

## BTCSVI / BTECVI / BTELVI

## Term-End Examination

00094

June, 2017

## BIEE-001 : BASICS OF ELECTRICAL ENGINEERING

Time : 3 hours

Maximum Marks : 70

**Note :** Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is allowed.

1. State Thevenin's theorem. Find the current through the  $4\ \Omega$  resistor in the circuit given in Figure 1, using Thevenin's theorem. 3+7

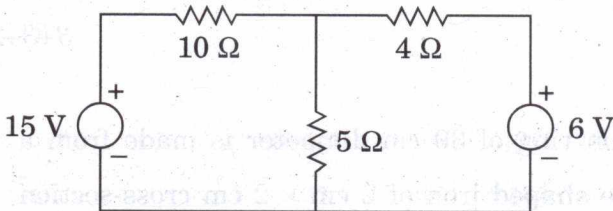


Figure 1

2. With the help of a neat sketch, explain the construction and working of a lead acid battery. Enumerate any two methods of charging. 8+2
3. (a) Derive an expression for the force on a conductor placed in a magnetic field. 5
- (b) Explain the concept of hysteresis with the help of a neat diagram. 5
4. Explain Fleming's left hand and right hand rules with the help of neat diagrams. Where are they applied? 4+4+2
5. Explain the principle of self and mutual induction with the help of suitable examples. Define and explain self and mutually induced emf. 3+3+2+2
6. An iron ring of 30 cm diameter is made from a square shaped iron of 2 cm  $\times$  2 cm cross-section and is uniformly wound with 400 turns of wire of 2 mm<sup>2</sup> cross-section. Calculate the value of the self-inductance of the coil. Assume  $\mu_r = 800$ . 10

7. (a) Derive an expression for rise and decay of current in an RL circuit. 5
- (b) Define and explain Kirchhoff's laws with the help of suitable examples. 5
8. (a) State and explain the Superposition theorem with suitable example. 5
- (b) Explain series and parallel connections of batteries with the help of neat sketches. 5
9. Write short notes on any *two* of the following :  $2 \times 5 = 10$
- (a) Importance of air gap in magnetic circuits
- (b) Care and maintenance of lead acid battery
- (c) Significance of Lenz's law
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