Reg. No. :

Question Paper Code: 42307

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Second Semester

Electrical and Electronics Engineering

14UEE207- ELECTRIC CIRCUITS

(Regulation 2014)

Duration: 1.15 hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. If a resistor to carry 1 A of current to handle 100 W of power, estimate the value of resistance. Assume that voltage can be adjusted to any required value.

    (a) 50 Ω   (b) 100 Ω   (c) 10 Ω   (d) 1 Ω

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) 0.9 *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. The admittance and impedance of the following kind of network have the same properties

    (a) LC   (b) RL   (c) RC   (d) RLC

7. In a series parallel circuit, any two resistances in the same current path must be in

(a) series with each other
(b) parallel with each other
(c) series with the voltage source
(d) parallel with the voltage source

8. An RL circuit has $R = 2\ \Omega$ and $L = 4\ H$. The time constant is

(a) $4s$ (b) $0.5s$ (c) $8s$ (d) $2s$

9. In a Y-Y system, a line voltage of 220 V produces a phase voltage of

(a) 381 V (b) 156 V (c) 127 V (d) 22 V

10. In the measurement of 3 phase power by two Wattmeter method, if the two Wattmeter readings are equal and have same sign, the power factor of the circuit is

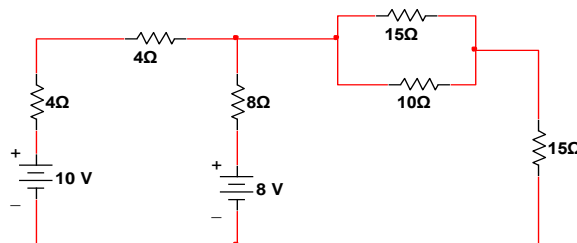(a) unity   (b) zero   (c) 0.8 leading   (d) 0.8 lagging

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Determine the current supplied by each battery in the circuit shown in figure using mesh analysis. (8)
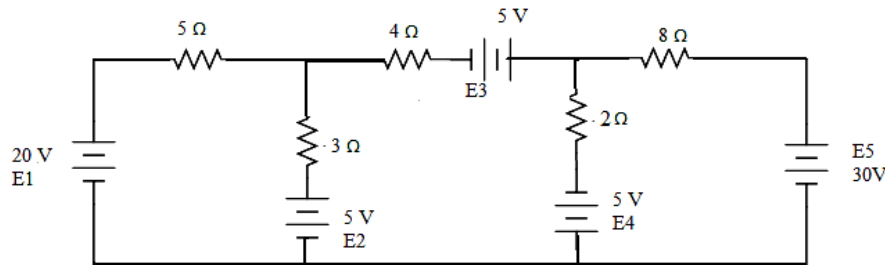
12. Calculate the current in 10 Ω resistor of the network shown below using superposition theorem. (8)

13. 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. (8)

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14. Derive the expression for the current $i(t)$ in the series RC circuit: (a) with initial conditions (b) with relaxed initial conditions for a step input excitation, using Laplace transform technique. (8)

15. With a neat circuit and phasor diagram explain the three phase power and power factor measurement by two Wattmeter method. (8)