0907335 Computer Organization (Fall 2014)

Quiz 2

الاسم: رقم التسجيل: الرقم التسلسلي:

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Instructions: Time **20** minutes. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. **No questions are allowed**.

<Good Luck>

Q1. Represent the decimal number -128.75 in single-precision floating-point representation using IEEE Standard 754-1985. Show your work clearly.

<2 points>

$-128.75 \rightarrow -10000000.11_2 \rightarrow (-1)^1 \times 10000000.11 \times 2^0 \rightarrow$
$(-1)^1 \times 1.000000011 \times 2^{0+7}$
$(-1)^1 \times 1.000000011 \times 2^{7+127}$
$(-1)^1 \times 1.000000011 \times 2^{134}$
$(-1)^1 \times 1.000000011 \times 2^{10000110}$
1 10000110 00000001100000000000000

Q2. For the following C statement, what is the corresponding MIPS assembly code? Assume that all variables are double-precision floating-point numbers. Also assume that the compiler maps the Constant `7.0` to the offset `const7` in the global region and maps the starting addresses of Arrays `A` and `B` to Registers `$s0` and `$s1`, respectively.

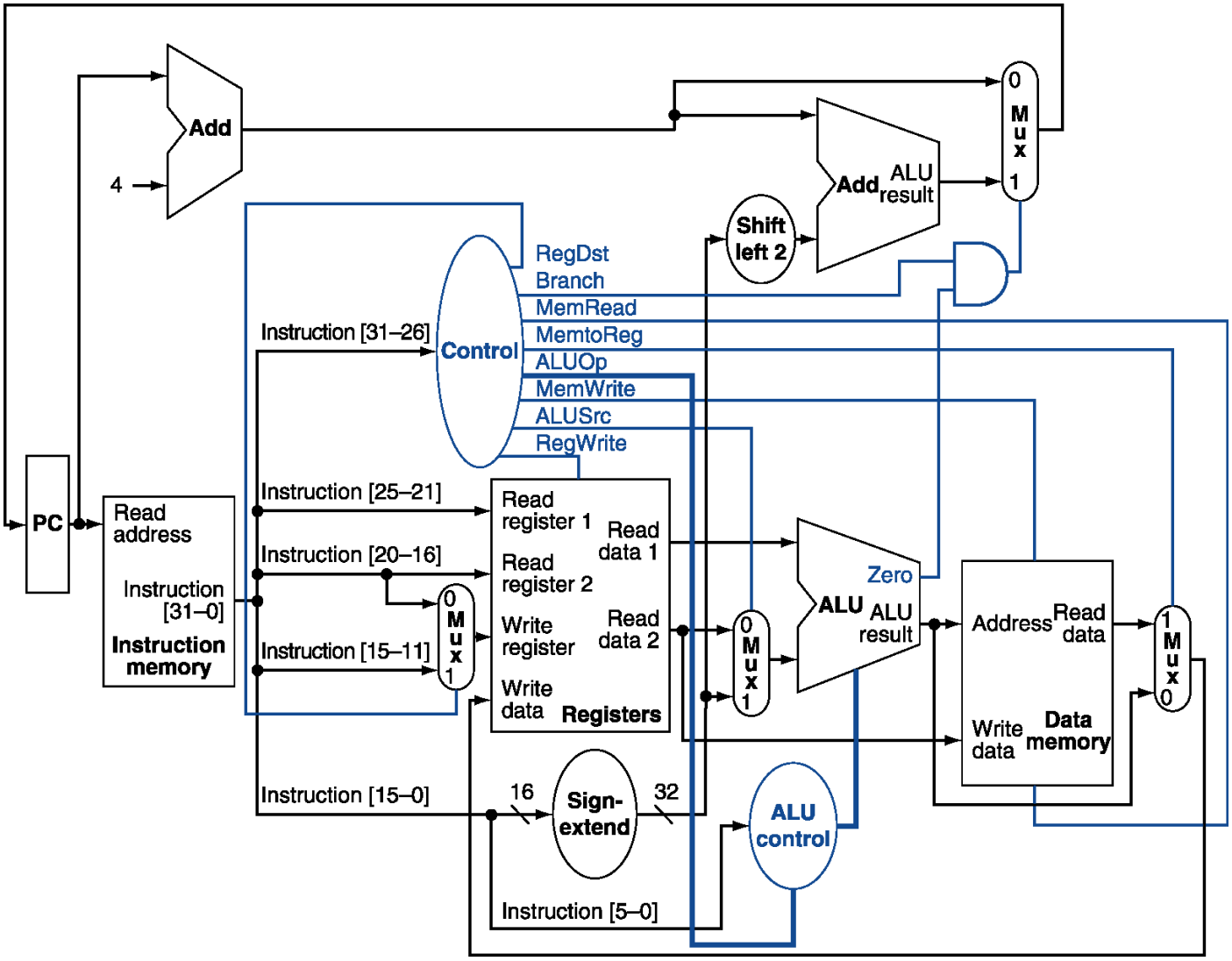
<2 points>

```
A[0] = B[3] + 7.0;
```

```
l.d   $f0, 24($s1)
l.d   $f2, const7($gp)
add.d $f4, $f0, $f2
s.d   $f4, 0($s0)
```

Q3. Assume that the following single-cycle processor is executing the instruction `slt r7, r8, r9`.

