



C09-AEI-304

3214

**BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2014
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. Explain junction, branch and loop.
2. Explain ideal voltage source and ideal current source.
3. Define resonance in parallel circuit.
4. Write the formula for impedance for a series *R-L-C* circuit.
5. Derive a relationship between voltage and current in a pure resistive circuit connected across an AC source voltage.
6. Classify DC machines with reference to excitation.
7. What are various losses in a DC machine?
8. Explain the principle of working of DC motor.
9. Explain potential transformer.
10. List the applications of 3-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. Write the loop equations for the circuit shown in Fig. 1 below and solve for the current in the 12 resistor :

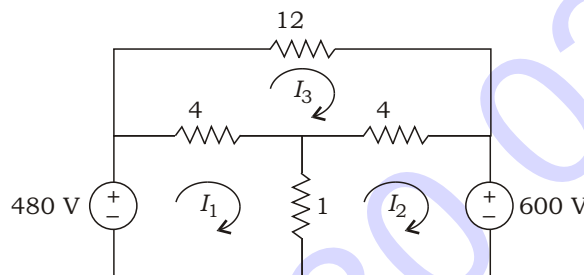


Fig. 1

12. Determine the equivalent resistance across *AB* of the circuit shown in Fig. 2 below :

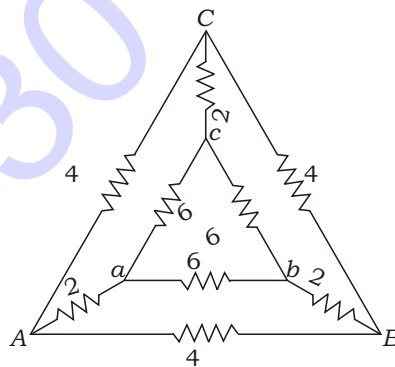


Fig. 2

13. Determine the total impedance, current, phase angle, capacitive voltage and resistive voltage for the circuit shown in Fig. 3 below :

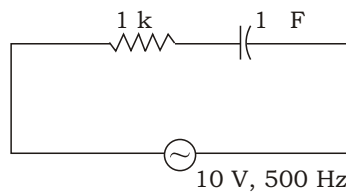


Fig. 3

- * **14.** For the circuit shown in Fig. 4 below, determine the total current, impedance and phase angle :

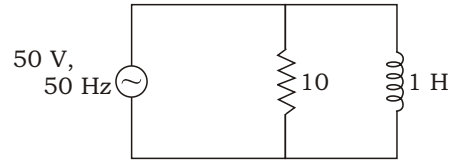


Fig. 4

- 15.** Explain electrical and mechanical characteristics of DC series and shunt motors.

- 16.** A 4-pole, 220 V DC generator is delivering 20 A to a load of 10Ω . Its shunt field resistance is 50Ω and armature resistance is 0.5Ω . Calculate the induced e.m.f. and efficiency of the machine. Allow a drop of 1 V per brush, assuming the stray losses to be 864 W.

- 17.** (a) Derive the e.m.f. equation of a transformer.

- (b) State the relationship among voltage, current and turns ratios.

5+5

- 18.** Explain the construction features of alternator.
