

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

ELECTRICAL TECHNOLOGY

[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. Define the capacitive reactance of a capacitor.
2. List the main losses in a transformer.
3. Define back emf in DC motor.
4. Identify the principle of operation of a DC generator.
5. Define the slip in AC motor.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Derive an equation for finding the impedance of an RLC series circuit.
2. Write short notes on :
(a) RMS value (b) Amplitude (c) Phase.
3. State and explain Thevenin's theorem.
4. Derive the EMF equation of the transformer.
5. Explain the general classifications of DC motors with circuit diagram.
6. Define armature reaction and list its effects.
7. Explain the working principle of three phase induction motor.

(5×6 = 30)

PART — C

(Maximum marks : 60)

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

UNIT — I

- III (a) A capacitor has a capacitance of $10\mu\text{F}$ and a phase difference of 10° . It is inserted in series with a 100Ω resistor across a 220V, 50Hz line. Find (i) increase in resistance due to insertion of this capacitor (ii) power dissipated in the capacitor and (iii) circuit power factor. 8

- (b) With neat sketch explain the method of pipe earthing. 7

OR

- IV (a) When a voltage of 100V at 50Hz is applied to a choking coil A, the current taken is 8A and the power is 120W. When applied to a coil B, the current is 10A and the power is 500W. What current and power will be taken when 100 V is applied to the two coils connected in series. 8

- (b) Explain the necessity of earthing of equipment and how it protects the installations from high voltage. 7

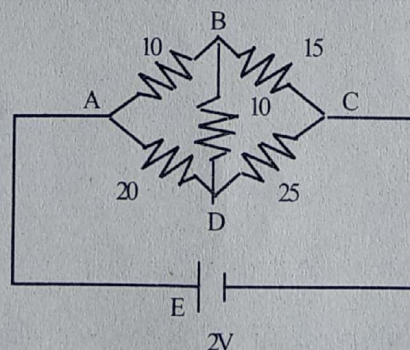
UNIT — II

- V (a) State and explain Superposition theorem. 8

- (b) A 50KVA, 6000/250V transformer has 52 turns on the secondary. Determine the number of primary turns and calculate primary and secondary currents. 7

OR

- VI (a) A Wheatstone bridge network has the following resistances ; $AB = 10\Omega$, $BC = 15\Omega$, $CD = 25\Omega$, $DA = 20\Omega$ and $BD = 10\Omega$. A cell of 2V with negligible internal resistance is connected across AC, calculate the current in the branch BD. 8



- (b) Explain the various types of losses in transformer. 7

UNIT — III

- VII (a) A six pole wave wound armature has 780 conductors and a flux of 12 mWb. Find the speed of the armature when generated emf is 400V. What will be the speed when it is lap wound ? 8
- (b) Explain the significance of back emf in DC motor. 7

OR

- VIII (a) Briefly explain the working principle of DC generator. 8
- (b) Explain the necessity and working of three point starters in DC shunt motor. 7

UNIT — IV

- IX (a) Derive the EMF equation of an alternator. 8
- (b) Explain the working and applications of servo motor. 7

OR

- X (a) Explain the working and applications of stepper motor. 8
- (b) Explain the general classifications and application of AC motors. 7
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