

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2023**

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 Form factor.
2. State Kirchoff's current law.
3. Explain working principle of DC motor.
4. What are the different types of DC generator?
5. List down the advantages and disadvantages of universal motor. (5 x 2 = 10)

PART – B

Maximum marks: 30

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

1. Define: (a) power factor (b) Frequency (c) cycle (d) RMS value.
2. State and explain Thevenins theorem.
3. Derive the emf equation of DC generator.
4. Explain the relation between speed and frequency of alternator.
5. What are the characteristics of dc motor? Explain the characteristics of DC series motor.
6. Explain the significance of back emf in DC motor.
7. Explain the open circuit characteristics of alternator. (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) Explain Megger with a neat sketch. (8)
- (b) A series circuit consist of 300Ω resistance, $7.97\mu\text{F}$ capacitor, 2.06H inductor of negligible resistance. If the supply voltage is 250V 50Hz . Calculate.
- (i) circuit current (ii) phase angle (iii) voltage drop across each element (7)

OR

- IV.** (a) Define earthing. Explain pipe earthing with a neat sketch. (8)
(b) Describe AC through RLC circuit. (7)

UNIT-II

- V.** (a) State and explain superposition theorem. (8)
(b) State and explain maximum power transfer theorem. (7)

OR

- VI.** (a) 40KVA single phase transformer has 400 turns in primary and 100 turns in secondary. The primary is connected to 2000V, 50Hz supply. Determine
(i) secondary voltage
(ii) current flowing through primary and secondary
(iii) maximum value of flux. (6)
(b) Explain the construction and types of transformer. (9)

UNIT-III

- VII.** (a) Explain the necessity of starter in DC motor and working of 3 point starter. (9)
(b) 8 pole generator running at 1200rpm with a flux of 25mWb/pole generate 440V. Calculate the number of conductors if the armature is (i)lap wound (ii)wave wound. (6)

OR

- VIII.**(a) Explain working and types of DC generator in detail. (10)
(b) Calculate the voltage induced in the armature winding of a 4 pole lap wound DC machine having 728 conductors and running at 1800 rpm. The flux per pole is 30mWb. (5)

UNIT-IV

- IX.** (a) Explain the working and applications of servomotor. (8)
(b) Explain the working and applications of stepper motor. (7)

OR

- X.** (a) Derive the emf equation of alternator. (6)
(b) Explain the construction and working of three phase induction motor. (9)
