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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

I Sem B.E. (Credit System) Mid Semester Examinations – I, January 2015

14EE105 – BASIC ELECTRICAL ENGINEERING

Duration: 1 Hour

Max. Marks: 20

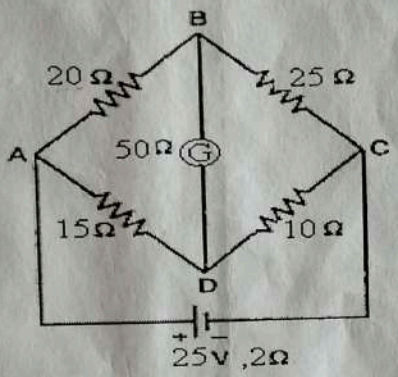
*Note: Answer any **One** full question from **each Unit.***

Unit – I

1. a) With an example explain Kirchoff's laws. 04

   b) Find the inductance of a coil of 300 turns wound on a paper core tube of 25cm length and 4cm radius. Also calculate energy stored in it if current rises from zero to 5A. 06

2. a) Using loop equations find the current flowing through all the resistances.



06

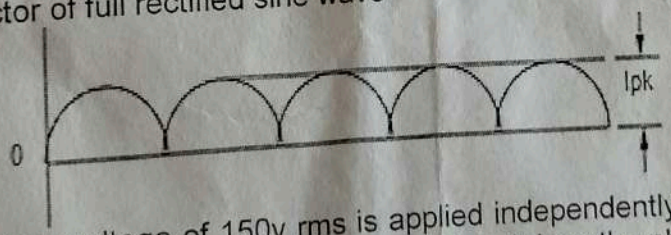
   b) State and illustrate Faraday's Laws of electromagnetic induction and Lenz's law. 04

Unit – II

3. a) Define and derive expression for the RMS value of a sinusoidally varying voltage. 04

   b) A pure inductive coil allows a current of 10 A to flow from 230 V, 50 Hz supply. Find i) inductive reactance of the coil ii) inductance iii) absorbed power. Also write down the equations of voltage and current. 06

4. a) Obtain form factor of full rectified sine wave



06

   b) A 50Hz alternating voltage of 150v rms is applied independently to resistance of 10 ohm, find the expression for the instantaneous current and draw the phasor diagram. 04

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14EE105 – BASIC ELECTRICAL ENGINEERING

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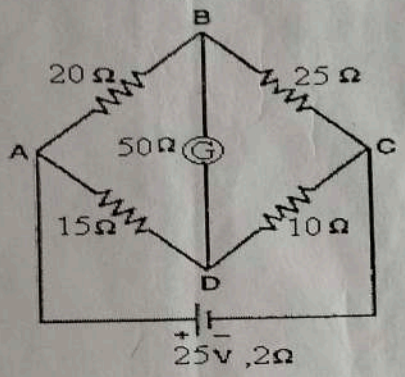

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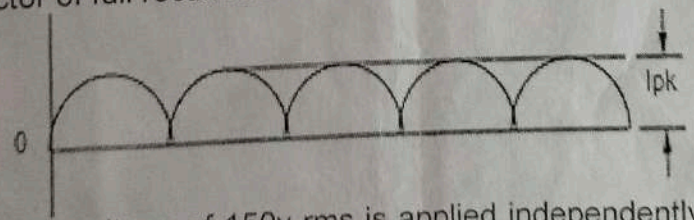

06

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

II Sem B.E. (Credit System) Mid Semester Examinations - II, March 2015

14EE105 - BASIC ELECTRICAL ENGINEERING

Duration: 1 Hour

Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

Unit – I

1. a) A delta connected load consists of 10Ω and a capacitance of 100μF in each phase. A supply of 410 V at 50 Hz is applied to the load. Find the line current, power factor and power consumed by the load ? 04
   b) With a neat diagram explain the workiing of an induction type single phase energy meter. 06

