Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PEEE 5407

Seventh Semester (Special) Examination – 2013

INDUSTRIAL AUTOMATION AND CONTROL

BRANCH : AEIE, EC, EEE, ETC, IEE

QUESTION CODE : 464

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) How multivariable control is more suitable in process control operation ?

   (b) Represent the basic method of tuning necessary for PID Controller during operation.

   (c) What are the algorithm required to programming three mode of digital PID Controller ?

   (d) What is the disadvantages of feed forward control ?

   (e) Explain the function of selective control.

   (f) Basically how many type of selective control are available in multi-loop control system ?

   (g) Distinguish the advantages and disadvantages of pneumatic actuator.

   (h) What is the difference between relay diagram and ladder diagram ?

   (i) Explain the communication method in DCS.

   (j) Represent multi-tasking associated with real time operating system in process control.

2. (a) Compare the P, PI, PD Controller in terms of their transient and steady state performance. 5

   (b) Represent the presence of off-set in simple "P" mode operation. 5

P.T.O.

3. (a) Describe any one algorithm use for Digital PID Controller programming. 5

(b) Explain in details about the functioning of open loop response curve in PID Control tuning. 5

4. (a) What do you mean by the phenomena of shrink and swell in boiler dram level control ? 4

(b) Explain with suitable example of feedback- feed forward control configuration. 6

5. (a) Describe with a sketch the principle of operation of a flapper-nozzle amplifier. 4

(b) Briefly explain all about electrical actuator necessary in process control and automation. 6

6. (a) With neat sketch explain the architecture and functional requirement of DCS. 4

(b) Define the following : 6

(i) task management

(ii) memory management

in real time operating system used for process control application.

7. (a) Define the following related to controller : 5

(i) two position control

(ii) multi-position control

(b) Describe distributed vs centralised control 5

8. Write short notes on any **two** of the following : 5×2

(a) Communication option on DCS

(b) Real time operation system

(c) Distributed control system

(d) Adaptive control.