The CPU of a computer is also known simply as the processor and forms the core of any electronic system. Your task is to find out about the main components of the processor and how they work. You may use any form of research available to you to answer the questions below in your own words.

Part 1.

A CPU is typically made from 4 components

- Control unit
- Arithmetic/logic unit (ALU)
- Memory *(dedicated registers)*
- Buses *(3)*

1. Describe what each of the following components do
    a. Control unit
    b. Arithmetic/logic unit

2. There are a number of dedicated registers inside the processor. Each register has its own purpose. Describe the purpose of each of the following registers
    a. The program counter (PC)
    b. The current instruction register (CIR)
    c. The memory address register (MAR)
    d. The memory data register (MDR)
    e. The accumulator (ACC)

3. The different parts of the CPU are connected via 3 buses. Describe the purpose of each of the following buses
    a. Control bus
    b. Data bus
    c. Address bus

Part 2.

The processor works by means of the Fetch-Decode_Execute cycle. This cycle has a number of stages which are repeated over and over while a program is running.

Describe the stages of the Fetch_Decode_Execute cycle referencing any registers that are used at each stage.

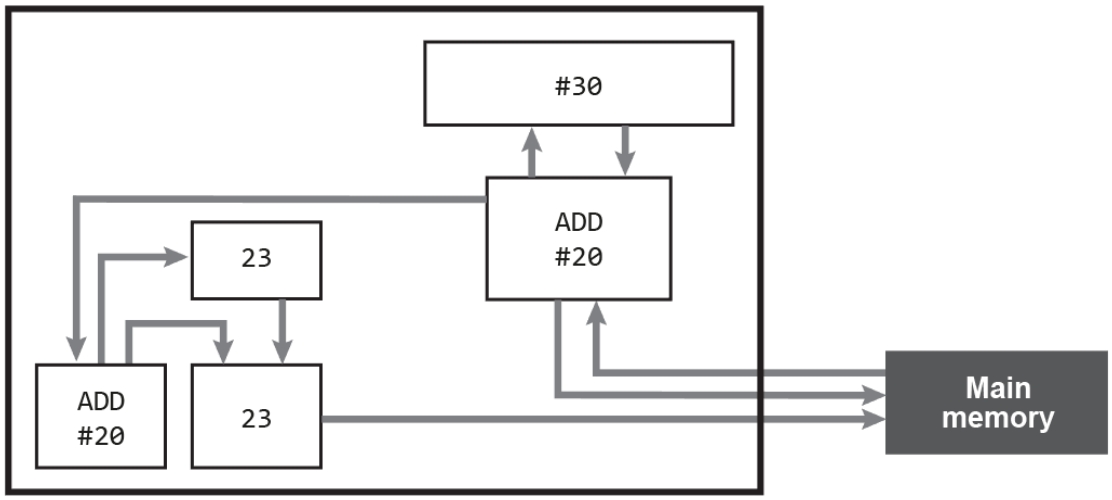
Part 3.

4. An incomplete diagram of processor components is shown below including possible data stored in various registers. The accumulator contains the value #30. The address 23 contains the instruction ADD #20.

   Complete the diagram by labelling the name of each component.

   Tip: Think about the contents and connections of each part.

   a. Program counter
   b. Memory address register
   c. Memory data register
   d. Current instruction register
   e. Accumulator



In the spaces below, justify your decisions:

I. Program counter

II. Memory Address Register

III. Memory Data Register

IV. Current instruction Register

V. Accumulator