

# CBCS SCHEME

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17EE42

## Fourth Semester B.E. Degree Examination, June/July 2019 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. Discuss the utility of hydrograph, flow duration curve and mass curve for the power plants. (06 Marks)
- b. Explain with neat sketch the working of hydroelectric power plant station and explain the function of each component in it. (10 Marks)
- c. Describe different turbines and their use in hydroelectric plants. (04 Marks)

### OR

- 2 a. What are the main considerations for selection of site for a hydroelectric power station? (06 Marks)
- b. Explain the governing mechanism of water turbine, with neat sketch. (06 Marks)
- c. How the Hydro plants are classified? Explain in detail. (08 Marks)

### Module-2

- 3 a. A thermal station has an overall efficiency of 21% and 0.75 kg of coal is burnt per kWh of generated energy. Determine the calorific value of coal. (04 Marks)
- b. Draw the schematic diagram of modern steam power station and explain its operation with its important components. (10 Marks)
- c. Write short notes on : (06 Marks)
  - (i) Electrostatic precipitator
  - (ii) Underfeed stokers.

### OR

- 4 a. Discuss in brief the methods of improving thermal efficiency of gas turbine power plants. (09 Marks)
- b. Discuss the advantages and disadvantages of a diesel power plant. (04 Marks)
- c. Draw a layout of Diesel power plant. Showing the various systems, including cooling, lubrication, starting, intake and exhaust systems. (07 Marks)

### Module-3

- 5 a. Explain with a neat diagram various parts of a nuclear reactor, explain clearly the each part. (06 Marks)
- b. Mention the factors to be considered for the selection of site for nuclear power plant. (06 Marks)
- c. Describe construction and working of a pressurized water reactor. (08 Marks)

### OR

- 6 a. With examples, explain the difference between a fissible material and a fertile material. (04 Marks)
- b. Describe the different types of fuels used in a Nuclear power plant and discuss the problem of nuclear waste disposal. (08 Marks)
- c. Explain the function of moderator, coolant, control rod and shielding in nuclear power plant. (08 Marks)



**Module-4**

- 7 a. Explain the function of transformer, high voltage circuit breaker and high voltage insulator in substation. (06 Marks)  
b. Define substation and mention different types of substation. (06 Marks)  
c. Explain resonant grounding and resistance grounding with a neat diagram. (08 Marks)

**OR**

- 8 a. Explain single bus-bar with bus sectionalizer. (06 Marks)  
b. Explain Gas Insulated substation and mention its advantages. (08 Marks)  
c. Explain Earthing Transformer with neat diagram. (06 Marks)

**Module-5**

- 9 a. Define Tariff. Explain (i) Block Rate Tariff (ii) Two Port Tariff (iii) KVA Maximum demand Tariff. (06 Marks)  
b. Explain methods of determination of depreciation. (09 Marks)  
c. Write a short notes on Classification of costs. (05 Marks)

**OR**

- 10 a. State the causes and effects of a poor power factor. Also explain methods of power factor improvement. (10 Marks)  
b. Calculate the annual energy cost of an industrial consumer who takes a load of 20 kW for 1 hour per day, 150 kW for 7 hours per day and 50 kW for 8 hours/day. The tariff in force is Rs. 20 per kilowatt of maximum demand (Maximum demand = 220 kW) and 10 paise per KWH. Assume 6 working days in a week. (06 Marks)  
c. Explain concept of load sharing and choice of size and number of generating plants. (04 Marks)

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