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Total Number of Pages : 2

B.TECH

2nd Semester Regular Examination-April-May 2019
BBSSES1042 – BASICS OF ELECTRICAL ENGINEERING
(Regulations 2018) CSE , MECH ENGG.

Time : 3 Hours

Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark**Q1. Answer ALL Questions.**

- a An inductor of inductance 0.1H, carrying current of 6 amps will store energy of _____ [CO1 PO1]
- b An ideal current source has zero _____ [CO1 PO1]
- c Two bulbs of 100w /250 V and 150w/250V are connected in series across a supply 250V. The power consumed by the circuit is _____ [CO1 PO2]
- d A load is connected to an active network. At the terminal to which the load is connected, $R_{th} = 10\Omega$ and $V_{th} = 60V$. The maximum power supplied to the load is _____ [CO1 PO2]
- e What is the rms value, average value, form factor and peak factor? [CO1PO1]
- f Two coupled coils connected in series have an equivalent inductance of 16 mH, if the circuit connection in series, additive and 8 mH if the circuit is series opposing. The value of mutual inductance is _____ [CO1PO2]
- g If a RLC series circuit having $R = 14.14\Omega$, and $X_c = 14.14\Omega$, then its capacitance is _____ [CO1PO2]
- h A coil has an mmf of 300 AT and a reluctance of 2×10^6 AT/Wb. Total flux in the magnetic circuit is _____ [CO1 PO2]
- i The flux created by current flowing through the primary winding of a transformer induces emf in _____ [CO2 PO1]
- j Power factor of an electric circuit is equal to _____ [CO1 PO1]

PART – B: (Short Answer Questions) 10 X 2=20 Marks**Q.2. Answer ALL questions**

- a A resistor of 12Ω is connected across a potential difference of 60 volts. Calculate the power dissipated and the energy transferred to heat in 4 minutes. [CO1 PO2]
- b What is the relation between the mutual inductance and self-inductance of coils? [CO2 PO2]
- c What are super node and super mesh? [CO2 PO2]
- d What is current division rule in dc network? [CO1 PO1]
- e Define the rms value, average value, form factor and peak factor. [CO2 PO1]
- f What is hysteresis loss and how it is dependent on supply voltage? [CO2 PO1]
- g Enumerate the types of dc compound motors? [CO3 PO1]
- h Explain rotating magnetic field? [CO3 PO1]
- i What is the basic principle of moving iron type instruments? [CO4 PO1]
- j Describe earthing? [CO4 PO2]

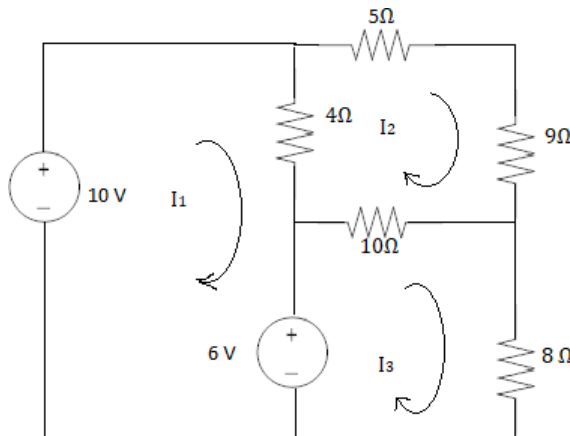
PART – C: (Long Answer Questions) 4 x 15 =60 MarksAnswer ALL questions**Q.3**

- a. State and explain Thevenin's Theorem with proper derivation. 8 [CO1 PO2]



b. Find loop currents I_1, I_2, I_3 for the given circuit:

[CO1 PO2]



7

OR

c. four lamps are connected in parallel to a 100 V dc supply. Three of the lamp currents are $I_{L1}=1.6$ A, $I_{L2}=1$ A, $I_{L3}=0.4$ A respectively. 8 [CO1 PO3]

If the total supply is 5 A, then calculate the resistance of each of the four lamps.

d. By using current division rule find the currents I_1 & I_2 of a dc linear circuit having two resistors of resistances $10\ \Omega$ & $15\ \Omega$ respectively connected in parallel with a current source of 6 A. 7 [CO1PO3]

Q.4

a. Derive the average value and RMS value of half sine wave. 8 [CO2PO2]

b. Consider a RC series circuit with $R= 10$ ohms and $C=0.05\ \mu\text{F}$. The applied voltage is given by $v=50\cos(10000t)$. Calculate the V_R, V_C and the phase angle of current with respect to supply voltage. 7 [CO2 PO3]

OR

c. Compare electric and magnetic circuits. 8 [CO2 PO2]

d. Explain the B-H curve of a magnetic circuit 7 [CO2 PO1]

Q.5

a. Derive EMF equation of transformer. 8 [CO3 PO2]

b. Explain about Armature voltage control method of speed control of a dc shunt motor. 7 [CO3 PO2]

OR

c. Derive the Torque equation of a Three-Phase induction motor. 8 [CO3 PO2]

d. A three phase, 6 pole, 50 Hz induction motor has a slip of 1% at no load and 3% at full load. Find 7 [CO3PO2]

(i) Synchronous speed

(ii) No-load speed

(iii) Full load speed

(iv) Frequency of rotor current at standstill

Q.6

a. Explain about classification of measuring instruments. 8 [CO4 PO2]

b. Explain two-wattmeter method. 7 [CO4 PO3]

OR

c. Explain the pipe & plate earthings. 8 [CO4 PO2]

d. Explain the working principle of a hydro power plant with net diagram. 7 [CO4 PO3]