



[4656] – 205

|             |  |
|-------------|--|
| Seat<br>No. |  |
|-------------|--|

**F.E. (Semester – II) Examination, 2014**  
**BASIC ELECTRICAL ENGINEERING**  
**(2012 Course)**

Time : 2 Hours

Max. Marks : 50

- Instructions :**
- 1) Attempt Q. No. 1 or 2, Q. No. 3 or 4, Q. No. 5 or 6, Q. No. 7 or 8.
  - 2) Figures to the **right** indicate **full** marks.
  - 3) **Use** of non-programmable pocket size scientific calculator is **permitted**.
  - 4) Neat diagrams must be drawn **wherever** necessary.
  - 5) Assume suitable data, if **necessary**.

1. a) Define temperature coefficient of resistance. State its unit and the factors on which it depends. 6
- b) Compare electric and magnetic circuit i.e. explain similarities and dissimilarities between them. 6

OR

2. a) A motor pump set lifts 1200 m<sup>3</sup> of water to a height of 15 meter per hour. If the efficiency of motor is 80% and that of pump is 75%, calculate the monthly bill of set if it is used 4 hrs per day for 30 days at a rate of Rs. 5/unit. 6
- b) An iron ring with mean circumference of 140 cm and cross section of 12 cm<sup>2</sup> is wound with 500 turns of wire. What is the relative permeability of the iron if exciting current of 2 Amp flowing in coil, produces flux of 1.2 mwb ? 6
3. a) Derive the expression for energy stored in the capacitor. 6
- b) Obtain the equation for root mean square value of alternating sinusoidal current in terms of its peak value. 6

OR

4. a) The equation for the alternating current is given by  $i = 100 \sin 100 \pi t$ . Find the time taken by current to reach
  - i) 30 Amp and
  - ii) 50 Amp for 1<sup>st</sup> time. 6
- b) A 600 KVA transformer has iron losses of 4 kw and half load copper losses are 2 kw. Calculate the efficiency of transformer at
  - i) half load 0.8 p.f. lagging and
  - ii) full load 0.8 p.f. lagging. 6

P.T.O.

[4656] – 205



5. a) Explain advantages of three phase system over single phase system. 6
- b) Sketch the voltage, current and power waveforms for R-L series circuit. State the equations of  $v$ ,  $i$  and  $p$ . 7
- OR
6. a) A series circuit, consist of resistance of 10 ohm and inductance of 0.1 Henry, connected across one phase 50 Hz A.C. supply. If the voltage across resistance is 50 volt. Calculate
- i) Voltage drop across inductance and
  - ii) Supply voltage. 7
- b) A coil having resistance of 50 ohm and inductance of 0.02 H is connected in parallel with a capacitor of  $35 \mu\text{F}$  across a single phase 200 V, 50 Hz supply. Calculate branch currents and total current drawn by the circuit. 6
7. a) State and explain Kirchhoff's laws. 6
- b) Derive the expressions/formulae to convert Delta connected network into its equivalent star connected network. 7
- OR
8. a) Apply Thevenin's theorem, to calculate current flowing in 10 ohm resistance, for the circuit shown in fig. 1. 7

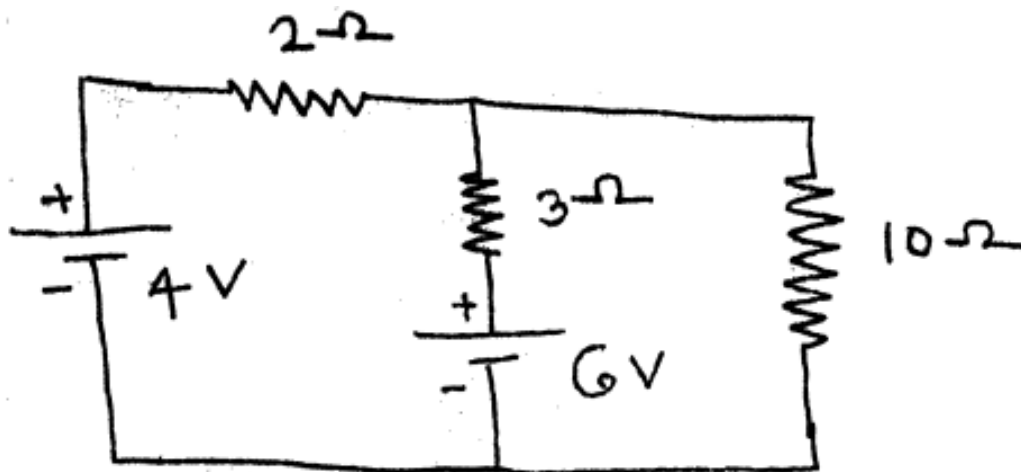


Fig. 1

- b) Apply Superposition Theorem, to the circuit shown in Fig. 1 to calculate current flowing in  $10 \Omega$  resistance. 6

B/II/14/