GANPAT UNIVERSITY
B.TECH SEM-II (IT/CE/EC/BM&I)
REGULAR EXAMINATION MAY-JUNE 2013
2EE101:-ELEMENTS OF ELECTRICAL ENGINEERING

Time: 3 Hours   Total Marks:-70

Instructions: - 1. Attempt all questions.
         2. Make suitable assumptions wherever necessary.
         3. Figures to the right indicate full marks.

SECTION-I

Que-1 (A)	Prove that total inductance for mutually coupled coils connected in series $L=L1+L2\pm2M$	[06]
(B)	Compare magnetic circuit with electric circuit.	[06]

OR

Que-1 (A)	What do you conclude by the term "co-efficient of coupling"? Derive its expression.	[06]
(B)	Discuss joules law of electric heating.	[06]

Que- 2 (A)	What is capacitor? Discuss time constant of a circuit that includes a resistor and a capacitor connected in series.	[06]
(B)	State and explain Superposition theorem. How it is applied for solving the network?	[05]

OR

Que- 2 (A)	Explain Construction, working and application of lead acid battery.	[06]
(B)	Discuss Different lighting schemes.	[05]

Que-3   **Attempt any three.**   [12]

(A) An iron ring of 50cm mean diameter and 10cm^2 cross section has 1000 turns of insulated copper wire wound uniformly on it. If it produce a flux of 2.5 mwb when a current of 4 A flows through it. Calculate the relative permeability of the iron.

(B) The number of turns in a coil is 250.When a current of 2A flows in this coil, the flux in the coil is 0.3mwb.when this current is reduce to zero in 2msec, the voltage induced in a coil lying in the vicinity of coil is 63.75V.If the co-efficient of the coupling between the coils is 0.85,find self inductance of the two coils, mutual inductance and number of turns in the second coil.

(C) A capacitor of 2 μf capacitance is joined in series with 2MΩ resistance to a d.c supply of 100 V. Calculate the current flowing and the energy stored in the capacitor at the end of an interval of 4 seconds from the start.

(D) Explain magnetic hysteresis.

SECTION-II

Que-4 (A) Define average value and obtain the same for a half wave rectified sinusoidal voltage wave. [06]

(B) Explain any one method for solving parallel ac circuit. [06]

OR

Que-4 (A) Write Short note on PMMC. [06]

(B) Discuss the safety rules and write function of fuse, relay, MCB, ELCB. [06]

Que- 5 (A) What is an impedance triangle? Draw impedance triangles for R-L, R-C and R-L-C series circuit. [06]

(B) Derive the relation between line voltage and phase voltage, line current and phase current for star connection. [05]

OR

Que- 5 (A) Explain two wattmeter method for 3-Ø power measurement. [06]

(B) Define tariff and discuss types of tariff. [05]

Que-6 **Attempt any three Questions** [12]

(A) An alternating current varying Sinusoidally has rms value 20A and frequency 50Hz.Write the equation of instantaneous value and find this value (i) 0.00025 sec and (ii) 0.0125 sec after passing through the positive maximum value. At what time measured from the zero reference time will the value of instantaneous current be 14.14A?

(B) Find the current that will flow through a coil of negligible resistance and inductance of 60mH, when connected to 230V, 50Hz, 1- Ø supply. What will be the current if the frequency is (i) decreased to 20Hz and (ii) increased to 60 Hz.

(C) An ac parallel circuit is composed of two impedances Z1=5+j10 and Z2=10-j15.if the total current drawn is 20 A, Find the power in each branch and voltage across inductive branch. Also determine the total reactive power of the circuit.

(D) Compare Series resonance with parallel resonance.

END OF PAPER
Best of Luck