



TED (15) – 3021

(REVISION – 2015)

Reg. No. ....

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

ELECTRICAL & ELECTRONICS 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. Define the Power factor of a circuit.
2. Write the expression for line voltage and current in a 3 phase delta connection.
3. What is meant by the term synchronous speed in  $3\Phi$  induction motors ?
4. Why controlling torque is needed in an indicating instrument ?
5. Draw the NOR gate and write its truth table.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Derive the expression for the R.M.S value of voltage  $v = V_m \sin \omega t$ .
2. Describe Flemings Right hand rule and explain its significance.
3. Derive an expression for the e. m. f. developed in a transformer.
4. Explain the working principle of 3-phase induction motor.
5. How can we measure 3-phase power using two watt meters ?
6. Draw and explain the Full wave bridge rectifier with 2 diodes.
7. List the advantages of automation.

(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) Describe the working of a single loop AC generator. 9
- (b) Define the terms :
- (i) Frequency (ii) R.M.S. value (iii) Form factor (iv) Maximum Value 6
- OR
- IV (a) A house is supplied with 220V AC, 50 Hz has the loads of 6 number of Fans of 40 W each, 6 lamps of 40 W each working for 5 hours daily, 5 lamps of 12 W each, one AC having 320 W, and a heater having 1200 W working for 2 hrs. daily. Calculate the monthly cost of energy if the tariff is Rs.2.5/unit. Also calculate the total current. 9
- (b) Explain the discharging and charging process of a Lead acid cell. 6

## UNIT — II

- V (a) Define transformation ratio. Find the transformation ratio for a step-up and step-down transformers ? 7
- (b) Draw and explain a 3-point starter of a DC motor. 8

OR

- VI (a) Give the classifications of a DC motor according to their field excitation. 8
- (b) Why single phase AC motors use split-phase windings in their construction ? 7

## UNIT — III

- VII (a) Explain the working of Repulsion type MI instrument. 7
- (b) What is induction heating ? List its advantages. 8

OR

- VIII (a) Compare Moving coil and moving iron indicating instruments. 7
- (b) Describe the working and principle of dynamometer type Wattmeter. 8

## UNIT — IV

- IX (a) What are rectifiers ? Draw full wave bridge rectifier with necessary waveforms. 8
- (b) Draw and explain the block diagram of basic closed loop control system. 7

OR

- X (a) Explain with diagrams the working of half wave diode rectifier. 7
- (b) Draw the symbol and truth table of basic digital logic gates. 8