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C16-EC–106

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BOARD DIPLOMA EXAMINATION, (C-16)

JANUARY/FEBRUARY—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 magnetic flux and flux density and state their units.

2. State the Fleming's left hand rule.

3. Define the terms absolute and relative permittivity.

4. A capacitor store 2 joules of energy when connected across 200 V DC supply. Calculate its capacitance.

5. Briefly explain the mathematical representation of vectors in symbolic notation.

6. Define the terms admittance and conductance and state their units.

7. Classify transformers based on power rating.

8. Define regulation of transformer.

9. State the working principle of a DC motor.

10. Classify AC motors based on the principle of operation.

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 Coulomb's laws of magnetism. 5

(b) State Faraday's laws of electromagnetic induction. 5

12. Compare electrostatic and magnetic fields. 10

13. *(a)* Find the equivalent capacitance of capacitors connected in parallel. 5

(b) Three capacitors of 10 μF, 20 μF and 50 μF are connected in series. Find the total capacitance. 5

14. Explain the effect of AC through pure resistance with vector diagrams. 10

15. A resistance of 50 Ω, inductance of 0.1 H and a capacitance of 150 μF are connected in series across 200 volt, 50 Hz supply. Determine the following : 10

(a) Inductive reactance

(b) Capacitive reactance

(c) Impedance

(d) Current

(e) Voltage across the inductor and capacitor

16. *(a)* Explain the working principle of a transformer. 7

(b) List the specifications of a transformer. 3

17. Explain the characteristics of DC shunt motor with neat sketch. 10

18. Explain the working principle of stepper motor. 10

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