Register Number:

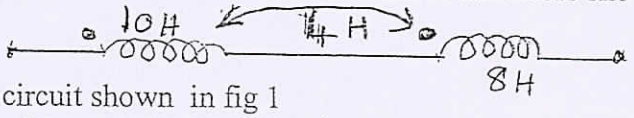
B.E /B.Tech (Full Time) END SEMESTER EXAMINATIONS, MAY 2019
ELECTRONICS AND COMMUNICATION ENGINEERING &
BIO-MEDICAL ENGINEERING
SECOND SEMESTER
EC8251 CIRCUIT THEORY
REGULATION(R-2012)

Time: 3 Hours Max. : 100marks

Answer All Questions

PART-A (10X2=20Marks)

1.Define ohm's Law
2.,What is meant by charge and current
3.Calculate the Q factor of a parallel LC circuit with fo=450KHz and B.W=10 KHz
4.What is the expression for the time constant of a RL circuit.
5. Define Apparent Power
6. Draw a circuit and mark its branches and nodes.
7.Define Norton's theorem.
8. Calculate the total inductance of the series combination of inductors shown below



9.Find the current of the circuit shown in fig 1
10.Draw the Dual circuit of the circuit shown in fig 2

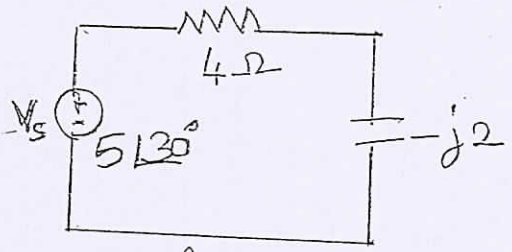


fig1

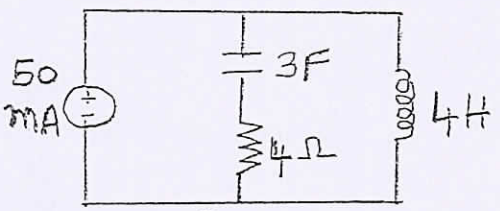


fig2

PART-B (5X16=80Marks)

11.(i) Calculate the phasor currents I_1 and I_2 in the circuit shown in fig 3
(ii) Write the complete and reduced incidence matrix for the given graph shown in fig 4

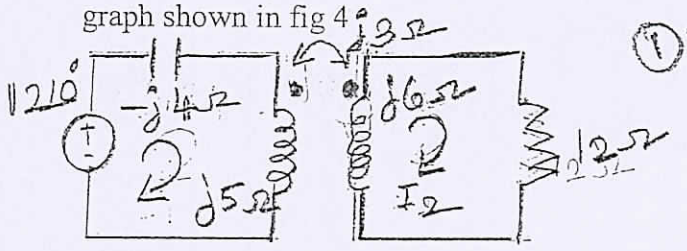


fig3

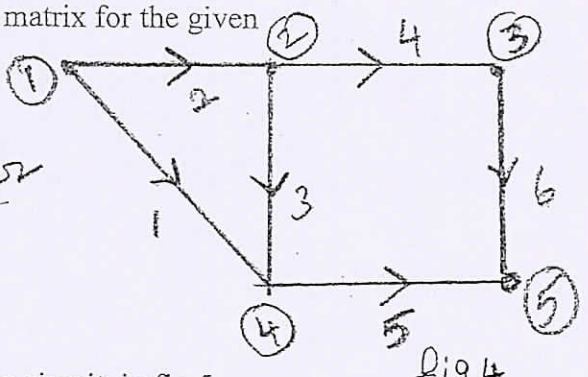


fig4

12.(a) (i) Calculate the equivalent resistance of the circuit in fig 5
(ii)For the circuit shown in fig 6 calculate Vo, power supplied by the current source and power absorbed by each resistor

(OR)

12.(b)Determine the voltages at the nodes in fog 7 using nodal analysis (nodes 1, 2 & 3)

