

Exercise 7 – Number System

Instruction: Convert the following (10 pts each). Please show your solutions. (Either screen shot/typed/ handwritten solutions.)

1. 71_{10} → 1000111_2

Div by 2	Quotient	Remainder
71/2	35	1
35/2	17	1
17/2	8	1
8/2	4	0
4/2	2	0
2/2	1	0
1/2	0	1



Answer: 1000111_2

2. 398_{10} → 616_8

Div by 8	Quotient	Remainder
398/8	49	6
49/8	6	1
6/8	0	6



Answer: 616_8

3. 3654_{10} → $E46_{16}$

Div by 16	Quotient	Remainder	Equivalent
3654/16	228	6	6
228/16	14	4	4
14/16	0	14	E



Answer: $E46_{16}$

4. $1111011_2 \rightarrow 123_{10}$

Place values	16 ¹			16 ⁰			
	4	2	1	8	4	2	1
Binary	1	1	1	1	0	1	1
	4*1	2*1	1*1	8*1	4*0	2*1	1*1
	4	2	1	8	0	2	1
	7			11			
	7 * 16 ¹			11 * 16 ⁰			
	7 * 16			11 * 1			
Decimal	112			11			
	123 ₁₀						

Answer: 123_{10}

5. $653_8 \rightarrow 427_{10}$

Place values	8^2	8^1	8^0
Octal	6	5	3
Conversion	6×8^2	5×8^1	3×8^0
Decimal	384	40	3
	427_{10}		

Answer: 427_{10}

6. $E1D_{16} \rightarrow 3613_{10}$

Place values	16^2	16^1	16^0
Hexa	E	1	D
Conversion	14	1	13
	14×16^2	1×16^1	13×16^0
Decimal	3584	16	13
	3613_{10}		

Answer: 3613_{10}

7. $111010100011_2 \rightarrow 7243_8$

Converting Binary to Decimal:

Place values	16 ²				16 ¹				16 ⁰			
	8	4	2	1	8	4	2	1	8	4	2	1
Binary	1	1	1	0	1	0	1	0	0	0	1	1
Conversion	8 * 1	4 * 1	2 * 1	1 * 0	8 * 1	4 * 0	2 * 1	1 * 0	8 * 0	4 * 0	2 * 1	1 * 1
	8	4	2	0	8	0	2	0	0	0	2	1
	14 * 16 ²				10 * 16 ¹				3 * 16 ⁰			
	3584				160				3			
Decimal	3747 ₁₀											

Converting from 3747_{10} to Octal:

Div by 8	Quotient	Remainder
3747/8	468	3
468/8	58	4
58/8	7	2
7	0	7



Answer: 7243_8

8. $110110010110111_2 \rightarrow 6CB7_{16}$

Place values	16 ³			16 ²				16 ¹				16 ⁰			
	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1
Binary	1	1	0	1	1	0	0	1	0	1	1	0	1	1	1
Conversion	4*1	2*1	1*0	8*1	4*1	2*0	1*0	8*1	4*0	2*1	1*1	8*0	4*1	2*1	1*1
	4	2	0	8	4	0	0	8	0	2	1	0	4	2	1
	6			12				11				7			
Equivalent	6			C				B				7			
Hexa	6CB7 ₁₆														

Answer: $6CB7_{16}$

9. $3456_8 \rightarrow 111\ 0010\ 1110_2$

Octal	3			4			5			6		
Place values	4	2	1	4	2	1	4	2	1	4	2	1
	0	1	1	1	0	0	1	0	1	1	1	0
Binary	011100101110₂											

Answer: 111 0010 1110₂

10. $FE1B_{16} \rightarrow 1111\ 1110\ 0001\ 1011_2$

Hexa	F				E				1				B			
Equivalent	15				14				1				11			
Place values	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1
	1	1	1	1	1	1	1	0	0	0	0	1	1	0	1	1
Binary	1111111000011011₂															

Answer: 1111 1110 0001 1011₂