CPTS 260 Intro to Computer Architecture, Quiz 2 Solutions

Q 1 What are the required components for a lw instruction?

The components needed for specifying load instructions include the register for the base address (32 bit address), the offset from base address, and the destination register. For instance, if we have a instruction below:

```
lw $r1, 100($r2)
```

To execute the instruction the effective address is calculate as:

```
Effective address =  Value in $r2 + 100
```

Then the value at memory location given by the effective address is loaded into register $r1.

Q 2 Which field in the binary encoding of R-format instructions is used for specifying the number of bits to shift?

Solution: The *shamt* field is reserved for the number of shifts in an instruction.

Q 3 MIPS provides instructions that can perform memory and arithmetic operations in the same instruction.

Solution: This is false because MIPS is a register-register instruction set. It means, instructions that have arithmetic operations cannot have loads or stores.

Q 4 Which register is used to store the return address when a function call is made?

Solution: The $ra register is reserved for storing the return address.

Q 5 Which instruction is used to call a function in MIPS?

Solution: The jump and link i.e. jal instruction is used to call functions in MIPS.