CBCS SCHEME

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15EE742

Seventh Semester B.E. Degree Examination, Aug./Sept.2020
Utilization of Electrical Power

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

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-1

1 a. Mention the advantages of Electrical heating. **(04 Marks)**

b. With neat sketch, explain the working of a vertical core type induction furnace. **(06 Marks)**

c. Explain the principle of Dielectric Heating. Derive the mathematical expression of power consumed in such process. **(06 Marks)**

OR

2 a. Define Resistance welding and explain any one technique, with neat sketch and its applications. **(06 Marks)**

b. State and explain Faraday's laws of electrolysis. **(04 Marks)**

c. What is Electro deposition? Discuss the factors that influence electro deposition. **(06 Marks)**

Module-2

3 a. State and prove :

i) Inverse Square Law ii) Lamberts Cosine law with respect to Illumination. **(06 Marks)**

b. Discuss the requirements of good lighting. **(05 Marks)**

c. Two lamps posts are 16m apart and are fitted with 500 CP lamp each at a height of 6m above the ground. Calculate :

i) Illumination Mid – way between the posts.

ii) Illumination under each lamp. **(05 Marks)**

OR

4 a. Define the following terms :

i) Lux or Metro candle.

ii) Mean Horizontal Candle Power (MHCP).

iii) Brightness or Luminance (L). **(03 Marks)**

b. With neat figure, explain construction and working of Fluorescent Lamp. **(07 Marks)**

c. Two Lamps L_1 & L_2 are hung at a height of 9 meter from the floar level. The distance between the lamp is 1m. Lamp L_1 is of 500 CP. If the illumination on the floor vertically below this lamp is 20 Lux, find the candle power of Lamp L_2. **(06 Marks)**

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Module-3

5 a. Define for a train the following :

i) Tractive effort ii) Dead weight iii) Adhesive weight

iv) Co-efficient of adhesion. **(04 Marks)**

b. What is Speed – time Curve? With graph, explain Speed – time Curve. **(04 Marks)**

c. Derive an expression for distance traveled between two stations. Assume trapezoidal speed time curve. **(08 Marks)**

OR

6 a. With a neat figure, explain the construction and working of a Single Phase AC series motor. **(06 Marks)**

b. With relevant figure, explain the steps involved in bridge transition method of Series – Parallel starting of two DC Series motors. **(06 Marks)**

c. An electric train has a max speed of 70 kmph. The schedule speed and stop at station are 450 Mph and 30 sec respectively. If the acceleration is 1.5Kmph. Find the value of retardation when the distance between stops is 4km. **(04 Marks)**

Module-4

7 a. What is Regeneration Braking System? Derive the expression for energy returned during regeneration. **(08 Marks)**

b. Explain the working of linear Induction Motor. Mention its application in traction. **(08 Marks)**

OR

8 a. Explain the various systems of track Electrification. **(04 Marks)**

b. Write a note on Tram ways and Trolley buses. **(06 Marks)**

c. Compare the D.C and A.C systems of railway electrification from the point of main line and sub – urban line railway services. **(06 Marks)**

Module-5

9 a. Explain with block diagram of Electric Vehicles configuration. **(08 Marks)**

b. Explain tractive effort and transmission requirements for electric vehicle. **(06 Marks)**

c. Mention the advantages of Electric vehicle. **(02 Marks)**

OR

10 a. Explain the concept of Hybrid Electric Drive trains. **(08 Marks)**

b. Explain with block diagram of Series Hybrid Electric Drive trains. **(08 Marks)**

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