Q1: Answer the following questions:

1. What are the microprocessor tasks?
2. Define buses, what they do and what its types?
3. How the microprocessor performs the read operation?
4. Compare between RAM and ROM?
5. What are the phases of instruction cycle?

Q2: It is assumed that a computer system consists of a microprocessor with 128 operation, a memory unit with size 4096*16 and use indirect addressing format. Use this information to answer the following:

1. What is the opcode size?
2. What is the operand address size?
3. What is the instruction size?

Q3: answer the following question with respect to 8086 addressing mode:

1. How the direct address mode differs from the immediate addressing mode?
2. What is the similarity between direct addressing mode and indirect addressing mode?
3. what is the address mode for the following instruction:
   MOV [BX].ALPHA, AL
4. Calculate the physical address for the destination operand in the instruction above if DS=0200, ALPHA=AB54,[BX]=9000.
5. Give example about base index addressing mode.

Q4: what is the content of AL before and after executing the following instruction sequence?

MOV AL,65H
AND AL,FAH
OR AL,21H
XOR AL,FFH
NOT AL
Q5: write an assembly program that counts the frequency of letter 'A' in a given string. Assume that the string length is 10 characters and it is stored in memory at offset START.

Q6: write an assembly program that compares the elements of two arrays, A(i) and B(i), each array contains 100 16-bit signed numbers. The comparison is to be done by comparing the corresponding elements of the two arrays until either two elements are found to be unequal.