

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, APRIL - 2025**

**ELECTRICAL TECHNOLOGY**

[Maximum marks: 100]

[Time: 3 Hours]

**PART – A**

**Maximum marks: 10**

**I.** (Answer *all* the questions in one or two sentences. Each question carries **2** marks)

1. Define the term frequency.
2. Define Kirchhoff's current law.
3. Write the voltage transformation ratio of transformer.
4. List any two different types of a DC motor.
5. Define synchronous speed of an alternator at frequency 50Hz. (5 x 2 = 10)

**PART – B**

**Maximum marks: 30**

**II.** (Answer any *five* of the following questions. Each question carries **6** marks)

1. Explain the working of Megger.
2. Derive emf equation of transformer.
3. State and explain Thevenin's theorem.
4. Explain armature reaction and its effects.
5. Explain the importance of back EMF in a DC motor.
6. Explain working of single phase capacitor start induction motor.
7. Explain the working of universal motor. (5 x 6 = 30)

**PART – C**

**Maximum marks: 60**

(Answer *one full* question from each unit. Each full question carries **15** marks)

**UNIT – I**

- III.** (a) An inductor coil of 0.2H with a resistance of  $20\Omega$  and a capacitance of  $160\mu\text{F}$  are connected in series and fed by a 230V, 50Hz supply. Find impedance, power factor, active power and reactive power. (8)

- (b) Explain the plate earthing method with neat sketch. (7)

**OR**

- IV.** (a) A resistance of  $50\Omega$ , an inductance of  $0.015H$  and a capacitance of  $250\mu F$  are connected in series in an ac circuit, across a  $250V$ ,  $50Hz$  supply. Find impedance, power factor, active power and reactive power. (8)
- (b) Explain the plate earthing method with neat sketch. (7)

**UNIT - II**

- V.** (a) State and explain Super position theorem. (8)
- (b) Explain the various losses in transformer. (7)

**OR**

- VI.** (a) State and explain Maximum power transfer theorem. (8)
- (b) Explain the types of transformers based on construction. (7)

**UNIT - III**

- VII.** (a) Explain classifications of DC compound generators with neat diagrams. (8)
- (b) An 8 pole lap wound armature has 1200 conductors and a flux of  $25mWb$ . Find average value of generated EMF when rotating at a speed of  $1500rpm$ . (7)

**OR**

- VIII.** (a) Explain the working of a three point starter with neat sketch. (8)
- (b) Draw and explain electrical characteristics of a DC series motor (7)

**UNIT – IV**

- IX.** (a) Derive EMF equation of an alternator. (8)
- (b) Explain working of a DC servo motor. (7)

**OR**

- X.** (a) Explain working of stepper motor. (8)
- (b) A 6 pole induction motor is connected to a  $50Hz$  supply. Find out
- (i) Synchronous speed of the machine in RPM
- (ii) If the rotor rotates at  $950RPM$  find percentage slip. (7)