

Code: 13A10602

B.Tech III Year II Semester (R13) Regular &amp; Supplementary Examinations May/June 2017

**POWER PLANT INSTRUMENTATION**

(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) How wind energy is converted into electrical energy?
  - (b) What do you understand by water hammer?
  - (c) What do you mean by swelling effect of boiler drum level?
  - (d) What is furnace draft control?
  - (e) What does pH indicate?
  - (f) What is the principle of operation of O<sub>2</sub> in flue gases?
  - (g) How maintenance of measuring instruments is done?
  - (h) What are interlocks for boiler operation?
  - (i) What is lubricating oil temperature control?
  - (j) How to measure speed of turbine?

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

- 2 Explain the importance of instrumentation and control in power generation.
- OR**
- 3 Discuss about control rooms in power generation.

**UNIT – II**

- 4 Discuss about measurement of temperature, pressure and flow level in air fuel circuit.
- OR**
- 5 (a) With a neat diagram, explain about combustion control  
(b) Discuss about Boiler Drum Level control with a neat diagram.

**UNIT – III**

- 6 (a) With a neat diagram, explain about Gland Steam Exhaust Pressure Control.  
(b) Discuss about INLET and OUTLET measurements in turbines.

**OR**

- 7 (a) Discuss about condenser vacuum control in a gas/steam turbine.  
(b) Discuss about speed vibration shell temperature monitoring and control.

**UNIT – IV**

- 8 (a) Discuss about boiler efficiency and give necessary mathematical expressions for boiler efficiency.  
(b) Discuss about intrinsic and electrical safety in power plant management.

**OR**

- 9 (a) Explain about interlocks for boiler operation.  
(b) Discuss about distributed control systems in power plant management.

**UNIT – V**

- 10 (a) With a neat diagram, explain about infrared flue gas analyzer.  
(b) Discuss about dust monitor.

**OR**

- 11 (a) Discuss about conductivity meter.  
(b) Explain about carbon dioxide measurement.