*R22 Regulation* *Subject code:4P6BC*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

## B.Tech VI Semester Regular/Supplementary Examinations, April 2026

## UTILIZATION OF ELECTRICAL ENERGY

*(EEE)*

***Maximum Marks: 60*** Date:21.04.2026 Duration: 3 hours

**Note: 1.This question paper contains two parts A and B.**
**2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.**
**3. Part B consists of 5 Units. Answer any one full question from each unit.**
**4. Each question carries 10 marks and may have a, b, c, d as sub questions.**

Part-A

| All the following questions carry equal marks (10X1M=10 Marks) | | Marks | CO | Bloom Tx |
|---|---|---|---|---|
| 1.a) | Explain advantages of electric drives over other drives. | 1M | 1 | Understanding |
| b) | List the dependent factors that will rise the temperature of the motors. | 1M | 1 | Analyzing |
| c) | What are the merits of electric heating? | 1M | 2 | Remembering |
| d) | What factors dielectric losses on depend? | 1M | 2 | Remembering |
| e) | Define the following terms Candle power and Mean Horizontal Candle Power? | 1M | 3 | Remembering |
| f) | Distinguish between a plane angle and Solid Angle? | 1M | 3 | Analyzing |
| g) | List out various traction systems? | 1M | 4 | Analyzing |
| h) | What do you mean by Electric Traction? | 1M | 4 | Remembering |
| i) | Define tractive effort? | 1M | 5 | Remembering |
| j) | Define Dead weight, Accelerating weight? | 1M | 5 | Remembering |

Part-B

| Answer All the following questions. (5X10M=50Marks) | | Marks | CO | Bloom Tx |
|---|---|---|---|---|
| 2 | What is meant by heating time constant? Derive an expression for Heating time constant of a motor. | 10M | 1 | Remembering |
| | OR | | | |
| 3 | Explain the various factors that govern the size and the rating of a motor for particular service. | 10M | 1 | Understanding |
| 4 | Define Electric heating and explain Resistance Heating with any one example method. | 10M | 2 | Remembering |
| | OR | | | |
| 5 | Summarize with neat sketches various methods of arc welding. | 10M | 2 | Understanding |
| 6 | Explain the following lighting schemes with respect to Illumination: i) Direct lighting ii) Indirect lighting iii) Semi – direct lighting iv) Semi – indirect lighting v) General diffusing lighting | 10M | 3 | Understanding |
| | OR | | | |

| | | | | |
|---|---|---|---|---|
| 7 | Define illumination. Explain the laws of illumination. | 10M | 3 | Remembering |
| 8 | Explain the Analysis and Calculations are involved in trapezoidal Speed time curve. | 10M | 4 | Understanding |
| | OR | | | |
| 9 | An electric train has a schedule speed of 35 kmph between stations 750 m apart. The duration of the stop is 15 seconds, the maximum speed is 15 % higher than the average running speed and the braking retardation is 4 kmphps. Calculate the rate of acceleration required to operate this service? | 10M | 4 | Analyzing |
| 10 | What are the factors affecting specific energy consumption of train with necessary expressions? | 10M | 5 | Remembering |
| | OR | | | |
| 11 | An electric train has an average speed of 48 kmph on a level track between stops 1200m apart. It is accelerated at 1.8 km/hour/second and it is braked at 3.2km/hour/second. Draw the speed time curve and estimate the specific energy consumption. Assume tractive resistance as 45 N/tonne and allow 8% of the rotational inertia. | 10M | 5 | Analyzing |