

AU – 2855

Seventh Semester B. E. (Mechanical Engineering) (CGS) Examination

MECHATRONICS

Elective – I

Paper – 7 ME 05

(USC – 10877)

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) Illustrate your answer wherever necessary with the help of neat sketches.
- (4) Use pen of Blue/Black ink/refill only for writing book.

SECTION A

1. (A) Explain the working of a stepper motor. What is half – step phase sequencing in stepper motors ? 8
- (B) Explain the working of an LVDT. 5

OR

2. (A) What are different types of proximity sensors ? Explain the working of any one type. 7
- (B) What is an absolute encoder ? With suitable diagram explain the working of an absolute rotary encoder. 6
3. (A) With the help of a block diagram, explain the working of an analog to digital converter. 8
- (B) Explain successive approximation method applied in ADC. 5

AU-2855

P.T.O.

OR

4. (A) With the help of a neat signal plot, define the following terms related to ADC
- (i) Quantization
 - (ii) Sampling
 - (iii) Resolution
 - (iv) Quantization error. 8
- (B) What is Sampling Theorem ? What is aliasing ? 5
5. (A) What is a PLC ? What are the main advantages of a PLC ? 8
- (B) Draw ladder logic diagram for :—
- (i) XOR Logic (ii) NOR Logic (iii) OR Logic. 6

OR

6. (A) What is sum of products rule and product of sums rule in the design of logic network ? Take help of any logical example to explain the rules. 8
- (B) What is a microcontroller ? Explain the working and state its applications. 6

SECTION B

7. (A) Explain the construction and working of pressure reducing valve. 5
- (B) Explain the working of the following elements with the help of ISO symbols.
- (i) Directly operated pressure relief valve
 - (ii) Heater on a hydraulic line with gaseous heating medium
 - (iii) FRL unit
 - (iv) Flow divider with two coupled motors. 8

OR

8. (A) Explain the construction and working of pressure relief valve. 5
(B) Explain the working of the following elements with the help of ISO symbols.
(i) A check valve on a pneumatic line AB.
(ii) Separator with manual drain
(iii) OR logic pneumatic symbol
(iv) Roller operated 3/2 limit switch. 8

9. (A) Design, draw and explain meter out type forward stroke speed control of a horizontal pneumatic cylinder. 7
(B) Design draw and explain pneumatic circuit for power chucking operation. 6

OR

10. (A) Design, draw and explain bleed off type of speed control of the forward stroke of a horizontal pneumatic cylinder. 7
(B) Design, draw and explain a pneumatic circuit to move a workpiece at a constant speed. <http://www.sgbauonline.com> 6
11. (A) Describe the components of a general structure of a hydraulic circuit. Compare merits of hydraulics over pneumatics. 7
(B) Explain with the help of a hydraulic circuit, the travel dependent sequencing of two hydraulic cylinders. 6

OR

12. (A) Explain with neat circuit diagram braking and replenishing of high speed hydraulic motor. 7
(B) Explain the hydraulic circuit that causes continuous reciprocation of the work table of a surface grinder. 6

