Seventh Semester B.E. Degree Examination, June/July 2015
Electrical Power Utilization

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART - A

1   a. State the advantages of electric heating over other forms of heating. **(06 Marks)**
    b. With neat sketch, explain the working of a Coreless Induction furnace. **(06 Marks)**
    c. A 10KW, single phase, 230 volts resistance over employed nichrome strip of thickness 0.03cm. If the wire temperature is to be 1100^0C and that of the charge to be 700^0C, calculate the length and width of the strop required. If the radiating efficiency is 0.6 and emissivity is 0.9. The resistivity of nicrome allay is $1.03 \ \mu\Omega - m$. **(08 Marks)**

2   a. State and explain the Faraday's laws of electrolysis. **(06 Marks)**
    b. Explain the terms : i) Anodizing   ii) Polarization. **(06 Marks)**
    c. Discuss the factors affecting the electro deposition. **(08 Marks)**

3   a. Define the following terms :
      i) Luminous flux   ii) MHCP   iii) Solid angle. **(06 Marks)**
    b. State and explain laws of Illumination. **(06 Marks)**
    c. Discuss the requirements of good lighting. **(08 Marks)**

4   a. Explain the terms : i) Reflection   ii) Refraction   iii) Diffusion. **(06 Marks)**
    b. Write a note on Flood Lighting. **(06 Marks)**
    c. A Lamp of 250 C.P is hung at the centre of a room $8 \times 6m^2$ at a height of 3m from the floor. Calculate the maximum and minimum illumination produced and mention the points where it falls. **(08 Marks)**

PART - B

5   a. Discuss the advantages and disadvantages of electric traction. **(06 Marks)**
    b. Explain the terms Tractive effort and co-efficient of Adhesion. **(06 Marks)**
    c. Assuming Trapezoidal speed – time curve, derive equations for   i)   total distance travelled by the train between two stops and   ii)   Maximum velocity. **(08 Marks)**

6   a. Derive an expression for the specific energy consumption of a train. **(10 Marks)**
    b. An electric train weighing 180 tonnes runs at a speed of 75km.hr. The train resistance at this speed is 48 Nw/tone. Determine the current drawn from 1500 voltage dc mains at total efficiency of 82%. How long will it continue to run if the supply is switched off? Assume accelerating weight as 1.05 times the dead weight of the train. **(10 Marks)**

7   a. Discuss the lighting system and its accessories in the train. **(06 Marks)**
    b. Explain Regenerative braking in traction system. **(06 Marks)**
    c. Explain series parallel control of dc motors. Discuss how the energy is saved in this method. **(08 Marks)**

8   a. Write a note on Electric vehicles. **(10 Marks)**
    b. Explain the tractive effort and discuss the performance characteristics of electric vehicles. **(10 Marks)**

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