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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

January 2017 Semester End Make Up Examinations

Course: Basic Electrical Engineering **Duration: 3 hrs**
Course Code: 14EE1ICBEE **Max Marks: 100**
Date: 16.01.2017

Instructions: Answer Any Five Full Questions, Choosing One From Each Unit

UNIT 1

1. a) List out the similarities and differences between magnetic circuit & electric circuit 6

   b) For the network shown in figure 1 b , compute the currents in all the branches and the p.dbetween D & A 8

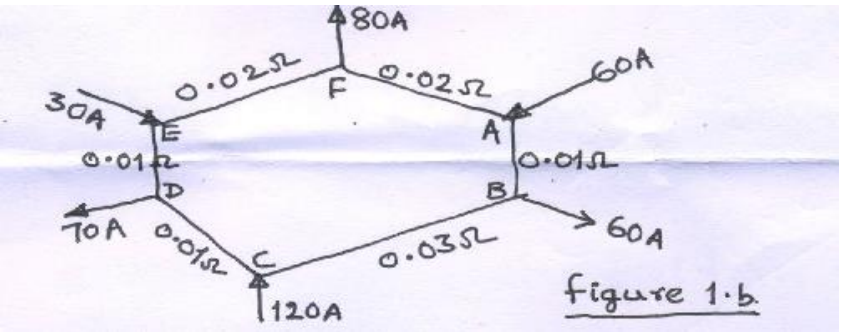

figure 1.b

   c) For the circuit shown in figure 1 c , compute the current I using superposition theorem 6

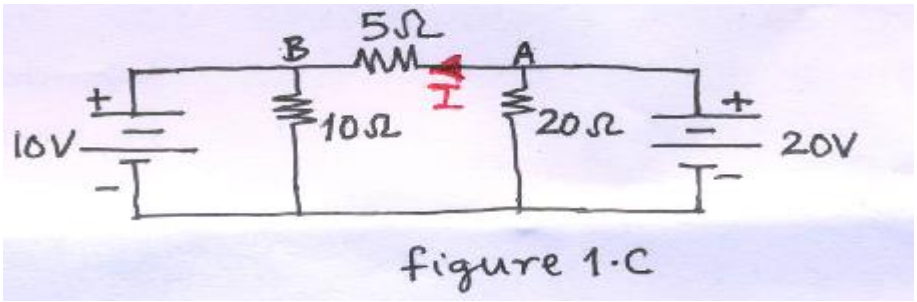

figure 1.C

UNIT 2

2. a) Sketch the constructional features of a dc machine & mention the function of each part. 8

   b) Sketch & describe Ta versus Ia characteristics of (i)dc shunt motor (ii) dc series motor 6

c) A three phase , 6 pole induction motor operates from 50 Hz supply. Compute (i) the speed of the revolving magnetic field produced by the stator (ii) estimate the number of poles in order to get a synchronous speed of 1500 rpm & also compute the rotor speed ,if the motor operates at 3% slip. 6

OR

3. a) With the help of relevant phasor diagram, show that the application of 3 phase balanced voltages to a 3 phase balanced winding of an induction motor produces a rotating magnetic field in the air gap. 8

b) Show that $f_r = s\ f$ in a 3 phase induction motor. 5

c) A 440V dc motor takes an armature current of 20A & runs at 500 rpm. The armature resistance is 0.6 ohm.If the flux is reduced by 30% & the torque is increased by 40%, what are the new values of armature current & speed . 7

UNIT 3

4. a) Derive expressions for rms value & average value of a sinusoidal varying alternating current in terms of its peak value. 6

b) Two impedances 150+ j 157 ohms and 100- j 110 ohms are connected in parallel across a 220V ,50Hz supply. Compute (i)the branch currents (ii)total current & (iii) power factor. 6

c) A inductive coil draws a current of 2A,when connected to a 230V ,50Hz supply. The power taken by the coil is 100W.Compute (i) impedance (ii) resistance & inductance of the coil (iii) power factor. 8

UNIT 4

5. a) Derive the emf equation of a single phase transformer. 6

b) Two coils, A of 12000turns & B of 15000 turns , lie in parallel planes so that 45% of the flux produced by coil A links with coil B. A current of 5A in coil A produces 0.05 mwb, while the same current in coil B produces 0.075mwb.Compute 6

(i) the self inductance of coil A & coil B.
(ii) the mutual inductance
(iii) the coupling coefficient.

c) A 600 KVA, single phase transformer has an efficiency of 92% both at full load & half full load at upf. Compute the efficiency at 75% full load at 0.9 power factor lag. 8

UNIT 5

6.	a)	With the help of circuit diagram & phasor diagram, derive the relationship between the line & phase values of voltage & current in 3 phase star connection.	7
	b)	With the help of neat sketch,explain the operation of dynamometer type wattmeter.	7
	c)	With the help of circuit diagram & switching table , explain the two way control of a lamp.	6

OR

7.	a)	Mention the advantages of three phase system over single phase system	6
	b)	Sketch & explain plate earthing in detail	6
	c)	A balanced star connected load of 6+ j8 ohm per phase is connected to a 3 phase , 400 Vsupply. Estimate (i) the phase current (ii) real power (iii)reactive power (iv) power factor.	8

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