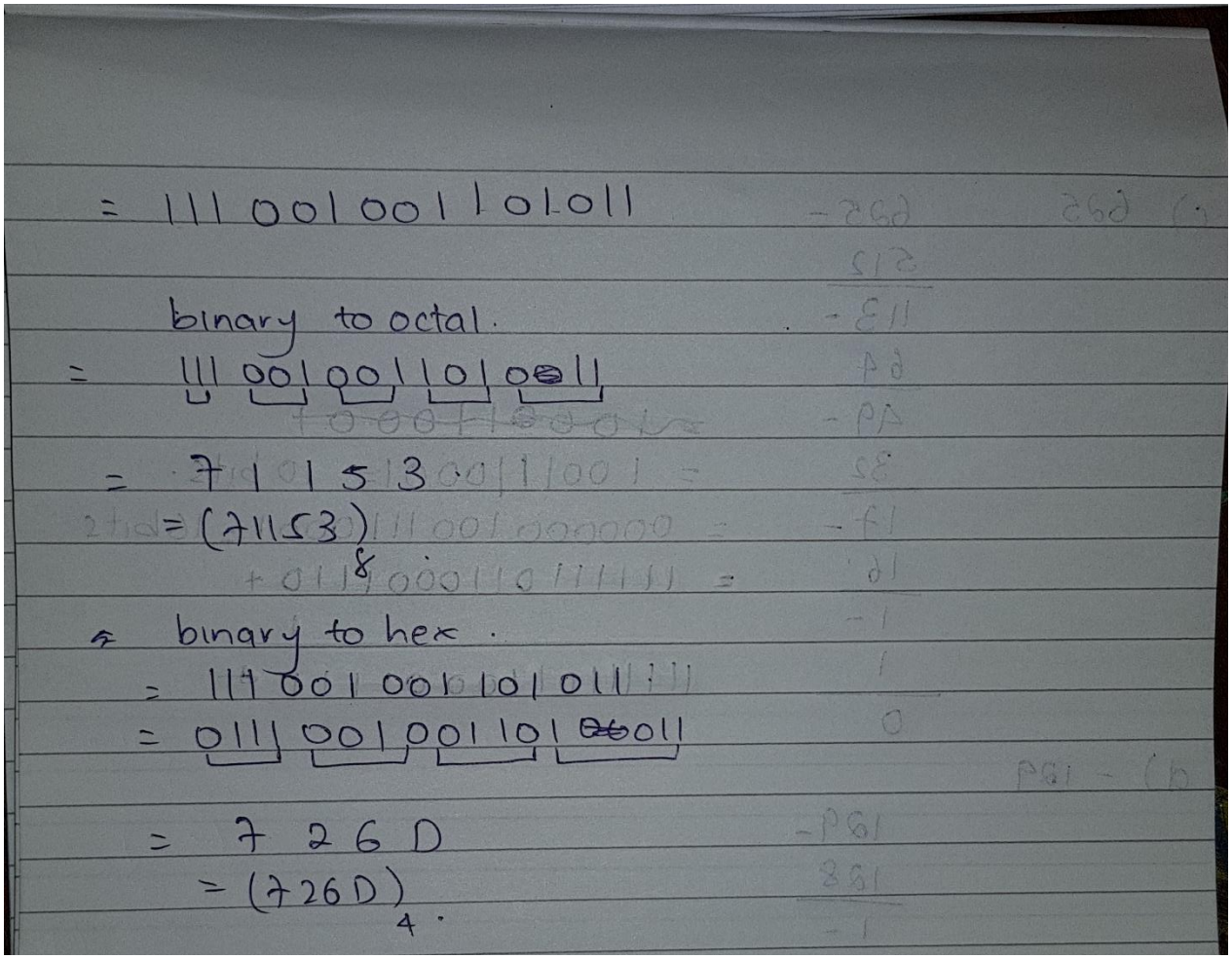
binary to octal
= 100 110 101 100 001
= 4 6 5 4 1
= (46541)$_8$

binary to hex
= 1001 1010 1100 0001
= 0100 1101 0110 0001
= 4 D 6 1
= (4D61)$_{16}$

