

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**POWER PLANT INSTRUMENTATION**  
**(Instrumentation & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. Describe a Wind power generation with the help of block diagram.
2. List the importance parameters that are to be monitored in tidal mill.
3. (a) What is meant by transfer function of an instrument? Explain the principle and operation of electrodynamicometer ammeter with a neat diagram. How it operates on A.C. and D.C.?  
(b) A basic d'Arsonval movement with internal resistance of  $100\ \Omega$  and full scale current of  $1\text{mA}$  is to be converted into a multirange ammeter with ranges  $0\text{--}10\text{mA}$ ,  $0\text{--}50\text{mA}$ ,  $0\text{--}100\text{mA}$  and  $0\text{--}250\text{mA}$ . Design the multirange ammeter and draw the circuit arrangement.  
(c) What are the sources of error in measurement of current using moving iron ammeter? How the errors can be compensated?
4. What is a level transmitter? Explain with a neat sketch the principle of pneumatic level transmitter.
5. Explain in detail with neat sketches control of main header pressure system used in power plants?
6. Explain the role of computers in power plants in detail?
7. Write short notes on
  - (a) Turbine gland performance
  - (b) Calorimetric tests on generator
  - (c) Centrifuging
  - (d) Hydrogen Purity Meter
8. (a) Explain the measurement of pH with Glass electrode.  
(b) Write a brief notes on the sensing devices of pH meter.

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**POWER PLANT INSTRUMENTATION**  
**(Instrumentation & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. Explain the Non-conventional sources of energy.
2. Explain the controllable parameters in tidal mill.
3. Describe with a neat schematic, the three phase electrodynamic power factor meter. Draw also the phasor diagram.
4. Explain in detail how steam pressure is measured in power plant. What are the sources of error and how compensation can be provided?
5. With the help of neat sketches. Explain fuel and ash handling system used in power plants?
6. Explain in detail with neat sketches main and reheat steam temperature control system used in power plants?
7. What is turbine plant heat rate determination . Explain
8. Explain the concept behind the optical arrangement for the measurement of turbidity of water.

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**POWER PLANT INSTRUMENTATION**  
**(Instrumentation & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. Describe a Wind power generation with the help of block diagram.
2. Explain the Controllable parameters in thermal power plant.
3. Explain in detail the sources of error in electrodynamic wattmeter and the method of compensation.
4. Explain with a neat diagram the theory and working of optical pyrometer. What are the sources of error?
5. Explain in detail with neat sketches combustion control system used in power plants?
6. Explain in detail with neat sketches main and reheat steam temperature control system used in power plants?
7. Explain heat rate on non-reheat plant and reheat plant
8. (a) Describe the principle and working of a smoke detector with a neat sketch.  
(b) Explain the principle of CO monitor with a neat diagram.

\*\*\*\*\*

**III B.Tech. II Semester Regular Examinations, April/May -2005**  
**POWER PLANT INSTRUMENTATION**  
**(Instrumentation & Control Engineering)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

\*\*\*\*\*

1. What is the basic principle involved in wind mill. Explain in detail
2. Explain the importance of instrumentation in nuclear power plant.
3. (a) What is meant by transfer function of an instrument? Explain the principle and operation of electrodynamic ammeter with a neat diagram. How it operates on A.C. and D.C.?  
(b) A basic d'Arsonval movement with internal resistance of  $100\ \Omega$  and full scale current of  $1\text{mA}$  is to be converted into a multirange ammeter with ranges  $0-10\text{mA}$ ,  $0-50\text{mA}$ ,  $0-100\text{mA}$  and  $0-250\text{mA}$ . Design the multirange ammeter and draw the circuit arrangement.  
(c) What are the sources of error in measurement of current using moving iron ammeter? How the errors can be compensated?
4. (a) Explain the principle of head type flow meter to measure the feed water flow rate with a suitable diagram.  
(b) What is a rotameter? Can it be used to control the flow rate? How the viscosity effects of the fluid can be compensated.
5. With the help of neat sketch clearly explain about furnace control systems?
6. Explain in detail about interlocks in boilers used in power plants?
7. Discuss the role of lubricating oil temperature control in a power plant instrumentation.
8. Describe the principle and constructional details of flame photometric and flame ionization detectors used in gas chromatography, with neat sketches.

\*\*\*\*\*