

Time : 3 Hours

Total Marks : 80

- N. B. (1) Attempt any Four Questions from the six Questions.
(2) Figures to the right indicate full marks
(3) Support your answers with examples / case studies /
Diagrams wherever possible

1. (a) Explain Mechatronics Key Elements 10
(b) Explain 8051 Microcontroller Function Block Diagram and Architecture 10
2. (a) Explain Interfacing of HEX Keyboard and Stepper Motor with 8051 Microcontroller 12
(b) Give the differences between Sensors and Transducers with examples 08
3. (a) Explain Micro and Nano Sensors. 05
(b) Draw Electro-Pneumatic Circuit for Sequence: $A+ A- B+ A+ A- B-$
A and B represents Double Acting Cylinders and + represents forward movement and minus represents reverse movement of cylinder. 10
(c) Explain Meter-out hydraulic Circuit and give its advantages. 05
4. (a) Draw PLC ladder logic for Cylinder movement sequence : $A+ A- B+ B-$ 04
(b) Draw Pneumatic Cascade Circuit for multi Cycle sequence : $AB+ A- B-$
Incorporate Emergency Circuit also. 10
(c) Write Short note on Karnaugh Maps for signal Simplification 06
5. (a) Explain Timed Switch with neat labeled diagram 10
(b) Discuss on Fuzzy Logic and Artificial Intelligence in Mechatronics 10
6. (a) Define Mechatronics. 10
What are the integrated design Issues in Mechatronics?
(b) Give differences between Tactile sensors, Range Sensors, Proximity Sensors with 2 examples each. 10