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OIEE-001

B.Tech.

DECVI / DELVI / DCSVI / ACECVI / ACELVI / ACCSVI

Term-End Examination

December, 2015

OIEE-001 : BASICS OF ELECTRICAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks.*

1. (a) Define and explain the following terms : 7

(i) Resistivity

(ii) Conductivity

(iii) Potential Difference

(iv) Resistance Temperature Coefficient

(b) For the given circuit shown in Figure 1, calculate R, if power dissipated in the circuit is 70 W when applied voltage is 20 V across the circuit. 7

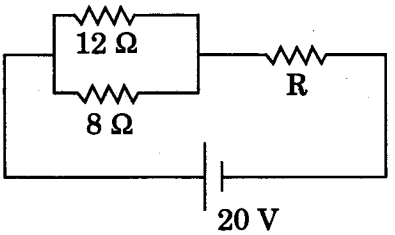

Figure 1

2. (a) By using Superposition Theorem, find the current in R = 1 Ω resistor for the circuit shown in Figure 2. 7

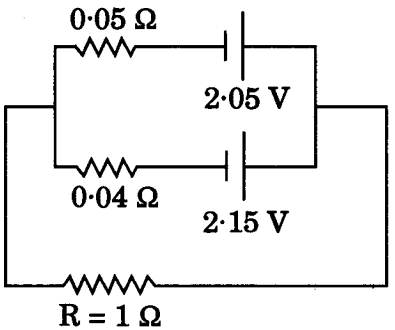

Figure 2

(b) State and prove Thevenin's Theorem. 7

3. (a) Distinguish between primary and secondary cells. 7

(b) Explain the constant current method of charging battery. 7

4. (a) Derive the expression for the force experienced by a current carrying conductor placed in a magnetic field. 7

(b) What do you understand by magnetic circuit ? Explain the terms reluctance and magnetomotive force of a magnetic circuit. 7

5. (a) What do you understand by statically and dynamically induced emf ? Write down the difference between them with examples. 7

(b) Prove that the energy stored in an inductor is $\frac{1}{2}$ LI^2. 7

6. (a) An alternating current is represented by $i = 70{\cdot}7 \sin 520t$. Determine the frequency, rms and average value of the current. 7

(b) Define the following : 7

(i) Active Power

(ii) Reactive Power

(iii) Apparent Power

(iv) Power Factor

7. (a) Explain resonance in parallel R-L-C circuits. 7

(b) An R-L series circuit as shown in Figure 3 is connected across 240 V, 50 Hz, 1-φ a.c. supply. If the voltage drop R is 100 V, then find the voltage drop across the inductor L and also the value of L. 7

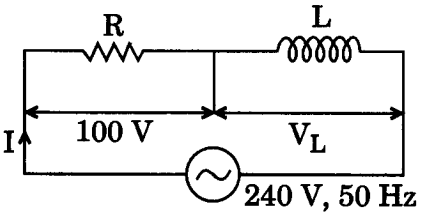

Figure 3

8. (a) Derive the relation between line current and phase current for a three-phase three-wire system. 7

(b) What are the advantages of a three-phase system over a single phase system ? 7