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80018

December, 2019
B.Tech. 1 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)

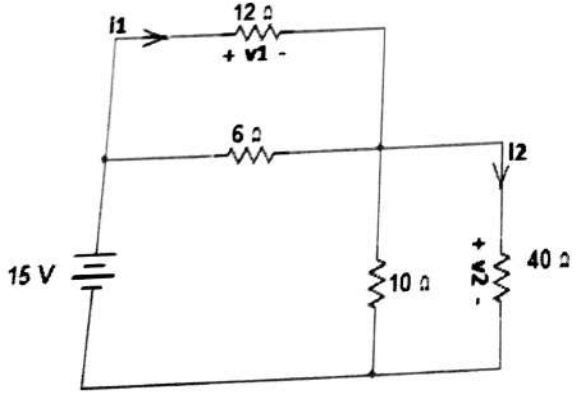
(i) Explain the advantages of three phase systems. (1.5)

(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)



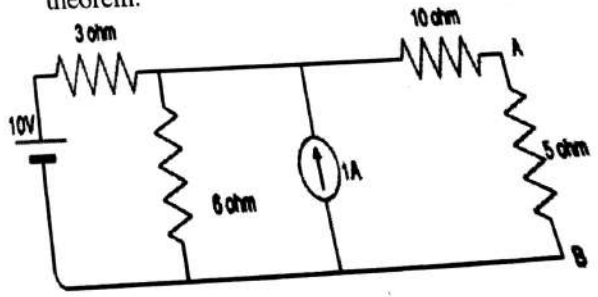
3. (a) A 230 V, 50 Hz ac supply is applied to a coil of 0.06 H inductance and 2.5 resistance connected in series with a 6.8 μF capacitor. Calculate (i) Impedance (ii) Current (iii) Phase angle between current and voltage (iv) Power factor. (8)

(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 μH and of self-inductance 5 pF is magnetically coupled to another coil of inductance 200 μH and of self-inductance 10 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)



(b) State the maximum power transfer theorem. Show that the condition for maximum power transfer $R_L = R_{TH}$. Explain its importance. (7)

6. (a) Explain the various losses in d.c. machine. (8)

(b) Explain the open circuit and short circuit on single phase transformer with diagram and find the equation for regulation on transformer. (7)

7. Explain the Principle of operation, constructional features and applications of Synchronous Generator. (15)
