Printed Pages: 4 **EEE-801**

(Following Paper ID and Roll No. to be filled in your Answer Books)	
Paper ID : 120801	**Roll No.**

B. TECH.

Theory Examination (Semester-VIII) 2015-16

UTILIZATION OF ELECTRICAL ENERGY & TRACTION

Time : 3 Hours ***Max. Marks : 100***

Note : Attempt all questions. Assume missing data it any :

(4 × 5 = 20)

1. Attempt any four parts of the following :

   (a) What are the various methods of heat transfer and what are the advantages of electrically produced heat over the other methods ?

   (b) Describe the constructional feature and working principle of Ajax Wyatt furnaces.

   (c) Six resistances each of 50 Ω are used in a resistance oven. How much power is drawn it supply is 400VAC single phase and the connections are :

      (i) Six groups are in parallel, each of one resistance unit,

      (ii) Three groups in parallel, each of two resistance units in series.

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(d) A piece of an insulating material is to be heated by dielectrio heating. the size of the piece is 10 × 10 × 3 Cm. A frequency of 20 megacycles is used and the power absorbed is 400 watts. Calculate the voltage necessary for heating and the current that follows in the material. the material has a relative permittivity of 5 and a power factor of 0.05.

(e) What are the advantages of dielectric heating ? Discuss about its applications.

(f) What is electro-deposition ? Explain in detail various factor's which have effect on the appearance and quality of the deposited surface.

2. Attempt any two parts of the following : (2×10=20)

(a) What do you mean by electric welding? Explain different procedures of electric welding ?

(b) A piece of plastic material of size 4 × 3 × 2 cm is heated by being placed between two electrodes, each having an area of 20 × 2 cm^2 and the distance of seperation between the two being 1.6 cm. The frequency of voltage impressed across the electrodes is 20 MHz. if the power consumed is 80 watts. Find the voltage applied across the electrodes and the current through the material. Assume relative permittivity as 5 and power factor 0.05

(c) Write the technical notes on the following:

(i) Defects in welding;

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(ii) Rebuilding;

(iii) Under-water welding.

3. Attempt any two parts of the following : (2×10=20)

(a) (i) Draw electronic circuit of a refrigerator and ex plain its working.

(ii) Find the height at which a light having uniform spherical distribution should be placed over a floor in order that the intensity of horizontal illumination at a given distance from its svertical line may be greatest.

(b) What do you mean by direct lighting scheme ? What are the drawbacks of this scheme ? Discuss factors required for good lighting arrangement.

(c) With the help of circuit diagram explain the working of the following light sources.

(i) High Pressure Mercury

(ii) Fluorescent tube

4. Attempt any two parts of the following : (2×10=20)

(a) Derive an expression of specific energy output on level track using a simplified speed time curve. What purpose is achieved by the determination of this quantity?

(b) Define the term "Coefficient of adhesion" and explain the factors on which it depends. A 220 tonne motor

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coach driven by four motors takes 18 seconds to attain a speed of 40 Km/h, starting from rest on an ascending gradient of 1 in 75. The gear ratio is 3.2, gear efficiency 90%, wheel diameter 92 Cm, train resistance 45 N/t and rotational inertia 8 percent of the dead weight. find the torque developed by each motor.

(c) State the main requirements for an ideal traction system. Name the different traction systems. Give merits and demerits of electric traction over steam engine traction.

5. Attempt any two parts of the following :

(a) Two motors each of 1200 V and armature resistance 0.3 ohm take 450 amperes during starting. if effective weight of train is 140 tonne and dead weight of 130 tonne, track resistance of 50 N/tonne, tractive effort/ motor 40000N, speed at the end of starting period 40 Kmph, find :

(i) Duration of starting period

(ii) Speed of train at transition

(iii) Rheostatic Loss.

(b) Explain the working principle of metadyne control of traction motor mention merits and demerits of this control.

(c) What are the different metnods of speed control of induction motor ? Why thyristorised method is advantageous ?

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