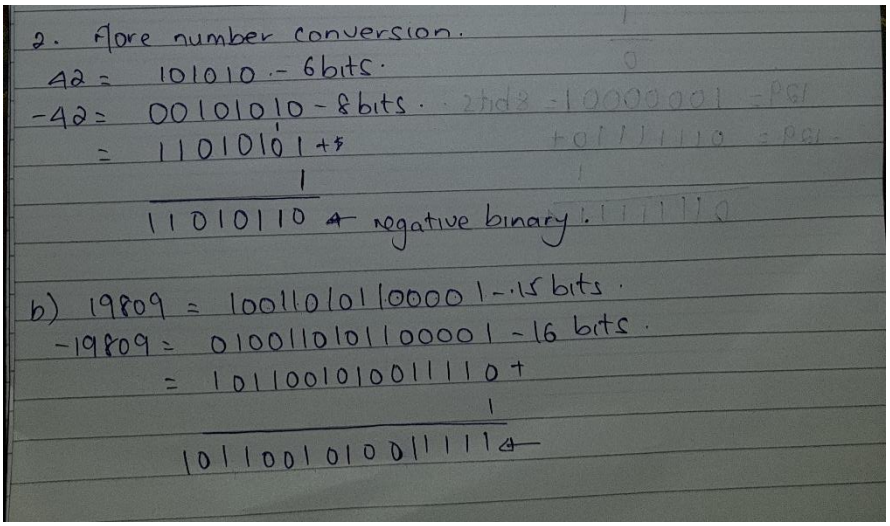
d) 29291 =

29291 -
16384
12907 -
8192
4715 -
4096
619 -
512

107 -
64
43 -
32
11 -
8
3 -
2
1 = 0



2. More Number Conversion!



c) 625

625 -
512
113 -
64
49 -
32
17 -
16
1 -
1
0

= 1001110001 = 10 bits.

