Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (EEE) (Sem.–6)

# ELECTRIC DRIVES AND UTILIZATION

Subject Code : EE-304

M.Code : 57037

Time : 3 Hrs. Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

**Q1. Write briefly :**

a) Discuss the advantages of electric traction.

b) Draw the typical speed/time curve for electric trains operating on passenger services.

c) What is dielectric heating?

d) Write down the merits of laser welding process.

e) Explain the process of domestic refrigeration.

f) Write down two applications of electrolysis.

g) Write down the laws of illumination.

h) What is load equalization?

i) The motor operates continuously based on the following duty cycle.

   a. 50hp for 20 seconds

   b. 100hp for 20 seconds

   c. 150hp for 10 seconds

   d. 120hp for 20 seconds

   e. Idle for 15 seconds.

   Find the proper size of the motor.

j) What are various electric drives and there utilization?

## SECTION-B

Q2. State the advantages of 25 kV AC used in electric traction system.

Q3. Explain the function of pantograph with the help of a neat diagram.

Q4. Explain the working of air conditioning in household. What is the optimum temperature in which the air conditioner temperature level must be set in Indian summer condition?

Q5. Explain the construction and operating principle of different artificial light sources.

Q6. The 20-minute rating of motor used in a domestic mixer is 300 W. The maximum efficiency of the motor occurs at 80 % of full load and the heating time constant is 60 min. Obtain the continuous rating of the motor.

## SECTION-C

Q7. Design a lighting scheme and equipment used for flood lighting.

Q8. Point out the various components of an ac locomotive running on single phase 25 kV, 50 Hz ac supply with the help of a neat diagram.

Q9. A 6 pole 50 Hz 3-phase induction motor has a moment of inertia of 9.5 kg-$m^2$ and rated torque equal to 550 N-m. Slip at rated torque is 5%. The maximum torque which the motor can supply is 720 N-m. This motor is used to supply a load having torque requirement of 1020 N-m for 12 seconds followed by light torque requirement of 220 N-m for a long period. Assume linear speed-torque characteristics of motor. Find the moment of inertia of flywheel for load equalization. No-load slip of motor is 3%.



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**