

Question Paper Code: 42307

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Second Semester

Electrical and Electronics Engineering

14UEE207- ELECTRIC CIRCUITS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

1. Six light bulbs are connected in parallel across 110 *V*. Each bulb is rated at 75 *W*. How much current flows through each bulb?

(a) 0.321 <i>A</i>	(b) 0.682 <i>A</i>	(c) 7.5 A	(d) 110 A

- 2. A 100 Ω resistor is connected across the terminals of a 9 V battery. What is the power dissipation in the resistor?
 - (a) 9 W (b) 0.09 W (c) 0.19 W (d) 0.81 W
- 3. Three equal resistances of 9 Ω are connected in delta. What is the resistance in one of the arms in an equivalent star circuit?
 - (a) 3 Ω (b) 9 Ω (c) 1 Ω (d) 27 Ω
- 4. Maximum power is transferred to load, when the load resistance is
 - (a) equal to half of the source resistance(b) equal to source resistance(c) equal to zero(d) equal to twice the source resistance
- 5. In a series RLC circuit, if C is increased, the resonant frequency

(a) Increases (b) Decreases (c) Remains the same (d) Becomes zero

6. Impedance of an ideal parallel resonant circuit without resistance in either branch is

7. Transient response occurs

(a) In resistive circuits only	(b) In inductive circuits only
(c) In capacitive circuits only	(d) In both (b) and (c)

- 8. An RL circuit has $R = 2 \Omega$ and L = 4 H. The time constant is
 - (a) 4*s* (b) 0.5*s* (c) 8*s* (d) 2*s*

9. In a three phase system, the volt-ampere rating is given by

(a) $V_L I_L$ (b) $3V_L I_L$ (c) $1.732 V_L I_L$ (d) $V_L I_L/3$

10. Two wattmeter method of power measurement can be used to measure power in

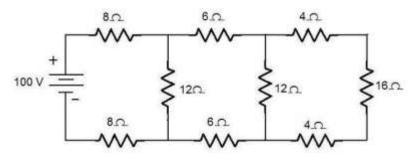
(a) Balance circuits	(b) Unbalanced circuits
(c) Both the (a) and (b)	(d) Neither of (a) and (b)

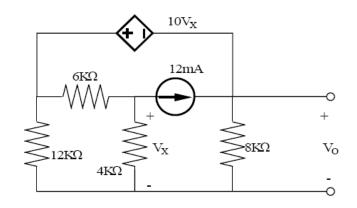
PART - B (
$$5 \times 2 = 10$$
 Marks)

- 11. State reciprocity theorem.
- 12. Modify the voltage source of 120 V in series resistance of 10 Ω into a current source in parallel resistance.
- 13. Point out the relation between self and mutual inductance.
- 14. Categorize the different types damping conditions occurred in RLC transient circuits.
- 15. Summarize the relation between line and phase values of voltage and current in a balanced star and delta connected load.

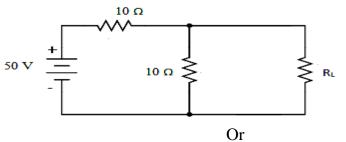
PART - C (5 x
$$16 = 80$$
 Marks)

16. (a) In the given circuit below calculate (i) the equivalent resistance across the terminals of the supply (ii) total current delivered by the source (iii) power delivered to 16 Ω resistor. (16)

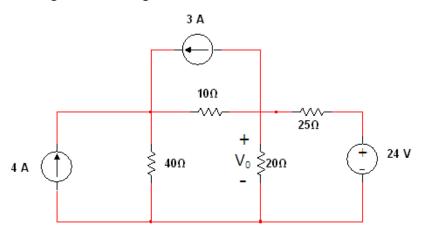




17. (a) Predict the value of load resistance so that maximum power is transferred from battery. (16)



(b) Calculate the voltage V_0 for the given circuit below.



18. (a) State the condition for resonance in series RLC circuit and obtain the expression for resonant frequency. Derive the expression for bandwidth for a series RLC circuit as a function of resonant frequency. (16)

Or

(b) For a two-branch parallel circuit $R_L = 15 \ \Omega$, $R_C = 30 \ \Omega$, $X_C = 30 \ \Omega$, $E = 120 \ V$ and $f = 60 \ Hz$. For the condition of resonance, calculate (1) the two values of *L* and (2) the two values of total current. (16)

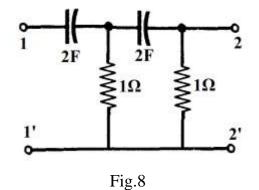
(16)

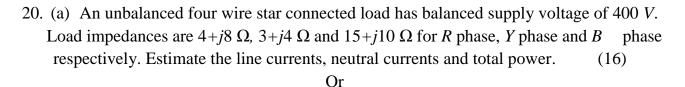
19. (a) Explain the characterization of two port networks in terms of Z, Y and h parameters.

(16)

Or

(b) Find the *Y* parameters for the *RC* ladder network shown in Fig.8. (16)





(b) Explain in detail the phasor diagrams of the voltages and currents of a three phase unbalanced circuit. (16)