

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:2160907****Date:18-12-2023****Subject Name:Utilization of Electrical Energy and Traction****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define and explain advantages of electric motors drives. **03**
 (b) Explain characteristics of ideal traction system. **04**
 (c) What is braking of electric motors? Explain rheostatic braking for d.c. shunt motors. **07**
- Q.2** (a) Explain electric locomotive. **03**
 (b) State and explain various systems of track electrifications. **04**
 (c) Explain dielectric heating with its applications. **07**
- OR**
- (c) List different methods of electric heating. Explain any one in detail. **07**
- Q.3** (a) Explain advantages of electric welding. **03**
 (b) Classify electric welding process. **04**
 (c) Explain the construction and working of Ajax Wyatt vertical core type furnace. **07**
- OR**
- Q.3** (a) List essential properties of resistance heating element. **03**
 (b) Explain Microwave heating in detail. **04**
 (c) Compare resistance welding and arc welding. **07**
- Q.4** (a) Define following terms: **03**
 i) Current efficiency, ii) Energy efficiency, iii) Electrodeposition.
 (b) Explain power supply for electrolytic process. **04**
 (c) With the help of schematic diagram explain the working principle of air conditioner. **07**
- OR**
- Q.4** (a) Define the following terms: **03**
 i) Refrigeration ii) Refrigerant iii) Refrigeration cycle
 (b) Draw and explain the electrical circuit used in refrigerator. **04**
 (c) Explain Faradays's laws of electrolysis. **07**
- Q.5** (a) Define the following terms used in illumination: **03**
 i) Luminous flux, ii) LUX, iii) Solid angle
 (b) Classify lighting schemes. **04**
 (c) Explain speed time curve for traction system with necessary diagram. **07**
- OR**
- Q.5** (a) Explain different categories of railway services depending on distance to be covered. **03**
 (b) Explain merits of regenerative braking used for traction systems. **04**
 (c) Write a technical note on : Incandescent lamp **07**
