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CS 325-ON40

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Exam One

1.
 - a. Main memory stores the computer's data.
 - b. The CPU controls the computer's processes and data computations.
 - c. The I/O handles data transfer between the computer and its peripheral devices.
 - d. System interconnection connects the main memory, the CPU, and the I/O to allow communication between all three components.
2. Moore's Law points out the ever-increasing trend of computer hardware capability over the years.
 - a. Power requirements decrease over time.
 - b. Smaller components mean shorter circuits, thus increasing processing speed.
 - c. Component prices remain relatively constant as hardware grows, indicating a decrease in production cost.
3. The IAS computer has a memory buffer register, memory address register, instruction register, instruction buffer register, program counter, accumulator, and multiplier quotient.
 - a. The MBR contains a word for memory or I/O operations.
 - b. The MAR contains the memory address to MBR's word.
 - c. The IR contains an 8-bit operation code for execution.

- d. The IBR contains the right-instruction of a word in memory.
- 4.
- a. $1110.0111 = 2^3 + 2^2 + 2^1 + 2^{-2} + 2^{-3} + 2^{-4}$
 $1110.0111 = 8 + 4 + 2 + 0.25 + 0.125 + 0.0625$
 $1110.0111 = 14.4375$
- b. $1110001.01 = 2^6 + 2^5 + 2^4 + 2^0 + 2^{-2}$
 $1110001.01 = 64 + 32 + 16 + 1 + 0.25$
 $1110001.01 = 113.25$
- c. $10000.101 = 2^4 + 2^{-1} + 2^{-3}$
 $10000.101 = 16 + 0.5 + 0.125$
 $10000.101 = 16.625$
- d. $110010.1001 = 2^5 + 2^4 + 2^1 + 2^{-1} + 2^{-4}$
 $110010.1001 = 32 + 16 + 2 + 0.5 + 0.0625$
 $110010.1001 = 50.5625$
- e. $11111000 = 2^7 + 2^6 + 2^5 + 2^4 + 2^3$
 $11111000 = 128 + 64 + 32 + 16 + 8$
 $11111000 = 248$