Printed Pages : 2 TIC – 603

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3099 Roll No.

B. Tech.

(SEM. VI) EXAMINATION, 2008-09

PROCESS CONTROL ENGG.

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt all questions.

1 Attempt any **four** parts of the following: **5×4=20**

(a) Explain the operation of a silicon controlled rectifier.

(b) What are the different types of analog signal conditioning?

(c) Explain the basic linearization procedure.

(d) What is integrator? Determine the equation of integrator for output voltage.

(e) What are the different types of digital to analog convertors?

(f) What is data acquisition system? Draw the block diagram of it.

2 Attempt any **four** parts of the following: **5×4=20**

(a) Define the different parts of final control operation.

(b) Explain the operating principles of ac and dc motors.

(c) Explain the principle of signal conversions.

(d) Describe the hydraulic activators.
(e) Explain control valve sizing.
(f) A measurement of temperature using a sensor that outputs 6.5 mV/°C must measure to 100°C. A 6-bit ADC with 10 volt reference is used. Find the temperature resolution.

3 Attempt any **two** parts of the following: **10×2=20**
(a) Describe the different composite control modes.
(b) Explain in detail process load, process lag and self regulation.
(c) Explain two position and floating control mode.

4 Attempt any **two** parts of the following: **10×2=20**
(a) Explain the cascade process control system with suitable block diagram.
(b) Explain the three standard measures of quality in a control system.
(c) Describe the control loop stability criteria with respect to a bode plot.

5 Attempt any **four** parts of the following: **5×4=20**
(a) Explain how controller modes are implemented in DDC.
(b) Define the sampling rate and sampling frequency.
(c) Define the effecfts of aliasing in data sampling systems.
(d) Explain the data logging.
(e) What are the elements of an analog controller?
(f) Describe the implementation of proportional integral controller using operational amplifier.