B.E. (Etrx) sem 8 (Rev.) Mechatronics 14/12/07

V-Ex-II-07-F-18

Con 5421-07. **(REVISED COURSE)** CD-6558

(3 Hours) **[Total Marks : 100**

N.B. : (1) Quesion No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume suitable **additional data** if **necessary** and state them **clearly**.
(4) Draw **neat** diagram and sketches.

1. Solve any **four** (**5** marks **each**) **20**
   (a) Give the list of gear types and draw any two diagram of gears
   (b) Give the list of cylinders types and explain any two diagram of cylinder
   (c) Comparison between Static and Dynamic models with examples
   (d) Define following terms with proper examples :—
   Proportional band, Dead band, Process lag, Process lead
   (e) Draw PLC ladder programming rungs steps of motor forward reversed application.

2. (a) Explain mechatronics design process in details with diagram. **10**
   (b) Explain mechatronics control in Automated manufacturing in details with diagram. **10**

3. (a) Draw the mechanical diagram of automobile suspension system construct impedance diagram and block diagram, determine the transfer function of the system. **10**
   (b) Explain construction and operation of principal of brushless DC motor. **5**
   (c) Explain operation of principal of Stepper motor with waveforms. **5**

4. (a) Explain various properties of sensors. **5**
   (b) Explain various controlled in intelligent supervisory control structure. **5**
   (c) Explain major components of Data acquisition and Control system. **10**

5. (a) What is the internal Block diagram of PLC ? How flow chart of PLC operation and ladder diagram perform the task of any application ? **12**
   (b) Construct the ladder diagram of :— **8**
   (i) Conditional jump rung
   (ii) Timer on rung
   (iii) Timer off rung
   (iv) Counter rung.

6. (a) Explain needs of PID controller with Any one application with justification. Draw P, PI, PD PID controller step input, ramp input response output waveforms. **15**
   (b) Write the steps the installation of I/O cards and software. **5**

7. Short notes on any four (**5** marks **each**) :— **20**
   (a) Fluid Power Circuit.
   (b) Micro Sensors
   (c) Various Tunings methods of PID
   (d) Fuzzy Logic
   (e) Over framing.