Menofia University
Faculty of Electronic Engineering
3rd year, Electronic and Communication Department, 1st Term Exam.

Optional Course (1)	Time allowed: 3 hours
Prof.Dr. Hossam Ahmed Mechatronics	21 January 2019

Solve all questions:

1. a) Define the following electro mechanical elements: sensors and its categories; actuators and transducer. What are the Limitations of Sensors?
   b) A variety of physical variables can be measured using sensors, remember these physical variables and the name of sensor using to measure each of them?

   (10 point)

2. a) Define: Hysteresis, Nonlinearity and Sensitivity.
   b) Explain types of strain gage and its operation?
   c) Define: Microcontroller and Microcomputer? Give a block diagram for each?

   (15 point)

3- Give a design circuit for Humidity measuring, using 8086 microprocessor, 7-segments as O/P, use a multiplexer to guide the 7-segment and use a 9-volt battery as a power supply.
   i.- Give the numbers of used components?
   ii.- Explain the operations of designed circuit?   (25 point)

4- Develop a simple computer to add or sub two numbers 3-bit op-code with input and output, also give the instruction table of this computer.   (5 point)

5- Write an assembly language program to add two 8 bit Hexadecimal numbers stored in memory locations 2050H and 2051H (2D15H) to 8 bit Hexadecimal numbers stored in memory locations 2052H and 20533H (3AC7H). Store the result in memory locations 2054H and 2055H. Give the flowchart of the program?
   (10 point)

6- Draw the block diagram of 8255 connected to microprocessor and suggest an I/P and O/P devices to every port (port A, port B, port C lower and port C upper). (I.e. proposed the connected devices to these ports by name only).

   (5 point)