



C09-AEI-304

3214

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2017

DAEI—THIRD SEMESTER EXAMINATION

BASIC 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. State Kirchhoff's current law and voltage law.
2. State Norton's theorem.
3. Define phase and phase difference.
4. Derive the relation between voltage and current in pure inductive circuit.
5. List the various methods used to solve the parallel circuits.
6. List the parts of a DC machine.
7. State the e.m.f. equation of a DC generator.
8. Define armature reaction.
9. Write the relation among turns ratio, voltage ratio and current ratio of a transformer.
10. State the working principle of 1-phase induction motor.

PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11.** (a) Explain ideal voltage source and ideal current source. 5
(b) 4 , 6 and 8 resistances are connected in star. Find its equivalent delta circuit. 5
- 12.** The four arms of a Wheatstone bridge have the following resistances :
 $AB = 10$, $CD = 4$, $DA = 50$
A galvanometer of 20 resistance is connected across BD, BC . Calculate the current through the galvanometer when a potential difference of 10 V is maintained across AC . 10
- 13.** Derive the formulae for impedance, current, phase angle, power and power factor in RLC series circuit. 10
- 14.** (a) Define Q -factor and explain the importance of Q -factor.
(b) Define resonance and derive the formulae for resonance frequency in series RLC circuit. 5+5=10
- 15.** Explain the speed control methods of DC motor by using (a) armature control method and (b) field control method. 5+5=10
- 16.** Classify the DC generators based on the excitation with diagrams and write the formulae for the above classifications. 10
- 17.** Explain the working principle of a 1-phase transformer with diagram. 10
- 18.** (a) Explain the working principle of synchronous motor. 7
(b) List any three applications of synchronous motor. 3
