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

Question Paper Code: 33403

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Electronics and Communication Engineering

01UEC303 - CIRCUIT THEORY

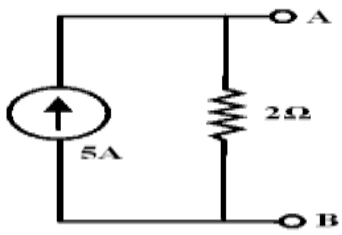
(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define ideal voltage source and current source.
2. Express the following circuit in its equivalent form using the voltage source between terminals *A* and *B*.



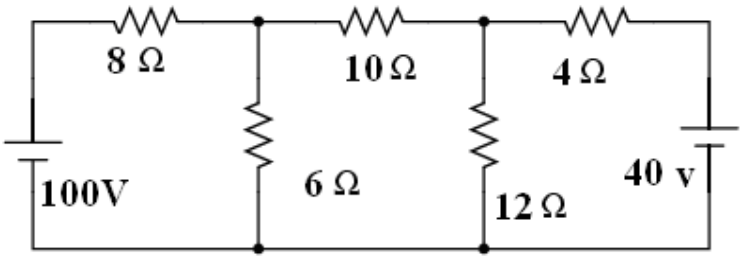
3. State maximum power transfer theorem
4. Give the condition for maximum power transfer theorem.
5. When the current is maximum in the series resonance circuit? Why?
6. Write the properties of a parallel RLC circuit.
7. Give the conditions for balanced star connected load.
8. Give the line and phase values in delta connection?
9. Define driving point and transfer point impedance.

10. What is impedance matching?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Construct a circuit which consist of three resistances of 12 Ω, 18 Ω and 36 Ω joined in parallel is connected in series with a fourth resistance. The whole circuit is applied with 60 volt and it is found that the power dissipated in 12 Ω resistor is 36 Watt. Determine the value of fourth resistance and total power dissipated in the circuit. (8)

(ii) Solve by using mesh current method and determine the current in 12 Ω resistor and also find the voltage drop across it for the circuit show below. (8)



Or

(b) (a) (i) Find the node voltage V_a and V_b which is shown in Figure -3 (16)

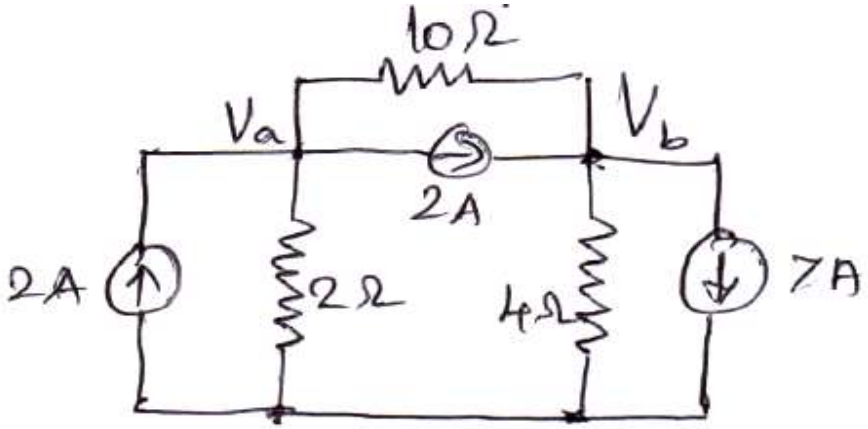
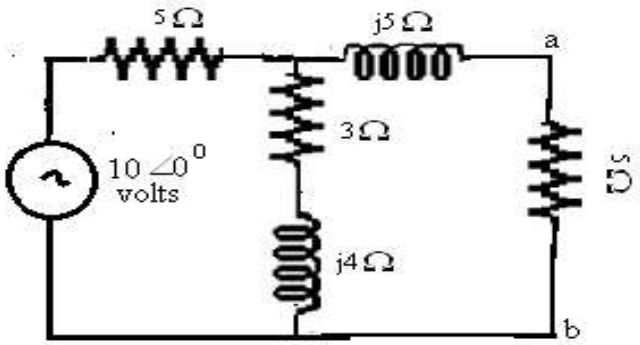


Figure-3

12. (a) State and explain Maximum power transfer theorem. Also give its applications. (16)

Or

(b) (i) State the Thevenin's theorem and find the current through branch a-b of the network shown in below figure. (16)



13. (a) A voltage $v(t)=10 \sin\omega t$ 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. (16)

Or

(b) Express the current response of RL series circuit with an excitation of $V_m \sin\omega t$ and obtain the complete solution. (16)

14. (a) With a neat circuit and phasor diagram explain the three phase power measurement by two wattmeter methods. (16)

Or

(b) (i) Show that two Watt meters are sufficient to measure power in a balanced or unbalanced three-phase load connected to a balanced supply. (8)

(ii) Find the (1) line current (2) neutral current for the unbalanced four wire star connected load has a balanced supply voltage of 400 *V*. The load impedance are $Z_R=4+j8\Omega$, $Z_Y=+j4\ \Omega$, $Z_B=15+j10\ \Omega$. (8)

15. (a) The impedance parameters of a 2 port network are

$Z_{11}= 6\Omega$, $Z_{22}= 4\Omega$, $Z_{12}= Z_{21}= 3\Omega$

Compute *Y* parameters and *ABCD* parameters. (16)

Or

(b) (i) Derive the equations for image parameters in terms of ABCD parameter. (8)

(ii) Explain in detail the characteristics of ideal low pass filter and high pass filter. (8)

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