Homework 2
EET 340
Introduction to Computer Organization and Architecture

<u>INSTRUCTIONS:</u> Show the detailed steps of your calculation. The homework solution can either be typed in word or handwritten. However, convert the word or scanned (handwritten) documents to PDF and submit to blackboard. Please comment your assembly code.

1. Convert Decimal value to binary and then convert them to hexadecimal value: (10 Points)
   - a. 45_{10}
   - b. 22_{10}

2. What will be the value of X1 after running the following instruction: LSL X1, X2, #2. Assume that X2 = 4. (show the steps of calculation) (10 points)

3. What will happen to X2 after running the following instruction: LDUR X2, [X5, #0]. Assume that X5 = 0X8000000000004000 and locations 0X8000000000004000 through 0X8000000000004007 contain 0X00, 0X00, 0X00, 0X00, 0X00, 0X00, 0X02, and 0X23, respectively. (10 points)

4. Convert following assembly instruction to 32 bit machine code and then change it to Hexadecimal format. (25 Points)
```
a.  LDUR X10, [X5, #16]
b.  SUB X12, X14, X15
c.  LSR X11, X19, #2
```

5. Convert C++ code snippet to LEGv8 assembly code. The following variables x, y, and z are associated with registers X19, X20, and X21 respectively, and base address of the array A is in X22. Comment the code. (15 Points)

```
x = x + y;
z = x + 4;
A[8] = A[3] + z;
```

6. Convert C++ code snippet to LEGv8 assembly code. The following variables x, y, and z are associated with registers X19, X20, and X21, respectively, and base address of the array d is in X22. Comment the code. (30 Points)

```
a.  if (x > y)
        z = y + 4;
    else
        z = y - 16;

b.  for (i=0; i<x; i++)
    {
      y = d[i] + z;
    }
```