

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025**Seventh Semester****Electronics and Communication Engineering****OMR351 – Mechatronics****Regulations - 2021**

Duration: 3 Hrs.

Maximum: 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BTL	CO	Marks
1.	Define Mechatronics and sketch its graphical representation.	L1	1	2
2.	What is the function of the Accumulator in an 8085 microprocessor?	L2	1	2
3.	Define PPI (Programmable Peripheral Interface).	L1	2	2
4.	Define a Programmable Logic Controller (PLC).	L1	2	2
5.	What is the basic principle in thermocouples?	L2	3	2
6.	Distinguish between open-loop and closed-loop control systems (State any two points).	L2	3	2
7.	Name the 3 main functional units of the 8085 Microprocessor.	L1	4	2
8.	Name the modes available in the 8255A Control Word format.	L2	4	2
9.	Why are PLC systems preferred over computers in factories (State any two reasons)?	L1	5	2
10.	What are the roles of sensors in a car engine management system?	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a Explain in detail the static and dynamic characteristics of a sensor or transducer with suitable examples.	L2	1	16
	Or			
	b Explain the concept of open-loop and closed-loop control systems with neat sketches and illustrate their differences.	L2	1	16
12.	a Explain with a neat block diagram the architecture and functional units of the 8085 microprocessor.	L3	2	16
	Or			
	b Explain the timing diagram for the memory read cycle in the 8085 microprocessor.	L3	2	16
13.	a Design an interface circuit to connect an ADC chip with an 8085 processor through 8255 ports. Explain the complete circuit and write an ALP to use BSR mode to START conversion and STATUS CHECK mode to read output data.	L3	3	16

Or

	b	Why do we need A/D and D/A converters in Mechatronics systems? Draw the block diagram to interface the 8085 microprocessor with an A/D converter and a D/A converter.	L3	3	16
14.	a	Explain the architecture of a Programmable Logic Controller (PLC) with a neat block diagram, detailing the function of each component.	L2	4	16
		Or			
	b	Explain the use of Timers and Counters in PLC programming with suitable ladder diagrams for an industrial application.	L2	4	16
15.	a	Design a robot for a pick-and-place operation and comment on the various elements and components used in the system.	L5	5	16
		Or			
	b	Evaluate the benefits of the Mechatronics design approach compared to the traditional design approach with an example.	L5	5	16