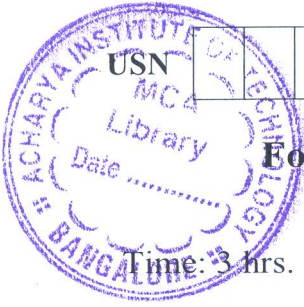


CBCS SCHEME

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 shieldingWith 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 charge is Rs.100/kWh 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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