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Question Paper Code : 91460

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Seventh Semester

Electronics and Instrumentation Engineering

EI 2021/EI 701/EI 1001 A/10133 EIE 21 — POWER PLANT INSTRUMENTATION

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of hydel power plant?
2. What are the components of a nuclear power plant?
3. What is the principle of smoke density measurement?
4. What are the different methods of power factor measurement?
5. Explain the principle of steam purity meter.
6. Explain the different sections of gas chromatography.
7. What is the necessity for steam temperature control?
8. Explain the various interlocks in boiler operation.
9. How do you control the vibration of turbine blades?
10. Why do we need to control lubricant oil?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare and evaluate the performance characteristics of thermal and nuclear power plants based on each component. (8)
- (ii) What are the basic instrumentation required in a thermal power plant? (8)

Or

- (b) (i) Explain the various types of turbines used for cogeneration system along with their advantages and disadvantages. (8)
- (ii) Discuss the characteristics of different windmill types and their relative advantages. (8)
12. (a) (i) How do you measure current, voltage, power in a power plant? Explain their basic principles. (8)
- (ii) Describe about the flow control measurements required in power plants. (8)
- Or
- (b) (i) Discuss on the working of various types of radiation detectors. (8)
- (ii) Explain the working of a dust monitor equipment. (8)
13. (a) (i) What are the different methods of analysis of fuel? Explain in detail the fuel analysis by bomb calorimeter. (8)
- (ii) Discuss on different methods of pH measurement. (8)
- Or
- (b) (i) What are the basic impurities in feed water and how do you analyse them? (8)
- (ii) Explain about gas chromatography and liquid chromatography. (8)
14. (a) (i) Discuss about various combustion control systems adopted in power plants. (8)
- (ii) Explain in detail about single element control and two element boiler drum level control. (8)
- Or
- (b) (i) Explain the instrumentation diagram using feedback controller for boilers. (8)
- (ii) Discuss about distributed control system in power plants. (8)
15. (a) (i) Explain how steam superheat and reheat temperature is measured and controlled at the inlet to turbine. (8)
- (ii) Explain the different methods for measuring the speed of turbine and explain their advantages. (8)
- Or
- (b) (i) Explain the advantages and disadvantages of both dry and wet cooling. (8)
- (ii) Describe in detail methods to control the steam pressure before letting it into a turbine. (8)