

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -3 SEMESTER – OLD PAPER – S23 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Electrical Power Generation and Transmission- 4330903

Unit I: Generation of Electrical Power

Repeated Questions:

1. **Draw and explain the line diagram of a Thermal Power Station.**
 - Appeared in: S23 (Q1c, 07 marks), S24 (Q1c, 07 marks), W22 (Q1c, 07 marks), S25 (Q1c, 07 marks)
2. **Explain the schematic diagram of a Nuclear Power Station.**
 - Appeared in: W23 (Q1c, 07 marks), W24 (Q2c, 07 marks), S25 (Q1 OR-c, 07 marks)
3. **State and explain the main elements of a Hydroelectric Power Station.**
 - Appeared in: S23 (Q1 OR-c, 07 marks), W22 (Q2c, 07 marks)
4. **Classify and explain different types of water turbines based on head in a hydro power station.**
 - Appeared in: S24 (Q2 OR-c, 07 marks), W24 (Q1c, 07 marks), S25 (Q2 OR-c, 07 marks)
5. **Compare a Thermal power station and a Nuclear power station.**
 - Appeared in: S23 (Q2 OR-b, 04 marks), W23 (Q2c, 07 marks)
6. **State the advantages and disadvantages of a Hydroelectric Power Station.**
 - Appeared in: W24 (Q2b, 04 marks)
7. **State the advantages and disadvantages of a Thermal Power Station.**
 - Appeared in: W24 (Q2 OR-b, 04 marks)

Other Important Questions:

1. **State the function of the following auxiliaries of a Thermal power station:**
 - 1) Air preheater 2) Economizer 3) Electrostatic precipitator
 - Appeared in: S23 (Q1a, 03 marks)
2. **Explain the electrical power generation cycle in a thermal power plant.**
 - Appeared in: S23 (Q1b, 04 marks)
3. **Give the classification of a hydroelectric power station.**
 - Appeared in: S23 (Q2a, 03 marks)
4. **What is the difference between nuclear fusion and fission?**
 - Appeared in: S23 (Q2b, 04 marks)
5. **Explain the chain reaction in a nuclear power station.**
 - Appeared in: S23 (Q2 OR-a, 03 marks)
6. **Sketch the cooling tower type thermal power station layout.**
 - Appeared in: S24 (Q1a, 03 marks)
7. **State the factors affecting the selection of site for a thermal power station.**
 - Appeared in: S24 (Q1b, 04 marks)
8. **State the various cycles/circuits of a thermal power station and explain any one.**
 - Appeared in: S24 (Q1 OR-c, 07 marks)
9. **Implement four turbo alternator set in sketch for hydro power station layout.**
 - Appeared in: S24 (Q2a, 03 marks), S25 (Q2a, 03 marks)
10. **Define the energy conservation process in a hydro power station.**

