

SILVEROAK COLLEGE OF ENGINEERING & TECHNOLOGY**BE - SEMESTER-II • MID SEMESTER-I • EXAMINATION – SUMMER 2019****SUBJECT: BASIC ELECTRICAL ENGINEERING (3110005) (IT/AE/ME/CL)**

DATE: 30-03-2019

TIME: 08:00 am to 09:30 am

TOTAL MARKS: 40

Instructions: 1. All the questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data if required.

- Q.1 (a) Discuss the below questions in short [3]**
 (i) For pure capacitive circuit what will be the value of power factor?
 (ii) For parallel R-L-C circuit with $R=90\Omega$, $L=16H$ and $C=160\text{ mF}$, obtain the value of resonant frequency?
 (iii) In balance star connected system phase voltage lags Line voltage by _____ angle?
(b) Explain KCL & KVL [3]
(c) Prove that $I_{av}=0.637I_m$ [4]
- Q.2 (a) Explain method of measuring of 3-phase power with Two Watt-meter method with its circuit and Phasor diagram. [6]**
(b) Define R.M.S value and Prove that $I_{r.m.s}=0.707I_m$ [5]
(c) Describe Thevenin's Theorem with Example. [4]
- OR**
- Q.2 (a) Derive the equation of Capacitor voltage in a series R-C circuit connected to a DC supply through a switch. Assume that switch is initially open with zero voltage in capacitor and it is closed at $t=0$. [6]**
(b) Derive the equations of active, reactive and apparent power in a series R-L circuit with sinusoidal AC supply [5]
(c) Define and write the unit of (1) Peak Factor (2) Form Factor (3) Power factor (4) Frequency [4]
- Q.3 (a) Explain R-L-C series circuit with Phasor diagram [6]**
(b) Circuit consists of Resistance of 10Ω Capacitance of $20\mu\text{F}$ and Inductance of $0.16H$ are connected in series. Supply voltage is 240 V and Frequency is 50 Hz . Calculate (1) Current (2) Voltage across Resistor (3) Reactive power [5]
(c) With 21 V applied, if $R_1 = 5\text{ ohm}$, $R_2 = 35\text{ ohm}$, and $R_3 = 14\text{ ohm}$, what is the current of R_2 if R_1 is series connected with parallel circuit R_2 and R_3 ? [4]
- OR**
- Q.3 (a) Derive the relation between phase & line values of voltages & currents in 3-phase Star Connection. [6]**
(b) Define Resonance frequency and Derive the equation for frequency at which current is maximum in R-L-C Series circuit. [5]
(c) Describe Norton's Theorem with Example. [4]