

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC SEM-I Examination-Dec-2011

Subject code: X10901

Date: 21/12/2011

Subject Name: Elements of Electrical Engineering

Time: 10.30 am -1.00 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 Faraday's laws of electromagnetic induction. **07**
(b) Compare statically induced emf and dynamically induced emf. **07**
- Q.2** (a) State and explain Lenz's law. **07**
(b) Discuss effect of temperature on resistance. **07**
- OR**
- (b) Explain charging of capacitor. **07**
- Q.3** (a) Compare electric circuit and magnetic circuit. **07**
(b) Define following terms. **07**
(1)M.M.F. (2)Reluctance (3)Permeability (4)Time constant
(5)Frequency (6)Power factor (7)Time period
- OR**
- Q.3** (a) Find the average value, RMS value, form factor and peak factor for full wave rectified circuit. **07**
(b) Three currents are represented by $I_1 = 10\sin\omega t$, $I_2 = 20\sin\{\omega t - \pi/6\}$, $I_3 = 30\sin\{\omega t + \pi/4\}$. Find the magnitude and phase angle of the resultant current. **07**
- Q.4** (a) Discuss resonance in R-L-C series circuit. **07**
(b) Explain admittance method for a.c parallel circuit **07**
- OR**
- Q.4** (a) Prove that power consumption of pure capacitive circuit is zero. **07**
(b) Three similar coils each of 28Ω resistance and inductance of $0.7H$ are connected in (i)star (ii)delta. If the supply voltage is $230 V$, $50 Hz$., calculate the line current and total power absorbed. **07**
- Q.5** (a) Explain measurement of 3-phase power by two wattmeter method. **07**
(b) Explain wiring diagram for tube light. **07**
- OR**
- Q.5** (a) Explain B-H curve for magnetic circuit. **07**
(b) Derive an expression for total power for a balanced 3-phase star or delta connected load. **07**
