

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Advanced Supplementary Examinations March 2025
CONCEPTS OF POWER SYSTEM ENGINEERING
(Open Elective)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from **Each unit**
All Questions Carry Equal Marks

UNIT-I

1. a) With a neat sketch, explain hydroelectric power plant. [7M]
b) Write the functions of economizer and condenser in a thermal power plant. [7M]
(OR)
2. a) Explain the working of gas turbine power plants with a schematic diagram. [7M]
b) Describe the radiation hazards and shielding in nuclear power plants? [7M]

UNIT-II

3. a) Explain the differences between overhead and underground systems. [7M]
b) What are the three classifications of transmission lines? What is the main reason for using a short transmission line? [7M]
(OR)
4. a) An overhead 3-phase transmission line delivers 5000kW at 22kV at 0.8p.f. lagging. The resistance and reactance of each conductor is 4Ω and 6Ω respectively. Determine (i) Sending end voltage (ii) Percentage regulation (iii) Transmission efficiency. [7M]
b) What is substation? Discuss the different ways of classifying the substation. [7M]

UNIT-III

5. a) Discuss the operation of lightning arresters with neat schematic. [7M]
b) Comparison between SF6 circuit breaker and vacuum circuit breaker. [7M]
(OR)
6. a) Discuss the function of the following (i) Fuse (ii) Relays (iii) Circuit breaker. [7M]
b) What are the methods of neutral grounding? Explain about the resistance grounding. [7M]

UNIT-IV

7. a) A generating station has a connected load of 40MW and a maximum demand of 20MW, the units generated being 60×10^6 . Calculate (i) The demand factor (ii) The load factor. [7M]
b) Define and explain the importance of the following terms in generation (i) Connected load (ii) Maximum demand (iii) Utilization factor (iv) Average load. [7M]
(OR)
8. a) Discuss about the flat rate tariff and block rate tariff. [7M]
b) What do you understand by the load curve? What information are conveyed by a load curve? [7M]

UNIT-V

9. a) Discuss about the series capacitor compensation with neat sketch. [7M]
b) Explain the need of voltage control in the modern power system. [7M]
(OR)
10. a) What are the causes and disadvantages of low power factor? [7M]
b) How do you increase or decrease power factor? What are the benefits of power factor improvement? [7M]
