GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER 1st / 2nd EXAMINATION (OLD SYLLABUS) – SUMMER - 2017

Subject Code: 110005 Subject Name: Elements of Electrical Engineering Time: 2:30 PM to 05:00 PM Instructions: Date: 07/00 Total Man				
Q.1	(a)	Explain the similarity and dissimilarity between electric circuit and magnetic circuit.	07	
	(b)	Define : (i) RMS value (ii) Average value (iii) Form factor (iv) Peak factor (v) Frequency (vi) Time period (vii) Amplitude	07	
Q.2	(a) (b)	Derive expression for star to delta conversion of resistive network. Explain Faraday's laws of electromagnetic induction. What is difference between statically induced e.m.f. & dynamically induced e.m.f.?	07 07	
Q.3	(a)	Explain the phenomena of A.C. through pure capacitor with circuit and vector diagram. Also prove that active power consumption is zero.	07	
	(b)	Two capacitors having 8 μ F and 4 μ F are connected in series and charges from a constant voltage of 210 V supply. Calculate: (i) Voltage across each capacitor (ii) Charge on each capacitor	07	
Q.4	(a)	Explain resonance condition in series R-L-C circuit. Also derive equation of	07	
	(b)	resonant frequency. A circuit consists of a resistance of 4 Ω, inductance of 0.5 H and a variable capacitance in series across a 100 V, 50 Hz supply. Calculate: (1) The value of capacitance to produce resonance (2) The voltage across the capacitance and (3) The Q-factor of the circuit.	07	
Q.5	(a) (b)	Explain the method of measuring 3-phase power by two wattmeter method. Two watt meters are connected to measure 3-phase power for star connected load and read 5.185 kW and 10.37 kW. The line current 10 A. Calculate: (i) Line and phase voltage (ii) Resistance and reactance per phase.	07 07	
Q.6	(a)	Derive the relation between line voltage and phase voltage, line current and phase current in delta connection.	07	
	(b)	Draw and explain the wiring diagram for the staircase wiring.	07	
Q.7	(a) (b)	Classify and explain various types of lighting schemes. List various protective devices used in the electric circuits and compare working of ELCB with MCB.	07 07	
