



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121658

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15
MECHATRONICS

Time : 2 Hours]

[Total Marks : 50

- 1 Attempt any FOUR parts : $3.5 \times 4 = 14$
- (a) Explain the building block of Electric drive system.
 - (b) Explicate the servo mechanism with suitable application.
 - (c) Illustrate hydraulic actuation system with suitable example.
 - (d) Compare the AC and DC stepper motor.
 - (e) Write short note on pressure control valves used in hydraulic and pneumatic system.
 - (f) Derive the mathematical model of spring, mass and Damper system.
- 2 Attempt any TWO parts : $6 \times 2 = 12$
- (a) Explain the operation of LVDT with its characteristics. Also elucidate how it is used as displacement transducer.

- (b) What is meant by data acquisition system? Also explain the various operations taking place in signal conditioning system.
- (c) Explain the typical capacitive type level transducer in detail.
- 3 Attempt any TWO parts : 6×2=12
- (a) Describe the architecture of PLC in detail. Also - write the Ladder logics for controlling traffic system.
- (b) Explain the I/O ports and Timer functions of a micro-controller. Also write simple codes to control the level of water tank.
- (c) Sketch the ladder logic diagram for universal gates.
- 4 Attempt any 'TWO parts : 6×2=12
- (a) In a reactor the temperature control plays a crucial role, to control the temperature of reactor design ladder logic to activate the alarm if the temperature exceeds 1500° C and it should sound till the temperature falls below 1250° C.
- (b) Design a mechatronic system for Fuel feed Rate in automobiles. Consider the different criteria involved and justify each assumption made.
- (c) Write a case study for electromechanical system. which is employed in automobiles.