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Question Paper Code: 91477

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Seventh Semester

Electronics and Instrumentation Engineering

EI 2402/EI 72/10133 IC 702 – LOGIC AND DISTRIBUTED CONTROL SYSTEM

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

 $PART A - (10 \times 2 = 20 \text{ marks})$

- 1. Write about rung and Program scan.
- 2. Mention the programming devices of PLC also write about the importance of optocoupler.
- 3. Write a simple program using relay ladder logic to implement traffic light control system.
- 4. Give examples for sequencer instructions and define.
- 5. Write about Tag and mention its uses.
- 6. Compare PLC and SCADA.
- 7. Define DCS.
- 8. Write some of the bus standards used in process control industry.
- 9. Mention the protocols to be used for communication between a PC / Drive/Operator Panel.
- 10. Write the differences between operator and engineering interfaces.

PART B — $(5 \times 16 = 80 \text{ marks})$

11.	(a)	(i)	Explicate with an example advantages of PLC over relay logic. (6)
		(ii)	Explain the analog and discrete I/O modules of PLC. (10)
	•		Or
	(b)	(i)	Write down the steps to be considered for designing a 16 analog input and 5 digital input. 5 analog output and 2 digital output PLC. (8)
	•	(ii)	What is the purpose of input status table and output status table in PLC and write any PLC program using timer and counter applications? (8)
1 2 .	(a)	(i)	Classify the types of instructions in PLC and mention its uses. (10)
	•	(ii)	How to use a PC as a PLC – Explain with an example. (6)
••			\mathbf{Or}
•	(b)	(i)	Mention the inputs and outputs used in a bottling application and write a program using relay logic (Use Minimum 6 I/O, 2 Timers, 1 Counter).
		(ii)	Write a PLC ladder diagram for a process plant. Assume total of 5 inputs and 6 outputs. Mention the I/Os. (8)
13.	(a)	(i)	Describe about direct digital control systems with examples. (10)
		(ii)	Explain the protocols used in the computer controlled systems and mention its standards. (6)
			\mathbf{Or}
	(b)	Exp	lain the architecture of SCADA with neat diagram. (16)
14.	(a)	(i)	Explain the components used in DCS. (12)
		(ii)	Brief about local control unit used in a process industry. (4)
-		•	Or
•	(b)	(i)	In a petroleum industry what are all the process interfacing issues related to DCS. (8)
•	•	(ii)	Mention the important communication facilities used in a process industry. (8)
15 .	(a)·	(i)	List the features present in high level operator interfaces. (6)
		(ii)	Explain the operator displays used in any of the process industry. (10)
•		·	\mathbf{Or}
	(b)	(i)	Describe with an example low level and high level engineering interfaces. (6)
		(ii)	Explain the role of general purpose computers in DCS. (10)