



Correction of the Quiz

Correction of the exercise 1: (5.0 pts)

1. The two main components that make up an automated system are: (0.5 pts)
 - Operative part (OP)
 - Control part (CP).
2. Sensors, pre-actuators, and actuators: (1.0 pts)
 - Sensors: Temperature sensor, LDR sensor.
 - Pre-Actuators: Contactor, Speed controller.
 - Actuators: Heating resistors, 7-segment display.
3. The two advantages and two disadvantages of automated systems: (1.0 pts)

Advantages:

 - Accelerated production capacity.
 - Suitability for all production environments.

Disadvantages:

 - High equipment costs, especially for hydraulic systems.
 - Maintenance requires a structured approach.
4. The organization of the CPU memory in a PLC. (1.0 pts)

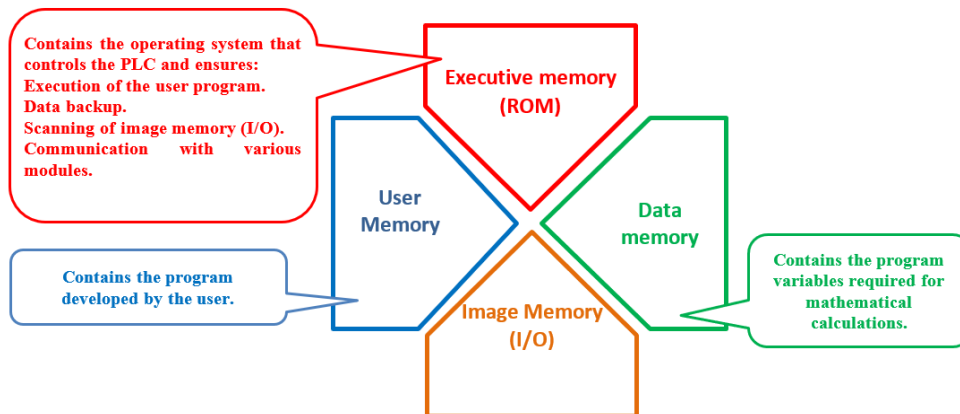


Figure1. Organization of the CPU Memory

5. The difference between a compact (monoblock) PLC and a modular PLC? (1.0 pts)

Monoblock PLC:

- Typically has a small number of inputs and outputs.
- Designed for simple automation tasks based on sequential logic.
- Extensions are sometimes possible but limited.
- Fixed instruction set: Cannot be expanded.

Modular PLC:

- It supports a variety of modules, including analog I/O and specialized ones like PID, BASIC, and C Language.
- Its modular design allows for quick troubleshooting.
- It provides greater flexibility in operation.

6. HMI stands for **Human-Machine Interface**. (0.5 pts)

Correction of the exercise 2: (3.0 pts)

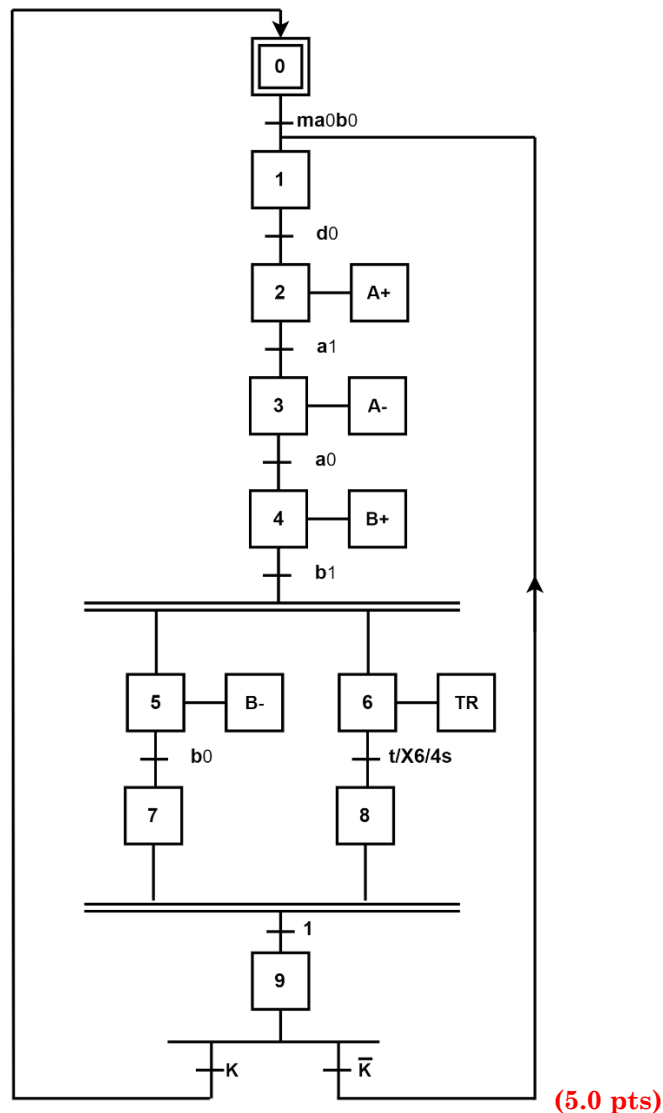
- a) True. (0.5 pts)
- b) True. (0.5 pts)
- c) True. (0.5 pts)
- d) False, The PLC's I/O memory stores the status of inputs and outputs, not the PLC program itself. The program is stored in the program memory. (0.5 pts)
- e) False, The S7-1214C CPU communicates with the Personal Computer (PC) via Ethernet, not Profibus. (0.5 pts)
- f) False, The S7-1214C CPU is powered by a power supply unit that provides a 24V DC voltage. (0.5 pts)

Correction of the exercise 03: (06.0 pts)

Inputs: a0, a1, d0, b0, b1, m, k (1.0 pt)

Outputs: A+, A-, B+, B-, TR

Below is the GRAFCET diagram describing the operation of the control system.



Correction of the exercise 04: (06.0 pts)

Below is the GRAFCET diagram describing the operation of the control system.

