

Code: EE5T3

**III B.Tech - I Semester – Regular Examinations - December 2016**

**UTILIZATION OF ELECTRICAL ENERGY  
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

1. a) Compare Individual drive and Group drive.
- b) Can you elaborate the reason for D.C is preferable to A.C for electric drives?
- c) What do you understand by Electric Welding?
- d) What is Stefan's Law? Discuss.
- e) Define Illuminance.
- f) List the various types of Lightning schemes.
- g) What are the requirements of an Ideal traction system?
- h) How would you summarize Hybrid vehicle?
- i) Define Dead Weight and Coefficient of adhesion referred to electric traction.
- j) Discuss the factors affecting the specific energy consumption of a train.
- k) Justify "Torque in a shunt motor varies with the armature current".

## PART – B

Answer any *THREE* questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Discuss the various factors that govern the choice of a motor for a given service. 8 M
- b) A DC series motor drives a load, the torque of which varies as the square of the speed. The motor takes current of 30 amps, when speed of 600 rpm. Determine the speed and current when the field winding is shunted by a diverter, the resistance of which is 1.5 times that of the field winding. The losses may be neglected. 8 M
3. a) With a neat sketch explain the working principle of Coreless type Induction furnace. 8 M
- b) What are the fundamental differences between Resistance welding and Electric Arc welding. 8 M
4. a) What are the polar curves? Explain Rousseau's diagram and its importance in Illumination engineering. 8 M
- b) Compare Tungsten filament lamp and Fluorescent lamp. 8 M

5. a) Explain how Rheostatic braking is done in DC shunt motors and series motors. 8 M
- b) What are the requirements of good electric braking? 8 M
6. a) Explain the mechanics of train movement with neat sketch. 8 M
- b) Derive an expression for specific energy output on level track using a simplified speed-time curve. What purpose is achieved by this quality? 8 M