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Question Paper Code : 51539

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Seventh Semester

Electrical and Instrumentation Engineering

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

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Define PLC.
2. What are all the programming devices available to program the PLC ?
3. Write a simple program using PLC to implement the EXOR logic gate.
4. Write the format of multiply and divide instructions.
5. What are the Features of SCADA systems ?
6. Give any four editors available in SCADA package.
7. Compare individual, centralized and distributive control systems.
8. What is the role of communication interfaces in DCS ?
9. Mention the features provided in operator interfaces.
10. State the main functions of computers in DCS.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Differentiate PLC and conventional relay based logic system. (6)
(ii) Explain the functioning of analog and digital 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. (6)
(ii) What is the purpose of input status table and output status table in PLC and write any PLC program using counter instruction. (10)

12. (a) (i) Develop the logic ladder diagram for liquid level control application. (10)
(ii) How to use a PC as a PLC ? (6)

OR

- (b) (i) Mention the inputs and outputs used in a bottling application and write a program using RLL. (8)
(ii) Write a PLC ladder diagram for a process application of your choice. Mention the I/Os. (8)

13. (a) Distinguish between SCADA and DCS and explain the hardware architecture of SCADA. (16)

OR

- (b) Explain the direct digital control structure with a neat diagram and compare the advantages of DDC over conventional analog controllers. (16)

14. (a) (i) Discuss Local Control Unit (LCU) of DCS.
(ii) Explain the LAN topology of DCS in detail. (16)

OR

- (b) Describe the different types of alarms and alarm management in DCS. (16)

15. (a) (i) Discuss the features of high level operator interfaces in detail. (8)
(ii) Explain the hierarchy of operator display used in DCS. (8)

OR

- (b) List the various engineering interfaces used in DCS. With neat diagram explain the low and high level engineering interfaces. Differentiate between them. (16)