= 0000001001110001 = 16bits

d) - 129

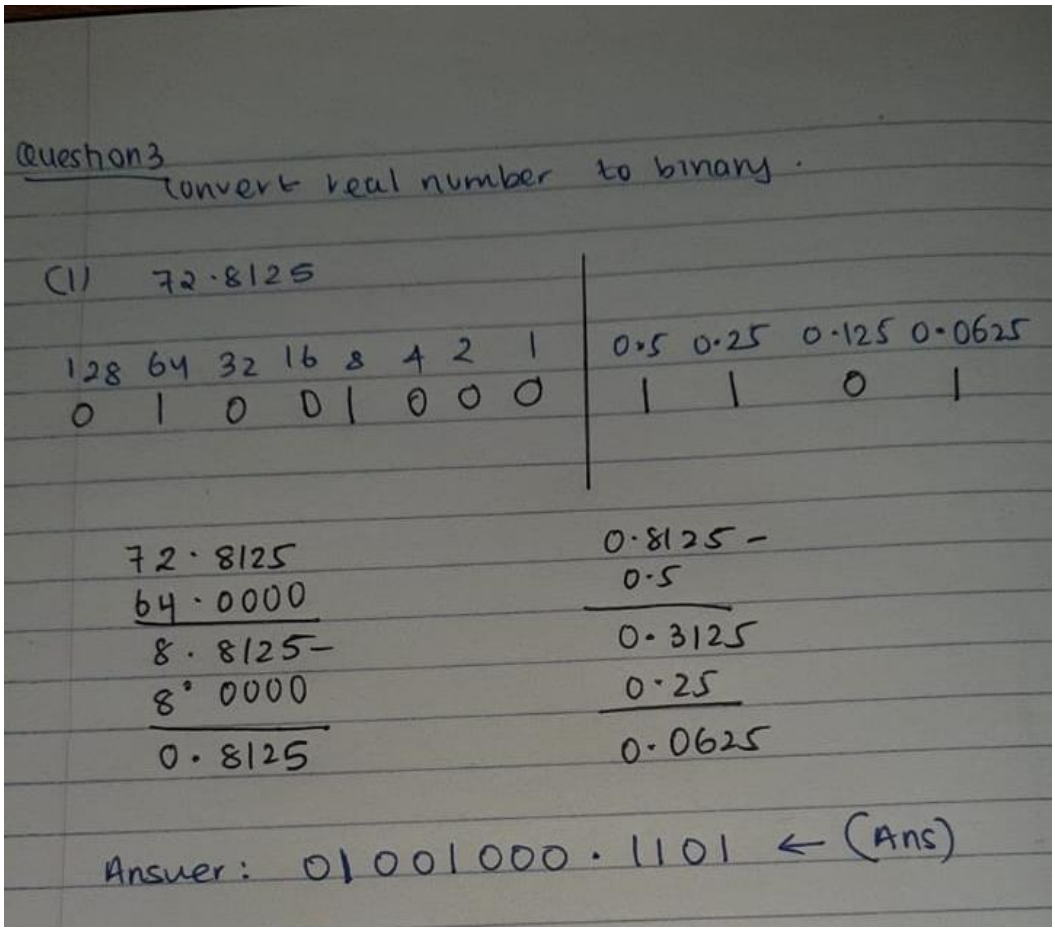
129 -
128
1 -
1
0

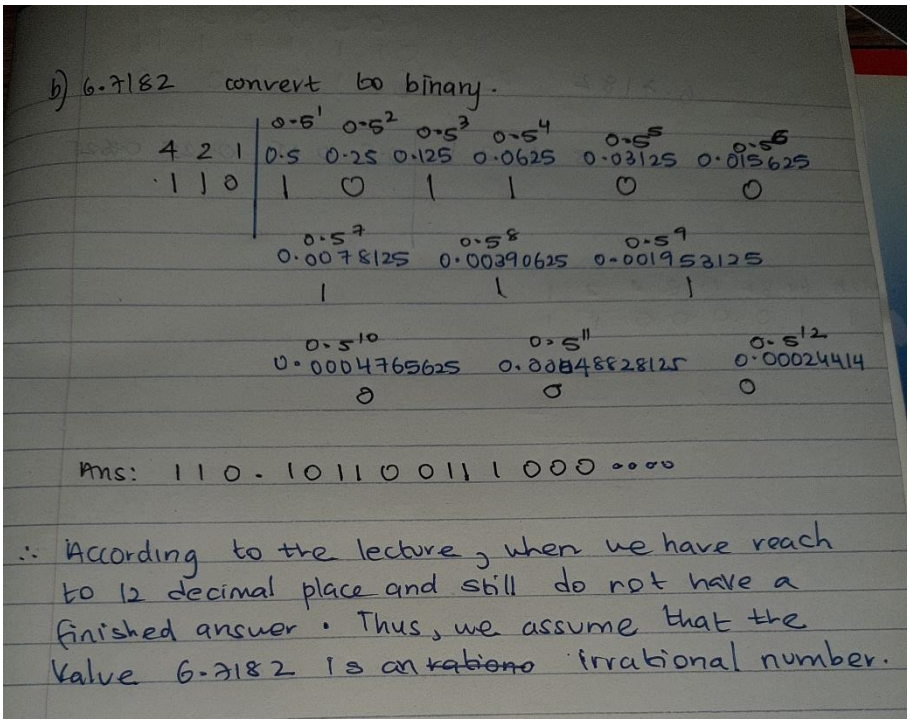
129 = 10000001 = 8bits.

