Total No. of Questions :5] *[Total No. of Printed Pages : 2*

Roll No .....

EX-501

B.E. V Semester

Examination, December 2016

Utilization of Electrical Energy

Time: Three hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Define illumination, luminance and luminous intensity.
   b) Explain terms
      i) Glare ii) Reflection.
   c) Derive the relation between plane angle and solid angle.
   d) Explain the laws of illumination.

      OR

      A lamp fitted with a reflector is mounted 12 m above the centre of a circular area of 24 m dia if the combination of lamp and reflector give a uniform CP of 1000 over the circular area, calculate maximum and minimum illumination produced on the area.

Unit - II

2. a) Discuss properties of good heating elements.
   b) What are different types of electric welding?
   c) What is electro-polishing and electro-metallisation?

   d) What is electron beam welding? What are its applications?

      OR

      A 20 kW; Single phase, 220 V resistance over employs circular nichrome wire for its heating element, if the wire temperature is not to exceed 1227° and the temperature of the change is to be 427°C. Calculate the size and length of the wire required. Assume emissivity = 0.9, radiating efficiency = 0.6 and specific resistance of the wire = $1.09\times10^{-6}\Omega$–m.

Unit - III

3. a) Why a series motor is preferred the electric traction?
   b) Define tractive effort and scheduled speed.
   c) What are the advantages of electrification of tracks?
   d) Explain dead weight, accelerating weight and train resistance referred to traction.

      OR

      Draw the general speed time curve of train running on main line and explain.

Unit - IV

4. a) What are the various types of electric braking used?
   b) What do you understand by electric drive?
   c) Explain Load equalisation.
   d) What are the factors affecting the choice of electric drive?

      OR

      Explain Regenerative braking in electric motors.

Unit - V

5. a) Name the major subsystem of electric device train.
   b) State the relation for tractive effort and vehicle speed for electric drive.
   c) What type of transmission system is used in electric vehicle?
   d) How the performance of electrical vehicle is evaluated?

      OR

      Write a short note on Hybrid vehicle.

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