

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E. Degree Examination, December 2012

Mechatronics and Microprocessor

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is mechatronics? What are the objectives of mechatronics? (05 Marks)
 b. Explain briefly the elements of a measuring system, with an example. (05 Marks)
 c. Explain with the block diagram, how a microprocessor based control system is used to control the focusing and exposure of an automatic camera. (10 Marks)
- 2 a. What is the difference between a sensor and transducer? (04 Marks)
 b. What is Hall effect? Explain with a neat sketch the principle of Hall effect sensor. (06 Marks)
 c. What are light sensor? Explain briefly the following:
 i) Photo emissive cell ii) Photo conductive cell iii) Photovoltaic cell (10 Marks)
- 3 a. What is an actuator? List the various types of actuators. (04 Marks)
 b. Explain the terms bouncing and debouncing as applied to mechanical switches? Mention the various methods which can be to tackle the problem of bouncing in mechanical switches. (08 Marks)
 c. What are stepper motors? State the advantages and applications. (08 Marks)
- 4 a. Define signal conditioning. What are the necessity for signal conditioning? (05 Marks)
 b. What is an operational amplifier (op-amp)? Why it is called an operational amplifier? (05 Marks)
 c. What do you mean by the term filtering and filter? How are filters classified? (05 Marks)
 d. List the functions of signal conditioning equipment. Explain the function of these equipments. (05 Marks)

PART – B

- 5 a. Explain briefly the evolution of microprocessor. (06 Marks)
 b. Represent the real numbers +16.5 and -16.5 in a 32 bit memory using floating point notation. (06 Marks)
 c. Explain the concept of overflow and underflow with an example. (08 Marks)
- 6 a. Enumerate the difference between microprocessor and microcontroller. (04 Marks)
 b. What is a clock? Why a clock is necessary in a microprocessor? Draw the ideal and non-ideal clock. (06 Marks)
 c. What is meant by instruction set? Discuss the five group of instruction set with an example (for each group). (10 Marks)
- 7 a. Draw the functional block diagram of the Intel 8085 microprocessor. (04 Marks)
 b. Explain with a block diagram the flow of instruction word and flow of data word in a microprocessor. (12 Marks)
 c. What are the functions of CPU? (04 Marks)
- 8 Write short notes on the following:
 a. Assembly language programming b. Fetch cycle and write cycle
 c. System timing d. Character representation (20 Marks)