Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: X 10901 **Date: 23/01/2013**

Subject Name: Element of Electrical Engineering

Time: 10.30 am - 01.00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Explain the similarity & dissimilarity between magnetic circuit & electrical circuit	**07**
	(b)	Derive the expression for equivalent capacitance for a group of capacitor are connected in series & parallel	**07**
Q.2	**(a)**	Explain the absolute & relative permittivity of the system & also explain the laws of electrostatics	**07**
	(b)	Explain dynamically & statically induce E.M.F.	**07**
		OR	
	(b)	Define (a) M.M.F. (b) Relative Permeability (c) Self Inductance (d) Mutual inductance (e)Reluctance (f)Magnetic field Intensity (g) Magnetic Flux Density	**07**
Q.3	**(a)**	State and explain Lenz's law.	**07**
	(b)	Find the current in Z_1 and Z_2 respectively when they are connected in parallel and supplied by 230 volts rms. Also find total current drawn and power factor. $Z_1 = 3 + j\,4\ \Omega$ $Z_2 = 3 - j\,4\ \Omega$	**07**
		OR	
Q.3	**(a)**	A relative soft Iron ring of relative permeability 1000 has mean circumference of 800mm & cross sectional area 500mm square, a radial air gap of 1mm width is cut in the ring which is wound with 1000turns.Calculate the current require to produce an airgap flux of 0.5mwb, if leakage factor is 1.2 & stacking factor is 0.9	**07**
	(b)	Explain the resonance phenomena in R-L-C Series circuit & derive the equation for resonance frequency	**07**
Q.4	**(a)**	Define the followings (a)phase(b) Frequency (c) form Factor (d) Amplitude (e) derive the equation for R.M.S value using analytical method for sinusoidal quantity	**07**
	(b)	Explain the phenomena of A.C. through pure inductor with circuit & vector diagram, also prove that active power consumption is zero	**07**
		OR	
Q.4	**(a)**	Explain the phenomena for the generation of three phase power & also state it's advantages & dis advantages over single phase	**07**
	(b)	Define Phase voltage & line voltage & derive the equation between them for three phase star connection	**07**
Q.5	**(a)**	Explain B-H curve for magnetic circuit.	**07**
	(b)	Explain wiring diagram for tube light.	**07**
		OR	
Q.5	**(a)**	Explain measurement of 3-phase power by two wattmeter method.	**07**
	(b)	Explain admittance method for a.c parallel circuit	**07**

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