

THIRD SEMESTER DIPLOMA EXAMINATION IN  
ENGINEERING/TECHNOLOGY — APRIL, 2017

**ELECTRICAL TECHNOLOGY**

(Common for EL, EC and BM)

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. List two advantages of earthing.
2. Identify the relation between frequency and time period.
3. State Kirchhoff's voltage law.
4. List two application of DC series motor.
5. Define synchronous speed of alternator. (5×2 = 10)

PART— B

(Maximum marks : 30)

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

1. Derive an equation for impedance in an ac series RLC circuit.
2. Define power factor and give equations.
3. State and explain super position theorem.
4. Efficiency of a transformer is normally very high compared to similar machines in electric field. State your comment on this.
5. Explain the no load characteristic of DC generator.
6. Explain the armature reaction and its effects.
7. Derive the EMF equation of an alternator. (5×6 = 30)

## PART — C

(Maximum marks : 60)

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

## UNIT — I

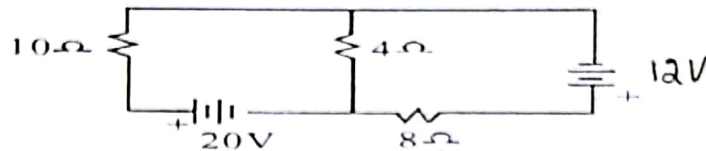
- III (a) Define the terms  
 (i) Cycle (ii) Amplitude (iii) Phase  
 Mark all these on a wave form. 8
- (b) Explain pipe earthing with the help of neat sketches. 7

OR

- IV (a) A coil of resistance  $10\Omega$  and an inductance of  $0.1H$  is connected in series with a capacitor of  $150\mu F$  across  $200V$ ,  $50$  Hz supply. Determine the power and power factor of the circuit. 8
- (b) Explain the operation of megger used for measuring high resistance, with neat sketch. 7

## UNIT — II

- V (a) Calculate current in  $10\Omega$  resistor by using Kirchhoff's law.



- (b) Explain the working of a transformer with neat sketch. 7

OR

- VI (a) State and explain the procedure for finding open circuit voltage and equivalent resistance of a network using Thevenin's theorem. 8
- (b) Describe the losses in transformer. 7

## UNIT — III

- VII (a) Draw the diagram of DC three point starter and explain how it limits the starting current of a DC shunt motor. 8
- (b) Derive the EMF equation of a DC generator. 7

OR

- VIII (a) Explain the types of DC motor with circuit diagram of each type. 8
- (b) Define back emf and state the reasons for using starters in DC motor. 7

## UNIT — IV

- IX (a) Explain the working principle of a universal motor with its applications. 8
- (b) Explain the working principle of an alternator. 7

OR

- X (a) Explain the working principle of a stepper motor. 8
- (b) Explain the classification of AC motors and their uses. 7