KUMARAGURU
college of technology
character is life

B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Fourth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEI4205**:** PLC Automation

COURSE OUTCOMES

CO1:   Describe the architecture of PLC.

CO2:   Understand the working of PLC analog input and output devices.

CO3:   Program on basic ladder logic diagram using timer and counters.

CO4:   Understand the interface of PC with PLC and hardware implementation.

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

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

1.	Define PLC and give its applications.	CO1	[K₂]
2.	Distinguish between Siemens and Allen Bradley PLC Input and Output modules	CO1	[K₂]
3.	Classify the following memory chips into Fixed memory or Erasable Memory:	CO1	[K₁]
	ROM b. RAM c. PROM d. EEPROM		
4.	List the various parts of a ladder diagram.	CO2	[K₁]
5.	What are opto isolators?	CO2	[K₁]
6.	List out the methods of programming in PLC.	CO2	[K₁]
7.	Develop a ladder logic to Turn "ON" a motor after a time period of 25 secs	CO3	[K₂]
8.	Illustrate the block diagram of up/down counter?	CO3	[K₂]
9.	List the various parameters required to be entered for a SQO instruction in PLC	CO4	[K₂]
10.	Differentiate between SKIP and BRANCH instruction in PLC	CO4	[K₂]

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

11.	a)	Write the truth table and draw the ladder diagram to satisfy the below conditions in a Rail wheel factory to avoid accidents during wheel manufacture :	10	CO1	[K₂]

- When any two switches are ON Red alert to glow

- When any three switches are ON Alarm to be "ON"

If all the four switches are ON then the Fire Alarm to be "ON"

	b)	Illustrate with a neat diagram the working principle of Input module in PLC	6	CO1 [K$_2$]
12.	a)	List and explain the various criteria for selection of PLC	6	CO1 [K$_2$]
	b)	Explain with a neat diagram the architecture of PLC	10	CO1 [K$_1$]
13.	a)	Classify the following devices into input and output devices with respect to PLC:	4	CO2 [K$_2$]

    1. Pressure Switch 2. Thermocouple 3.Motor 4. Push Button switch

5. Solenoid Valve 6. Toggle Switch 7. Proximity Sensor 8. LED

	b)	Develop the ladder logic diagram for AND,OR,NAND and NOR Gate	12	CO2 [K$_2$]
14.	a)	Explain ON delay timer with a neat timing diagram	10	CO3 [K$_2$]
	b)	Construct a ladder diagram for the following process:	6	CO3 [K$_3$]

An indicating light is to go ON when a count reaches 25 and the light is then to go OFF when a count of 30 is reached.

15.	a)	Explain any four arithmetic functions used in PLC	10	CO4 [K$_2$]
	b)	Describe the working of JUMP instruction with a neat ladder diagram	6	CO4 [K$_2$]
16.	a)	Explain the Input and Output Sequencer Instruction with their Block representation.	8	CO4 [K$_2$]
	b)	Explain with a ladder diagram the Conveyor Motor Ladder Logic or Conveyor Belt Control using a programmable logic controller	8	CO3 [K$_3$]

****