- Appeared in: S24 (Q2b, 04 marks), S25 (Q2b, 04 marks)
- 11. **Explain nuclear fusion and nuclear fission process in a nuclear power station.**
 - Appeared in: S24 (Q2c, 07 marks), S25 (Q2c, 07 marks)
- 12. **Execute the chain reaction for U235.**
 - Appeared in: S24 (Q2 OR-a, 03 marks), S25 (Q2 OR-a, 03 marks)
- 13. **State the different types of nuclear reactor.**
 - Appeared in: S24 (Q2 OR-b, 04 marks), S25 (Q2 OR-b, 04 marks)
- 14. **State the function of: 1] Economiser 2] Superheater 3] FD Fan**
 - Appeared in: W22 (Q1a, 03 marks)
- 15. **Explain the Fuel and Ash cycle of a thermal power station.**
 - Appeared in: W22 (Q1b, 04 marks), S25 (Q1a, 03 marks)
- 16. **Interpret the line diagram of a Nuclear Power Station.**
 - Appeared in: W22 (Q1 OR-c, 07 marks)
- 17. **State the advantages of a Hydroelectric power station.**
 - Appeared in: W22 (Q2a, 03 marks)
- 18. **Explain the site selection of a Hydroelectric power station.**
 - Appeared in: W22 (Q2b, 04 marks)
- 19. **State and explain types of Nuclear reactors.**
 - Appeared in: W22 (Q2c, 07 marks)
- 20. **List the turbines used in a hydro power station and draw any one.**
 - Appeared in: W22 (Q2 OR-a, 03 marks)
- 21. **Explain the process of disposal of Solid and liquid Nuclear waste.**
 - Appeared in: W22 (Q2 OR-b, 04 marks)
- 22. **Sketch the diagram of Energy Conversion in a Hydro Power Station.**
 - Appeared in: W23 (Q1a, 03 marks)
- 23. **Define the following auxiliary of a Thermal Power Station: 1. Super heater 2. Electrostatic Precipitator, 3. Condenser, 4. Magnetic Separator.**
 - Appeared in: W23 (Q1b, 04 marks), S25 (Q1b, 04 marks)
- 24. **Explain and Draw an Impulse Turbine.**
 - Appeared in: W23 (Q1 OR-c, 07 marks)
- 25. **Draw and explain the Electrical circuit of a Thermal Power Station.**
 - Appeared in: W23 (Q2a, 03 marks)
- 26. **List the site selection factors for a Thermal Power Station.**
 - Appeared in: W23 (Q2b, 04 marks)
- 27. **Explain the main element of a Nuclear Power Station.**
 - Appeared in: W23 (Q2c, 07 marks)
- 28. **Draw and explain Draft tube and Surge Tower.**
 - Appeared in: W23 (Q2 OR-a, 03 marks)
- 29. **List types of Nuclear Reactor.**
 - Appeared in: W23 (Q2 OR-b, 04 marks)
- 30. **Execute the nuclear fission process for ^{235}U .**
 - Appeared in: W24 (Q1a, 03 marks)
- 31. **State the main elements of a nuclear reactor.**
 - Appeared in: W24 (Q1b, 04 marks)
- 32. **State the various cycles/circuits of a thermal power station and explain any one.**
 - Appeared in: W24 (Q1 OR-c, 07 marks)
- 33. **Demonstrate four turbo alternator set for hydro power station layout.**
 - Appeared in: W24 (Q2a, 03 marks)
- 34. **Sketch the schematic diagram of a boiler for a thermal power station.**
 - Appeared in: W24 (Q2 OR-a, 03 marks)
- 35. **Explain various equipment used in a thermal power station.**
 - Appeared in: W24 (Q2 OR-c, 07 marks)
- 36. **Draw and explain fuel and ash cycle in thermal Power Station.**
 - Appeared in: S25 (Q1a, 03 marks)

Unit II: Variable Load on Power Station

Repeated Questions:

1. **What is a load curve? What information is obtained from it?**
 - Appeared in: S23 (Q3b, 04 marks), W22 (Q3a, 03 marks)
2. **Define and explain the following: Demand Factor, Load Factor, Connected Load Factor.**
 - Appeared in: W22 (Q3b, 04 marks), S23 (Q3 OR-b, 04 marks), W24 (Q3c, 07 marks)
3. **Explain methods of improving string efficiency.**
 - Appeared in: W22 (Q3c, 07 marks)

Other Important Questions:

1. **Compare base load and peak load power station.**
 - Appeared in: S23 (Q3a, 03 marks)
2. **Compare DC transmission system and AC transmission system.**
 - Appeared in: S23 (Q3c, 07 marks)
3. **What is sag? What are the factors affecting the sag in a transmission line?**
 - Appeared in: S23 (Q3 OR-a, 03 marks), W24 (Q3a, 03 marks)
4. **Define string efficiency and describe any one method of improving it.**
 - Appeared in: S23 (Q3 OR-c, 07 marks)
5. **Explain load curve and load duration curve with an example.**
 - Appeared in: W22 (Q3b, 04 marks)
6. **Compare over head system with Underground transmission system.**
 - Appeared in: W22 (Q3c, 07 marks)
7. **State the desirable properties of line insulators.**
 - Appeared in: W22 (Q3 OR-a, 03 marks)
8. **A generating station supplies the power to the five substations each having maximum demand of 10 MW, 20 MW, 15 MW, 25 MW, and 5 MW respectively. The diversity factor between substation and power station is 1.2. If the connected load to the power station is 80 MW and the annual load factor is 40 %, calculate. (i) Maximum Demand on Power Station (ii) Number of Units Generated per Annum (iii) Average Demand (iv) Demand Factor (v) Connected Load Factor.**
 - Appeared in: S24 (Q3c, 07 marks)
9. **Draw the load curve from the following data of a power station and find (i) Maximum Demand (ii) No. of units generated during 24 hours. (iii) Average Demand (iv) Daily load factor.**

