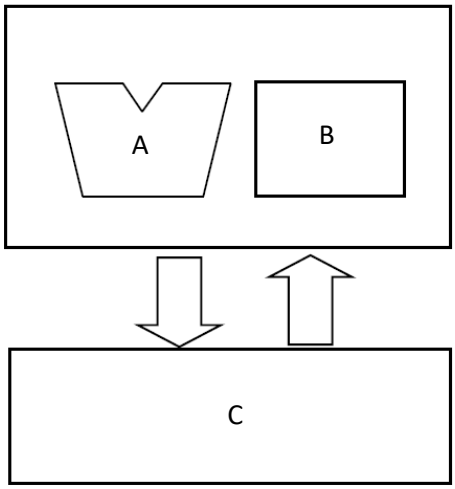
The CPU – Worksheet 1

Answer the following questions about the CPU:

1. The diagram below shows various system components.



a. Name the system components by filling the table below with the terms: ALU, CU and Memory Unit: [1.5]

A:		B:		C:	

b. What do the following acronyms stand for? [2.5]
   i. CPU:
   ii. ALU:
   iii. PC:
   iv. CU:
   v. IR:

c. What is a CPU register? [1]

d. What is the role of the ALU? [1]

e. How is the accumulator register related to the role of the ALU? [1]

f. Which CPU register is responsible for holding the address of the next instruction to be executed? [0.5]

g. Briefly explain the role of the Instruction Register. [1]

h. Distinguish between Specific-Purpose and General-Purpose registers. [1]

i. Give an example of a General-Purpose register found in the CPU. [0.5]

2. CPU evolution has been a long struggle to improve its efficiency.

   a. Name and briefly describe the relevance of 3 factors that determine CPU speed: [3]

Factor	Description

Intel Core i7-10700F Comet Lake 2.9GHz (4.8GHz) S1200 CPU

QUICK OVERVIEW

This CPU has a base clock speed of 2.9 GHz and comes with features such as Intel Optane Memory support, Intel Boot Guard, Intel VT-d virtualization technology for directed I/O, and Intel Hyper-Threading technology.

Additionally, this processor features 8 cores with 16 threads in an LGA 1200 socket, has 16MB of cache memory, and 16 PCIe lanes. Having 8 cores allows the processor to run multiple programs simultaneously without slowing down the system, while the 16 threads allow a basic ordered sequence of instructions to be passed through or processed by a single CPU core.

   b. Read the CPU overview shown above, and by referring to the three factors you mentioned in question ‘a’, explain why this CPU is quite fast: [2]