CSE2201- Computer Organization
2nd Midterm Examination (Questions and Answers)
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Q1.

a. Describe what an instruction set is. List the elements of an instruction.
b. What type of instructions a processor have. Give one example for each type.

A1.

a. The complete collection of instructions that are understood by a CPU.
   Operation code (Op code)
   Source Operand reference
   Result Operand reference
   Next Instruction reference.
b. Data processing (add)
   Data storage (load)
   Data movement (I/O) (in)
   Program flow control (jump)

Q2. An address field in an instruction contains decimal value 10. Where is the corresponding operand is located for:

a. immediate addressing
b. direct addressing
c. indirect addressing
d. register addressing
e. register indirect addressing

A2.

a. the address field
b. memory location 10
c. the memory location whose address is in memory location 10
d. register 10
e. the memory location whose address is in register 10

Q3. Classify and describe registers that a CPU consists of.

A3.

a. User-visible register: A User-Visible Register is one that may be referenced by means of the machine language that the CPU executes.
   General purpose,
   Data,
   Address,
   Condition codes (flags)
b. Control and status registers: Registers that are employed to control the operation of the CPU.
   Program Counter (PC)
   Instruction Register (IR)
   Memory Address Register (MAR)
   Memory Buffer Register (MBR)

Q4.

a. If the last operation performed on a computer with an 8 bit word was an addition in which the two operands were 2 and 3, what would be the value of the following flags: 1. Carry, 2. Zero, 3. Overflow, 4. Sign
b. What if the operands were -1 (2's complement) and +1?

A4.

a. 00000010
   00000011
   00000101

   Carry = 0; Zero = 0; Overflow = 0; Sign = 0.

b. 11111111
   00000001
   100000000

   Carry = 1; Zero = 1; Overflow = 1; Sign = 0.

Q5.

a. What are the basic elements of a processor?
b. Describe the functions of a control unit.

A5.

a. ALU
   Registers
   Internal data paths
   External data paths
   Control Unit
b. Sequencing: Causing the CPU to step through a series of micro-operations.
   Execution: Causing the performance of each micro-operations.