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

Question Paper Code : 21865

B.E/B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Sixth/Seventh Semester

Mechanical Engineering

ME 2403/ME 73/ME 1353/10122 ME 704 – POWER PLANT ENGINEERING

(Regulations 2008/2010)

(Common to PTME 2403/10122 ME 704 – Power Plant Engineering for B.E. (Part – Time) Seventh Semester – Mechanical Engineering Regulations 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How do you compare the nuclear and steam power plants in relation to environmental aspect?

2. How do you classify diesel power plant?

3. What are the advantages of pulverized coal firing?

4. What are the basic functions of draught system?

5. What is "half life" of nuclear fuels?

6. Distinguish between 'storage' and' pondage'.

7. What is the use of surge tank and day tank in diesel engine power plant?

8. How the Brayton cycle is applied for Gas turbine power plant?

9. What are the advantages and disadvantages of the geo-thermal power plant?

10. What are the major factors that decide the economics of power plants?

PART B — (5 × 16 = 80 marks)

11. (a) Draw a detailed layout of a modern steam power plant and mention the essential requirements and site selection for steam power station.

Or

(b) (i) Discuss the working principle of MHD power generation. (10)

(ii) A power station has to supply load as follows: (6)

Time (hours)	0-6	6-12	12-14	14-18	18-24
Load (MW)	45	135	90	150	75

Draw the load and load duration curve.

12. (a) (i) What is the role of stoker in coal based power plant? Delineate the working method of (1) Spreader stoker and (2) Underfeed stoker. (12)

(ii) List the types of cooling towers and brief. (4)

Or

(b) (i) What is the need of condenser? How it is classified? Explain the working method of surface condensers. (12)

(ii) Write briefly on 'Ash handling system'. (4)

13. (a) (i) Discuss the function of essential components of a Nuclear reactor. (10)

(ii) Bring out the differences between nuclear fission and fusion process. (6)

Or

(b) (i) Give the detailed classification of hydraulic turbines. Discuss in detail about 'governing of impulse turbine'. (12)

(ii) Write on 'Micro Hydel' power plant briefly. (4)

14. (a) (i) Explain the necessity of the cooling system in a diesel engine. What are the methods of cooling the IC engine? (8)

(ii) Discuss the wet sump lubrication system pertaining to a diesel engine. (8)

Or

(b) (i) Explain with neat sketch the effect of inter-cooling and reheating in a gas turbine power plant. (10)

(ii) Bring out the difference between the closed and open cycle gas turbine power plants. (6)

15. (a) (i) Describe with help of neat sketch the working of a solar thermal receiver system plant and enumerate the advantages and disadvantages of concentrating collectors over flat plate collectors. (10)

(ii) Explain the working of closed cycle OTEC system. (6)

Or

(b) (i) Find the cost of generation per kW-h from the following data: (8)

Capacity of the plant	= 120 MW
Capital cost	= Rs. 1200 per kW installed
Interest and depreciation	= 10% on capital
Fuel consumption	= 1.2 kg/kW-h
Fuel cost	= Rs. 40 per tone

Salaries, wages, repairs and maintenance = 6,00,000 per year. The maximum demand is 80 MW and load factor is 40%.

(ii) Explain with a neat sketch a pumped storage hydro plants. (8)
