

Question 40

Not yet  
answered

Marked out of  
1.00

Flag question

Biết rằng sau khi thực hiện xong chương trình hợp ngữ MIPS dưới đây, giá trị của thanh ghi **\$s0** là **0x15F**. Hãy điền nội dung phù hợp vào các ô trống để hoàn chỉnh lệnh

```
addi     , $zero, 0x15
 $t2, $t3, 4
addi    $s0, $t2, 
```

??

0x15 → 0x150

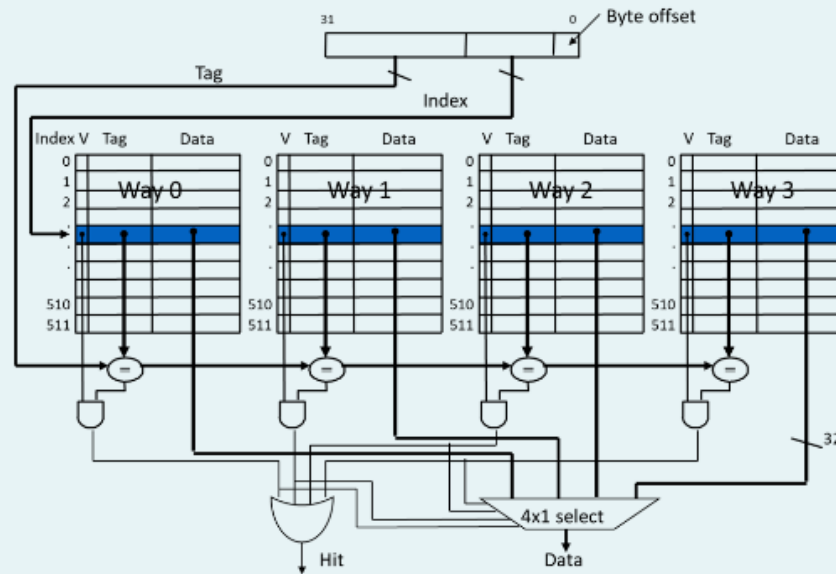
Question 13

Not yet answered

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Given a 4-way set associative cache memory organized as in the following figure. How many blocks are there in this cache?



$$2^9 \times 4$$

- ☒ a. 2048
- ☐ b. 512
- ☐ c. 1024
- ☐ d. 511

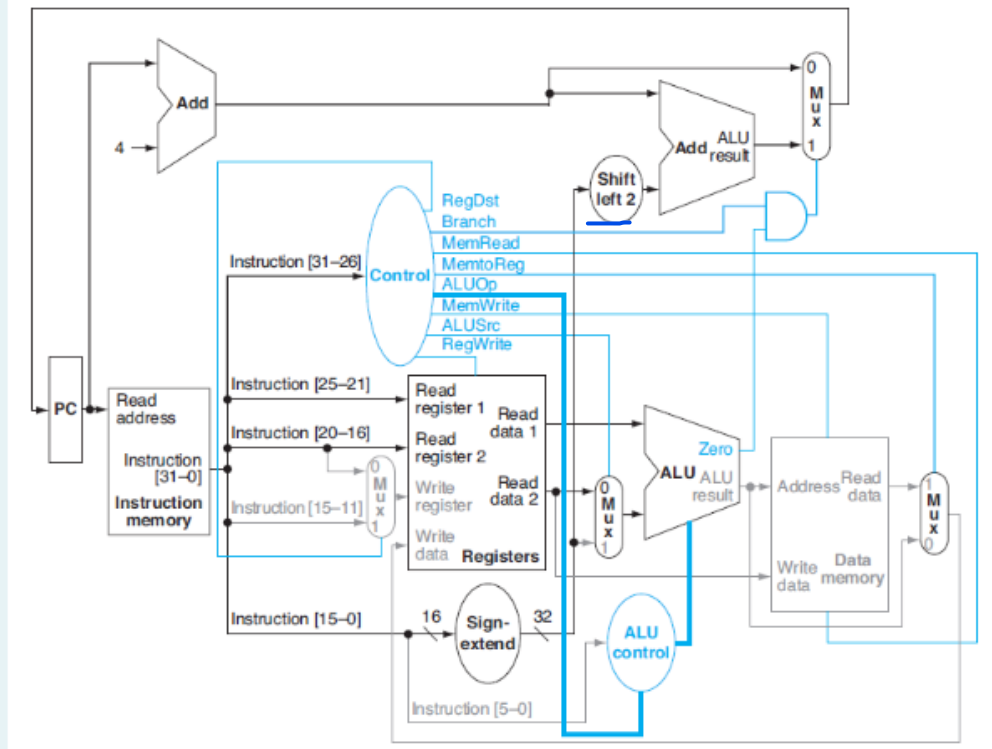
Question 6

Answer saved

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Given a single-cycle MIPS CPU shown below. Which instruction requires the component Shift left 2?



