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Total Number of Pages : 02

Course: B.Tech  
Sub\_Code: REI6C002

6th Semester Back Examination: 2022-23

SUBJECT: Industrial Automation and Control

BRANCH(S): AEIE,EIE

Time : 3 Hour

Max Marks : 100

Q.Code : M063

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part-I

- Q1 Answer the following questions: (2 x 10)
- What are the timer instructions of PLC?
  - State the three important points of adaptive control.
  - What are the categories of control valve?
  - Draw the block diagram of self tuning regulator and explains.
  - Why a PID controller is more preferred over PI controller?
  - Write the transfer function of a PID controller.
  - State the importance of ratio Control.
  - Compare between DCS and PLC.
  - Define final control element. How does it work in control system Engg?
  - Why do we choose signal conditioning in a circuit?

Part-II

- Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)
- With suitable examples, bring out the advantages of closed-loop systems over open loop systems.
  - What are the advantages of cascade control configuration?
  - State the different types of actuator and narrate these actuators with diagram.
  - Explain scanning process of PLC.
  - Compare fixed and programmable automation on any six points.
  - What is Feedback control? State the difference between feed forward and feedback control systems with examples.
  - Write the control parameters. Explain the multi position and single mode position in control system.
  - In a real time operating system explain how the inter-task Communication is achieved?
  - Construct ladder diagram for the logical expression  $y = AB + BC + CD$ .
  - Mention features of SCADA.

- k) What is control valve? Explain the control valve principle and control valve characteristics.
- l) Write a ladder diagram program for tank level control.

**Part-III**

**Only Long Answer Type Questions (Answer Any Two out of Four)**

- Q3** Define DCS and mention its features. (16)  
List the advantages and applications of DCS.
- Q4** What is the need of tuning in PID Controller .Also explain Zeigler-Nichols (16)  
Tuning Method briefly.
- Q5** What is adaptive control? State and explain the different types of adaptive (16)  
with proper diagram.
- Q6** List and describe eight major timing functions that are commonly used in (16)  
circuits and processes.