

Total No. of Questions: 22

Total No. of Pages: 02

Roll No. \_\_\_\_\_

Paper Code  
3E1221

**B.Tech. III-Sem (Main & Back) January-2026**  
**Electrical & Electronics Engg.**  
**3EX3-04 Power generation Process**  
**EE,EX**  
**3E1221**

Time : 3 Hours

Maximum Marks : 70

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly. Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. \_\_\_\_\_ 2. \_\_\_\_\_

**Part-A**

(Answer should be given up to 25 words only)

All questions are compulsory T-437

10x2=20

- Q. 1 State the basic working principle of a thermal power plant. .
- Q. 2 List two differences between open cycle and closed - cycle gas turbine plants. .
- Q. 3 Define pumped storage plant and mention its main purpose. .
- Q. 4 Differentiate between nuclear fission and nuclear fusion. .
- Q. 5 Define Load factor and Diversity factor. .
- Q. 6 Write two major impacts of thermal power plants on the environment. .
- Q. 7 Define power factor and mention one cause of low power factor. .
- Q. 8 What is meant by two-part tariff? .
- Q. 9 Define capacity factor and utilization factor. .
- Q.10 Differentiate between base load and peak load with suitable examples. .

**Part B**

(Analytical/Problem solving questions)

Attempt any Five questions. T-437

5x4=20

- Q. 1 Explain with a neat sketch the working of hydroelectric power plants. .

- Q. 2 Discuss the greenhouse effect and its impact on the global climate.
- Q. 3 Discuss the concept of spot pricing and its advantages in modern power markets.
- Q. 4 Explain the need for sustainable energy systems and conservation of natural resources.
- Q. 5 A generating station has a connected load of 50MW and a maximum demand of 40MW. The annual energy generated is  $175 \times 10^6 \text{ kwh}$ . Calculate the load factor and plant capacity factor.
- Q. 6 Write short notes on:
- (a) Annual fixed and operating costs of plants .
  - (b) Depreciation cost
- Q. 7 Explain the following terms with respect to nuclear power station.
- (a) Moderator (b) Control Rods (c) Coolant

### Part C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any three questions.

3x10=30

- Q. 1 (a) Explain the layout and working of a thermal power plant with a neat schematic diagram.
- (b) Discuss its advantages and disadvantages compared to hydro power plants.
- Q. 2 State the difference between different types of nuclear reactors used in power generation.
- Q. 3 Compare thermal, hydro, nuclear, and gas power plants based on initial cost, running cost, efficiency, location of plant, pollution, life span, safety, cost of energy per kwh, losses.
- Q. 4 Define Tariffs. Explain the different types of tariff structures used for electricity consumers.
- Q. 5 Discuss renewable energy generation through wind, solar and tidal sources with neat sketches.