Code: ME7T1

IV B.Tech - I Semester – Regular/Supplementary Examinations
October – 2019

MECHATRONICS
(MECHANICAL ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer *all* the questions.   All questions carry equal marks
                                                                11 x 2 = 22 M

1. a) Distinguish between open-loop and closed-loop system.

   b) Give the working principle of inductive proximity sensor.

   c) State any two differences between micro switch and reed switch.

   d) Write objectives of Direction Control Valves.

   e) State the application of stepper motor in Mechatronic system.

   f) What are the basic building blocks of the mechanical system?

   g) Define Hydraulic Capacitance.

   h) What do you mean by discrete process controllers?

   i) Differentiate Microprocessor and Microcontroller.

j) What is meant by latching in PLC's?

k) State the applications of logic gates.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) With an example explain the various functional units of a measurement system.   8 M

   b) With a neat sketch, explain the working of laser interferometer.   8 M

3. a) Explain the working principle of stepper motor in half step mode.   8 M

   b) Compare and contrast Hydraulic, Pneumatic and Electrical actuation systems.   8 M

4. a) Derive a mathematical model for a resistor-inductor-capacitor system using Kirchoff's law.   8 M

   b) Derive the output response, if a step input is applied to a second order system.   8 M

5. Draw the architecture diagram of 8085 microprocessor and explain its elements.   16 M

6. a) What are logic gates? Explain 'AND', 'OR' gates with their truth table for two inputs.   8 M

   b) Draw and explain the cascaded timers in PLC.   8 M