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**B. TECH.**  
**(SEM V) THEORY EXAMINATION 2021-22**  
**MECHATRONICS SYSTEMS**

**Time: 3 Hours****Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. Discuss Key elements of Mechatronics systems as an individual.
  - b. Describe how Transducer is different form Sensor.
  - c. Show difference between open loop and closed loop control systems.
  - d. Differentiate accuracy from preciseness.
  - e. Describe "NRV" with applications.
  - f. Show difference between normally open and normally closed conditions.
  - g. Describe scan time in PLC.
  - h. Discuss basic concept of Ladder diagram.
  - i. Define and draw symbol of TRIAC Optoisolator.
  - j. Explain "Latching" in PLC.

**SECTION B**

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Explain all Avionics, Autotronics and Bionics with suitable example.
  - b. Outline static and dynamic characteristics of sensors.
  - c. Explain classification of "Electrical motors".
  - d. Discuss Ladder diagram in case of Automatic car park system.
  - e. Illustrate the Application of "AND" Valve.

**SECTION C**

- 3. Attempt any one part of the following: 10 x 1 = 10**
- (a) Analyze Capacitive Proximity sensor with working.
  - (b) Explain working and applications of "Hall Effect Sensor".
- 4. Attempt any one part of the following: 10 x 1 = 10**
- (a) Outline construction and working of "Double acting Cylinder".
  - (b) Illustrate various Direction control valve used in pneumatics.
- 5. Attempt any one part of the following: 10 x 1 = 10**
- (a) Explain working and applications of "Timer" in PLC.
  - (b) Explain working and applications of "Counters" in PLC.
- 6. Attempt any one part of the following: 10 x 1 = 10**
- (a) Show Block diagram of Digital liquid level measurement system
  - (b) Model a window AC in closed loop control system with all elements.
- 7. Attempt any one part of the following: 10 x 1 = 10**
- (a) Discuss various sensors used in Engine Management system.
  - (b) Design PLC programming for extending and retracting of pneumatic pistons.