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

Question Paper Code: 93302

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

Third Semester

Electrical and Electronics Engineering

19UEE302 – ELECTRICAL CIRCUIT ANALYSIS

(Regulation 2019)

Duration: One hour Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Which of the following combinations of components represents an impedance of (110 + j 314) Ω at a frequency of 100 Hz? CO1- App
   (a) A resistor of 314 Ω in series with an inductor of 5 mH.
   (b) A resistor of 110 Ω in series with a capacitor of 5 uF.
   (c) A resistor of 110 Ω in series with a capacitor of 5 uF.
   (d) An inductor of 50 mH in series with a capacitor of 5 uF
2. In a series parallel circuit with 6 resistances if there are three in one parallel bank, these three resistances must have CO1- App
   (a) The same current as in the voltage source
   (b) The same current
   (c) The same IR drop
   (d) An IR drop equal to the applied voltage
3. An amplifier has an output impedance Z_0 of (70 + j35) Ω. What value of load impedance will permit maximum power transfer? CO2-R
   (a) (70 + j35)Ω (b) (-70 + j35)Ω
   (c) (70 - j35)Ω (d) (-70 - j35)Ω
4. A 12 Ω resistor, a 40 μF capacitor, and an 8 mH coil are in series across an ac source. The resonant frequency is CO3- App
   (a) 28.1 Hz (b) 281 Hz (c) 2810 Hz (d) 10 KHz
5. If two winding having self-inductances L1 and L2, and a mutual inductance m are connected in series will opposite, then the total inductance of series combination will be CO3- U
   (a) L1 + L2 - 2M (b) L1 + L2 + 2M (c) L1 - L2 + 2M (d) L1 + L2 – M

6. If a coil has a resistance of 10 ohms and an inductance of 1 H, what will be the value of current 0.1 second after switching on a 500 V d.c. supply? CO4- R

(a) 6.32 A (b) 3.16 A (c) 3.7 A (d) 4.0 A

7. In a three phase, delta connection ——- CO5- R

(a) Line current is equal to phase current

(b) Line voltage is equal to phase voltage

(c) Line voltage and line current is zero

(d) None of the above

8. For a 2-port network to be reciprocal, CO6- R

(a) $Z_{11} = Z_{22}$ (b) $Y_{22} = Y_{11}$ (c) $h_{21} = -h_{12}$ (d) AD – BC = 0

