

AU – 2877

Seventh Semester B. E. (Electronics Engineering) Examination

MECHATRONICS

Elective - I

Paper – 7 XN 04

(USC – 10690)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
(2) Answer **Three** questions from Section A and **Three** questions from Section B.
(3) Due credit will be given to neatness and adequate dimensions.
(4) Assume suitable data wherever necessary.
(5) Illustrate your answer wherever necessary with the help of neat sketches.
(6) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Explain the Elements of Mechatronics and draw suitable block diagram. 7
(b) Explain PID controllers in detail. 7

OR

2. (a) Explain the function of Microprocessor Based Controllers with example. 7
(b) Explain Digital Controllers with suitable diagram. 7
3. (a) Explain any one example using MOSFET Drives. 6
(b) Explain four quadrant operation of DC motor in detail. 7

OR

4. (a) Enlist the various braking methods for DC motors and explain any one in brief. 7

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- (b) Explain D. C. servo motors in detail. Give the application of D. C. servo motor in mechatronics. 6

5. (a) Explain Latching with Ladder diagram. 6
(b) Explain the function of each element of PLC with suitable diagram. 8

OR

6. (a) Explain the interfacing of different Sensors and Actuators with PLC. 7
(b) Explain point to point motion control and give its application. 7

SECTION B

7. (a) A force of 500 N is required to Open a Process control valve. What area of diaphragm will be needed with a diaphragm actuator to open valve with a control gauge Pressure of 85 KPa ? 7
(b) Explain Harmonic transmission with neat diagram. 6

OR

8. (a) Explain linear bearings. 6
(b) Explain in brief :
(i) Electro-Pneumatic actuator
(ii) Hydraulic actuator. 7

9. (a) Describe Bulk Manufacturing in detail. 6
(b) Explain the thermal sensor and phototransistor with suitable example. 7

OR

10. (a) Explain Micro-electro Mechanical technology. 7
(b) Explain Micro valves and Micro pumps in brief. 6

11. (a) Explain the Mechatronics system design process with neat diagram. 6
(b) Explain Automatic tool and pallet charger system. 7

OR

12. (a) Explain Mechatronic based Pick and place manipulator with neat diagram. 7
(b) Give the difference between traditional and Mechatronic design. 6



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