- *Time in Hrs.:* 12 MN to 6 am, 6 am to 7 am, 7 am to 8 am, 8 am to 12 Noon, 12 Noon to 2 pm, 2 pm to 5 pm, 5 pm to 6 pm, 6 pm to 8 pm, 8 pm to 9 pm, 9 pm to 11 pm, 11 pm to 12 MN.
 - *Load in kW:* 500, 1500, 3500, 3000, 1000, 2000, 1500, 4500, 3000, 1000, 500.
 - Appeared in: **S24 (Q3 OR-c, 07 marks)**
10. **Draw the load curve from the following data of a power station and find (i) Maximum Demand (ii) No. of units generated during 24 hours. (iii) Average Demand (iv) Daily load factor.**
- *Time in Hrs.:* 12 MN to 4 am, 4 am to 8 am, 8 am to 12 Noon, 12 Noon to 2 pm, 2 pm to 6 pm, 6 pm to 10 pm, 10 pm to 12 MN.
 - *Load in kW:* 50, 60, 100, 40, 80, 120, 60.
 - Appeared in: **S25 (Q3 OR-c, 07 marks)**
11. **One power station has a connected load of 50 MW and a maximum demand of 30 MW. The units generated being 105×10^6 per annum. Calculate Demand Factor and Load Factor.**
- Appeared in: **W24 (Q3 OR-c, 07 marks)**
12. **Single phase 22KV transmission line, 1000KW power transmitted at 0.8 P.F lag. The line resistance is 5 ohm and inductance is 25 mH per conductor. Calculate (a) voltage regulation (b) efficiency, (c) sending end voltage and P.F.**
- Appeared in: **W23 (Q4c, 07 marks), S25 (Q3c, 07 marks)**
13. **The maximum demand on a power station is 60MW and the connected load is 100MW. If the average demand on the power station is 30MW. Find (a) load factor, (b) demand factor, (c) the connected load factor.**
- Appeared in: **W23 (Q4 OR-d, 07 marks)**

Unit III: Elements of Overhead Transmission System

Repeated Questions:

1. **Explain string efficiency.**
 - Appeared in: S24 (Q3a, 03 marks), W24 (Q3 OR-a, 03 marks), S25 (Q3a, 03 marks)
2. **What is sag? What are the factors affecting the sag in a transmission line? / Write and explain factors affecting on sag.**
 - Appeared in: S23 (Q3 OR-a, 03 marks), W24 (Q3a, 03 marks)
3. **Weight of conductor of the transmission lines is 1.5 kg/1.8 kg per meter length. Span is 200m/250m. The maximum tensile strength of the conductor is 4000 kg/3500 kg/5000 kg. Calculate sag assuming the factor of safety of 2.**
 - Appeared in: S24 (Q4b, 04 marks), W22 (Q4 OR-b, 04 marks), W23 (Q3 OR-b, 04 marks), W24 (Q4 OR-b, 04 marks), S25 (Q4b, 04 marks)
4. **List the different elements of a transmission system.**
 - Appeared in: S24 (Q3b, 04 marks), W24 (Q3 OR-b, 04 marks), S25 (Q3b, 04 marks)
5. **State the advantages of Bundled Conductors.**
 - Appeared in: W22 (Q4a, 03 marks), S23 (Q4a, 03 marks)
6. **Compare Pin type and Suspension type insulator.**
 - Appeared in: W22 (Q4b, 04 marks)
7. **Describe ACSR wire.**
 - Appeared in: S24 (Q4 OR-a, 03 marks), W24 (Q4a, 03 marks)

Other Important Questions:

1. **Define bundled conductors.**
 - Appeared in: S24 (Q3 OR-b, 04 marks)
2. **Define stranded conductors.**
 - Appeared in: W24 (Q3b, 04 marks)
3. **33 KV, 3-phase, 3-wire transmission line having three-disc insulators in string voltage across disc nearest line is 11 KV. Find string efficiency.**
 - Appeared in: S24 (Q4b, 04 marks), W24 (Q4b, 04 marks)
4. **Explain suspension type insulator.**
 - Appeared in: W24 (Q4 OR-a, 03 marks)
5. **Draw a neat sketch of Pin type Insulator.**
 - Appeared in: S23 (Q4 OR-a, 03 marks)