9. In a three phase delta connected load, relation between line voltage and phase voltage is CO5- R

(a) Line voltage is 3 times of phase voltage

(b) Line voltage is 1.732 times of phase voltage

(c) Line voltage is equal to phase voltage

(d) Line voltage is 2 times of phase voltage

10. Which parameter of two port network is used in power system transmission and distribution network? CO6- R

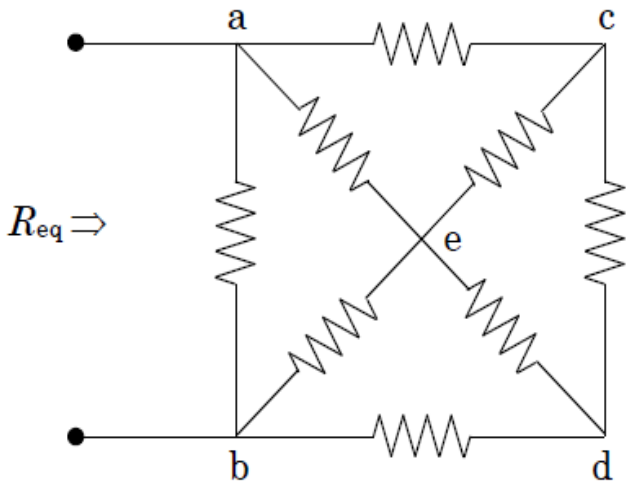
(a) *Z* - Parameter (b) *Y* - Parameter

(c) *h* - Parameter (d) *ABCD* - Parameter

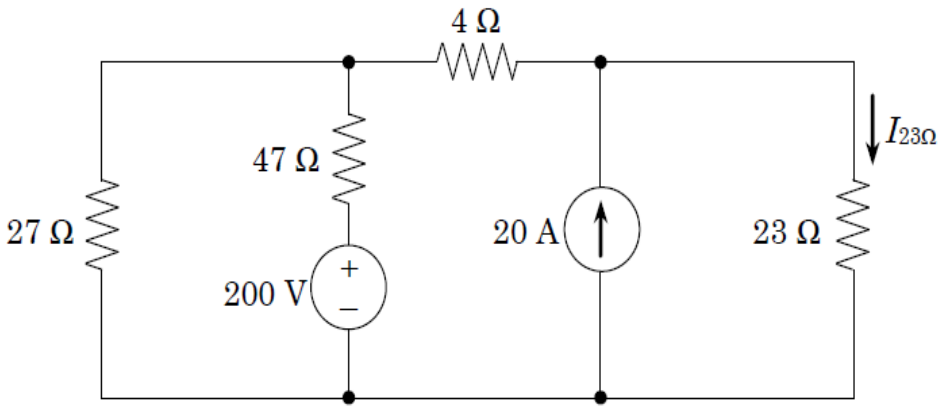
PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

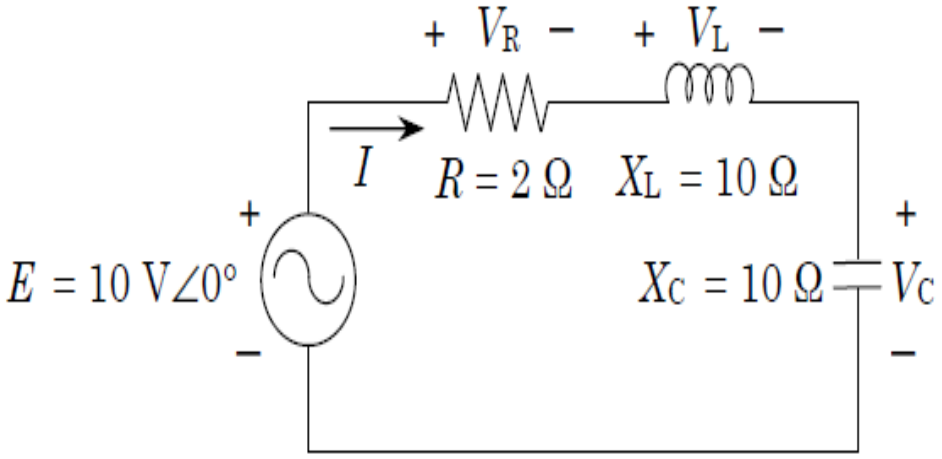
11. Calculate the equivalent resistance R_{ab} when all the resistances values are equal to 1Ω for the circuit shown below CO1- App (8)



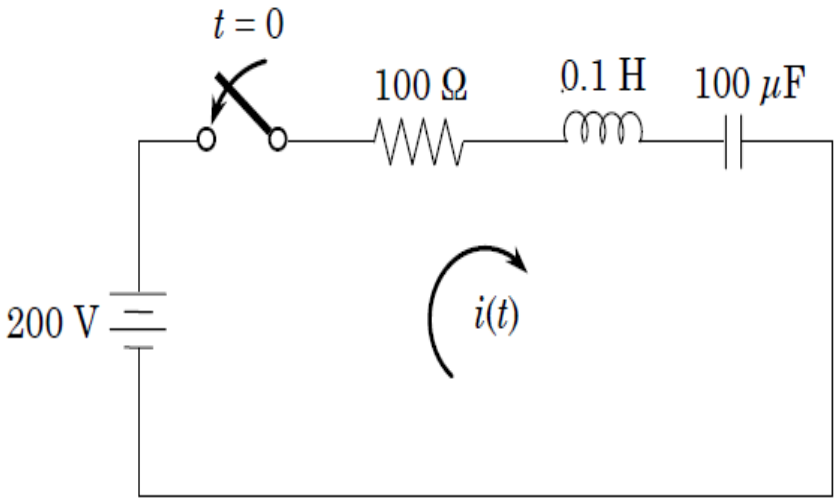
12. Compute the current in the 23 Ω resistor of the figure shown below by applying superposition principle. CO2- App (8)



13. For the series resonant of Fig, Find I; V_R; V_L and V_C at resonance. Also, if resonant frequency is 5000 Hz, determine bandwidth, Q factor, half power frequencies, and power dissipated in the circuit at resonance and at the half power frequencies. Derive the expression for resonant frequency. CO3- App (8)



14. A series RLC circuit with R =100 Ω, L = 0.1H, and C = 100μF has a DC voltage of 200V applied to it at t=0 through a switch. Find the expression for the transient current. Assume initially relaxed circuit condition. CO4- App (8)



15. Three equal impedances, each of (8 + j10) Ω are connected in star. This is further connected to a 440 V, 50 Hz, three phase supply. Calculate the active and reactive power and line and phase currents. CO5- E (8)