

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER 1st / 2nd EXAMINATION (NEW SYLLABUS) – SUMMER - 2017

Subject Code: 2110005

Date: 07/06/2017

Subject Name: Elements of Electrical Engineering.

Time: 2:30 PM to 05:00 PM

Total Marks: 70

Instructions:

1. **Question No. 1 is compulsory. Attempt any four out of remaining Six questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	Objective Question (MCQ)	Mark
	(a)	07
	<ol style="list-style-type: none">1. Define Temperature Coefficient.2. Draw Impedance Triangle for R-L series and R-C series circuit.3. What is the power factor for pure resistive circuit?4. Two capacitors of value 2 Micro Farad are connected in parallel. What is the value of equivalent capacitance?5. Write the equation for resonant frequency of R-L-C series circuit.6. What is the unit of Magneto motive force?7. Define Ampere Hour efficiency of Battery.	
	(b)	07
	<ol style="list-style-type: none">1. Draw Circuit diagram for Tube Light wiring.2. Two capacitors of value 2 Micro Farad are connected in series.. What is the value of equivalent capacitance?3. Define Time period and Frequency.4. Two same value of resistors are connected in series across 200 V DC supply. What is the value of voltage across each resistor?5. Write the equation of quality factor Q.6. What is the unit of Electric field intensity?7. List out types of wiring system.	
Q.2	(a) Explain Ohm's law and limitation of it.	03
	(b) Explain KCL and KVL.	04
	(c) Derive the necessary equation for conversion of Star connection to Delta Connection.	07
Q.3	(a) Draw B-H curve for different types of magnetic materials.	03
	(b) Explain the difference between electric circuit and magnetic circuit.	04
	(c) Three currents are represented by $i_1 = 25 \cos \omega t$, $i_2 = 20 \sin (\omega t - \pi/2)$, $i_3 = 15 \sin (\omega t - \pi/6)$. Find the value of resultant current and phase angle. Write the equation of resultant current.	07
Q.4	(a) List out the materials required for residential wiring.	03
	(b) Explain the methods to analyze the ac parallel circuit.	04
	(c) Why fuse is always connected in series with phase wire? Draw well labeled circuit diagram for residential wiring which includes energy meter, main switch, distribution board, switch board and load.	07
Q.5	(a) Explain the specifications of Battery.	03
	(b) A 3 phase star connected balanced load is supplied with 400 V ac supply. The two wattmeter readings are: 10 kW and -3.5kW. Find the load power factor and line current.	04

- (c) Explain the two wattmeter method for measurement of 3-phase power. **07**
- Q.6** (a) Derive necessary equation for energy stored in capacitor. **03**
(b) State and explain Faraday's laws of electromagnetism. **04**
(c) Explain the charging and discharging of capacitor. **07**
- Q.7** (a) A single phase R-L series circuit is connected with 200 V, 50 Hz ac supply. The value of resistor and inductive reactance is 10Ω and 5Ω respectively. Find Impedance, current and power factor of circuit. **03**
(b) Explain the R-L-C series resonance phenomena. **04**
(c) Determine the Average and R.M.S. value of sinusoidal wave form. **07**
