

Code: EE5T3

**III B.Tech - I Semester – Regular/ Supplementary Examinations
October 2017**

**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) List any 2 applications of electric drives.
- b) What is the importance of multi motor drive?
- c) What is meant by arc welding?
- d) What is meant by resistance heating?
- e) List any 2 good requirements for welding.
- f) What is meant by temperature radiators?
- g) List any 2 ideal requirements of a filament of incandescent lamp.
- h) Explain any 2 reasons why the hybrid vehicles are called environmental friendly.
- i) How energy is converted to hybrid vehicles through motors?
- j) List any 2 disadvantages of electric traction.
- k) List any 2 types of electrical braking system used in traction.

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

- 2.a) Discuss in detail about the speed-current characteristics of d.c series motor. 8 M
- b) Explain different types of electric drives in detail. 8 M
- 3.a) Explain the principle of induction heating in detail. 8 M
- b) What are the advantages of resistance welding? Explain clearly Butt welding along with its application. 8 M
- 4.a) Explain about the photometer in detail. 8 M
- b) The illumination in a drawing office 30 m × 10 m is to have a value of 250 lux and is to be provided by a number of 300-W filament lamps. If the coefficient of utilization is 0.4 and the depreciation factor 0.9, determine the number of lamps required. The luminous efficiency of each lamp is 14 lm/W. 8 M
- 5.a) A train is required to run between two stations 1.6 km apart at the average speed of 40 kmph. The run is to be made to a simplified quadrilateral speed-time curve. If the maximum speed is to be limited to 64 kmph, acceleration to 2.0

kmphs and coasting and braking retardation to 0.16 kmphs and 3.2 kmphs respectively, determine the duration of acceleration, coasting and braking periods. 8 M

b) With neat sketches explain the functioning of A.C locomotive. 8 M

6.a) Explain about OHE in traction system. 8 M

b) A train weighing 120tonnes is to be driven up an incline of 2 percent at a speed of 36 kmph. If the train resistance at this speed is 2 kg per tonne, find the current required at 1,500V DC if the efficiency of the motors and gearing is 88 percent. If the current were cut off, how long would the train take to come to rest. 8 M