



C16-EC-106

6033

**BOARD DIPLOMA EXAMINATION, (C-16)
JUNE/JULY—2022**

**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 field intensity and flux density.
2. State Fleming's left hand rule.
3. Calculate equivalent capacitance when two capacitors of 20 micro farads and 15 micro farads are connected in series.
4. Define electric potential and potential difference.
5. Define inductive reactance and power factor.
6. Define quality factor of a coil.
7. State the reasons for using laminated core in transformers.
- * 8. List the applications of transformers.
9. What is the need for starter in DC motors?
10. State the important specifications of AC motors.

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PART—B

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** 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 Coulomb's law of magnetism. 5
(b) Explain dynamically and statically induced EMF. 5
- 12.** (a) Compare electrical circuit with magnetic circuit. 5
(b) Find the energy stored when three capacitors of $10\ \mu\text{F}$, $25\ \mu\text{F}$ and $50\ \mu\text{F}$ are connected in series across $400\ \text{V}$ supply voltage. 5
- 13.** Explain the charging and discharging of a capacitor. 10
- 14.** Explain the effect of AC through capacitor with vector diagrams. 10
- 15.** A resistance of $20\ \Omega$, inductance of $0.2\ \text{H}$ and capacitance of $150\ \mu\text{F}$ are connected in series and are fed by a $230\ \text{V}$, $50\ \text{Hz}$ supply. Find (a) inductive reactance, (b) capacitive reactance, (c) impedance of the circuit, (d) current flowing through the circuit and (e) power factor. 10
- 16.** (a) Explain the working of auto transformer. 6
(b) State the losses in a transformer. 4
- 17.** Derive the voltage equation of DC motor and condition for maximum power. 10
- 18.** Explain the working of servo motor. 10

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