15

BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Quiz
Duration: 35 minutes

Semester :Summer 2022
Full Marks: 15

CSE 340: Computer Architecture

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1. **(CO3) Convert** the following MIPS codes to 32 bit **machine code**. **[4 Marks]**

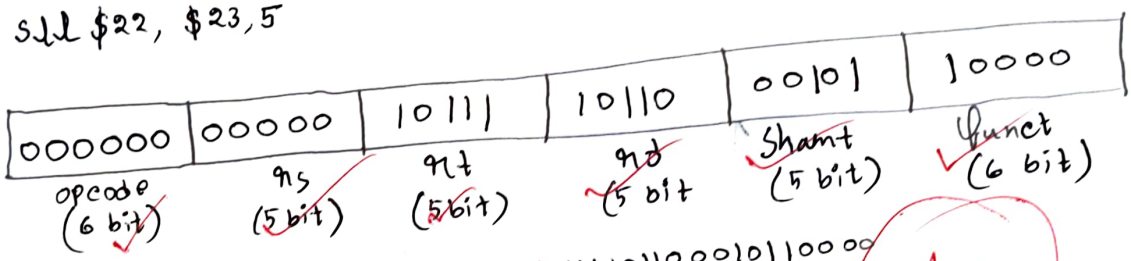
•sll $22, $23, 5

lw $10, 128 ($9)

The identifying values for sll, lw are 16, 43 respectively.

Ans: sll $22, $23, 5

R-type:

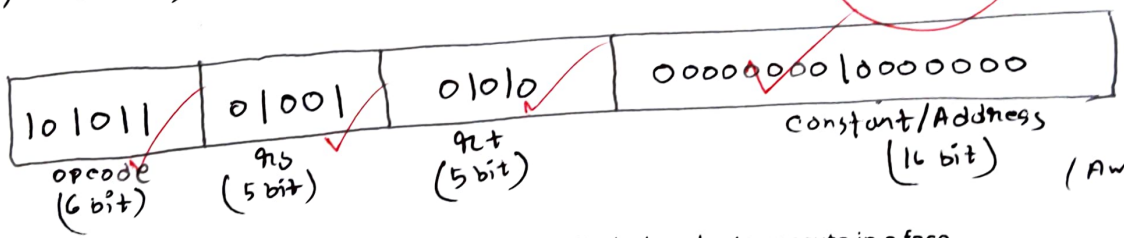


So, 32 bit machine code = 00000000000101111011000101100000

4

lw $10, 128 ($9)

I-type:



(Ans)

2. **(CO3)** Suppose, a computer with 250 Hz clock takes 4500 clock cycles to execute in a face recognition program. Now, a specific part of the algorithm takes 66% of the total time. If we improve that specific part by a factor of 7, what would be the new execution time for the program? **[5 Marks]**

CPU time = $\frac{4500}{250}$ = 18 s

Specific program takes 66% of the total time.

So, the specific time is = $18 \times \frac{66}{100}$ = 11.88 s

So, improving the specific part by a factor of 7.

$\frac{11.88}{7}$ = 1.697 s

Unaffected time = (18 − 11.88) = 6.12 s

So, New execution time = 1.697 + 6.12

= 7.817 s

(Ans)

5

3. **(CO3) Convert** the following C code to MIPS code: **[6 Marks]**

x[22] = 1028 * B[21] + y – 111

The base addresses of x and B are $s0 and $s1. y is in $s2.

```
lw  $t0, 84($s1)
sll $t1, $t0, 10
sll $t2, $t0, 2
add $t1, $t1, $t2
add $t1, $t1, $s2
addi $t1, $t1, -111
sw  $t1, 88($s0)
```

(Ans)

$t0 = B[21]

$t1 = 1024B[21]

$t2 = 4.B[21]

$t1 = 1028 B[21]

$t1 = 1028 B[21] + y

$t1 = 1028 B[21] + y - 111

6