PAPER ID-310879

Subject Code: BME054

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2025-26
MECHATRONICS SYSTEMS

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 07 = 14**

Q no.	Question	CO	Level
a.	Write the mechatronics application in automobiles.	CO1	K2
b.	What do you mean by Bionics?	CO1	K2
c.	Write short notes on load cell.	CO2	K1
d.	Enlist the importance of sensor calibration.	CO2	K1
e.	Name the components of air preparation unit in pneumatic system	CO3	K2
f.	What is scan cycle?	CO4	K1
g.	Enlist the role of sensors in packaging automation.	CO5	K2

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	List and describe the basic elements of a Mechatronic system.	CO1	K3
b.	Write the classification of transducer based on the working principle.	CO2	K3
c.	Explain the working of direction control valve and its types.	CO3	K3
d.	Differentiate between types of PLCs based on application.	CO4	K3
e.	Describe the working of a sorting and packaging unit.	CO5	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	What are the major application areas of Mechatronics in manufacturing?	CO1	K4
b.	Discuss the open loop control system with suitable example and neat sketch.	CO1	K4

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Describe the working principle of an inductive proximity sensor.	CO2	K3
b.	Discuss the principle and use of ultrasonic sensors.	CO2	K3

5. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain single and double-acting actuators with diagrams.	CO3	K3
b.	Discuss the working principle of solenoids in actuation.	CO3	K3

6. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Discuss the selection criteria for PLCs in industrial applications.	CO4	K3
b.	Discuss the role of counters in PLC-based automation.	CO4	K3

7. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain the operation of a coin counter system.	CO5	K3
b.	Explain the working of an automatic car park system.	CO5	K3