

**College of Engineering, Pune**  
(An Autonomous Institute of Government of Maharashtra)  
SHIVAJI NAGAR, PUNE - 411 005

**END Semester Examination**  
**IE(DE)-14001 Power Plant Instrumentation**

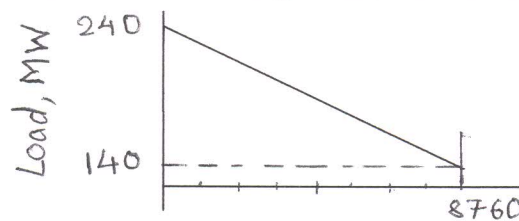
Course: B. Tech.  
Date-1/12/2012  
Year: 2014- 15

Branch: Instrumentation & Control  
Timing: 2.00pm to 5.00pm  
Max. Marks: 60

Instructions:

1. All Questions are compulsory and carry equal marks
2. Assume suitable data
3. Draw neat diagrams wherever necessary
4. Use of non programmable calculators are allowed

- Q-1 A A 300MW thermal power station is used to supply power to a system having maximum and minimum demand of 240MW and 140 MW respectively in a year. Assuming the load duration curve to be straight line, estimate the a) load factor, b) capacity factor. 5



- Q-1 B Draw main steam and water circuit of a boiler-turbine power plant. Why feed water quality is important in boiler operation? How to maintain same? 5
- Q-2 A Draw simplified schematic of gas-firing system and explain instrumentation associated with it. 5
- Q-2 B Gives classification and use of flame igniter according to NFPA 8502. 5
- Q-3 A Explain heat losses in furnaces. Discuss 'fuel-lead' and 'air-lead' approaches. What are implications of these situations on boiler operation. 5
- Q-3 B What are the problems associated with boiler drum level measurement? What control strategy will you prefer while there is rapid change in power demand and feed water supply? 5
- Q-4 A Explain boiler shut down procedure in details. 5
- Q-4 B How turbine speed and power demand are balanced in thermal power generation plant? Explain steam turbine control system. 5

- Q-5 A      **Answer following questions.**      5
- i) A parabolic collector of length 2m has angle of acceptance  $2\theta$  as  $15^\circ$ . Find the concentration ration of the collector.
  - ii) List out components of flat plate collector
  - iii) List out limitation of solar system
  - iv) Explain stall effect to wind turbine blades.
  - v) What are parts of wind turbine blades.
- Q-5 B Which instruments are used with steam turbine while using for power generation?      5  
Explain operation of same with neat diagram.
- Q-6 A Explain operation of nuclear reactor in details and associated terminologies.      5
- Q-6 B Explain COEP campus power distribution system with neat diagram. Explain associated automation system.      5