

**80018****December, 2019****B.Tech. I SEMESTER Reappear  
Basic of Electrical Engineering (EE-101C)**

Time : 3 Hours

Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Assume the relevant data if required. Different sub-parts of a question are to be attempted adjacent to each other.*

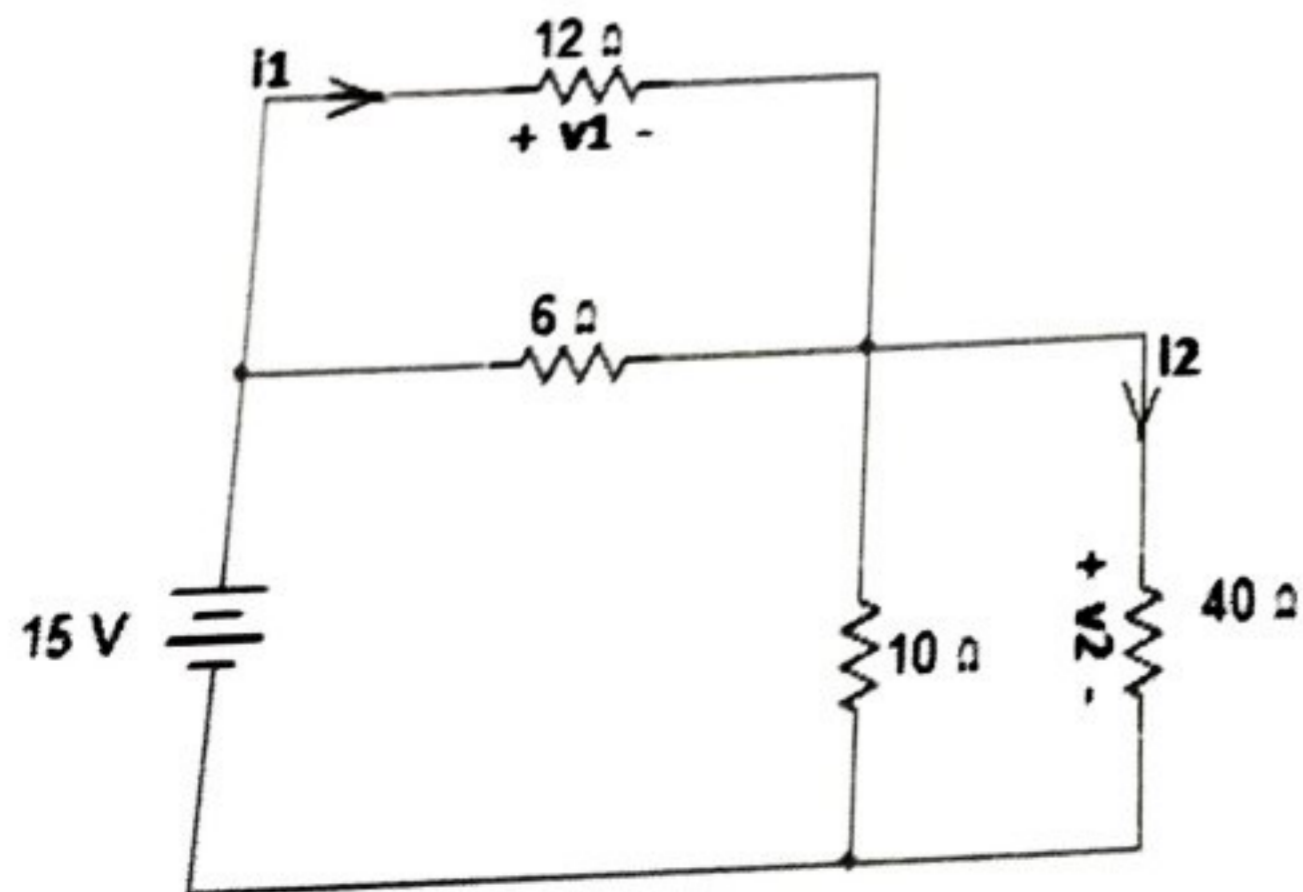
**PART - A**

1. (a) Distinguish between unilateral and bilateral network. (1.5)
- (b) Why transformer is also called the static transformer? (1.5)
- (c) Give reason why power factor is important? (1.5)
- (d) Define reactive power. (1.5)
- (e) Explain the applications of Miliman's Theorem. (1.5)

- (f) Draw slip-torque characteristics of three phase induction motor. (1.5)
- (g) Make a comparison between magnetic and electric circuit. (1.5)
- (h) Explain statically induced E.M.F. (1.5)
- (i) Explain the advantages of three phase systems. (1.5)
- (j) Find the Form Factor and Peak Factor of the sinusoidal alternating current. (1.5)

### PART - B

2. (a) Prove that the area within the loop of a B-H curve represents the hysteresis loop. (7)
- (b) Find  $i_1$ ,  $i_2$ ,  $v_1$ ,  $v_2$  and power dissipated in 12 ohms resistor. (8)



3. (a) A 230 V, 50 Hz ac supply is applied to a coil of 0.06 H inductance and 2.5 resistance connected in series with a  $6.8 \mu\text{F}$  capacitor. Calculate (i) Impedance (ii) Current (iii) Phase angle between current and voltage (iv) Power factor. (8)
- (b) Derive an expression for the average power consumed in resistive circuit. (7)
4. (a) Derive the expression of resonance frequency and impedance in case of parallel R-L-C circuit. (8)
- (b) A coil of inductance  $100 \mu\text{H}$  and of self-inductance  $5 \text{ pF}$  is magnetically coupled to another coil of inductance  $200 \mu\text{H}$  and of self-inductance  $10 \text{ pF}$ . The co-efficient of coupling between the coil is 0.1. Calculate the effective mutual inductance between them at 1 MHz. (7)

5. (a) Find the current in the 5 ohms resistance using Norton's theorem. (8)

