

6033

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

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. A coil having 100 turns links with a flux of 1 mwb. If the direction of this flux is reversed in 0.01 Second, find the e.m.f. induced in the coil.
2. Define Fleming's right hand rule.
3. Define the terms electric field and field intensity.
4. Define the terms absolute and relative permittivity.
5. Define the following terms :
  - (a) Conductance
  - (b) Power factor
6. Define the following terms :
  - (a) Inductive reactance
  - (b) Impedance

7. Define the following terms :
  - (a) Voltage transformation ratio
  - (b) Efficiency of a transformer
8. Give the classification of transformers based on construction.
9. Write the voltage equation along with DC motor circuit diagram.
10. Write any three applications of AC motors.

### PART—B

10×5=50

**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) Explain Coulomb's law of magnetism.  
(b) Explain Faraday's laws of electromagnetic induction.
12. (a) Explain Laplace law.  
(b) Explain the terms electric potential and potential difference.
13. (a) Find the equivalent capacitance of capacitors connected in series.  
(b) Two capacitors of 25 micro F and 50 micro F are connected in series. Find the total capacitance and charge on it when connected to 230 V Supply.
14. (a) Explain the effect of AC through pure inductance.  
(b) A resistance of 9 ohms is connected in series with an inductive reactance of 12 ohms. The current in the circuit is 10 A. Find (i) Voltage across the entire circuit, (ii) Draw the phasor diagram of the voltage and current and (iii) Write expressions for the instantaneous values of current and the applied voltage.

- 15.** (a) Explain RLC circuit connected across AC supply.  
(b) A resistance of 50 ohms, inductance of 100 mH and a capacitance of 100 micro F are connected in series across 200 V, 50 Hz supply. Determine (i) Inductive reactance, (ii) Capacitive reactance (iii) Impedance, (iv) Power factor and (v) Power in watts.
- 16.** (a) Explain working principle of auto transformer.  
(b) State any five applications of transformers.
- 17.** (a) Explain working principle of DC motor.  
(b) Explain significance of back EMF.
- 18.** (a) Explain the Principle of Induction motor.  
(b) Explain torque speed characteristics of AC motors.

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