Printed Pages: 02 **Sub Code:KME-052**

Paper Id:	2	3	1	2	4	4

Roll No.												

B.TECH.
(SEM- V) THEORY EXAMINATION 2022-23
MECHATRONICS SYSTEMS

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x10 = 20**

(a) Define mechatronics systems.
(b) Write the scope and application areas of mechatronics.
(c) Discuss the principle and working of Ultrasonic sensor.
(d) Differentiate between sensor and transducer.
(e) Explain the physical components in hydraulic system with diagram.
(f) Explain the term "accumulator".
(g) Define counters with an example.
(h) Discuss the Selection criteria and Applications of PLC.
(i) Explain the working of automatic car parking system.
(j) Explain the working of Engine Management System.

SECTION B

2. Attempt any *three* of the following: **10x3 = 30**

(a) With the help of block diagram discuss the key components of a typical mechatronic system.
(b) Explain the working of LVDT with the help of diagram. Also write its advantages, disadvantages and applications.
(c) What are the three types of Pressure Control valve? Explain with the help of suitable diagram.
(d) Discuss the working of PLC and also define scan cycle.
(e) Illustrate the operations of bottling plant.

SECTION C

3. Attempt any *one* part of the following: **10x1 = 10**

(a) Illustrate the following terms:
(i) Autotronics and their applications
(ii) Avionics and their applications
(iii) Bionics and their applications

(b) Discuss the function of control system. Classify the different types of control system. Explain the Elements of open and closed loop control system with the help of diagram and example.

4. Attempt any *one* part of the following: 10 x1 = 10

(a) Illustrate the static & dynamic characteristics of sensors.

(b) Explain the following sensors:
  (i) Inductive Proximity sensor
  (ii) Hall effect sensor

5. Attempt any *one* part of the following: 10x1 = 10

(a) Explain the principle and working of following motors:
  (i) 3 Phase Induction Motor
  (ii) Stepper motors
  (iii) Servo motors

(b) With the help of neat sketch, explain the working and application of Pneumatic actuation System.

6. Attempt any *one* part of the following: 10x1 = 10

(a) Explain the timers in PLC ladder logic with an example.

(b) Discuss the meaning of latching or holding. Write the ladder program for latching using single push button for on and off the output.

7. Attempt any *one* part of the following: 10x1 = 10

(a) With the help of a case study explain the working of a mechatronic system. Explain how pick and place robot works?

(b) Discuss the working of an automatic washing machine with the help of block diagram.