-129 = 01111110 +
1

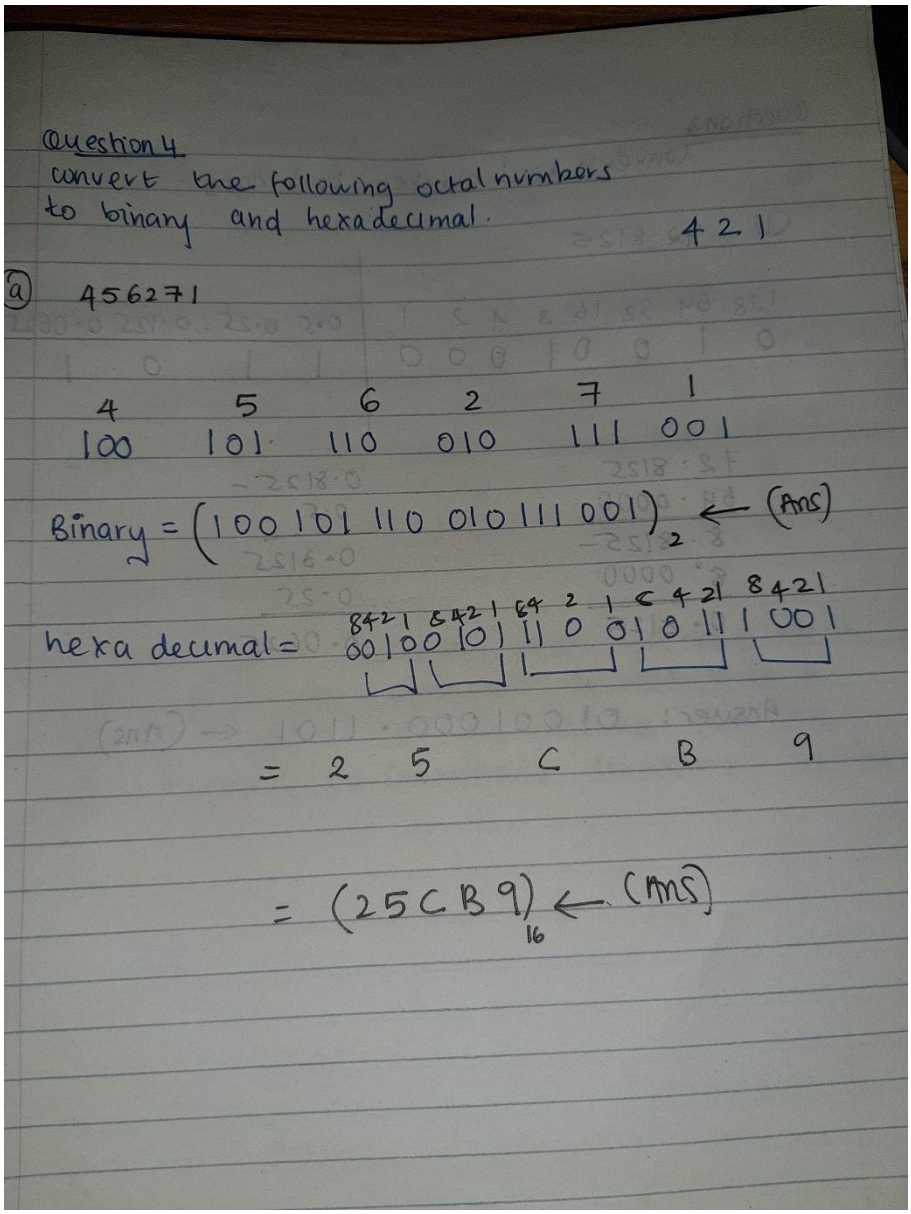
01111111

3. Real Number Conversion





4. Octal



Question 4

convert the following octal numbers to binary and hexadecimal.

(a) 456271

4	5	6	2	7	1
100	101	110	010	111	001

Binary = $(100\ 101\ 110\ 010\ 111\ 001)_2$ ← (Ans)

hexa decimal =

8421	8421	8421	8421	8421	8421
0010	0101	1100	1011	1001	

= 2 5 C B 9

= $(25CB9)_{16}$ ← (Ans)

4 2 1

(b) 36251

3 6 2 5 1

011 110 010 101 001

$= (0111100101001001)_2$ ← (Ans)

