

Electrical Power Generation, Transmission and Distribution (313333)

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. 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 hydro-electric power stations in Maharashtra with their installed capacity.
- b) Define: i) Hot reserve ii) Connected load.
- c) State the standard voltage levels used in India for: i) Secondary transmission ii) Primary distribution iii) Secondary distribution.
- d) Name any two 765 kV EHVAC transmission lines (routes) in India.
- e) State any two advantages and two limitations of wireless power transmission.
- f) Write the function of: i) Circuit breaker ii) Current transformer in a substation.
- g) State any two features of High Temperature Low Sag (HTLS) conductors.

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

- a) Draw the layout of a pumped storage hydro power plant and explain its working.
- b) Explain the phenomenon of corona. State the factors affecting corona and the methods to reduce it.
- c) Explain the effect of load power factor on the voltage regulation of a short transmission line with phasor diagrams.
- d) Draw the layouts of monopolar and homopolar HVDC transmission links.

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

- a) State any four factors governing the selection of site for a thermal power plant.
- b) A generating station supplies four consumers whose maximum demands are 30 MW, 25 MW, 20 MW and 15 MW. The total connected load of the consumers is 120 MW. The maximum demand on the station is 70 MW and the annual load factor is 50 %. Calculate: i) Average load ii) Energy generated per year iii) Demand factor iv) Diversity factor.

- c) State the different types of overhead line supports with their applications.
- d) Draw the single line diagram of an 11 kV / 400 V pole mounted distribution substation and label: i) Lightning arrester ii) AB switch iii) DO fuse iv) Distribution transformer.

Q.4 Attempt any THREE of the following:

12

- a) Draw a neat layout of a thermal power plant and state the function of: i) Superheater ii) Economiser.
- b) What is Ferranti effect? State when it occurs and how it can be reduced. Draw the phasor diagram.
- c) Explain interconnected (grid) distribution system with a neat diagram. State its advantages.
- d) Classify distribution substations according to constructional features. Differentiate between indoor and outdoor substations (any two points).
- e) State the need and benefits of compensation of EHV transmission lines.

Q.5 Attempt any TWO of the following:

12

- a) Draw neat sketches and explain fire tube and water tube boilers.
- b) A 3-phase, 50 Hz, 12 km long overhead line delivers 1.5 MW at 11 kV and 0.8 p.f. lagging. The resistance and reactance of each conductor are 0.22 Ω /km and 0.35 Ω /km respectively. Calculate: i) Sending end voltage ii) Transmission efficiency iii) Voltage regulation. Draw the phasor diagram.
- c) The daily load on a generating station is as follows:

Time (h)	0-5	5-9	9-13	13-17	17-21	21-24
Load (MW)	20	45	65	55	75	35

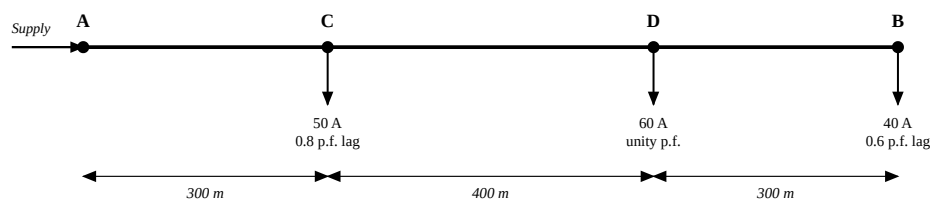
Draw the daily load curve and the load duration curve. Find the maximum demand, units generated per day, average load and load factor.

Q.6 Attempt any TWO of the following:

12

- a) Describe the safe practices to be followed in hydro power plants (any six).
- b) Draw the circuit and phasor diagram of nominal T method for a medium transmission line and derive the expression for sending end voltage.
- c) A single phase AC distributor AB, 1 km long, is fed at end A at 240 V and loaded as shown in Fig. 1. The impedance of the distributor (go and return) is $(0.1 + j0.15) \Omega$ per km. The power factors are referred to the voltage at the far end B. Calculate the voltage at the far end B and the total voltage drop.

Fig. 1



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

