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C16-EC-106

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BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2018

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 ampere.

2. State Laplace law (Biot-Savart law).

3. State unit of capacitance.

4. Calculate the energy stored in a capacitor of 100 μF connected across 230 V supply.

5. Define the following terms :

(a) Admittance

(b) Power factor

6. Define *Q*-factor of coil.

7. List the applications of a potential transformer.

8. Why is core laminated in the transformer?

9. What is the need for starter?

10. List specifications of AC motor.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain the concept of lines of force and magnetic field. 5

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

12. *(a)* State Lenz's law and Fleming's right-hand rule. 5

(b) Explain the terms electric potential and potential difference. 5

13. *(a)* Explain the equivalent capacitance of capacitor connected in series. 6

(b) Three capacitors of 10 μF, 20 μF and 50 μF are connected in series. Find the total capacitance. 4

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

15. A resistance of 50 ohms, inductance of 100 mH and a capacitance of 100 μF are connected in series across 200 V, 50 Hz supply. Determine the following : 10

(a) Inductive reactance

(b) Capacitive reactance

(c) Impedance

(d) Current flowing through the circuit

(e) Power factor

16. *(a)* Explain the working principle of an autotransformer. 5

(b) Explain constructional details of *(a)* core type and *(b)* shell type transformers. 5

17. Explain DC motor characteristics of *(a)* DC series motor and *(b)* DC shunt motor. 10

18. *(a)* Explain the working principle of servomotor. 6

(b) Write the applications of servomotor. 4

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