

**UNIT- I****Chapter 1 : Introduction to Power Plants 1-1 to 1-18****Syllabus :**

- 1.1 World and national scenario of demand and supply of energy.
- 1.2 Introduction to power plants: their importance and types.
- 1.3 Hydroelectric power plant : Classification, General arrangement, operating principle, advantages and limitations, Maintenance.
- 1.4 Diesel power plant : Introduction, components, advantages and limitations, Diesel generating set, Maintenance.

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**UNIT- II****Chapter 2 : High Pressure Boilers 2-1 to 2-17****Syllabus :**

- 2.1 High Pressure Boilers : Classification.
- 2.2 Construction and principle of working of Lamont boiler, Benson boiler, Loeffler boiler, Velox boiler, Schmidt Hartman boiler, Ramsin boiler.
- 2.3 Fluidized bed combustion boilers (FBC): principle, need, types, various arrangement, control system and advantages over other boiler systems.
- 2.4 Comparison of various types of boilers.
- 2.5 Indian Boiler Regulation Act.
- 2.6 Maintenance procedure of major components of high pressure and FBC boilers.

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### UNIT- III

## Chapter 3 : Steam and Gas Power Plants 3-1 to 3-34

### Syllabus :

#### Steam power plant

- 3.1 Steam power plant : Introduction, components, advantages and limitations.
- 3.2 Fuel handling systems in power plants : types, components.
- 3.3 Electro-Static Precipitators.
- 3.4 Control systems of power plant Elements, Types, desirable characteristics.
- 3.5 Steam temperature control and feed water control systems.
- 3.6 Maintenance procedure of major components of Steam power plant.

#### Gas Turbine Power Plants

- 3.7 Open and close cycle with constant pressure gas turbine power plant.
- 3.8 Components of gas turbine power plant.
- 3.9 Methods to improve the thermal efficiency of a simple open cycle constant pressure gas turbine power plant.
- 3.10 Advantages of gas turbine power plant over others.
- 3.11 Maintenance procedure of major components of Gas turbine power plants.

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### UNIT- IV

#### Chapter 4 : Waste Heat Recovery, Cogeneration and Trigeneration 4-1 to 4-18

##### Syllabus :

- 4.1 Waste heat recovery in thermal power plants : Need, opportunities, present practices.
- 4.2 Cogeneration : Need, opportunities, present practices.
- 4.3 Trigeneration : Need, opportunities, present practices.

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### UNIT- V

#### Chapter 5 : Nuclear Power Plants 5-1 to 5-14

##### Syllabus :

- 5.1 Nuclear power plant : Classification, General arrangement, operating principles.
- 5.2 Nuclear Fuels and Reactors.
- 5.3 Advantages and limitations.
- 5.4 Introduction to regulating agencies and regulations : Atomic Energy Regulatory Board (AERB), International Atomic Energy Agency (IAEA).

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## UNIT- VI

### **Chapter 6 : Economic Analysis of Power Plant 6-1 to 6-18**

#### **Syllabus :**

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- 6.2 Estimation of various performance parameters.
- 6.3 Factors affecting choice of a power plant.

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| ➤ <b>Appendix A - Solved MSBTE Question Paper of Winter 2019 .....</b> |   | <b>A-1 to A-3</b> |