

EXTRA

QP Code : 64306

(3 Hours)

Total Marks : 80

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any **Three** questions out of the remaining.

(3) Figures to the right indicate full marks

(4) Support your answers with examples / case studies wherever possible.

1. (a) Design and Draw electro-pneumatic circuit for the sequence of operations as below:-
A+, A-, B+, Delay 5 seconds, B- with Emergency switch. 15
Cylinders A and B are pneumatic double acting cylinders and are actuated by 5/2 DCV operated by Single solenoid and Double solenoid for Cylinder A and Cylinder B respectively.
- (b) Explain Timed Switch with neat Diagram. 5
2. (a) What are the integrated design issues in Mechatronics system? Give the differences between traditional and Mechatronic design. 10
- (b) Explain Functional Block Diagram of 8051 micro-controller with diagram 10
3. (a) Write short notes on Analog Interfacing and Data Acquisition. 10
- (b) Explain Working principle of Ultrasonic Sensors with neat diagram. 10
4. (a) Design and Draw Pneumatic Cascade circuit for the sequence of operations as below:-
AB-, A+, A-, Delay, B+, A+. 15
Cylinder B- moves slowly. Cylinders A and B are double acting type.
- (b) Write short notes on Micro and Nano sensors in Mechatronics 5
5. (a) Discuss Case Study of the following (any one):- 7
- (i) Car Park Barrier
- (ii) Pick and Place Robot
- (b) Explain the Functional Modules of PLC mechatronic system. 8
- (c) Write applications of Electro - pneumatic and Electro - Hydraulic systems. 5
6. (a) Give the principle differences between Microprocessor and Microcontroller 5
- (b) Explain working of Dominant ON and Dominant OFF latching circuit 5
- (c) Write short notes on : Interfacing of HEX – Keyboards 5
- (d) Explain Karnaugh Map for signal simplification. 5