6. **State the causes of failure of insulators.**
 - Appeared in: **W22 (Q4 OR-a, 03 marks)**
7. **List types of Line supports and Draw any one.**
 - Appeared in: **W23 (Q3a, 03 marks)**
8. **Sketch and explain the suspension type insulators.**
 - Appeared in: **W23 (Q3b, 04 marks)**
9. **Explain properties required for transmission line supports.**
 - Appeared in: **S23 (Q4b, 04 marks)**
10. **Explain the effect of load power factor on voltage regulation and transmission efficiency.**
 - Appeared in: **S23 (Q4 OR-b, 04 marks)**

Unit IV: Performance of Transmission System

Repeated Questions:

1. **Explain the Nominal T method for a medium transmission line with a vector diagram.**
 - Appeared in: W22 (Q4c, 07 marks), S23 (Q4c, 07 marks)
2. **Explain the functions of a Load Dispatch Center.**
 - Appeared in: W22 (Q5 OR-b, 04 marks), S23 (Q4 OR-c, 07 marks), W23 (Q4b, 04 marks)
3. **Explain load dispatch techniques.**
 - Appeared in: W22 (Q4c, 07 marks), S23 (Q4 OR-c, 07 marks)
4. **Describe the essential equipment in a load dispatch center.**
 - Appeared in: S24 (Q4c, 07 marks), W24 (Q4c, 07 marks)

Other Important Questions:

1. **Explain a single line diagram of a power supply system.**
 - Appeared in: S24 (Q4a, 03 marks)
2. **Compare an overhead system with an underground transmission system.**
 - Appeared in: S25 (Q4 OR-b, 04 marks)
3. **Explain the position of the transmission system in the Power supply system.**
 - Appeared in: W23 (Q3c, 07 marks)
4. **Explain the Nominal Π method for the medium transmission line with a vector diagram.**
 - Appeared in: S23 (Q4c, 07 marks)
5. **State the factors of load dispatch techniques and explain any one.**
 - Appeared in: W24 (Q4c, 07 marks)

Unit V: HVDC Transmission System

Repeated Questions:

1. **State the limitations of EHV A.C. transmission system.**
 - Appeared in: S24 (Q5a, 03 marks), S23 (Q5a, 03 marks), W22 (Q5a, 03 marks), S25 (Q5a, 03 marks)
2. **Explain the types of HVDC system. / State different types of HVDC system and explain any one system with a block diagram.**
 - Appeared in: S24 (Q5c, 07 marks), W22 (Q5c, 07 marks), S23 (Q5 OR-c, 07 marks)
3. **State the advantages of HVDC transmission system. / State the advantages & disadvantages of HVDC Transmission System.**
 - Appeared in: W22 (Q5 OR-c, 07 marks), S23 (Q5c, 07 marks)
4. **State the advantages of an Interconnected grid system.**
 - Appeared in: W22 (Q5 OR-a, 03 marks), S23 (Q5 OR-a, 03 marks)
5. **Define the corona effect. / Explain the corona effect.**
 - Appeared in: S24 (Q5b, 04 marks), W24 (Q5b, 04 marks), S23 (Q5 OR-b, 04 marks)
6. **Define the skin effect and Ferranti effect. / Explain the skin effect. / Explain Proximity effect and Ferranti effect.**
 - Appeared in: S24 (Q5b, 04 marks), W22 (Q5b, 04 marks), S23 (Q5b, 04 marks), W23 (Q4a, 03 marks)

Other Important Questions:

1. **Describe a high voltage D.C. Transmission System. / Describe an extra high voltage D.C. transmission system.**
 - Appeared in: S24 (Q5 OR-c, 07 marks), W24 (Q5c, 07 marks), S25 (Q5 OR-c, 07 marks)
2. **State the limitations of the HVDCT system.**
 - Appeared in: S24 (Q5 OR-a, 03 marks), S25 (Q5 OR-a, 03 marks)
3. **State the advantages of the HVDCT system.**
 - Appeared in: W24 (Q5a, 03 marks)
4. **Define the proximity effect and Ferranti effect.**
 - Appeared in: W24 (Q5 OR-b, 04 marks)
5. **State and explain the methods to reduce corona loss.**
 - Appeared in: S23 (Q5 OR-b, 04 marks)
6. **Explain the Grid system.**
 - Appeared in: W23 (Q4 OR-a, 03 marks)
7. **Comparison between HV A.C and HVDC transmission System.**
 - Appeared in: W23 (Q4 OR-b, 04 marks)
8. **Explain base load and peak load with importance.**
 - Appeared in: W23 (Q4 OR-c, 07 marks)
9. **Discuss the scope of the HVDC system in India.**
 - Appeared in: W24 (Q5 OR-c, 07 marks)