2. a) A single phase 20KVA transformer has 1000 primary turns and 2500 secondary turns. The net cross sectional area of the core is 100 sq.cm. When the primary winding is connected to 500V, 50Hz supply, Find i) the maximum value of the flux density ii) the voltage induced in the secondary winding iii) the primary and secondary full load currents. 04
   b) Prove that the power in a balanced 3phase Delta connected circuit can be measured by using 2 wattmeters. Draw the relevant connection diagram and vector diagram? 06

Unit – II

3. a) With neat constructional details explain the working principle of 1 phase transformer 04
   b) Each of the two watt meters connected to measure the input to a 3 phase system reads 10 kW on a balanced load when the power factor is unity. What does each instrument reads when the power factor falls to (a) 0.866 lagging (b) 0.5 leading. The total 3 phase power remains unchanged. 06

4. a) A 4 pole lap wound DC generator has a useful flux of 0.07 Wb per pole. Find the EMF generated when it is rotated at a speed of 900 RPM. The armature consists of 440 conductors. Find the EMF generated if this lap wound armature is replaced by wave wound armature. 04
   b) With neat sketch explain the constructional features of a DC machine. 06

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

I Sem B.E. (Credit System) Mid Semester Examinations - II, October 2015

15EE105 – BASIC ELECTRICAL ENGINEERING

uration: 1 Hour

Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

		Marks	BT*
	Unit – I		
a)	With a neat sketch explain the working of attraction type of moving iron instruments	4	L*2
b)	For the given Star connected load, show that two wattmeters are sufficient to measure three phase power expended in the load.		

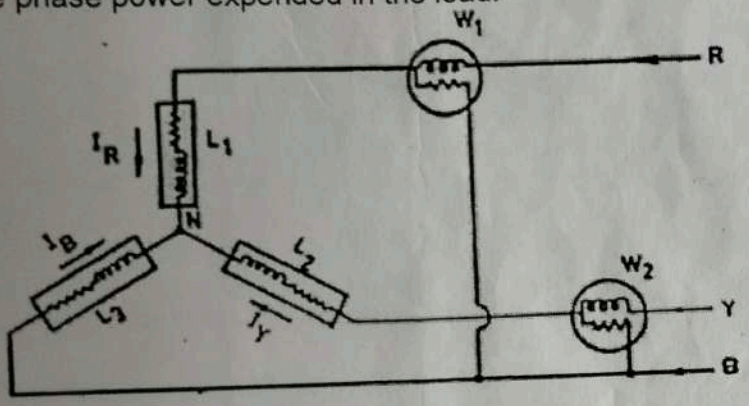

Fig . Star connected load

6 L5

a) A resistance of 10 Ohms, inductive reactance of 8 Ohms and a capacitive reactance of 15 Ohms are connected in parallel across a single phase 120V, 50Hz mains. Determine i) total current ii) circuit power factor iii) power. 4 L4
b) List any four advantages of 3-phase system over single phase system 2 L1
c) With neat sketch explain the functioning of an induction type single phase energy meter 4 L2

Unit – II

a) A 4 pole lap wound DC generator has a flux of 0.07 Wb per pole. Find the EMF generated when it is rotated at a speed of 900 RPM. The armature consists of 440 conductors. Also find the EMF generated if this lap wound armature is replaced by wave wound armature 4 L3
b) Define voltage regulation and efficiency of a single phase transformer 2 L1
c) Explain the function of the following parts of a DC machine i) Yoke ii)Poles iii) Commutator 4 L2

a) A 50kVA transformer has $N_1:N_2 = 300:20$. The primary winding is connected to a 2200V, 50Hz supply. Calculate i) secondary voltage on no-load ii) approximate values of primary and secondary currents on full load iii) the maximum value of the flux 4 L3
b) Explain the working principle of auto transformer 3 L2
c) Explain the working principle of a DC generator 3 L2

* Bloom's Taxonomy, L* Level

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