**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – NOVEMBER – 2022**

ELECTRICAL TECHNOLOGY

(Common for EC, EL and BM)

(Maximum Marks : 100)   (Time : 3 hours)

PART – A

(Maximum Marks : 10)

Marks

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

1.   Define Amplitude and Frequency of Sinusoidal AC signal.

2.   Why the Earth pin of three pin plug has greater length and cross-sectional area compared to other two pins? Justify.

3.   State Superposition Theorem.

4.   List two difference between DC Shunt Motor and DC series Motor.

5.   Define Synchronous speed of Induction Motor.   (5x2=10)

PART –B

(Maximum Marks : 30)

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

1.   With neat circuit and phasor diagram, derive an equation for impedance in AC series RL circuit.

2.   With neat figure, explain the method of measuring Insulation resistance using Megger.

3.   State maximum power transfer theorem and derive the condition for maximum power transfer.

4.   With neat equivalent diagram, explain ideal transformer.

5.   Explain open circuit characteristics of DC generator.

6.   With neat figure, explain the working principle of permanent magnet stepper motor.

7.   Derive emf equation of alternator.   (5x6=30)

PART – C

(Maximum Marks : 60)

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

UNIT – I

III. A current of 5 A flows through a resistance in series with a coil when supplied at 250V, 50Hz. If the voltage across the resistance is 125V and across the coil is 200V. Calculate

    a) Impedance, reactance and resistance of coil.

    b) Power absorbed by the coil and total power.

    c) Draw the phasor diagram. (15)

OR

IV. With neat circuit diagram derive the expression for Impedance and phase angle of R-L-C series circuit. Draw the phasor diagrams for 0.5 leading power factor, 0.866 lagging power factor and unity power factor. (15)

UNIT – II

V. (a) Explain Faraday's law of Electromagnetic induction and how it is applied in transformer. (8)

    (b) Compare Core type and Shell type transformer. (7)

OR

VI. (a) Illustrate the construction of core type Transformer. (8)

    (b) Describe mutually induced emf. Derive the equation for mutually induced emf. (7)

UNIT –III

VII. (a) Illustrate Armature reaction and its effect. (7)

    (b) With neat circuit diagrams explain DC shunt and series motors, their characteristics and Applications. (8)

OR

VIII. (a) Illustrate the working principle of DC generator. (7)

    (b) Illustrate the function of Three point starter with neat sketch. (8)

UNIT – IV

IX. (a) Explain rotating magnetic field generation in 3-phase induction motor. (8)

    (b) Describe Servo motor and its application. (7)

OR

X. (a) Describe OCC of Alternator. (8)

    (b) Explain the working principle of universal motor and its application. (7)

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