

B.Tech. Degree I Semester Regular/Supplementary & II Semester Supplementary Examination December 2016

GE 15-1104 B CS/EC/IT & GE 15-1204 A CE/EE/ME/SE
BASIC ELECTRICAL ENGINEERING
(2015 Scheme)

Time : 3 Hours

Maximum Marks : 60

PART A
 (Answer *ALL* questions)

(10 × 2 = 20)

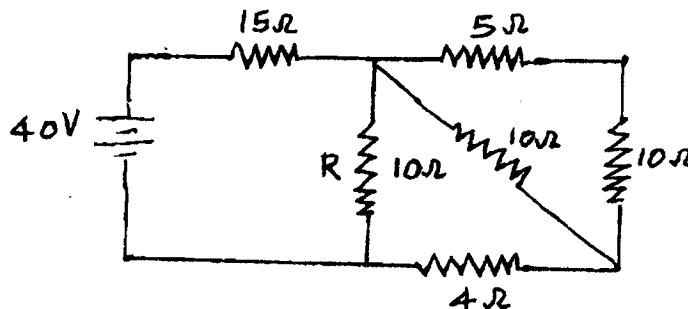
- I. (a) State and explain Kirchhoff's laws for an electric circuit.
- (b) A circuit consists of three resistors of $3\ \Omega$, $4\ \Omega$ and $6\ \Omega$ in parallel and a fourth resistor of $4\ \Omega$ in series. A battery of e.m.f. 12 V and internal resistance of $6\ \Omega$ is connected across the circuit. Find the total current in the circuit and terminal voltage across the battery.
- (c) What are the factors affecting the capacitance value of a capacitor?
- (d) An iron ring has a cross sectional area of $400\ \text{mm}^2$ and a mean diameter of 25 cm. It is wound with 500 turns. If the value of relative permeability is 250, find the total flux set up in the ring. The coil resistance is $474\ \Omega$ and the supply voltage is 240 V.
- (e) Distinguish between statically induced e.m.f. and dynamically induced e.m.f. Give one example for each.
- (f) What do you understand by average value and effective value of an alternating quantity?
- (g) The current flowing through a circuit is $i(t) = 25 \sin(\omega t - 30^\circ)$ when a voltage of $v(t) = 100 \sin(\omega t)$ is applied. Find the active and reactive power.
- (h) Distinguish between star and delta connection in three phase circuits.
- (i) Explain the working principle of a transformer.
- (j) State the principle of operation of DC generators and DC motors.

PART B

(4 × 10 = 40)

- II. (a) Calculate the current through R in the circuit.

(7)

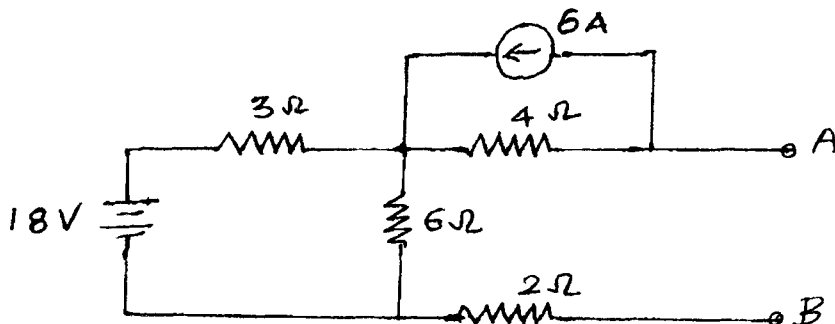


(P.T.O.)

- (b) Two small identical conducting spheres have charges of $2 \times 10^{-9} \text{ C}$ and $0.5 \times 10^{-9} \text{ C}$ respectively. When they are placed 3 cm apart, what is the force between them? (3)

OR

- III. (a) What is Thevenin's theorem? (4)
 (b) Find Thevenin's equivalent circuit for the given network for the terminal pair AB. (6)



- IV. State and illustrate the following about electromagnetic induction. (10)
 (i) Faraday's laws.
 (ii) Len's law.
 (iii) Fleming's right and rule.

OR

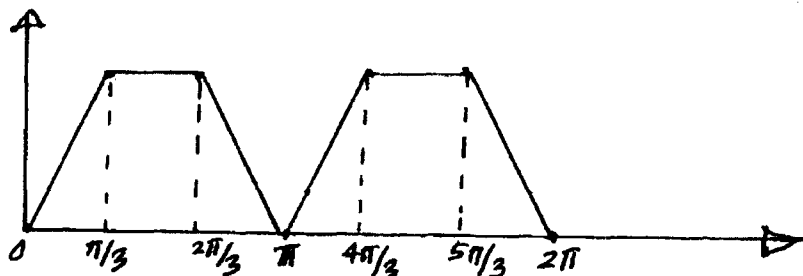
- V. Explain the working principle of PMMC Ammeter with the help of a neat diagram. (10)

- VI. A non inductive resistor connected in series with a choke coil is fed from a 250 V, 50 Hz supply. The voltage across resistor is 125 V and voltage across coil is 200 V. Current flowing through the circuit is 5 A. Calculate. (10)

- (i) The reactance of the coil.
 (ii) The inductance of the coil.
 (iii) Voltage across the choke coil.
 (iv) Power absorbed by the choke coil.

OR

- VII. For the trapezoidal wave form given below find (i) RMS value (10)
 (ii) Average value (iii) Form factor and (iv) Peak factor.



- VIII. Briefly explain the important types of DC machines. (10)

OR

- IX. With the help of a schematic, explain the working of a thermal power station. (10)