CBCS SCHEME

USN | | | | | | | | | | 18EE42

Fourth Semester B.E. Degree Examination, June/July 2025
Power Generation and Economics

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define the following:
i) Hydrograph
ii) Mass Curve
iii) Flow duration Curve **(06 Marks)**

b. Explain the factors to be considered for selection of site for hydro electric power plant. **(07 Marks)**

c. List the merits and demerits of hydro electric power plant. **(07 Marks)**

OR

2 a. What is meant by the phenomenon " water hammer" ? Explain how a surge tank helps in reducing water hammer effect. **(07 Marks)**

b. With the neat sketch, explain the working of pelton wheel turbine. **(08 Marks)**

c. Explain the classification of hydro electric power plant based on water head. **(05 Marks)**

Module-2

3 a. Explain the working of steam power plant with neat schematic diagram. **(08 Marks)**

b. Explain the techniques of dust collection in steam power station. **(06 Marks)**

c. Explain the function of air-preheater and condensers in thermal plant. **(06 Marks)**

OR

4 a. Mention the application of diesel power plant. **(05 Marks)**

b. With neat diagram, explain the working of a gas turbine plant. **(08 Marks)**

c. With flow diagram, explain the fuel handling system. **(07 Marks)**

Module-3

5 a. Mention the factors which 80 in favour of Nuclear Power station. **(06 Marks)**

b. Explain the function of the following in a Nuclear reactor :
i) Control rod
ii) Modulator
iii) Reflector
iv) Biological shield **(08 Marks)**

c. Describe about fast breeder reactor stating its advantages. **(06 Marks)**

OR

6 a. With the neat layout diagram, explain the working of Nuclear power plant. **(10 Marks)**

b. Explain the methods of nuclear waste disposal. **(07 Marks)**

c. What is meant by radio activity. **(03 Marks)**

Module-4

7 a. Define substation and mention different types of substation. **(05 Marks)**

b. Write short notes on:
i) High voltage circuit breakers
ii) Lightning Arrestors
iii) Reactors and Capacitors **(09 Marks)**

c. List out the advantages and disadvantages of outdoor substation over indoor substation. **(06 Marks)**

OR

8 a. Explain the advantages of gas insulated substation. **(07 Marks)**

b. Explain single bus bar arrangement with sectionlisation **(07 Marks)**

c. Explain i) Resistance ground and ii) Reactance ground **(06 Marks)**

Module-5

9 a. Define the following terms:
i) Load factor
ii) Diversity factor
iii) Plant use factor **(06 Marks)**

b. What are the factors to be considered while deciding the number of generating units. **(06 Marks)**

c. A consumer has the following connected load: 10 lamps each of 60w, 2 heaters each of 1000W. Maximum demand = 1500W on an average the consumer utilizes 8 lamps for 5 hours per day, each heater for 3 hours per day. Find :
i) Average load
ii) Monthly energy consumption
iii) Load factor **(08 Marks)**

OR

10 a. Define Tariff . Explain different types of Tariff. **(07 Marks)**

b. What are the causes of poor power factor and measures for power factor improvement. **(07 Marks)**

c. The yearly consumption of an industrial concern is 5×10^6 KWH with a maximum demand of 1500 KW. Compare the annual costs of electrical energy under the following tariffs.
i) Rs 75 per KW maximum demand plus 2 paise / KWH.
ii) Flat rate of 5 paise / KWH. **(06 Marks)**

* * * * *