

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Second Semester

Electronics and Communication Engineering

20ECPC201 - CIRCUIT ANALYSIS

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

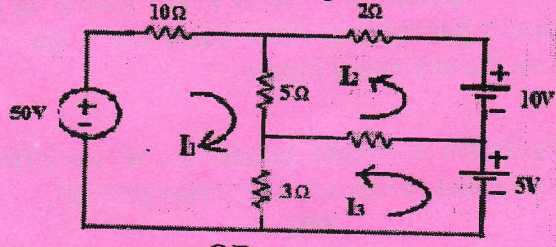
Answer ALL Questions

- | | <i>Marks,</i> |
|---|--------------------|
| | <i>K-Level, CO</i> |
| 1. Define Ideal Voltage Source. | 2,K1,CO1 |
| 2. Name the methods for drawing a dual network. | 2,K1,CO2 |
| 3. Draw the Thevenin's equivalent circuit. | 2,K1,CO3 |
| 4. What are the applications of maximum power transfer theorem? | 2,K1,CO3 |
| 5. Outline the expression for resonant frequency. | 2,K2,CO4 |
| 6. Why and where the tuned coupled circuits are employed? | 2,K1,CO4 |
| 7. In a series RL Circuit Voltage across resistor and inductor are 3V and 4V respectively, then find the applied voltage. | 2,K1,CO5 |
| 8. An RL circuit with $R = 12 \Omega$ has time constant of 5 ms. Find the value of the inductance. | 2,K1,CO5 |
| 9. What are the different types of connection in two port network? | 2,K1,CO6 |
| 10. The currents of a two port network are given by $I_1=6V_1-V_2$, $I_2=-V_1+2V_2$. Find the equivalent π network. | 2,K1,CO6 |

PART - B (5 × 13 = 65 Marks)

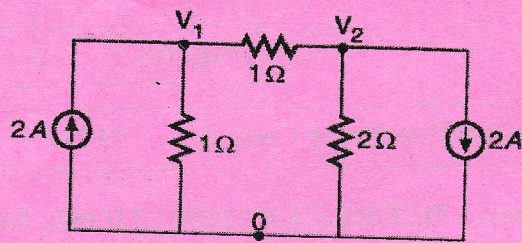
Answer ALL Questions

11. a) Solve the mesh currents for the following network. 13,K3,CO1

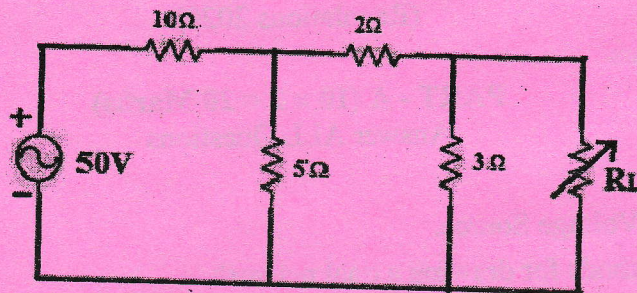


OR

- b) Solve the node voltage equations for the circuit shown in Fig. 13,K3,CO1



12. a) Identify the maximum power delivered to the load in the circuit shown in below figure. 13,K3,CO3



OR

- b) Outline an expression for star to delta conversion. 13,K2,CO3
13. a) A series RLC circuit has $R=10\Omega$, $L=0.1H$ and $C=50\mu F$. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil. 13,K2,CO4

OR

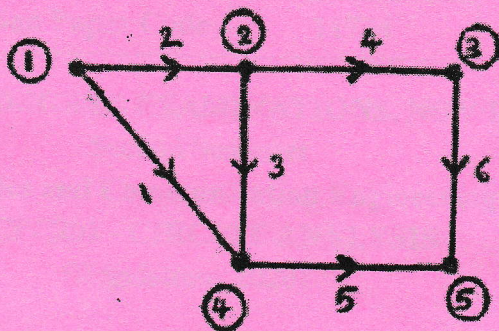
- b) A coil of inductance 5 mH and resistance 10Ω is connected in parallel with a 250nF capacitor across a 50 V variable-frequency supply. Find (a) the resonant frequency, (b) the dynamic resistance, (c) the current at resonance, and (d) the circuit Q-factor at resonance. 13,K2,CO4
14. a) Show the Transient Response of series RLC-circuit with DC excitation. 13,K2,CO5

OR

- b) A series R-C circuit has $R = 20\Omega$ and $C = 100\mu F$. A voltage $v = 200 \sin 314t$ is applied at $t = 2.14$ msec. Relate an expression for current with circuit parameters. Also, show the value of current after time 1m sec from the switching instant. 13,K2,CO5
15. a) Explain the calculation of overall parameters, if two different two- port networks are connected in cascade and series-parallel. 13,K2,CO6
- OR
- b) The Z parameters of the two port are $Z_{11}=10\Omega$, $Z_{22}=15\Omega$, $Z_{12}=Z_{21}=5\Omega$. Build the equivalent T network, Y and ABCD parameters. 13,K2,CO6

PART - C (1 × 15 = 15 Marks)

16. a) Interpret the complete and reduced incidence matrix for the given graph shown 15,K3,CO2



OR

- b) For the Given Network, illustrate a tie-set Schedule. 15,K3,CO2

