CBCS SCHEME

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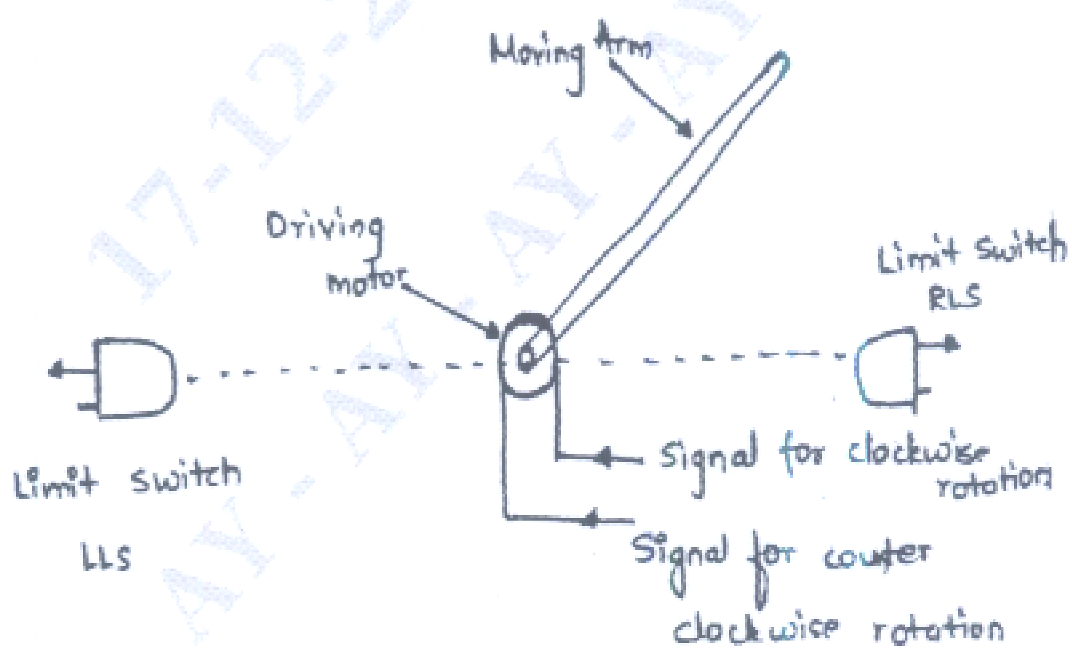
BMT601

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Programmable Logic Controller and SCADA Technology

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the architecture of PLC with a neat diagram.	10	L2	CO2
	b.	Define PLC. Explain the different types of PLC.	10	L2	CO2
		OR			
Q.2	a.	Draw detailed diagram of the processor section of PLC and explain the different types of memory in PLC.	10	L2	CO2
	b.	Discuss the different characteristics advantages and disadvantages of PLC.	10	L2	CO2
		Module – 2			
Q.3	a.	Draw the equivalent ladder diagram of i) AND gate ii) OR gate iii) XOR gate iv) NOR gate v) NAND gate.	10	L3	CO1
	b.	Explain the DE-Morgan's theorem with equivalent ladder logic diagram.	10	L2	CO1
		OR			
Q.4	a.	Design a 4:1 multiplexer using ladder logic. Assume the inputs are connected to I : 0/1, I : 0/2, I : 0/3 and I : 0/4 ; control signals are connected to I : 0/5 and I : 0/6 and output terminal is 0 : 0/1.	10	L3	CO1
	b.	A bi-directional movable arm shown in Fig Q4(b). Draw a ladder diagram to control it as per conditions mentioned. The conditions that apply to the problem are as follow : Both the start and stop switches are push buttons. When the system is turned ON, the motor should rotate continuously, alternating between the counter clockwise and clockwise directions, as the movable arm touches two limit switches, RLS and LLS.  Fig Q4(b)	10	L2	CO1

		Module – 3			
Q.5	a.	Discuss the Timer ON, Timer OFF, Retentive and Non retentive times.	10	L2	CO4
	b.	Draw a ladder diagram for box packaging system with following conditions: five boxes stacked at a time, and then bound with a wrapper. The input and output are as follows : i) Box present signal I : 0/1 ii) Wrapper machine relay 0 : 0/1 iii) Go to step 1	10	L3	CO4
		OR			
Q.6	a.	Explain the counter up (CTV) and counter down (CTD) with a neat diagram.	10	L2	CO4
	b.	Draw the equivalent diagram for an agitator motor system having the following conditions : Agitator starts after 5 seconds the pump can be started, when the pump is switched off the agitator also stops, when the agitator goes OFF, it connot be started for 3 seconds.	10	L3	CO4
		Module – 4			
Q.7	a.	Explain sinking and sourcing in detail with a neat diagram.	10	L2	CO3
	b.	Discuss threshold detection and isolation in PLC systems.	10	L2	CO3
		OR			
Q.8	a.	Explain the following i) Parallel I/O ii) Serial I/O	10	L2	CO3
	b.	Discuss the power supply requirement and power supply configuration in PLC.	10	L2	CO3
		Module – 5			
Q.9	a.	Explain the architecture and communication requirement in SCADA.	10	L2	CO4
	b.	Discuss the operation of SCADA system in chemical plant process.	10	L3	CO5
		OR			
Q.10	a.	Explain the different generation of SCADA system.	10	L2	CO4
	b.	Demonstrate the operation of SCADA system in petroleum refining process.	10	L3	CO5

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