CBCS SCHEME

USN | | | | | | | | | | |

18EE42

Fourth Semester B.E. Degree Examination, June/July 2024
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. Explain any five factors affecting run-off. **(10 Marks)**

b. With neat diagram, explain pumped storage power plants. **(05 Marks)**

c. Mention the factors considered for the site selection of hydro electric power plant. **(05 Marks)**

OR

2 a. Discuss the components of a hydro electric plant with a neat layout of the hydel plant. **(10 Marks)**

b. Discuss the following characteristics of water turbines:
i) Head
ii) Efficiency at loads
iii) Specific speed
iv) Turbine setting
v) Runaway speed. **(10 Marks)**

Module-2

3 a. What are the merits and demerits of steam power plants? **(05 Marks)**

b. Explain fluidized bed combustion system in detail. Also elaborate on advantages and disadvantages. **(10 Marks)**

c. Highlight the applications of diesel power plants. **(05 Marks)**

OR

4 a. Show the schematic arrangement of a diesel power plant and explain the elements of a diesel power plant. **(10 Marks)**

b. Explain with a neat figure, how the use of regenerator, intercooler and reheater in gas turbine power plants help in improvement of thermal efficiency. **(10 Marks)**

Module-3

5 a. With respect to nuclear power plant, what do you mean by capital costs, plant operating costs, and external costs? **(06 Marks)**

b. Elaborate on factors considered for selection of site for nuclear power plant. **(06 Marks)**

c. With a neat figure, explain boiling water reactor. **(08 Marks)**

OR

6 a. Explain the role of
i) Moderator
ii) Control rods
iii) Coolant
iv) Reflector
v) Thermal shielding
With respect to nuclear reactor. **(10 Marks)**

b. What are merits and demerits of nuclear power plant? **(05 Marks)**
c. Discuss various materials used for shielding. **(05 Marks)**

Module-4

7 a. What is meant by sub-station? What are the equipments used for sub-stations, briefly discuss? **(10 Marks)**
b. Explain with neat figure, the
i) Single bus-bar with sectionalization
ii) Double bus-bar system. **(10 Marks)**

OR

8 a. Explain resistance and Peterson-coil grounding in detail. **(10 Marks)**
b. Explain the ungrounded neutral system. Also discuss the circuit behavior under single line-to-ground fault. **(10 Marks)**

Module-5

9 a. Discuss the effects of variable load on power systems. **(06 Marks)**
b. The equipment in a power station costs Rs.15,60,000 and has a salvage value of Rs.60,000 at the end of 25 years. Determine the depreciated value of the equipment at the end of 20 years on the following methods. **(06 Marks)**
c. Explain the following terms as applied to power system:
i) Load factor
ii) Plant capacity factor
iii) Plant use factor
iv) Demand factor. **(08 Marks)**

OR

10 a. Explain various types of tariffs in detail. **(10 Marks)**
b. A consumer has an annual consumption of 70,080 kWh. The change is Rs.100/kW of maximum demand plus 5 paise/kWh.
i) Find the annual bill and the overall cost per kWh if the load factor is 40%.
ii) What is the overall cost per kWh of the consumption was reduced by 25% with the same load factor? **(10 Marks)**

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