Course No: ESGD2204 **Course Title: Computer Arch.** **Date: 25/ 03 / 2013** **No. of Questions: ____3___** **Time: 1 H.** **Using Calculator (Yes)**	**University of Palestine** **Midterm Exam** **Second Term 2011/2012** **Total Grade: 20**	**Instructor Name: Eng. M. Timraz** **Student No.: _____** **Student Name: _____** **College Name: Engineering** **Dep. / Specialist: Software** **Using Dictionary (No)**

Q1: (10 points)

Write the operation or code for the following expressions.

a) Add a, b, c. (1/10)

b) Sub a, c, b. (1/10)

c) Lw a, b (1/10)
Lw d, c
Add z, a, d

d) F = (a + d) – (b+a) (2/10)

e) If the parameter a = 5, b = 6, c = 12, d = 20, and e = 30 are stored in the bios of a computer system, what is the output of the following expression. (2/10)

```
Lw    t0, a
Lw    t1, b
Add   t0, t0, t1
Lw    t1, e
Add   t2, t0, t1
Sub   t3, t2, t0
Sw    t1, t0
```

What are the values stored in each register.

f) According to the parameters values mentioned in the previous question, Determine if the following code will run correctly on the complier or not, and if not, explain why, and then write the correct code? (3/10)

```
Lw    t10, a
Lw    t11, b
Lw    t12, c
Add   t10, a, b
Sw    t11, t10
Sub   t10, b, c
Sw    t12, t10
Add   t10, a, c
```

Q2: (5 points)

A) A memory has 32768 words in it; each word has 16 bits along, what it takes bits to select a word in memory. (2/5)

B) Mention the steps of execution instructions and draw a graph to explain the execution cycle. (2/5)

C) State and explain the performance metrics. (1/5)

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Q3: (5 points)

A) Consider the following three hypothetical, but not atypical, processors, which we run with the SPEC gcc benchmark:

1. A simple MIPS two-issue static pipe running at a clock rate of 4 GHz and achieving a pipeline CPI of 0.8.
2. A deeply pipelined version of a two-issue MIPS processor with slightly smaller caches and a 5 GHz clock rate. The pipeline CPI of the processor is 1.0.
3. A processor has a 2.5 GHz clock, and CPI of this processor is 0.75.

Determine the relative performance of these three processors when running two different programs A and B, which has 22000 Instructions and 150000 instructions and 3 CPI, 5 CPI respectively.

Good Luck