

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(EE) (2011 Onwards E-II)**  
**B.Tech.(Electrical & Electronics) (2011 & 2012 Batch E-II)**  
**(Sem.-7,8)**

**INDUSTRIAL PROCESS CONTROL**

**Subject Code : BTEE-804D**

**Paper ID : [A3038]**

**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**

**Q1 Answer briefly :**

- a) How models are being classified?
- b) How physical models are being developed?
- c) Explain how the validation of simulation models can be achieved.
- d) What is a distillation column?
- e) What are batch processes?
- f) Discuss the advantages of an on-off controller.
- g) Discuss the role of derivative term in a PID controller.
- h) Explain set point control.
- i) How neural networks can be used in process control applications?
- j) What are smart transmitters?

### SECTION-B

- Q2 By taking example of a blending process develop its modeling equations in terms of mass as well as energy balance equations.
- Q3 Explain any one method used for system identification.
- Q4 Discuss the role of distillation column in a chemical process industry. Write down its modeling equations.
- Q5 Consider a waste treatment system. A pH controller may need to adjust the pH by manipulating either basic or acidic stream flow rates. Design a split range control strategy to do this.
- Q6 Draw the block diagram of programmable logic controller and explain it.

### SECTION-C

- Q7 Explain briefly :
- a) Steam turbine and water treatment controls.
  - b) Ratio control.
- Q8 By taking example of a liquid level control problem explain feedback, cascade and cascade+ feed-forward control schemes with the help of suitable block diagrams.
- Q9 a) Discuss the role of fuzzy logic in process control applications.
- b) Explain the working of distributed control system.