KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV /DEC 2024

(Regulation 2018A)

Sixth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EII6201**:** Industrial Automation

COURSE OUTCOMES

CO1: Apply the design aspects of industrial automation

CO2: Build PLC program and logic controllers with case study

CO3: Develop PLC diagram &implement the Automation technique used in Industry

CO4: Solve engineering problems for Field Automation and analyse their safety/redundancy

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

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1.	Explain the difference between open-loop and closed-loop control systems.	CO1	[K_2]
2.	What are the steps involved in hardware selection for automation	CO1	[K_2]
3.	State the difference between PLCs and dedicated controllers.	CO2	[K_3]
4.	What is the role of circuit breakers in PLC systems?	CO2	[K_2]
5.	Define a latch in PLC programming	CO3	[K_2]
6.	Explain the use of system bits in PLC programming.	CO3	[K_2]
7.	Define a PID function block.	CO3	[K_2]
8.	What is the purpose of communication protocols in SCADA?	CO4	[K_2]
9.	Explain the role of network field instruments in SCADA.	CO4	[K_3]
10.	List out the few Alarm Event.	CO4	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Explain in detail the preparation and implementation of process sequences for an industrial application	8	CO1	[K_2]
	b)	Describe the functioning of analog i/o modules of PLC	8	CO1	[K_2]

12.	a)	Draw the generalized architecture for a PLC and discuss each functional block	16	CO2	[K$_2$]

13.	a)	Illustrate the preparation of an input/output list for a basic automation system	8	CO2	[K$_2$]
	b)	Develop a hardware selection procedure for a temperature monitoring system.	8	CO2	[K$_2$]

14.	a)	Develop a detailed PLC diagram for a manufacturing unit's conveyor belt system, incorporating counters used to reset the count after every 10 boxes.	10	CO3	[K$_3$]
	b)	Explain with an example how memory functions are used in PLC programming.	6	CO3	[K$_3$]

15.	a)	Develop a ladder logic program for the given Automated Packaging System	10	CO3	[K$_3$]
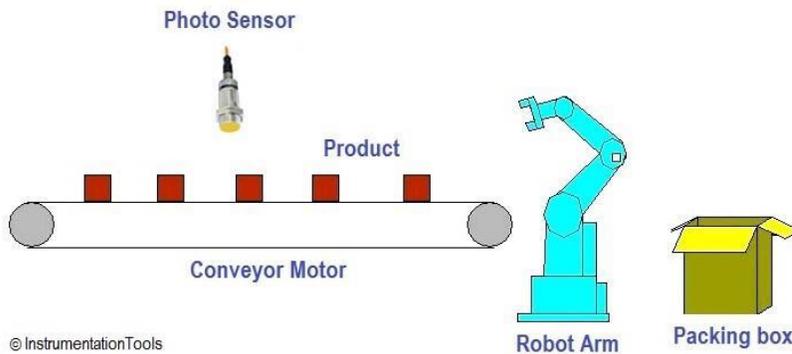
	b)	Evaluate the role of data transfer and arithmetic functions in optimizing industrial processes.	6	CO3	[K$_3$]

16.	a)	Develop a SCADA-based architecture for a water treatment plant.	8	CO4	[K$_3$]
	b)	Analyze the role of DCS in large-scale industries and compare it with SCADA systems	8	CO4	[K$_3$]

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