

**Electrical Power Generation, Transmission and Distribution (313333)**

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

**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. 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 two thermal power stations in Maharashtra with their installed capacity.
- b) Define: i) Firm power ii) Spinning reserve.
- c) State the standard voltages used in India for: i) Generation ii) Secondary transmission iii) Primary distribution iv) Secondary distribution.
- d) State any four types of supports used for overhead transmission and distribution lines.
- e) Name any two  $\pm 500$  kV or  $\pm 800$  kV HVDC transmission lines in India.
- f) List the types of distribution schemes (feeder systems).
- g) Draw the symbols of: i) Current transformer ii) Potential transformer.

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

- a) Explain any four factors to be considered in the selection of site for a thermal power plant.
- b) Define: i) Maximum demand ii) Average demand iii) Load factor iv) Plant use factor.
- c) State the need of transposition of overhead line conductors with a neat diagram.
- d) Explain corona in overhead lines. State the factors affecting it and the methods to reduce it.

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

- a) State the functions of the following in a thermal power plant: i) Superheater ii) Economiser iii) Air preheater iv) Condenser.
- b) A single phase overhead line delivers 500 kW at 6.6 kV and 0.85 p.f. lagging. The total resistance and reactance of the line are  $2.5 \Omega$  and  $4 \Omega$  respectively.

Determine: i) Sending end voltage ii) Percentage voltage regulation iii) Transmission efficiency. Draw the phasor diagram.

- Draw the layout of a bipolar HVDC link and list the main components of an HVDC transmission system.
- Draw the single line diagram (layout) of a 33/11 kV substation and state the function of: i) Isolator ii) Current transformer.

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

12

- Give the classification of hydro power plants on the basis of: i) Water flow regulation ii) Water head.
- State the causes of grid failure (blackout). Give one example each of a major blackout at national and international level.
- Explain Ferranti effect. State two methods to reduce it.
- Compare EHVAC and HVDC transmission on the basis of: i) Voltage level ii) Line losses iii) Substation equipment iv) Initial cost.
- Classify distribution substations according to service requirement and write one application of each.

**Q.5 Attempt any TWO of the following:**

12

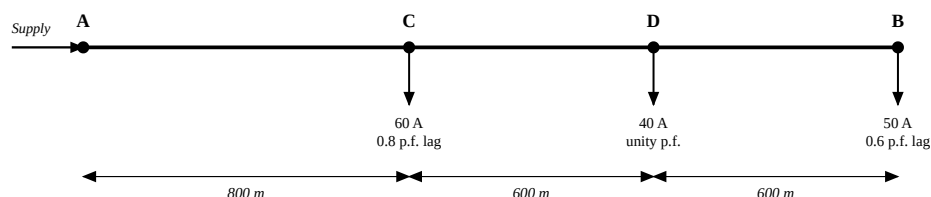
- Draw a neat labelled layout of a thermal power plant and explain the coal handling and ash handling systems.
- The daily load on a power station with installed capacity of 100 MW is as follows:

| Time (h)  | 0–6 | 6–10 | 10–16 | 16–20 | 20–24 |
|-----------|-----|------|-------|-------|-------|
| Load (MW) | 25  | 50   | 70    | 85    | 45    |

Draw the load curve and the load duration curve. Calculate: i) Maximum demand ii) Units generated per day iii) Average load iv) Load factor v) Plant capacity factor.

- A single phase distributor AB of 2 km length has a total impedance (go and return) of  $(0.12 + j0.18) \Omega$ . It is fed from end A and loaded as shown in Fig. 1. Taking the voltage at the far end B as 230 V and the power factors referred to it, calculate: i) Total voltage drop ii) Sending end voltage  $V_A$ .

Fig. 1



**Q.6 Attempt any TWO of the following:**

12

- a) State any three safe practices each for thermal power plants and hydro power plants.
- b) Compare nominal T and nominal  $\pi$  methods of representing a medium transmission line (any six points). Draw the circuit of each.
- c) Explain the concept of wireless transmission of electrical power with a block diagram. State its methods, advantages and applications.

**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](http://anandatechnologies.in)