- ☐ a. addi \$t0, \$t1, 2
- ☐ b. lw \$s1, 4(\$s2)
- ☒ c. sll \$s1, \$s2, 2
- ☒ d. beq \$t1, \$t2, L1

Clear my choice

50i



## Question 8

Not yet answered

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Given a 5-stage-pipelined MIPS CPU running a program with dynamic instruction counts as below:

R-type	beq	j	lw	sw
50%	15%	5%	20%	10%

The CPI in the ideal case if no hazard occurred during the program execution should be 1. However as the program consists of many conditional branch instructions, control hazard will occur and actual CPI will increase.

Assume that this CPU uses branch not taken prediction to deal with control hazard, and no other type of hazard will happen. Given the correct branch prediction rate of 80%, and the penalty of wrong prediction is 1 clock cycle. Show the new CPI in this case: 1.03

Note: use "." as the decimal separator.

$$15\% \times 20\% = 3\%$$

## Question 1

Answer saved

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Given a 5-stage pipelined MIPS CPU with clock cycle of **4 ns**, and when no hazard happens its CPI is 1. The CPU has forwarding mechanism (including ALU-ALU and Mem-ALU forwarding paths) to help solve data hazard.

How much time will this CPU take to execute the below program, including pipeline fill-up time?

```

sll $t0, $s0, 2      # $t0 = 4*j
add $t0, $s6, $t0     # $t0 trỏ vào A[j]
sll $t1, $s1, 2      # $t1 = 4*i
add $t1, $s7, $t1     # $t1 trỏ vào B[i]
lw $t3, 0($t0)        # $t3 = A[j]
lw $t4, 4($t0)        # $t4 = A[j+1]
sll $t4, $t4, 2        #
add $t5, $t3, $t4     # $t5 = A[j]+4*A[j+1]
sw $t5, 0($t1)        # B[i] = A[j]+A[j+1]

```

1 cycle (

$$(10 + 4) \times 4 = 56$$

- ☐ a. 180.0 ns  
☒ b. 36.0 ns  
☐ c. 52.0 ns  
☒ d. 56.0 ns

Clear my choice

Sai

<

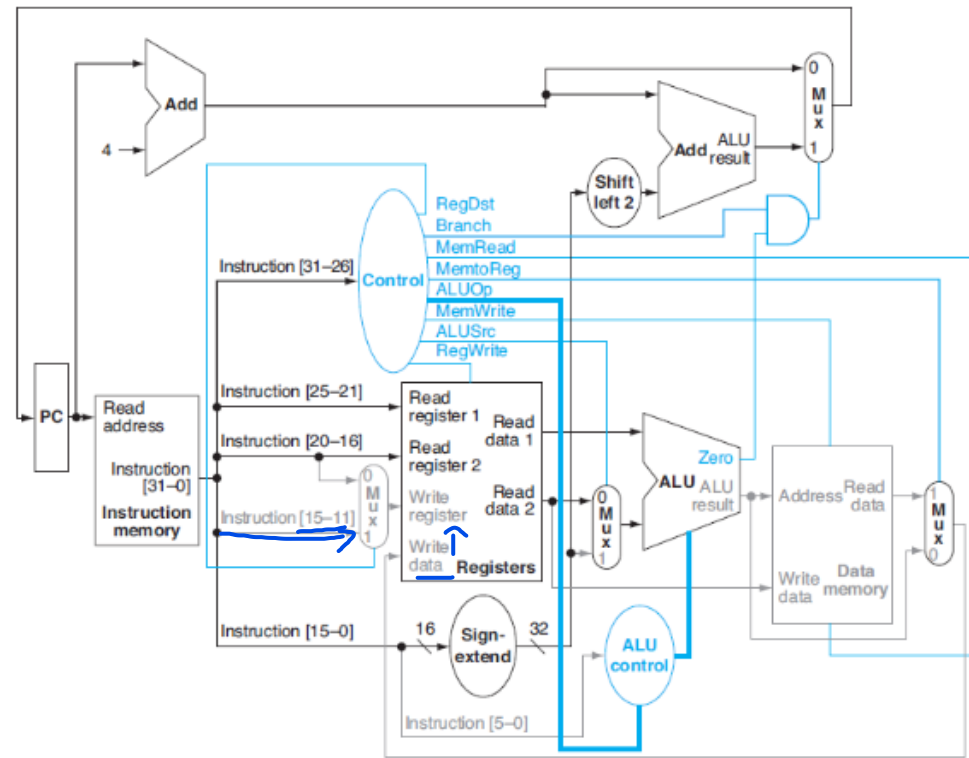
Question 12

Answer saved

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Given the single-cycle MIPS CPU below. Which instruction sends Instruction[15-11] to Write register input?



