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Total Number of Pages : 02

B.Tech
PEI6I101

6th Semester Regular / Back Examination 2018-19

PROCESS CONTROL

BRANCH : AEIE, EIE, IEE

Max Marks : 100

Time : 3 Hours

Q.CODE : F994

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 Only Short Answer Type Questions (Answer All-10)

(2 x 10)

- Define process load and process lag.
- Define proportional band and how is it related to proportional gain?
- Distinguish between controlled variable and controlling variable.
- Draw circuit diagram to implement ON-OFF controller.
- Write the metals used for making RTD and state its equation.
- What is the need of linearization of signals?
- State the characteristics of DAC.
- State the three major functions of adaptive controller.
- What is need of self latching ladder diagram?
- What is Buffer? Explain tri-state buffer and its application.

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)

(6 x 8)

- Draw a circuit and explain application of instrumentation amplifier in signal conditioning circuit.
- Draw circuit diagram of voltage to current converter and current to voltage converter and explain operations of these circuits.
- Describe basic principle of operations of Sample and Hold circuit for use with an ADC. What are issues related to a practical Sample and Hold circuit?
- Describe the characteristics of proportional and integral controller.
- Draw the circuit diagrams of low pass and high pass RC filters and derive the transfer function.
- Draw the PLC block diagram and explain each block.
- With suitable diagram describe the measurement of strain using strain gauge.
- Briefly describe LASER principle and its applications.
- State the fundamental difference feed forward and conventional feedback control.
- What are the main advantages of cascade control? For what kind of processes can you employ cascade control?
- With suitable example, describe the working of a self regulated process. Why is it called so?
- Narrate the working of selective control system. How is it different from adaptive control?

Part-III

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

Q3 What is Adaptive Controller? State the types of adaptive controller and explain them with block diagram. **(16)**

Q4 With neat sketches discuss the various blocks of final control operation. **(16)**

Q5 State the difference between continuous and discontinuous controller. Explain two position and composite control mode. **(16)**

Q6 A control valve has a linear variation of opening as the input voltage varies from 0 to 10 Volts. A microcomputer outputs 8-bit word to control the valve opening using an 8-bit DAC to generate the valve voltage. **(16)**

- a) Find the reference voltage required to obtain a full open valve (10V)
- b) Find the percentage of valve opening for 1-bit change in the input word.