English/Automatic/ undergraduate (3rd year)	
Name:	Group:

English Test

A microcontroller is an electronic device belonging to the microcomputer family. In a broader sense, the components which constitute a microcontroller are the memory, peripherals and most crucially a processor. Microcontrollers are present in devices where the user has to exert a degree of control. They are designed and implemented to execute a specific function such as displaying integers or characters on an LCD display module of a home appliance. Application of microcontrollers is myriad. In simpler terms, any gadget or equipment which has to deal with the functions such as measuring, controlling, displaying and calculating the values consist of a microcontroller chip inside it. They are present in almost all the present day home appliances, toys, traffic lights, office instruments and various day-to-day appliances.

The most important part of a microcontroller is a central processing unit with a word length ranging from 4-bit, 8 bit to 64-bit and in some modern microcontrollers the word length goes even beyond the limit of 64-bit. Timers and counters are the fascinating constituent parts of a microcontroller, they are used in operations which include modulation, clock functions, frequency generation and measuring and pulse generation. There is also a watchdog timer. Memory spaces such as RAM, ROM, EEPROM, EPROM are there to store data and programs. For data storage, volatile memory RAM is used while for the program and operating parameter storage ROM and other memory spaces are used. Input/output ports are used to interface various peripherals such as printers, external memories, LEDs and LCDs to the microcontroller.

Exercise 1: *(6 points)*

1. What are the four main constituents of the microcontroller?

The main constituents of the microcontroller are: the central processing unit, timers, counters, memories, Input/output ports, a watchdog timer.

2. Where can we find the microcontrollers?

We can find microcontrollers in any gadget or equipment which has to deal with the functions such as measuring, controlling, displaying and calculating the values, all the present day home appliances, toys, traffic lights, office instruments and various day-to-day appliances.

3. How many components for storing data and programs are indicated in the text?

In the text, there are four components for storing data and programs.

4. Give synonyms of:

to connect	screen	tool	a watch
to interface	display	equipment	a clock

5. Give opposites of:

the least	counted	few	fixed
the most	myriad	several	volatile

6. Translate to English the following French words:

jouets	minuterie	puce	appareil
toggles	timer	chip	device

NB: All answers are found in the text.

Exercise 2 (QCM): *(4 points)*

For each definition, it is given four propositions **a**, **b**, **c** and **d**. **One**, **two** or **three** propositions could be correct. - Surround correct answers.

(0.5 pt) if each response is correct and completed, (0pt) otherwise

1. The number of independent directions which would allow the robot to move is: **a.** Degree of freedom **b.** Arm **c.** End-effector **d.** Axis	**2. A device that measures the changes in the temperature is:** **a.** Light sensor **b.** Thermistor **c.** Color sensor **d.** Transistor
3. A device or system that is used to store information in a computer is: **a.** Control Unit **b.** Arithmetic Logic Unit **c.** Memory **d.** Input/Output interface	**4. A device or a module that helps to detect any changes in physical quantity can be:** **a.** Sensor **b.** Microprocessor **c.** Transducer **d.** Detector
5. A register which is incremented after fetching an instruction is: **a.** Operand **b.** Arithmetic Logic Unit **c.** Flag Register **d.** Instruction Pointer	**6. A direction used to specify the robot motion in a linear or rotary mode is:** **a.** Degree of freedom **b.** Arm **c.** End-effector **d.** Axis
7. A non-contact type of sensors that detects the presence of an object are: **a.** Alcohol Sensor **b.** Proximity Sensor **c.** Smoke Sensor **d.** Ultrasonic Sensor	**8. A register that contains information about the state of the processor is called:** **a.** Flag Register **b.** Instruction Register **c.** Status Register **d.** Address register

Exercise 3 : *(6 points)*

Fill in the gaps with the following words:

are, can, converted, equipment, forms, information, of, or, outputs, such as, translate, used

Sensing and Actuation elements interface directly and physically to the process equipment and machines. The sensing elements translate the physical process signals such as temperature, pressure or displacement to convenient electrical or pneumatic forms of information, so that these signals can be used for analysis, decisions and finally, computation of control inputs. These computed control inputs, which again are in convenient electrical or pneumatic forms of information, need to be converted to physical process inputs such as, heat, force or flow-rate, before they can be applied to effect the desired changes in the process outputs. Such physical control inputs are provided by the actuation elements.

Exercise 3 : *(4 points)*

Translate the following sentences:

A microcontroller is an electronic device belonging to the microcomputer family. Its most important part is a central processing unit with a word length goes even beyond the limit of 64-bit.
Un microcontrôleur est un appareil électronique appartenant à la famille des micro-ordinateurs. Sa partie la plus importante est une unité de traitement centrale dont la longueur de mot va au-delà de la limite de 64 bits.

Timers and counters are used in operations which include modulation, the clock functions, frequency generation, measuring and pulse generation.
Les minuteries et les compteurs sont utilisés dans des opérations qui incluent la modulation, les fonctions d'horloge, la génération de fréquence, la mesure et la génération d'impulsions.

For data storage, volatile memory RAM is used while for the program and operating parameter storage ROM and other memory spaces are used.
Pour le stockage de données, la mémoire volatile RAM est utilisée pendant que le programme et le paramètre de fonctionnement de stockage ROM et d'autres espaces de mémoire sont utilisés.