Paper Code: EEE-801	Roll No.									

B.Tech.
(SEM VIII) EVEN SEMESTER EXAMINATION, 2015-16
UTILIZATION OF ELECTRICAL ENERGY & TRACTION

[Time: 3 hrs.] **[Max. Marks: 100]**

1. Attempt any four of the following :- **[5x4=20]**

(a) What are the advantages and disadvantages of direct and indirect arc furnaces?
(b) What are the causes of failure of heating element?
(c) Explain the principle of arc heating.
(d) What are the applications of induction heating?
(e) Explain the principle of dielectric heating.
(f) What is pinch effect?

2. Attempt any two parts of the following:- **[10x2=20]**

(a) Give classification of electrical welding. Explain Resistance Welding in detail.
(b) Enlist the types of electrodes used for welding operation also give advantages of using coated electrodes.
(c) Write a short note on electric welding equipments.

3. Attempt any two parts of the following:- **[10x2=20]**

(a) Give detail comparison between tungsten filament lamps and fluorescent lamps.
(b) Explain in detail the function of a refrigerator along with suitable electric circuit.
(c) Explain the working of an air-conditioner with suitable electrical circuit.

4. Attempt any two parts of the following:- **[10x2=20]**

(a) Give detail comparison between DC series motor and AC series motor in context to traction applications.
(b) What do you understand by electrical braking? Explain regenerative braking in context to DC series motor in detail.
(c) Two DC traction motors, each takes a current of 45 A from 450 V mains and runs at a speed of 600 and 625 rpm, respectively. Each motor has an effective resistance of 0.4 Ω. Calculate the speed and voltage across each machine when mechanically coupled and electrically connected in series and taking current of 45A from 450 V mains the resistance of each motor being unchanged.

5. Attempt any two parts of the following:- **[10x2=20]**

(a) What do you understand by tractive effort? Derive the expression for the tractive effort for a train on a level network.
(b) A 250 ton motor coach having four motors each developing 6000N-m torque during acceleration, starts from rest. If the gradient is 40 in 1000, gear ratio is 4, gear transmission efficiency is 87%, wheel radius is 40 cm, train resistance is 50N/ton, the addition of rotational inertia is 12%. Calculate the time taken to attain a speed of 50km-ph. If the line voltage is 3000 V, DC and the efficiency of motor is 85%. Find the current during notching period.
(c) Explain the following terms:
(i) Coefficient of adhesion (ii) specific energy consumption (iii) tractive resistance