

Power Plant Engineering (315374)

MSBTE Diploma · K-Scheme · Model Question Paper — Set B

Time: 3 Hours**Max. Marks: 70****Instructions:**

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Use of non-programmable electronic pocket calculator is permissible.
7. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:**10**

- a) Name any four types of conventional power plants.
- b) State the types of fluidized bed combustion (FBC) boilers.
- c) State the function of: (i) Superheater (ii) Economiser.
- d) List the fissile and fertile nuclear fuels.
- e) Define plant capacity factor and plant use factor.
- f) Define trigeneration.
- g) State any four equipment used for in-plant coal handling.

Q.2 Attempt any THREE of the following:**12**

- a) State the importance of power plants in the development of a country.
- b) Explain the three-element boiler feed water control system with a neat schematic diagram.
- c) Differentiate between open cycle and closed cycle gas turbine power plants (any four points).
- d) State any four functions of the Atomic Energy Regulatory Board (AERB).

Q.3 Attempt any THREE of the following:**12**

- a) Explain the ash handling system of a thermal power plant with a neat layout.
- b) Explain with a neat sketch the regeneration method used to improve the thermal efficiency of an open cycle gas turbine plant.
- c) Name any four nuclear power plants in India with their installed capacity.
- d) State the emission norms of MPCB / CPCB for coal-based thermal power plants.

Q.4 Attempt any THREE of the following:**12**

- a) Discuss the factors considered for selection of site for a thermal power plant.

- b) Draw a neat layout of a diesel power plant used as a captive / standby plant and name its systems.
- c) Explain MTEE and FEEED initiatives under NMEEE.
- d) State the need of steam traps. Explain the working of a float type steam trap with a sketch.
- e) A thermal power plant has two units of 80 MW each running for 7200 hours and one unit of 30 MW running for 2500 hours in a year. The energy generated is 1000×10^6 kWh per year. Determine the plant load factor and the plant use factor.

Q.5 Attempt any TWO of the following:

12

- a) Explain the world and national (Indian) scenario of demand and supply of electrical energy.
- b) Explain the construction and working of a Pressurised Water Reactor (PWR) power plant with a neat sketch.
- c) Describe the electrostatic precipitator with a neat sketch. State its advantages.

Q.6 Attempt any TWO of the following:

12

- a) Explain the important provisions of the Indian Boiler Regulations (IBR) for steam boilers.
- b) Explain trigeneration with a neat block diagram. Discuss its necessity.
- c) A generating station has a maximum demand of 25 MW, a load factor of 64 %, a plant capacity factor of 50 % and a plant use factor of 80 %. Find: (i) daily energy produced (ii) installed capacity and reserve capacity of the plant (iii) maximum energy that could be produced daily if the plant, while running, were fully loaded (iv) number of hours the plant runs per day.

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in