

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-I & II EXAMINATION – WINTER 2015

Subject Code: 110005

Date: 02/01/2016

Subject Name: Elements of Electrical Engineering

Time: 10:30am to 01:00pm

Total Marks: 70

Instructions:

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

- Q.1** (a) Explain effect of increase of temperature on resistance in case of i) Pure metals ii) Insulators iii) Semi conductors. Also define Temperature coefficient of resistance with its unit. **07**
- (b) State and explain Kirchoff's Laws applied to electric circuit. **07**
- Q.2** (a) Derive the equation: $V_c = V[1 - e^{-t/RC}]$ for charging of a capacitor **07**
- (b) When two capacitors A and B are connected across 200volt d.c. supply, the potential difference across A is 120 volt and that across B is 80 volts. The potential difference across A rises to 140 volts when B is shunted by $3\mu F$ capacitor. Calculate capacitance of A and B, assuming the supply voltage same in both cases. **07**
- Q.3** (a) Give the comparison between electrical and magnetic circuits. **07**
- (b) Explain statically induced e.m.f and mutually induced e.m.f. in detail. **07**
- Q.4** (a) Define: i) RMS Value ii) Average value iii) Crest factor iv) Phase sequence v) Amplitude vi) Frequency vii) Phase difference **07**
- (b) A choke coil of negligible resistance is connected across 230V, 50 Hz supply. It draws 5Amp from mains. Calculate the inductance of a coil. If the frequency is reduced to 40 Hz, what will be the current drawn from mains? **07**
- Q.5** (a) Explain the resonance in R-L-C series circuit. **07**
- (b) Explain the method of measuring power in 3 phase circuit by two wattmeter method with relevant phasor diagram. **07**
- Q.6** (a) Explain the construction and working of Lead acid battery **07**
- (b) Write short note on stair case wiring with necessary diagram. **07**
- Q.7** (a) State and describe various types of lighting schemes. **07**
- (b) What is earthing? What is purpose of earthing? Classify any three methods of earthing. **07**
