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Reg. No. : | | | | | | | | | | |

Question Paper Code: 57502

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Electronics and Instrumentation Engineering

15UEI702 -PLC and SCADA

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Jury's Stability Test is used to analyze CO1-R

   (a) Stability of the system (b) Controllability of the system

   (c) rank of the system (d) none of the above

2. Velocity form of digital controllers causes Controller drift when _____ control action is absent CO1-R

   (a) P (b) I (c) PI (d) D

3. Small PLCs have a memory from ---------- to store the user's logic programs. CO2-R

   (a) 2Kb to 10 KB (b) 10 Kb to 20KB

   (c) 30Kb-40Kb (d) 1Gb

4. In a current sinking DC input module _____. CO2-R

   (a) The current flows out of the input field device

   (b) Requires that a AC sources be used with mechanical switches

   (c) The current flows out of the input module

   (d) Currents can flow in either direction at the input module

5. Which one of the following is a Program control instruction CO3- R

   (a) MCR (b) Timer (c) Coil. (d) ALU

6. _____ instruction is used as a program control function. CO3- R

(a) MCR (b) RESET (c) TIMER (d) CNTL

7. HMI means ---------- Machine Interface CO4 -R

(a) Human (b)Heart (c) Head (d)High

8. To identify non-metal objects in a conveyor _____ sensor is most preferable. CO4 -R

(a) Capacitive Proximity (b) Inductive Proximity

(c) IR (d) Ultrasonic

9. Line Modems used to connect RTU to a network uses _____ technique to establish communication. CO5- R

(a) Phase Shift Keying (b) Time Shift Keying

(c) Frequency Shift Keying (d) Coded Shift Keying

10. ----------is needed to provide an interface between the sensor and the SCADA network. CO5- R

(a) Remote Terminal Unit (b) DCS

(c) Multiplexer. (d) Decoder

PART – B (5 x 2= 10Marks)

11. Determine the Z-transform for e^{-at} CO1 -R

12. Differentiate modular PLC and fixed PLC. CO2-U

13. Write the difference between SKIP and JUMP Instruction. CO3-U

14. Draw a ladder diagram to implement the logic y = a'b+ab'. CO4-R

15. Give the advantage of SCADA. CO5-U

PART – C (5 x 16= 80Marks)

16. (a) Discuss about the position and velocity form of PID system CO1-App (16)

Or

(b) With an example explain about Jury's stability test. CO1-App (16)

17. (a) Discuss in detail about the evolution of Programmable Logic Controller and its components. CO2 -U (16)

Or

	(b)	(i) Explain the various timer logics in PLC.	CO2 -U	(10)
		(ii) Develop a ladder program to control traffic light in one direction.	CO2-Ana	(6)
18.	(a)	Explain in Detail about Sequencer Instruction in PLC. Draw a Ladder Logic to implement the Traffic Lights control system using sequencer instruction.	CO3 -U	(16)
		Or		
	(b)	(i) List the various compare instructions in PLC and discuss any 3 compare instructions in detail.	CO3 -U	(10)
		(ii) Develop a ON/OFF control based ladder logic program to maintain the temperature of a tank within 1% deviation between setpoint.	CO3-Ana	(6)
19.	(a)	Explain about case study of bottle filling system with suitable diagram.	CO4-U	(16)
		Or		
	(b)	With suitable diagram explain the construction and operation of LPG filling system and also write a PLC program to monitor and control the reactor.	CO4 -App	(16)
20.	(a)	With a neat architecture diagram describe about SCADA	CO5- U	(16)
		Or		
	(b)	Explain with block diagram the multiplexed ADC and DAC used in Data Acquisition System.	CO5-U	(16)

57502