

7033

BOARD DIPLOMA EXAMINATION, (C-20)

MAY—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 electric flux.
2. Define electric potential.
3. Give the expression for equivalent capacitance, if three capacitors connected in series.
- * 4. State Kirchhoff's laws.
5. Define conductance.
6. Define Q-factor of a coil.
7. Classify the transformers based on construction.
8. List the specifications of transformer.
9. Mention the speed equations of a DC shunt motor.
10. Compare between DC series and DC shunt motor in any three aspects.

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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) Explain charging and discharging of capacitor.

12. (a) Explain current division rule for two branch parallel resistive network.

(OR)

(b) Derive the expression for equivalent resistance of resistors connected in series and find the equivalent resistance of 10Ω, 20Ω, 30Ω. resistors connected in series.

13. (a) Explain the effect of AC flowing through pure inductor.

(OR)

(b) Explain AC response when resistance and capacitance are connected in series.

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

(OR)

(b) Explain the applications of potential transformer and current transformer.

15. (a) Explain the significance of back EMF in DC motor.

(OR)

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

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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 10Ω and capacitance of $100\ \mu\text{F}$ are in series and connected across 230 V, 50 Hz supply. Calculate capacitive reactance, impedance, current and power factor.

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