Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 31046

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Sixth Semester

Mechanical Engineering

080120036 — POWER PLANT ENGINEERING

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the conventional power plants.

2. What are the purposes of a hydro project?

3. What is meant by 'over feed' and under feed' principles of firing coal?

4. What is the role played by 'cooling towers' in steam power plant?

5. What is a chain reaction? How is it controlled?

6. List the various parts of a nuclear reactor.

7. What is the main objective of supercharging?

8. What are the applications of gas turbine?

9. What is the difference between demand factor and diversity factor?

10. What is meant by load curve?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the essential features of a water-power plant. (8)

(ii) Discuss the factors considered in selecting a prime-mover for a hydro-electric power plant. (8)

Or

(b) (i) Describe, giving a neat sketch, the construction and working of a Lamont boiler. (8)

(ii) Discuss combined steam and gas turbine power plant. (8)

12. (a) (i) Make neat sketch and explain the working of Chain grate stoker. (8)

(ii) State the advantages and disadvantages of pulverised fuel firing. (8)

Or

(b) (i) Describe the operation of a balanced draught system. (8)

(ii) Discuss the advantages, disadvantages and requirements of a surface condenser. (8)

13. (a) (i) Discuss the various factors to be considered white selecting the site for nuclear power station. (8)

(ii) Describe a fast breeder reactor. (8)

Or

(b) (i) What is meant by uranium enrichment? Describe some methods of Uranium enrichment. (8)

(ii) Discuss the factors which go in favour of nuclear power plant as compared to other types of power plants. (8)

14. (a) (i) Write a note on fuel system of diesel power plant. (8)

(ii) List the main functions of a lubricant and the properties of a good lubricant. (8)

Or

(b) (i) Write a note on the gas turbine starter. (8)

(ii) Explain how "reheating" improves the thermal efficiency of a simple open cycle gas turbine plant. (8)

15. (a) (i) Define 'depreciation' and explain its significance. (8)

(ii) A hydro power plant is to be used as peak load plant at an annual load factor of 30%. The electrical energy obtained during the year is 750×10^5 kWh. Determine the maximum demand. If the plant capacity factor is 24% find reserve capacity of the plant. (8)

Or

(b) (i) Discuss the requirements of tariff. (6)

(ii) A steam power station has an installed capacity of 120 MW and a maximum demand of 100 MW. The coal consumption is 0.4 kg per kWh and cost of coal is Rs. 80 per tonne. The annual expenses on salary bill of staff and other overhead charges excluding cost of coal are Rs. 50×10^5. The power station works at a load factor of 0.5 and the capital cost of the power station is Rs. 4×10^5. If the rate of interest and depreciation is 10% determine the cost of generating per kWh. (10)
