C   **Reg. No. :**

Duration: Three hours   Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. Which among the following is true about ohm's law?   CO1- U

    (a) $I \propto V$ (b) $I = V/R$ (c) $V = IR$ (d) All of the above

2.   The form factor of sinusoidal wave form is ____   CO2- U

    (a) 1.414   (b) 1.11   (c) 0   (d) 1.5

3. When the power transferred to the load is maximum, the efficiency of   CO3- U
    power transfer is

    (a) 25%.   (b)100%.   (c) 75%.   (d) 50%

4. In a series resonance circuit, series resonance occurs when?   CO4- U

    (a) $X_L = 1$ (b) $X_C = 1$ (c) $X_L = X_C$ (d) $X_L = - X_C$

5. The time constant of an R-C circuit is?   CO5- U

    (a)RC   (b) R/C   (c) R   (d) C

PART – B (5 x 3= 15 Marks)

6. Two resistors of 4Ω and 6Ω are connected in parallel. If the total current is   CO1- U
    30A. Find the current through each resistor.

7. A sinusoidal voltage represented by the equation 100 sin 503t. What is the
    frequency and time period?   CO2- U

8. Write the expression to find the load by using Norton's equivalent circuit   CO3- U

9. Write the relation between self and mutual inductance   CO4- U
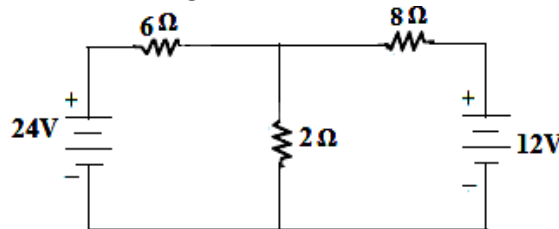
10. What is damping ratio? CO5- U

PART – C (5 x 16= 80Marks)

11. (a) In the circuit shown below, find the total resistance and the current   CO1-App   (16)
    through each branch.

Or
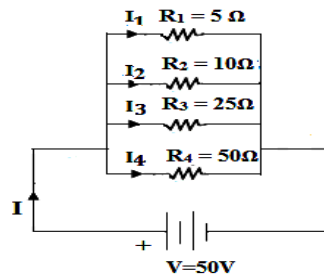
(b) By using Kirchhoff's law, find the current supplied by the batteries   CO1-App   (16)
   and the current through 2 Ω resistors for the circuit below

12. (a) Derive an expression for power and power factor of an RC series   CO2-Ana   (16)
    circuit

Or

(b) Two impedance $Z_1 = (6 + j8)\,\Omega$ and $Z_2 = (3 - j4)\,\Omega$ are   CO2-App   (16)
    connected in parallel. This combination is connected across 230V,
    50HZ AC supply. Calculate the current in each branch, total current
    and total power consumed by the circuit

13. (a) compute the current through the 6 ohm load resistance in the   CO3-App   (16)
    following figure   shown below by applying upper position
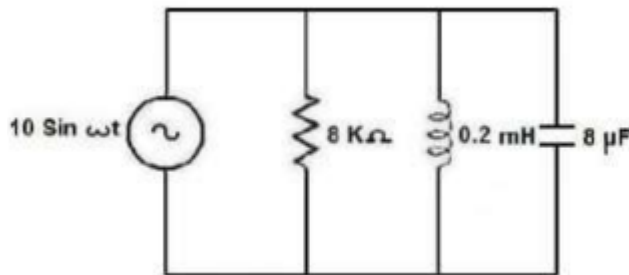   theorems

Or

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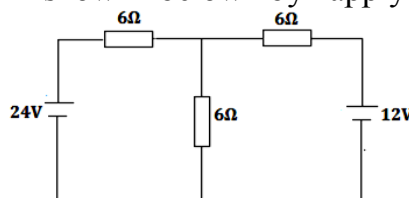
(b) (i) State and explain the procedure for Norton's theorems   CO3-Ana   (8)

(ii) In the circuit of figure ,find the current through the batteries by CO3-App   (8)
mesh method
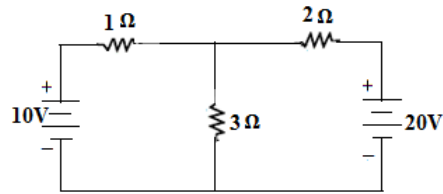
14. (a) In the parallel RLC circuit, calculate resonant frequency, bandwidth CO4-App   (16)
Q-factor and power dissipated at half power frequencies.

Or

(b) (i) Obtain the expression for resonant frequency, bandwidth and Q- CO4-U   (8)
factor for Series R-L-C circuit

(ii) Compare series and parallel resonance.   CO4-U   (8)

15. (a) Derive the step response of RL and RLC circuits. Compare their CO5-Ana   (16)
performance

Or

(b) Derive the transient response of RC series circuit when the switch   CO5-Ana   (16)
is closed at t=o

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