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

Question Paper Code: 33403

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

Third Semester

Electronics and Communication Engineering

01UEC303 - CIRCUIT THEORY

(Regulation 2013)

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

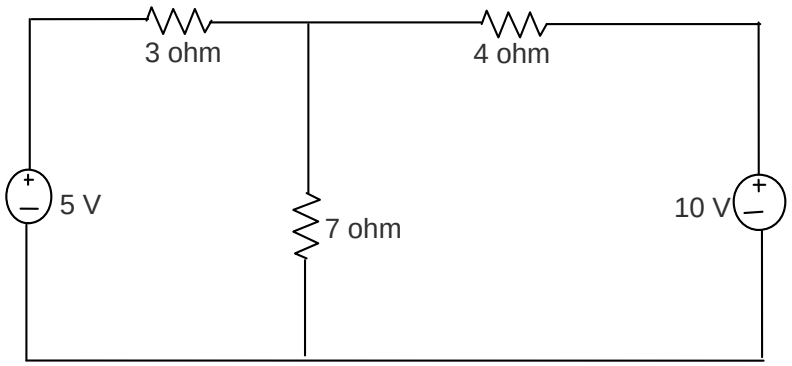
10. The number of possible combinations generated by four variables taken two at a time in a two port network is

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

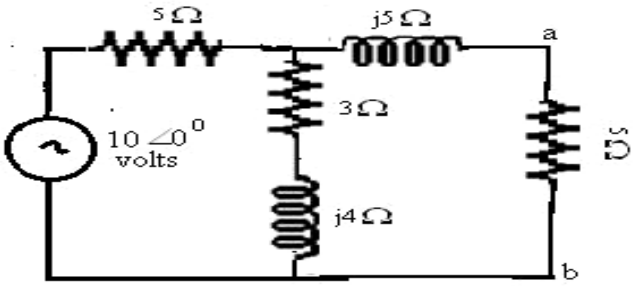
PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Draw the dual network of the given circuit. (8)



12. State the Thevenin's theorem and find the current through branch a-b of the network shown in below figure. (8)



13. A voltage *v (t)=10 sinωt* is applied to a series RLC circuit. At the resonant frequency of the circuit, the maximum voltage across the capacitor is found to be 500*V*. Moreover the bandwidth is known to be *400 rad/sec* and the impedance at resonance is 100Ω. Find the resonant frequency. Also find the values of *L* and *C* of the circuit. (8)

14. Explain the single tuned circuit with neat diagram and obtain the gain and mutual inductance. (8)

15. Convert the given T-network to a Π network. (8)