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Question Paper Code: 36602

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Instrumentation and Control Engineering

01UIC602 - LOGIC AND DISTRIBUTED CONTROL SYSTEMS

(Common to Electronics and Instrumentation Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List out any four PLC input and output devices.
2. Compare T_{ON} and T_{OFF} timers.
3. Write a simple program using PLC to implement the EXOR logic gate.
4. Mention any four real time applications of PLC.
5. Draw the general block representation of a computer control system.
6. Differentiate between analog controller and digital controller.
7. What is the need can be satisfied in designing an industrial grade LCU?
8. Mention the applications of DCS in rolling mills.
9. Mention the advantages of field bus communication.
10. Differentiate between interchangeability and interoperability.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Draw the architecture of PLC and explain individual components. (8)
(ii) Point out the advantages and disadvantages of PLC over relay logic. (8)

Or

- (b) Summarize the functions of analog I/O module of Programmable Logic Controllers. (16)

12. (a) (i) Describe the function of program control instructions and develop a program to illustrate their use. (8)
(ii) Compose how PC can be used as PLC. (8)

Or

- (b) Describe the program control instructions of PLC with examples. (16)

13. (a) With neat diagrams, explain the open loop and closed loop sampled data control system in detail. (16)

Or

- (b) Mention the necessary conditions and sufficient conditions for Jury's stability test; check the stability conditions with an example. (16)

14. (a) Describe the architecture of Distributed Control System and its main sub-system. (16)

Or

- (b) With neat diagram explain the architecture of DCS in detail. List the advantages in control system applications. (16)

15. (a) (i) Illustrate the HART multi-drop networks operations in detail. (8)
(ii) Brief about the field bus topology, with neat diagrams. (8)

Or

- (b) Describe the basic requirements of field bus standards. (16)