COMSATS University Islamabad, Lahore Campus

Assignment 2 – FALL 2024

Course Title:	Computer Organization & Architecture			Course Code:	CPE 343	Credit Hours:	4(3,1)
Course Instructor:	Dr. Muhammad Naeem Awais			Program Name:	BCE		
Semester:	5th	Batch:	FA21	Section:	A, B	Date Given:	8th October, 2024
Submission Date:	**15th October, 2024**			**Maximum Marks:**		**30**	
Name:				**Registration Number:**			

Important Instructions / Guidelines:

- Draw neat schematics wherever needed
- Do your own work, PLAGARISM will be graded as ZERO
- **No late submission**.

Question 1: **[CLO3-PLO2-C3]** **[10 Marks]**

For the given piece of C code, ***produce*** the equivalent MIPS assembly code.

```
For (i = 20; i >= 0; i = i - 1)
        W[i+1] = X[i-1] + s*Y[i];
```

While generating the assembly code, assume that W, X and Y are arrays and their base addresses are in registers $s0 to $s2. Whereas s is a 32-bit number that corresponds to $t0 and i is an array index that corresponds to $t1.

Question 2: **[CLO3-PLO2-C3]** **[10 Marks]**

For the given piece of C code, ***produce*** the equivalent MIPS assembly code.

```
While   (s*Y[i] != X[j])

          X[j] = X[i] + 100;

          i += 1;

          j += 1;
```

While generating the assembly code, assume that X and Y are arrays and their base addresses are in registers $s0 to $s1. Whereas s is a 32-bit number that corresponds to $t0 and i and j are array indices that corresponds to $t1 and $t2 respectively.

Question 3: **[CLO3-PLO2-C3]** **[10 Marks]**

For the given piece of C code, ***produce*** the equivalent MIPS assembly code using **STACK**:

```
int exampleprocedure (int g, int h, int i)
     {int f = 0;

     while (g!=h)
     {f = f*i*X[h];h--;}
```

```
                                    return f;}
```

While translating the code, assume that g, h, i correspond to parameter registers $a0 to $a2 and f corresponds to $s0 whereas X is an array and its base address is stored in registers $s1. Assume array X is accessed in descending order and has total 10 elements.