Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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B.Tech.(EIE) (2011 & Onwards) (Sem.–5)

# PROCESS DYNAMICS AND CONTROL

Subject Code : EI-305

M.Code : 58023

Time : 3 Hrs. Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

**1. Answer briefly :**

(a) What are the objectives of Automatic Process control?

(b) What is offset in a proportional controller?

(c) Define integral time.

(d) What is the effect of time delay in process control loop?

(e) What is the function of a control valve positioner?

(f) What are interacting systems in Process control?

(g) What do mean by tuning of a controller?

(h) What is need of mathematical modeling of process elements?

(i) Define turndown of a control valve.

(j) What are the drawbacks of the derivative control?

## SECTION B

2. What do you mean by the action of a controller in a control loop? Differentiate between the continuous and discontinuous mode of controllers.

3. Discuss the various performance criterions used for the tuning of the controllers.

4. A liquid level control system linearly converts a displacement of 2 to 3 m into a 4-20mA control signal. A relay serves as the two position controller to open or close an inlet valve. The relay closes at 12 mA and opens at 10 mA. Find :

   (a) The relation between displacement level and current

   (b) The neutral zone in meters

5. Compare the characteristics of the proportional, integral and derivative mode of a controller.

6. Draw the construction and working of a hydraulic PI controller with a suitable diagram.

## SECTION-C

7. Derive & comment on the responses of a PID controller for a ramp, step and & impulse error inputs.

8. Discuss the construction and flow lift characteristics of the following types of control vales used for the fluid control :

   (a) Globe valves

   (b) Butterfly valves

9. Why there is a need of restriction in the flapper nozzle system? Explain the working of the pneumatic PID controller with neat sketches.



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**