Reg. No. : ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

Question Paper Code : **86601**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Eighth Semester

Electrical and Electronics Engineering

EE 1452 – ELECTRIC ENERGY GENERATION, CONSERVATION AND UTILIZATION

(Regulations 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define diversity factor and plant capacity factor.

2.   What is the difference in efficiency of loading power transformer and distribution transformers?

3.   Define annual plant use factor.

4.   What is two part tariff?

5.   Give the relation between solid angle and plane angle.

6.   Define electro-deposition principle.

7.   Mention the methods of braking in electric train.

8.   What are the advantages of electric traction?

9.   Write the properties of heating element.

10. Write the principle of operation of induction heating.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the electrical systems in aircrafts and ships. (16)

Or

(b) Describe the different types of distributed generations based on their prospects and challenges. (16)

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

C_1 = (Rs. 10,00,000 + Rs. 100/KW + 6P/KWhr)

C_2 = (Rs. 80,000 + Rs. 60/KW + 8P/KWhr)

Determine the operating schedule of peak load station for minimum annual cost. Hence determine the overall cost per KWhr. (8)

(ii) Write short notes on Energy audit and Energy Management. (8)

Or

(b) (i) Discuss various loads that go into the generation of electrical energy. (8)

(ii) What is a tariff? Discuss and compare various tariffs used in practice. (8)

13. (a) (i) State and explain laws of illumination. (8)

(ii) Explain the factors which affect the design of lighting system. (8)

Or

(b) Write short notes on:

(i) Extraction and refining of metals. (8)

(ii) Power supply for electrolytic processes. (8)

14. (a) A train has schedule speed of 60 km/hr between stops which are 6 kms apart. Determine the crest speed over the run. Assume trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3km/hr/sec. The duration of stop is 60 seconds. (16)

Or

(b) Explain the following:

(i) Traction motor and control. (8)

(ii) Mechanics of train movement. (8)

15. (a) (i) Draw a neat sketch of Ajax-Wyatt induction furnace and describe its working.   (8)

     (ii) An insulating material 2 cm thick and 200 sq.cm. in area is to be heated by dielectric heating. The material has permittivity of 5 and p.f as 0.05. Power required is 400 watts and frequency of 40 MHz. Determine the voltage and the current that will flow through the material. If the voltage were limited to 700 volts what will the frequency to get the same loss?   (8)

Or

     (b) (i) Explain the design procedure of the heating element when the power and voltage of the oven is known.   (8)

     (ii) Explain the various types of resistance welding.   (8)

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