TED (15) – 2031

(REVISION — 2015)

Reg. No. .....

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018

BASIC ELECTRICAL ENGINEERING

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. State the current division rule.
2. State specific resistance.
3. Define electric flux.
4. Define absolute permeability.
5. What do you understand by dynamically induced EMF ? (5 × 2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Explain the phenomenon of electric shock.
2. Explain Fleming's Right Hand rule. List the appilications.
3. Compute the energy spent for a given period of time in an electric circuit.
4. State superposition theorem.
5. State and explain reciprocity theorem.
6. Derive the expression for capacitance connected in series.
7. Draw the B-H curve and explain the various regions in the curve. (5 × 6 = 30)

Marks

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) State & explain Kirchhoff's voltage and current law. 8

(b) A coil consists of 2000 turns of copper wire having a cross sectional area of 0.8mm^2. The mean length per turn is 80 cm and the resistivity of copper is 0.02μΩ-m. Find the resistance of the coil and power absorbed by the coil when connected across 110V DC supply. 7

OR

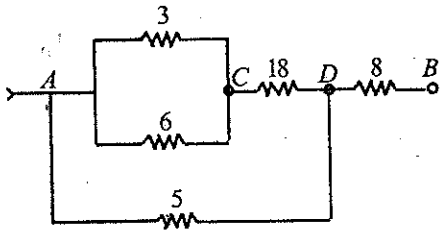
IV (a) A copper conductor has its specific resistance of 1.6×10^{-6}Ωcm at 0°C and a resistance temperature coefficient of 1/254.5 per°C at 20°C. Find (i) the specific resistance and (ii) the resistance - temperature coefficient at 60°C. 8

(b) Derive the equation for temperature coefficient of resistance. 7

UNIT — II

V (a) Compute the effective resistance of DC series, parallel combination of resistances. 8

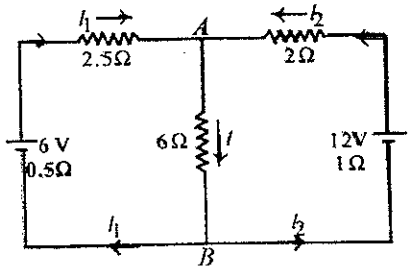
(b) Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a P.D. of 60 V is applied between points A and B.



7

OR

VI (a) Find the different currents flowing in the branches and voltage across 60 Ω resistor using superposition theorem.



8

(b) State and explain Thevenin's Theorem. 7

Marks

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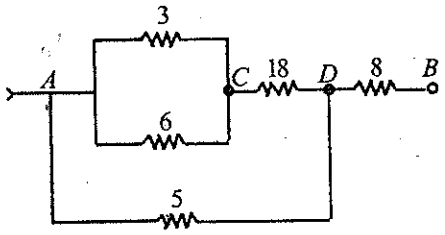

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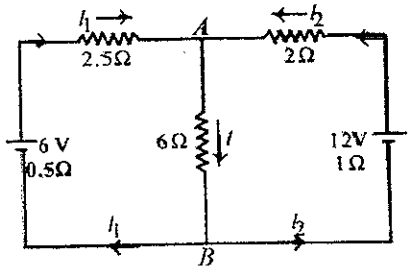

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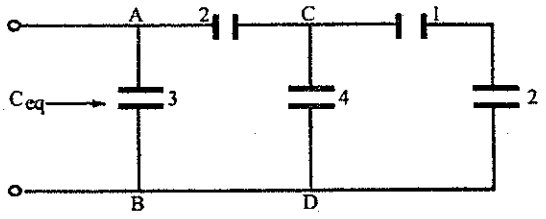
Marks

UNIT — III

VII (a) Describe the construction and concepts of elementary capacitor. 8

(b) Find the equivalent capacitance of the circuit shown in figure. All capacitances are in μF.



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OR

VIII (a) Derive the expression of energy stored in a capacitor. 8

(b) An air-capacitor of capacitance 0.005μF is connected to a direct voltage of 500 V, is disconnected and then immersed in oil with a relative permittivity of 2.5. Find the energy stored in the capacitor before and after immersion. 7

UNIT — IV

IX (a) What is hysteris loss ? On what factors does it depend ? 8

(b) Discuss the Absolute permeability and Relative permeability. 7

OR

X (a) Derive the expression for the energy stored in an inductor. 8

(b) State and explain Faraday's laws of electromagnetic induction. 7