1	2	3	4	5	6	7	8	9	10	Total

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1. What are the main
   a. functions of any general-purpose computer?
   b. components of any general-purpose computer?

2. Construct the operation XNOR using the basic Boolean operations AND, OR, and NOT.

3. Convert the following decimal numbers to their hexadecimal equivalent:
   a. 204.125 b. 255.875

4. Consider a hypothetical 32-bit microprocessor having 32-bit instructions composed of two fields: The first byte contains the opcode and the remainder the immediate operand or an operand address.
   a. What is the maximum directly addressable memory capacity?
   b. How many bits are needed for the program counter and the instruction register?

5. For the hexadecimal main memory address A1F81A show the following information, in hexadecimal format:
   a. Tag, Line, and Word values for a direct-mapped cache, when tag id= 8 bits, line id=14 bits, word id=2 bits.
   b. Tag and Word values for an associative cache, when tag id= 22 bits, word id=2 bits.

6. Classify the memory system in a computer. What are the differences between SRAM and DRAM?

7. Describe how data are written onto a magnetic disk and how data are read from a magnetic disk?

8. List and briefly define three techniques for performing I/O.

9. How can you form the negation of an integer in twos complement representation?

10. Find the following differences using twos complement arithmetic:
    a. 11001100 b. 111100001111
       - 101110 -110011110011

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