

B.Tech II Year II Semester (R15) Supplementary Examinations December 2018

ELECTRICAL POWER GENERATING SYSTEMS

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What are the different types of energy sources?
 - (b) What are the factors to be considered for selection of the site for a thermal power station?
 - (c) What is mass curve?
 - (d) How will you explain mechanism of energy release in a nuclear reactor?
 - (e) Differentiate between the direct beam and diffuse solar radiation reacting the earth's surface.
 - (f) What is meant by the capacity factor of a wind energy conversion system?
 - (g) Write the principle of operation of wave power generation.
 - (h) What are the factors effecting biogas generation?
 - (i) Define plant capacity factor and plant use factor.
 - (j) State what is meant by base load and peak load stations.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

- 2 (a) What are the types of a steam turbine? Briefly discuss about their use and characteristics.
(b) Why pulverized fuel is preferred? What are the types of pulverized fuel business?

OR

- 3 (a) Explain the types of boilers and their characteristics used in thermal power stations.
(b) What are the types of fuels used in thermal power plants? Briefly discuss.

UNIT – II

- 4 (a) How the hydro plants are classified? Discuss briefly.
(b) A turbine in a hydro plant develops 2400 hp with a head of 400 ft. Determine the specific speed of the turbine if it has to run at a speed of 500 rpm.

OR

- 5 (a) With necessary diagrams, explain about boiling water reactor and gas cooled reactors.
(b) Discuss the advantages and disadvantages of nuclear power station.

UNIT – III

- 6 (a) Enumerate the different types of concentrating type collectors.
(b) Explain the principle of conversion of solar energy into electric power.

OR

- 7 (a) Describe the electrical layout of a typical wind farm by means of a single line diagram.
(b) Explain the terms: (i) Yaw control. (ii) Pitch control. (iii) Tethering control.

UNIT – IV

- 8 What are the main types of OTEC power plants? Describe their working in brief.

OR

- 9 (a) Describe the single basin arrangement in tidal power generation.
(b) Discuss how geothermal energy is utilized for electric power generation.

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UNIT – V

- 10 (a) Name the elements that make up the operating expenditure of a power plant.
(b) A power station has a maximum demand of 15 MW, a load factor of 0.7, a plant capacity factor of 0.525 and a plant use factor of 0.85. Find: (i) Daily energy produced. (ii) Reserve capacity of the plant.

OR

- 11 (a) Determine the annual cost of a feed water softener from the following data:
Cost = Rs. 96,000
Salvage value = 5%
Life = 10 yrs
Annual repair and maintenance cost = Rs. 3,000
Annual cost of chemicals = Rs. 6,000
Labour cost per month = Rs. 360
Interest on sinking fund = 5%.
- (b) A base load power station and standby power station share a common load as follows:
Base load station annual output = 180×10^6 kWh
Base load station capacity = 42 MW
Maximum demand on base load station = 36 MW
Standby station capacity = 22 MW
Standby station annual output = 17×10^6 kWh
Peak demand on standby station = 18 MW.
- Determine the following for both power stations: (i) Load factor. (ii) Capacity (or plant) factor.