Hex 8421 8421 8421 8421

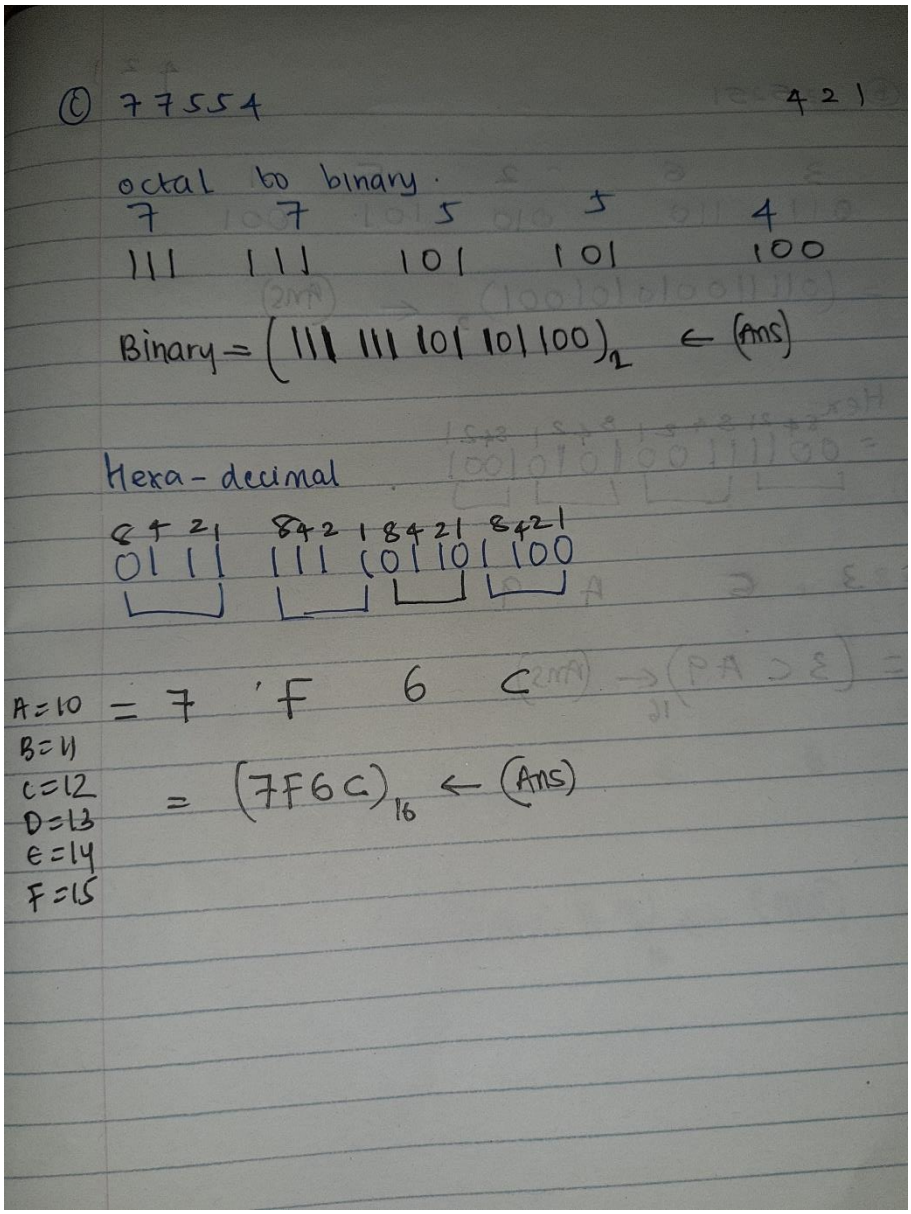
$= 0011\ 1100\ 1010\ 1001$

A = 10

B = 11

C = 12 $= 3\ C\ A\ 9$

$= (3CA9)_{16}$ ← (Ans)



5. Hexadecimal

Questions

(a) convert binary to octal

Hex to binary

14D

A = 10
B = 11
C = 12
D = 13

1 4 D

8421	8421	8421
0001	0100	1101

Binary = $(0001\ 0100\ 1101)_2$ ← (Ans)

Binary to octal

421	421	421	421
0001	0100	1101	

5 1 5

$= (515)_8$ ← (Ans)

(b) A B C

A = 10
B = 11
C = 12

Hex to binary

A	B	C
8421	8421	8421
1010	1011	1100

Binary $= (101010111100)_2 \leftarrow$ (Ans)

Binary to octal

421	421	421	421
101	010	111	100

$= 5\ 2\ 7\ 4$

$= (5274)_8 \leftarrow$ (Ans)

(c) 987

9	8	7
8421	8421	8421
1001	1000	0111

Binary $= (1001\,10000111)_2 \leftarrow$

Binary to octal

$=$ 4 2 1 | 4 2 1 | 4 2 1 | 4 2 1

$= 1001\,1000\,0111$

$= 4\ 6\ 0\ 7$

$= (4607)_8 \leftarrow (\text{Ans})$