



C20-EC-106

7033

**BOARD DIPLOMA EXAMINATION, (C-20)
OCTOBER/NOVEMBER—2023**

DECE – FIRST YEAR EXAMINATION

ELEMENTS OF ELECTRICAL ENGINEERING

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define magnetic flux density.
2. Define electric flux.
3. Classify induced EMF.
4. State Ohm's law and write the formula.
5. Define admittance.
6. Define reactance.
7. State the losses in a transformer.
8. Define voltage transformation ratio of a transformer.
9. State the need of starter for DC motor.
10. List any three specifications of DC motors.

PART—B

8×5=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) State and Explain Faraday's laws of electromagnetic induction.

(OR)

(b) Find the equivalent capacitance of 1×10^{-6} F, 2×10^{-6} F and 3×10^{-6} F connected in parallel.

12. (a) Derive the expression for equivalent resistance when three resistors are connected in series.

(OR)

(b) State Kirchhoff's laws.

13. (a) Explain the response of a pure inductor when connected across the AC supply.

(OR)

(b) Explain the AC response of a series RC circuit.

14. (a) Explain the applications of isolation transformer and current transformer.

(OR)

(b) Explain the working principle of a transformer.

15. (a) Explain the working principle of a DC motor with a neat sketch.

(OR)

(b) Explain the principle of operation of a stepper motor.

PART—C

10×1=10

- Instructions :**
- (1) Answer the following question.
 - (2) The question carries **ten** marks.
 - (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 16.** A resistance of $25\ \Omega$ and a capacitance of $1.5\ \mu\text{F}$ are connected in series across a 220 V, 50 Hz AC supply.

Calculate —

- (a) Power factor
- (b) Power dissipated in the circuit
- (c) Current
- (d) Impedance
- (e) Voltage across resistor

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