<3 points>

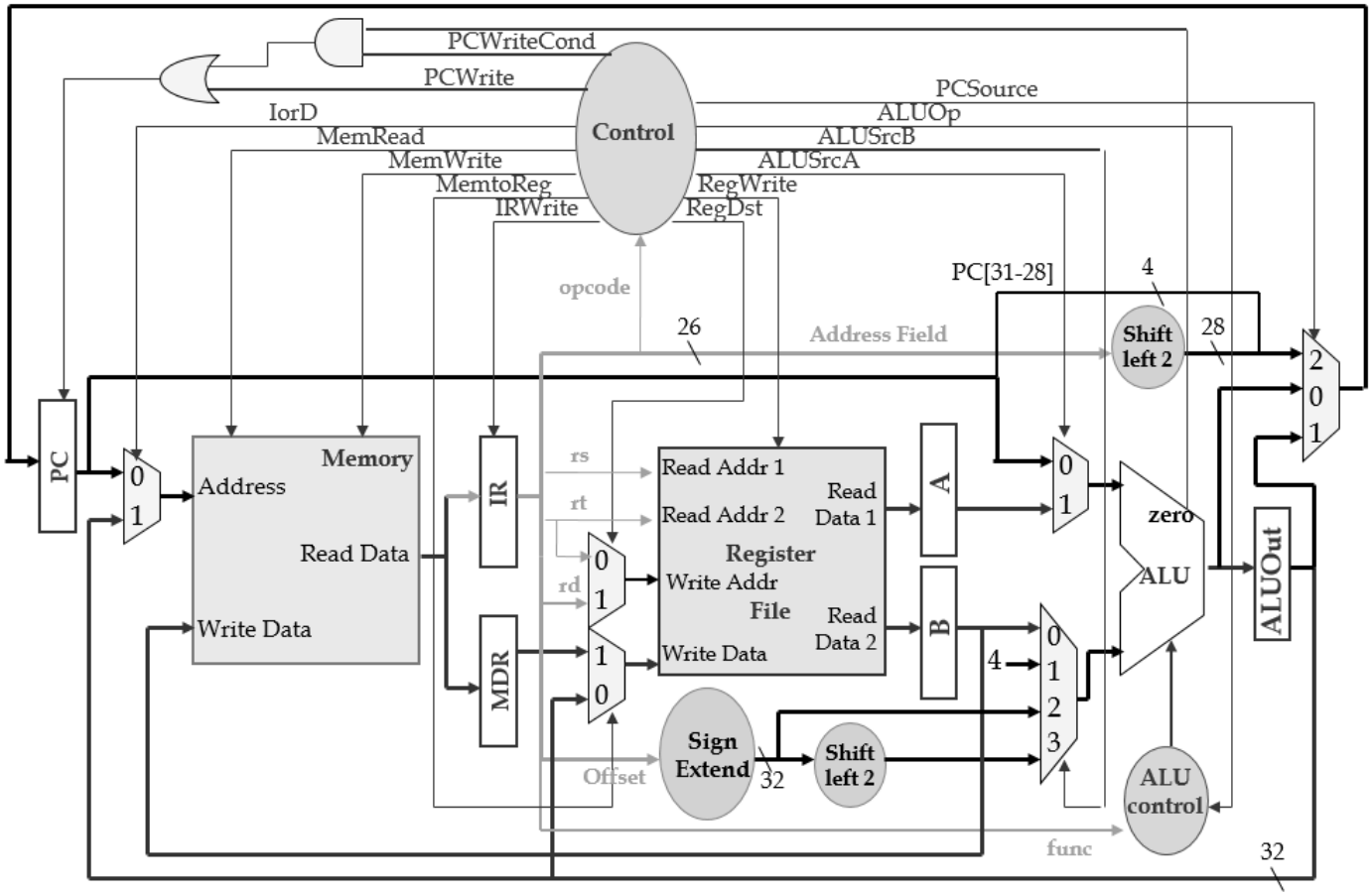


Specify the values of the following signals/fields at the end of the processor cycle.

Signal/Field	Value
ALUSrc	**0**
MemWrite	**0**
RegDst	**1**
Write Register	**7**
MemtoReg	**0**
ALUOp	**10_2**

Q4. Assume that the following multi-cycle processor is executing the instruction `sw r5, 4(r6)`.

<3 points>



Specify the values of the following signals/fields at the end of the specified cycles.

Signal/Field	Cycle	Value
IorD	1	**0**
rs	2	**6**
ALUSrcB	3	**10_2**
PCWrite	3	**0**
Output of Sign Extend	3	**00000004_{16}**
MemRead	4	**0**