Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 21412

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Eighth Semester

Electrical and Electronics Engineering

EE 2451/EE 81– ELECTRIC ENERGY GENERATION, UTILIZATION AND CONSERVATION

(Regulation 2008)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What are the factors required to select the suitable site for hydro power station?

2. What is meant by distributed generation?

3. What do you mean by economics of generation?

4. What are the effects of energy conservation?

5. Define luminous efficacy.

6. List the types of lighting system.

7. List the advantages of electric heating.

8. What is meant by resistance welding?

9. What are the disadvantages of electric traction?

10. What are the recent trends in electric traction?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the general layout of thermal power plant and explain the parts involved. (10)

(ii) Write short notes on combined operation of power station. (6)

Or

(b) (i) Explain in detail about Nuclear power plant. (10)

(ii) List the advantages and disadvantages of Nuclear power plant. (6)

12. (a) (i) What are the desired characteristics of tariff? (4)

(ii) A generating station has a maximum demand of 20MW, a load factor of 60%, a plant capacity factory of 48% and a plant use factor of 80%. Calculate (12)

(1) The daily energy produced

(2) The reserve capacity of the plant

(3) The maximum energy that could be produced daily if the plant was running all the time.

(4) The maximum energy that could be produced daily if the plant was running fully loaded and operating ad per schedule.

Or

(b) (i) A consumer has an annual consumption of 2×10^5 units. The tariff is Rs. 250 per kVA of maximum demand plus Rs.3 per kWh.

(1) Find the annual bill and the overall cost per kWh if the load factor is 35%

(2) What is the overall cost per kWh if the annual consumption is reduced by 25% with the same load factor?

(3) What is the overall cost per kWh if the load factor is 25% and the same consumption as in (i)? (9)

(ii) Explain in details about energy audit methodology. (7)

13. (a) (i) A hall 30 m long and 12 m wide is to be illuminated and the illumination required is 50 lumens / m^2. Calculate the number of fitting required, taking Depreciation Factors of 1.3 and Utilization Factor of 0.5. Given that the outputs of different types of lamp are given below: (10)

Watts	100	200	300	500	1000
Lumens	1615	3650	4700	9950	21500

(ii) Explain the factors affecting the design of lighting system. (6)

Or

(b) (i) Explain the operation of fluorescent lamp in details. (8)

(ii) A lamp of uniform intensity of 200 C.P. is enclosed in dins glass globe. 25% of the light emitted by lamp is absorbed by the globe. Determine

(1) Brightness of globe,

(2) CP of globe if diameter of globe is 30cm. (8)

14. (a) Explain the process and various methods of electric arc welding.

Or

(b) (i) A furnace consuming 5kW takes 15 minutes to just melt 2.5Kg of Aluminum, the initial temperature being 15°C. Find the efficiency of the furnace when the specific heat of Aluminum is 0.212cal/ gm/°C, Melting point is 658°C and letent heat of fusion is 320J/gm. (10)

(ii) What are the differences of AC welding and DC welding? (6)

15. (a) (i) A suburban electric train has a maximum speed of 65 km/hr. The scheduled including a station stop of 30 sec is 43.5 km/hr. If the acceleration is 1.3 kmphps, find the value of retardation when the averages distance between stops is 3km. (10)

(ii) Write short notes on Trolley bus. (6)

Or

(b) A train weighing 203 tonnes accelerates uniforms from the rest to a speed of 45 kmph up a gradient of 1 in 500, the time taken being 30 seconds. The power is then cut off the coasts down as uniform gradient of 1 in 1000 for a period of 40 seconds when brakes are applied for period of 15 seconds so as to bring the train uniformly to the rest on this gradient. Calculate

(i) The maximum power output from the driving axle

(ii) The energy taken from the conductor rails in Kwh. Assume efficiency is 60%, traction effort is 44 Newton/Tonne at all speed, rotational inertia is 10%. (16)