I. **Convert the following numbers to binary. Do each calculation using both conversion method.**

1. $29_{10} = \underline{11101_2}$

	2^9 512	2^8 256	2^7 128	2^6 64	2^5 32	2^4 16	2^3 8	2^2 4	2^1 2	2^0 1
Decimal	29	29	29	29	29	29	13	5	1	1
Bits	0	0	0	0	0	1	1	1	0	1

$29 \div 2 = 14$ r. 1

$14 \div 2 = 7$ r. 0

$7 \div 2 = 3$ r. 1

$1 \div 2 = 0$ r. 1

2. $79_{10} = \underline{1001111_2}$

	2^9 512	2^8 256	2^7 128	2^6 64	2^5 32	2^4 16	2^3 8	2^2 4	2^1 2	2^0 1
Decimal	79	79	79	79	15	15	15	7	3	1
Bits	0	0	0	1	0	0	1	1	1	1

$79 \div 2 = 39$ r. 1

$39 \div 2 = 19$ r. 1

$19 \div 2 = 9$ r. 1

$9 \div 2 = 4$ r. 1

$4 \div 2 = 2$ r. 0

$2 \div 2 = 1$ r. 0

$1 \div 2 = 0$ r. 1

3. $273_{10} = \underline{100010001_2}$

	2^9 512	2^8 256	2^7 128	2^6 64	2^5 32	2^4 16	2^3 8	2^2 4	2^1 2	2^0 1
Decimal	273	273	17	17	17	17	1	1	1	1
Bits	0	1	0	0	0	1	0	0	0	1

$273 \div 2 = 136$ r. 1

$136 \div 2 = 68$ r. 0

$68 \div 2 = 34$ r. 0

$34 \div 2 = 17$ r. 0

$17 \div 2 = 8$ r. 1

$8 \div 2 = 4$ r. 0

$4 \div 2 = 2$ r. 0

$2 \div 2 = 1$ r. 0

$1 \div 2 = 0$ r. 1

4. $127_{10} = \underline{111111_2}$

	2^9 512	2^8 256	2^7 128	2^6 64	2^5 32	2^4 16	2^3 8	2^2 4	2^1 2	2^0 1
Decimal	273	273	17	17	17	17	1	1	1	1
Bits	0	0	0	1	1	1	1	1	1	1

$127 \div 2 = 63$ r. 1

$63 \div 2 = 31$ r. 1

$31 \div 2 = 15$ r. 1

$15 \div 2 = 7$ r. 1

$7 \div 2 = 3$ r. 1

$3 \div 2 = 1$ r. 1

$1 \div 2 = 0$ r. 1

5. $742_{10} = \underline{1011100110_2}$

	2^9 512	2^8 256	2^7 128	2^6 64	2^5 32	2^4 16	2^3 8	2^2 4	2^1 2	2^0 1
Decimal	742	230	230	102	38	6	6	6	2	0
Bits	1	0	1	1	1	0	0	1	1	0

742 ÷ 2 = 371 r. 0

371 ÷ 2 = 185 r. 1

185 ÷ 2 = 92 r. 1

92 ÷ 2 = 46 r. 0

46 ÷ 2 = 23 r. 0

23 ÷ 2 = 11 r. 1

11 ÷ 2 = 5 r. 1

5 ÷ 2 = 2 r. 1

2 ÷ 2 = 1 r. 0

1 ÷ 2 = 0 r. 1

II. **Convert the following numbers to Octal. Write your solution for each item**

6. $742_{10} = \underline{201_8}$

129 ÷ 8 = 16 r. 1

16 ÷ 8 = 2 r. 0

2 ÷ 8 = 0 r. 2

7. $1248_{10} = \underline{2340_8}$

1248 ÷ 8 = 156 r. 0

156 ÷ 8 = 19 r. 4

19 ÷ 8 = 2 r. 3

2 ÷ 8 = 0 r. 2

8. $79_{10} = \underline{117_8}$

79 ÷ 8 = 9 r. 7

9 ÷ 8 = 1 r. 1

1 ÷ 8 = 0 r. 1

III. **Convert the following numbers to hexadecimal. Write your solution for each item**

9. $175_{10} = \underline{AF_{16}}$

$175 \div 16 = 10$ r. 15 = F

$10 \div 16 = 0$ r. 10

10 $7134_{10} = \underline{1BDE_{16}}$

$7134 \div 16 = 445$ r. 14 = E

$445 \div 16 = 27$ r. 13 = D

$27 \div 16 = 1$ r. 11 = B

$1 \div 16 = 0$ r. 1

11 $9653_{10} = \underline{25B5_{16}}$

$9653 \div 16 = 603$ r. 5

$603 \div 16 = 37$ r. 11 = B

$37 \div 16 = 2$ r. 5

$2 \div 16 = 0$ r. 2

12 $1052_{10} = \underline{41C_{16}}$

$1052 \div 16 = 65$ r. 12 = C

$65 \div 16 = 4$ r. 1

$4 \div 16 = 0$ r. 4