Reg. No. : | | | | | | | | | | |

Question Paper Code: 43403

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

Third Semester

Electronicsand Communication Engineering

14UEC303 - CIRCUIT THEORY

(Regulation 2014)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The number of independent loops for a network with n nodes and b branches is

   (a) n-1 (b) b-n
   (c) b-n+1 (d) independent for the number of nodes

2. Mesh analysis makes use of the basic equation

   (a) *[V] = [Z] [I]* (b) *[I] = [Z] [V]*
   (c) *[V] = [Y] [I]* (d) *[I] = [Y] [V]*

3. Superposition theorem is not applicable to networks containing

   (a) nonlinear elements (b) dependent voltage source
   (c) dependent current source (d) transformers

4. Maximum power gets transferred to the load when the load impedance is

   (a) equal to zero (b) equal to one
   (c) equal to source impedance (d) none of the above

5. What is the *Q* (Quality factor) of a series circuit that resonates at 6 *kHz*, has equal reactance of 4 *kilo-ohms* each, and a resistor value of 50 *ohms*?

   (a) 0.001 (b) 50 (c) 80 (d)4.0

6. The Q-factor in a series R-LC circuit at resonance is

   (a) $\frac{1}{R}\sqrt{\frac{C}{L}}$ (b) $\frac{1}{L}\sqrt{\frac{C}{R}}$ (c) $\frac{1}{R}\sqrt{\frac{L}{C}}$ (d) $\frac{1}{R^2}\sqrt{\frac{C}{L}}$

7. Self-inductance of a magnetic coil is proportional to

(a)N (b)$1/N$ (c)N^2 (d)$1/N^2$

8. In two wattmeter method of power measurement, when the power factor of load is zero leading or lagging the two wattmeter will give_____ reading.

(a) Zero (b) equal
(c) equal and opposite (d) not equal

9. Which parameters are widely used in transmission line theory?

(a) Z parameters (b) Y parameters
(c) ABCD parameters (d) h parameters

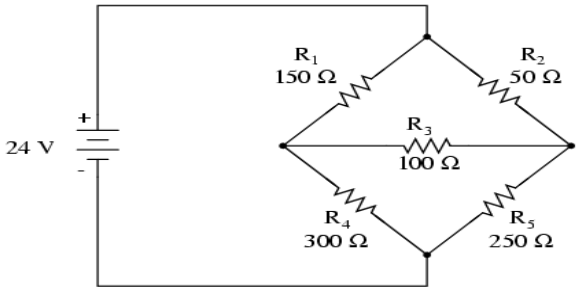
10. The number of possible combinations generated by four variables taken two at a time in a two port network is

(a) Four (b) Two (c) Six (d) Zero

PART – B (3 x 8= 24 Marks)

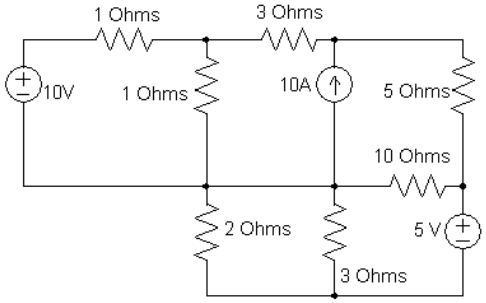
(Answer any three of the following questions)

11. Find the mesh currents for the following electric circuit shown in Figure (8)



Figure

12. Determine the current in 2 *ohm* resister for the electric circuit shown in Figure using superposition theorem. (8)

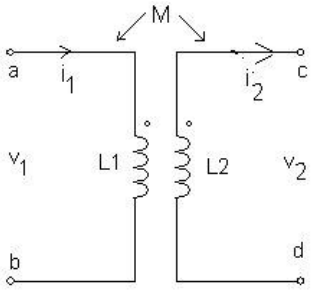


Or

13. Obtain the resonant frequency, Q-factor, band width and the voltage across the capacitor at resonance for the series RLC circuit having $R = 7.5\Omega$, $L = 6\mu H$ and $C = 40pF$, with a supply voltage of 0.5 *volts*. (8)

14. For the circuit shown in figure, $L1 = 4\ H$, $L2 = 9H$, $K = 0.5$, $i_1 = 5\ cos(50t\text{-}30^o)A$, $i_2 = 2\ \cos(50t\text{-}30^o)A$. Find

(i) V_1 (ii) V_2 (ii) total energy stored in the system at $t = 0$. (8)



15 Find the *h* parameters for the network shown in figure-6. (8)