- ☐ a. lw \$t0, 0(\$t1)
- ☒ b. slt \$t1, \$s1, \$s2
- ☐ c. slti \$t1, \$t0, 3
- ☐ d. addi \$t0, \$t1, 100

Clear my choice

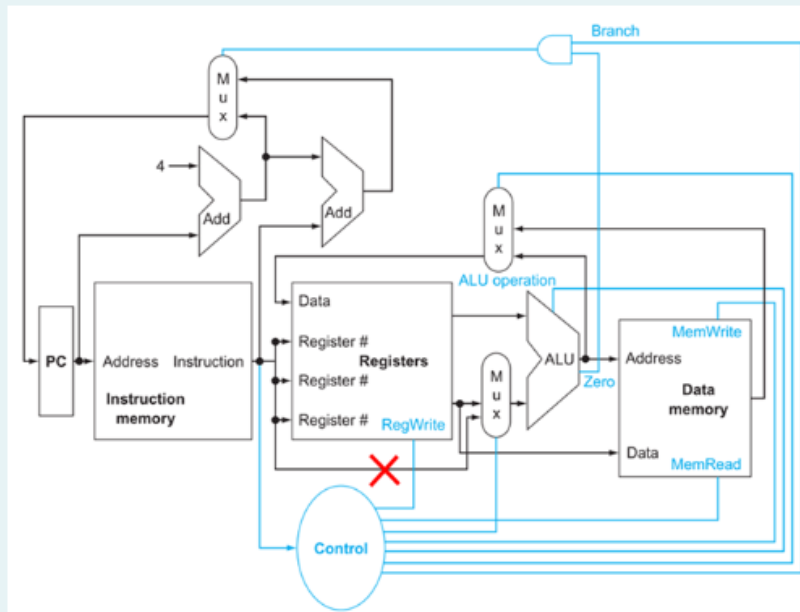
Question 4

Answer saved

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For the MIPS datapath shown below. Select the instruction that **will be affected** if the wire marked with "X" is cut (disconnected).



☐ a. and \$s1, \$s2, \$s3

☐ b. sub \$s1, \$s2, \$s3

☒ c. addi \$t1, \$t2, 3

☐ d. add \$t1, \$t2, \$t3 → Sai

Clear my choice

What is the value of register \$s5 in decimal system after executing the follow program

.data: A: .word 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

.text

li \$s1, 0

li \$s5, 0

li \$s3, 8

la \$s2, A

loop:

add \$t1,\$s1,\$s1

add \$t1,\$t1,\$t1

add \$t1,\$t1,\$s2

lw \$t0,0(\$t1)

add \$s5,\$s5,\$t0

addi \$s1,\$s1,1

bne \$s1,\$s3,loop

$A = [1, 3, 5, 7, \dots, 19]$

$s = 0$

while ( $i \neq 8$ )

{  $s += a[i]$

$i++;$

}

→ 64

=====

What is the value of register \$t1 in decimal system after executing the follow program

.text

```
li $s1, 902  + 15 = 917
li $s2, 1007
slt $t0,$s1,$s2
beq $t0,$zero,else
addi $t1,$s1, 15
j     endif
```

else:

```
addi $t1,$s2, 15
```

endif:

=====



What is the value of Z in decimal system after executing the follow program

.data

X : .word 900

$\therefore \text{int } X = 900$

Y : .word -400

Z : .word

.text

la \$t8, X

la \$t9, Y

lw \$t1, 0(\$t8)  $= 900$

lw \$t2, 0(\$t9)  $= -400 = -1600$

sll \$s0, \$t2, 2

add \$s0, \$s0, \$t1  $= -700$

la \$t7, Z

sw \$s0, 0(\$t7)

=====

What is the value of \$s1 in decimal after the following code is executed?

```
li $t0, 1001
```

```
li $t1, 2009
```

```
add $s1, $t0, $t1
```

3010

=====

Given A is an array of 4-byte integers, that has already been allocated in memory. What is the value of A[2] in decimal after the below code is executed?

```
la $s0, A
```

```
li $t0, 100
```

```
addi $t0, $t0, 0x08
```

108

```
sw $t0, 0x08($s0)
```

108

=====

What is the value of \$s1 in decimal after the following code is executed?

```
li $t0, 0x5566
```

0101 0101 0110 0110

```
sll $t1, $t0, 1
```

1010 1010 1100 1100

```
and $s1, $t0, $t1
```

0000 0000 0100 0100

0x44 → 68

0x — 44  
55