**Scenario**

You are a technician in an electronics company working in the field of designing and building electronics systems. Your manager asked you to start working on the new department of microprocessor systems. This assignment is given to you to prepare yourself for the new department.

**Task (1): To achieve the assessment criteria for pass (P1.1) you must answer the following task:**

**Compare between three types of microprocessor families in terms of the following:**

* + Speed.
  + Cost.
  + Input and output facilities.
  + Physical size.

**Task (2):To achieve the assessment criteria for pass (P1.2) you must answer the following task:**

**Evaluate three typical applications of microprocessor based systems from the following list.**

**Your assessor will choose 3 applications for you.**

**Applications.**

**Control System**

* Car engine management.
* Robotics
* Coin-operated machines
* Printers.
* Other control systems.

**Instrumentation systems**

* Data acquisition.
* Logging systems
* Indicator display systems
* Intelligent’ panel instruments
* Test equipment
* Other instrumentation systems.

**Communication systems**

* Modems
* Radio transmitters
* Radar systems
* Other communication systems.

**Commercial systems**

* Electronic funds transfer at point of sale systems (EFTPOS)
* Electronic bank teller
* Hand-held stock loggers
* Personal computers
* Other commercial systems

**Task (3):To achieve the assessment criteria for pass (M3.3) you must answer the following task:**

Prepare a presentation for your selected applications in Task (2).

**Task (4):To achieve the assessment criteria for pass (P2.1) you must answer the following task:**

Design Programs for the given specifications (Tasks) from the following list using: **Note :( your assessor will select two for you)**

* + Flow chart.
  + Pseudo code.

**Program tasks:**

1. Use your microprocessor module to make a LED flashing.
2. Use your microprocessor module to generate square wave at 1k Hz.
3. Use your microprocessor module to generate square wave at 2k Hz.
4. Use your microprocessor module to operate the Piezo sounder at 250 Hz.
5. Use your microprocessor module to add two loaded number from memory and then display the result on the LED array.
6. Use your microprocessor module to subtract two loaded number from memory and then display the result on the LED array.
7. Use your microprocessor module to Logical "And" two loaded number from memory and then display the result on the LED array.
8. Use your microprocessor module to Logical "OR" two loaded number from memory and then display the result on the LED array.
9. Use your microprocessor module to Logical "Xor" two loaded number from memory and then display the result on the LED array.
10. Use your microprocessor module to get the binary output from ADC on the LED array using input from potentiometer.
11. Use your microprocessor module to change optical sender intensity according to the loaded value from memory through the DAC.
12. Use your microprocessor module to change DC Motor speed according to the loaded value from memory through the DAC.

**Task (5):To achieve the assessment criteria for pass (P2.2) you must answer the following task:**

Write program codes to implement the (tasks) that was selected in Task (4).

**Task (6):To achieve the assessment criteria for pass (P2.3) you must answer the following task:**

Test your programs written in Task (5) using:

* + Simulator.
  + Z80 microprocessor module inside your lab.

**Task (7):To achieve the assessment criteria for pass (M2.2) you must answer the following task:**

Design a flowchart and then write a program code to add four successive memory locations and put the result in another memory location **by at least two methods.**

Use the following table for memory locations and associated values

|  |  |
| --- | --- |
| Memory Location | Value |
| 5002 | 23H |
| 5003 | 12H |
| 5004 | 31H |
| 5005 | 15H |