R13

Code: 13A02403

B.Tech II Year II Semester (R13) Regular & Supplementary Examinations May/June 2016
ELECTRICAL POWER GENERATING SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
(a)   What is the use of condenser in thermal power station?
(b)   Draw the Flue gas flow diagram of a thermal power plant.
(c)   What is the function of surge tank?
(d)   What is the necessity of moderator in nuclear power station?
(e)   Define altitude angle.
(f)   What are the main factors governing the selection of site for Wind turbine generating systems?
(g)   Write the applications and advantages of biogas.
(h)   Write the major disadvantages of geothermal power generating stations?
(i)   Define diversity factor? What should be the value of diversity factor for economic operation?
(j)   A consumer has a maximum demand of 200 kW at 40% load factor. If the tariff is Rs. 100 per kW of maximum demand plus 10 paise per kWh, find the overall cost per kWh.

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

UNIT – I

2   (a)   Draw a typical layout of a steam plant. Explain the main features of the layout.
(b)   What factors are taken into account while selecting the site for steam power station?
OR
3   (a)   Write short notes on: (i) Super heater. (ii) Economizer.
(b)   A steam power station spends Rs. 30 lakhs per annum for coal used in the station. The coal has a calorific value of 5000 kcal/kg and costs Rs. 300 per ton. If the station has thermal efficiency of 33% and electrical efficiency of 90%, find the average load on the station.

UNIT – II

4   (a)   Draw a neat schematic diagram of a hydro-electric plant and write the functions of various components.
(b)   What are the merits and demerits of hydro-electric plant?
OR
5   (a)   Explain the importance of fast breeder reactor in nuclear power station.
(b)   Explain how the heat output of nuclear reactor can be controlled.

UNIT – III

6   (a)   Explain how the solar energy can be collected by flat plate collector.
(b)   Explain I-V characteristics of solar cell.
OR
7   (a)   How are the Wind energy conversion systems classified? Discuss in brief.
(b)   Explain horizontal axis machine having two aerodynamic blades with neat sketch.

UNIT – IV

8   (a)   Explain the constructional detail and working of KVIC digester.
(b)   What are the factors which affect the size of the biogas plants?
OR
9   (a)   What are the sources of geothermal energy? Explain.
(b)   Explain open cycle OTEC system with neat diagram.

UNIT – V

10 (a) Explain the division of cost of electrical energy generated and express the total cost in three part form and two part form.

(b) A system has a straight line annual load duration curve with maximum and minimum demands of 15 MW and 5 MW respectively. The annual cost characteristics of base load and peak load stations are respectively given by:

C_1 = (Rs 1,00,000 + Rs 100/KW + 6 Paise/KWhr)

C_2 = (Rs 80000 + Rs 60/KW + 8 Paise/KWhr.

Determine the operating schedule of peak load station for minimum annual cost. Also determine the overall cost per kWhr.

OR

11 (a) Write the procedural steps to draw the load duration curve with example.

(b) A factory has a maximum load of 240 kW at 0.8 p.f. lagging with an annual consumption of 50,000 units. The tariff is Rs. 50 per kVA of maximum demand plus 10 paise per unit. Calculate the flat rate of energy consumption. What will be annual saving if p.f. is raised to unity?

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