ECE 1551 Assignment Chapter 1

1.

Write the following decimal numbers in
a) binary
b) hexadecimal notation
c) BCD notation

- 12
  a) 0000 1100
  b) 0C
  c) 0001 0010
- 24
  a) 0001 1000
  b) 18
  c) 0010 0100
- 35
  a) 0010 0011
  b) 23
  c) 0011 0101
- 135
  a) 1000 0111
  b) 87
  c) 001 0011 0101
- 68
  a) 0100 0100
  b) 44
  c) 0110 1000

2.

Write the following hexadecimal numbers in
a) binary
b) decimal

- `FF`
  a) `1111 1111`
  b) `255`
- `10`
  a) `0001 0000`
  b) `16`
- `32`
  a) `0011 0010`
  b) `50`
- `1A`
  a) `001 1010`
  b) `26`

3.

Obtain the 1′s and 2′s compliments of the following binary numbers:

- `0001 0000`
  a) `1110 1111`
  b) `1111 0000`
- `0000 0000`
  a) `1111 1111`
  b) `0000 0000`
- `1101 1010`
  a) `0010 0101`
  b) `0010 0110`
- `1010 1010`
  a) `0101 0101`
  b) `0101 0110`
- `1000 0101`
  a) `0111 1010`
  b) `0111 1011`
- `1111 1111`
  a) `0000 0000`
  b) `0000 0001`

4.

Perform the following operations using 2′s compliment notation. Make sure you use enough bits.

- `26 - 13`

  `26` in binary: `0001 1010`

  `13` in binary: `0000 1101`; 2′s compliment: `1111 0011`

```
   0001  1010
 +  1111  0011
 =  0000  1101

 =  13
```

- `-14 - 7`

  `14` in binary: `0000 1110`; 2′s compliment: `1111 0010`

  `7` in binary: `0000 0111`; 2′s compliment: `1111 1001`

```
   1111  0010
 +  1111  1001
 =  1110  1011

 =  -21
```

- `10 - 12`

  `10` in binary: `0000 1010`

  `12` in binary: `0000 1100`; 2′s compliment: `1111 0100`

```
   0000  1010
 +  1111  0100
 =  1111  1110

 =  -2
```

- `14 - 8`

  `14` in binary: `0000 1110`

  `8` in binary: `0000 1000`; 2′s compliment: `1111 1000`

```
   0000  1110
 +  1111  1000
 =  0000  0110

 =  6
```

- `30 - 7`

  `30` in binary: `0001 1110`

  `7` in binary: `0000 0111`; 2′s compliment: `1111 1001`

```
   0001  1110
 +  1111  1001
 =  0001  0111

 =  23
```