

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– 1st / 2nd • EXAMINATION – SUMMER 2016

Subject Code: 110005

Date:08/06/2016

Subject Name: Elements of Electrical Engineering

Time: 02:30 PM to 05:00 PM

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) State and explain Kirchoff's laws with suitable example. 07
(b) Write expressions of star to delta and delta to star conversion for three resistances. 07
Three resistances of 5 Ω , 10 Ω and 15 Ω are connected in star connection. Find equivalent resistances in delta connection.
- Q.2 (a) Define capacitance. Derive capacitance of parallel plate capacitor with uniform dielectric medium. 07
(b) Three capacitances of 50 μ F, 25 μ F and 10 μ F are connected in series across 250V supply. Find voltage across each capacitor. Also find charge on each capacitor if they are connected in parallel. 07
- Q.3 (a) Give comparison between electric circuit and magnetic circuit. 07
(b) An iron ring of mean length 60 cm has air gap of 1 mm wound with 200 turns. The relative permeability is 300. If the current flow through coil is 1 A, calculate flux density. 07
- Q.4 (a) Define (i) Frequency (ii) RMS value (iii) Average value (iv) Form factor (v) Power factor (vi) Instantaneous value (vii) Amplitude 07
(b) Prove that current in pure capacitive circuit leads its voltage by 90°. Draw phasor diagram. 07
- Q.5 (a) Explain resonance in R-L-C series circuit. Define Q-factor. 07
(b) Derive relationship between line and phase current and voltage relation in 3-phase delta connection. Draw phasor diagram. 07
- Q.6 (a) Explain constant current and constant voltage charging methods for battery. 07
(b) Explain types of wiring system. Draw staircase wiring diagram. 07
- Q.7 (a) Define illumination. Explain types of lighting schemes. 07
(b) Explain working of earth leakage circuit breaker with diagram. 07
