

CBCS SCHEME

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17EE42

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Power Generation and Economics

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, may be suitably assumed.*

Module-1

- 1 a. Explain with neat sketch the working of medium head power plant. (08 Marks)
b. Discuss the factors considered for selection of site for hydro electric power plant. (06 Marks)
c. What is meant by water hammer with a neat sketch? Explain the function of surge tank. (06 Marks)

OR

- 2 a. With a neat sketch, explain the function of governor used to control the speed of hydraulic turbine. (08 Marks)
b. Define: (i) Hydrograph (ii) Flow duration curve and mass curve. (06 Marks)
c. Explain mini and micro hydel power plants briefly. (06 Marks)

Module-2

- 3 a. Explain the working of steam power plant with neat schematic diagram. (08 Marks)
b. Explain any three methods used for the disposal of ash in steam power plant. (06 Marks)
c. Explain the function of air-preheater and economizer in thermal power plant. (06 Marks)

OR

- 4 a. With neat sketch explain the working of a gas turbine power plant. (08 Marks)
b. Give the comparison of gas power plant with steam and diesel power plant. (06 Marks)
c. Explain the layout of a typical diesel electric power plant with a diagram. (06 Marks)

Module-3

- 5 a. Explain the function of the following in a Nuclear reactor:
(i) Control rod
(ii) Moderator
(iii) Reflector
(iv) Biological shield
(v) Cladding and structure materials
(vi) Coolant (06 Marks)
b. Write a brief note on safety measures to be taken while disposing the nuclear waste material. Also explain the various methods of nuclear waste disposal. (06 Marks)
c. Draw a neat diagram of pressurized water reactor and explain its advantages and disadvantages. (08 Marks)

OR

- 6 a. List out the advantages and disadvantages of nuclear power plant. (06 Marks)
b. What is 'nuclear reactor'? How are nuclear reactor classified? (06 Marks)
c. Give the construction and working of a 'Gas-cooled reactor'. What are its advantages and disadvantages? (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain resonant grounding with a neat diagram and also list the advantages and disadvantages. (08 Marks)
 b. Draw a neat single diagram of substation and explain it. (06 Marks)
 c. Define a bus bar. Explain briefly a typical bus bar arrangement scheme. (06 Marks)

OR

- 8 a. What are the different methods of neutral earthing? Explain any one method in detail. (08 Marks)
 b. Draw the line diagram of 66/11 KV substation. (06 Marks)
 c. Write the specifications required for earthing as per I.S.I. (06 Marks)

Module-5

- 9 a. Explain:
 (i) Two part tariff
 (ii) Power factor tariff
 (iii) Maximum demand tariff (06 Marks)
 b. Discuss various methods of power factor improvement. (06 Marks)
 c. A generating station has the following daily load cycle:

| Time (hours) | 0-6 | 6-10 | 10-12 | 12-16 | 16-20 | 20-24 |
|--------------|-----|------|-------|-------|-------|-------|
| Load (MW) | 40 | 50 | 60 | 50 | 70 | 40 |

Draw the load curve and load duration curve and find :

- (i) Maximum demand
 (ii) Units generated per day
 (iii) Average load
 (iv) Load factor (08 Marks)
- OR**
- 10 a. Define the following terms applied to power system:
 (i) Load factor
 (ii) Demand factor
 (iii) Plant capacity factor (06 Marks)
 b. What are the objectives and requirements of tariff? (06 Marks)
 c. A generating station has a maximum demand of 30 MW, a load factor of 0.6, a plant capacity of 0.48, and a plant use factor of 0.82. Find:
 (i) The daily energy produced.
 (ii) The reserve capacity of the plant.
 (iii) The maximum energy that could be produced if the plant were running all the time.
 (iv) The maximum energy that could be produced daily, if the plant when running according to operating schedule were fully loaded. (08 Marks)

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