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SARDAR PATEL UNIVERSITY

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B.Sc. (5TH Sem) Examination - 2013 [CBCS]

15TH November, 2013

10:30 am - 1:30 pm

US05CINV02 (Instrumentation - Vocational)

Control Technique - I

Maximum Marks: 70

Que 1 Each question below gives a multiple choice of answers. Choose the most appropriate one. [10]

- 1 Temporary variation of one of the load parameters is known as _____.
 - i. Error
 - ii. Self Regulation
 - iii. Cycling
 - iv. None of the above
- 2 _____ Control Mode: Controller output depends on the rate of change of error.
 - i. ON - OFF
 - ii. Propotional
 - iii. Integral
 - 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 _____ has the property of being paramagnetic in nature.
 - i. Helium
 - ii. Hydrogen
 - iii. Both i) and ii)
 - iv. None of the above
- 5 _____ is the elapsed time between the instant a deviation (error) occurs and the corrective action first occurs.
 - i. Process Lag
 - ii. Control Lag
 - iii. Dead Time
 - iv. None of the above
- 6 _____ Control Mode is the natural extension of the principle of Floating Control Mode.
 - i. ON - OFF
 - ii. Propotional
 - iii. Derivative
 - iv. None of the above
- 7 Time for the process-control loop to make necessary adjustments to the final control element is known as _____.
 - i. Process Lag
 - ii. Dead Time
 - iii. Both i) and ii)
 - iv. None of the above
- 8 _____: The range of error to cover the 0% to 100% controller o/p.
 - i. Offset
 - ii. Propotional Gain
 - iii. Propotional Band
 - iv. None of the above
- 9 _____ Compressors are machines in which air or gas is compressed by the dynamic action of rotating blades.
 - i. Screw
 - ii. Piston
 - iii. Both i) and ii)
 - iv. None of the above
- 10 _____ Analysers depend for their operation upon the fact that some gases and vapours absorb specific wavelengths of infrared radiation.
 - i. Paramagnetic Oxygen
 - ii. Thermal Conductivity
 - iii. Both i) and ii)
 - iv. None of the above

Continue...

Que 2 Short Questions (Attempt any TEN)

[20]

- 1 Define: Error and Dead Time.
- 2 Enlist Characteristics of the Propotional Control Mode.
- 3 What is "Dryer"?
- 4 Explain operating principle of Gas Density Analyzer.
- 5 Define: Control Parameter Range and Self Regulation.
- 6 What do you mean by Continuous Control Mode?
- 7 Explain Oil Removal (with respect to Compressor).
- 8 State the Principle of Infrared Gas Analysers.
- 9 Define: Transient and Variable Range.
- 10 What is Composite Control Mode?
- 11 What is the necessity of Instrument Air System?
- 12 Explain in brief the working of Magnetic Wind Instruments.

Que 3 [A] Explain ON - OFF Controller.

[05]

[B] Write a note on Floating Control Mode.

[05]

OR

[C] With the help of necessary example, explain Process Equation, Process Lag, and Control Lag.

[05]

[D] Give an account of Multi - Position Control Mode.

[05]

Que 4 [A] Explain Integral Control Mode.

[05]

[B] Write a note on Propotional - Derivative (PD) Control Mode.

[05]

OR

[C] Discuss Derivative Control Mode.

[05]

[D] Write a note on PID Control Mode.

[05]

Que 5 [A] Write a detailed note on Compressor Control.

[05]

[B] Write a note on Air Distribution System with necessary diagram.

[05]

OR

[C] Explain Dynamic Compressor with necessary diagram.

[05]

[D] Explain Refrigeration Type Dryer.

[05]

Que 6 [A] What is Analyzer? What is its necessity? With necessary diagram, explain Thermal Conductivity Analyzer.

[10]

OR

[B] With necessary diagram, explain Paramagnetic Oxygen Analyser.

[10]