ISTM 214 Homework 10 (Due day: 1/2)

Name:_____ ID:_____

1. Perform the following signed conversions:

R(101101)$_2$	→	DR(	)$_2$	→	SM(	)$_2$
SM(101101)$_2$	→	DR(	)$_2$	→	R(	)$_2$
DR(101101)$_2$	→	SM(	)$_2$	→	R(	)$_2$

2. Express the decimal number $(-29)_{10}$, as an 8-bit binary number, in (a) sign-magnitude system, and (b) 1's complement system.

3. Determine the decimal value of this binary number $(10000110)_2$ when it is expressed as (a) an unsigned number, (b) a BCD number, (c) a signed number in sign-magnitude system, and (d) a signed number in 2's complement system.

4. Starting with the **signed** (two's complement) binary number $(1000\ 0000)_2$, perform eight consecutive **arithmetic right shifts** and determine the signed base 10 result after each shift.

Arithmetic Right Shifts	Binary Pattern	Base 10 Equivalent
(initial value)	1000 0000	-128
1		
2		
3		
4		
5		
6		
7		
8		

5. Starting with the **signed** (two's complement) binary number $(0000\ 0001)_2$, perform eight consecutive **arithmetic left shifts** and determine the signed base 10 result after each shift.

Arithmetic Left Shifts	Binary Pattern	Base 10 Equivalent
(initial value)	0000 0001	1
1		
2		
3		
4		
5		
6		
7		
8		

6. Radix addition (base 2).

```
  1 0 1 1 1
+ 0 1 1 1 1
-----------
```

```
  1 0 0 1 1
+ 1 0 1 1 1
-----------
```

```
  0 1 1 1 1
+ 1 0 0 0 0
-----------
```

```
  0 1 0 1 1
+ 0 1 0 1 0
-----------
```

7. Radix subtraction (base 2).

```
  1 0 0 1 1
- 1 1 1 1 1
-----------
```

```
  1 0 1 0 0
- 0 1 0 1 1
-----------
```

```
  0 1 0 1 1
- 0 0 0 0 1
-----------
```

```
  0 1 0 1 1
- 1 0 1 0 1
-----------
```