

VITHALBHAI PATEL & RAJRATNA P. T. PATEL SCIENCE COLLEGE

Vallabh Vidyanagar

Internal Test - First Term [2013 - 14]

Semester - Vth

B. Sc. (INSTRUMENTATION - VOCATIONAL)

Date: 01/10/2013

Subject: Control Techniques - 1 (US05CINV02)

Time: 3:30 pm - 5:00 pm

Maximum Marks: 30

Que 1 Each question below gives a multiple choice of answers. Choose the most appropriate one. [06]

1. _____ refers to the time for the process - control loop to make necessary adjustments to the final control element.
 - i. Process lag
 - ii. Error
 - iii. Both i) and ii)
 - iv. None of the above
2. _____ Control Mode is the natural extension of the principle of Floating Control Mode.
 - i. Propotional
 - ii. On - Off
 - iii. Derivative
 - iv. None of the above
3. The pressure levels used for instrument air systems vary from about _____.
 - i. 0.4 psig to 0.12 psig
 - ii. 4 psig to 12 psig
 - iii. 4 psig to 20 psig
 - iv. None of the above
4. _____ is a temporary variation of one of the load parameters.
 - i. Error
 - ii. Self - Regulation
 - iii. Cycling
 - iv. None of the above
5. _____ Control Mode: Controller output depends on the rate of change of error.
 - i. Single Speed
 - ii. Integral
 - iii. Propotional
 - iv. None of the above
6. Factors that should be considered in designing instrument air system is/are _____.
 - i. Temperature
 - ii. Humidity
 - iii. Vapour Pressure
 - iv. None of the above



Que 2 Short Questions (Attempt any Three) [06]

1. Define Variable Range and Control Lag.
2. What is Continuous Control Mode?
3. What is Dryer?
4. What do you mean by Direct Action and Reverse Action of Control Mode?
5. What do you mean by Composite Control Mode?
6. Enlist the factors that should be considered in designing instrument air systems.

Que 3 Write a note on Two - Position Control Mode. What is Neutral Zone? [06]

OR

What do you mean by Discontinuous Control Mode?

A controller outputs a 4 - 20 mA signal to control motor speed from 140 - 600 rpm with linear dependence. Calculate:

- i. Current corresponding to 310 rpm, and
- ii. Value of i) expressed as the % of controller output.

Que 4 Write a note on Propotional Control Mode. What is offset? [06]

OR

An Integral Control Mode is used for speed control with set point of 12 rpm within a range of 10 - 15 rpm. The controller output is 22% initially. The constant $K_i = -0.15$ controller output per second per percentage error. If the speed jumps to 13.5 rpm, calculate controller output after 2 second for a constant e_p .

Que 5 Explain Sliding Vane Rotary Compressor. [06]

OR

Discuss Dynamic Compressor.