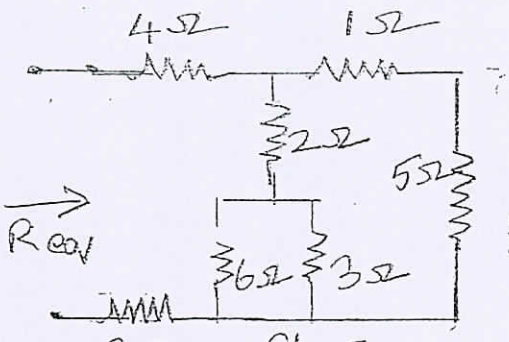


fig 5

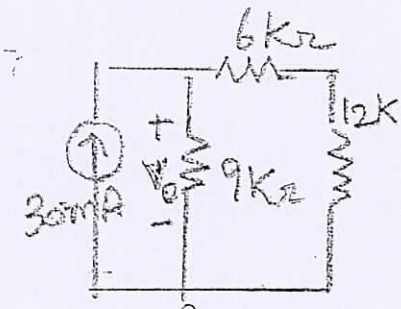


fig 6

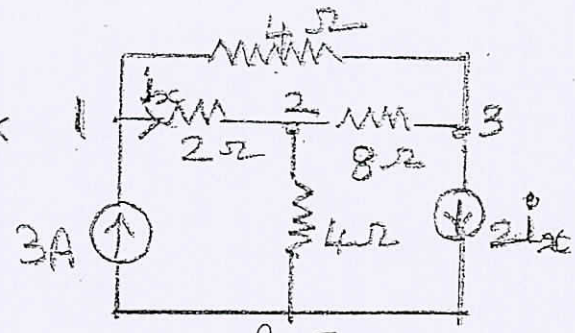


fig 7

13.(a)(ii)Obtain Thevenin's equivalent circuit at a-b terminals in fig 8.Using the Thevenin's circuit find the current througth $R_L = 36\Omega$ (8)

(ii) Use Superposition Theorem to find voltage across 4Ω resistor in fig 9 (8)

(OR)

(b)Write the expressions for DELTA to WYE connection. Also convert the network given in fig 10 to DELTA network.

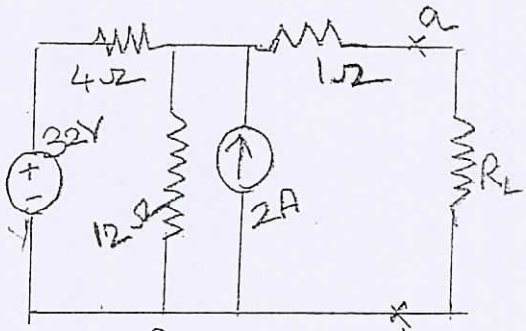


fig 8

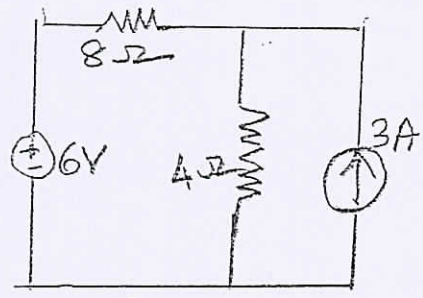


fig-9

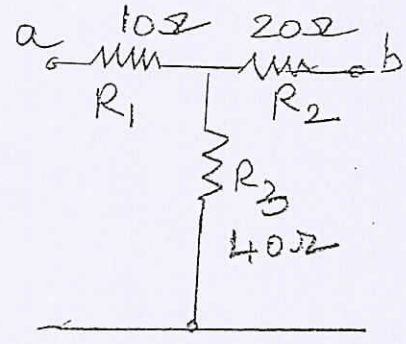


fig-10 C

14.(a)Determine the current Io in the circuit shown in fig 11 using **Mesh Analysis**

(OR)

(b)(i)Calculate the instantaneous power and average power ,given (8)
$v(t) = 120\ \cos(377t + 45^\circ)V$ and $i(t) = 10\ \cos(377t - 10^\circ)A$

(ii) Find the Power factor and Apparent power of the load which draws a current of $i(t) = 4\ \cos(100t + 10^\circ)$ when $v(t) = 120\ \cos(100t - 20^\circ)$ is applied. (8)

15.(a)Derive for the voltage response of source free RC circuit with respect to time .Tabulate the voltage values at $t = \tau, 2\tau, 3\tau, 4\tau$ seconds.Also draw the the voltage response. V_o is intial voltag

(OR)

(b)Derive for Z , Wo ,fo and the cut-off frequencies for series RLC circuit.Draw the frequency response of Z and I with respect to time.Also derive for average power P(w) and maximum power of RLC circuit in fig 12

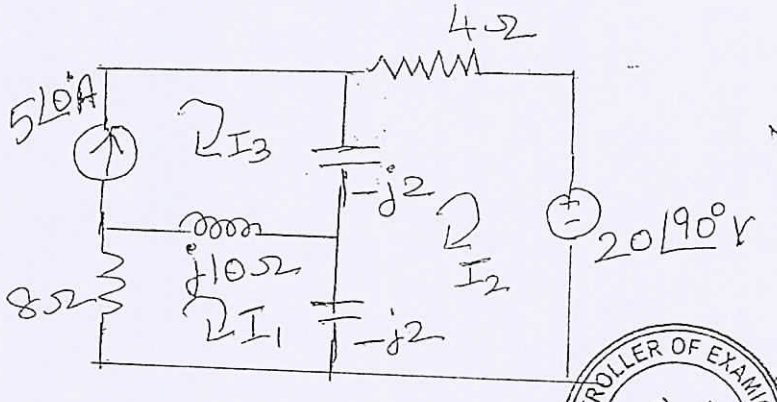


fig 11

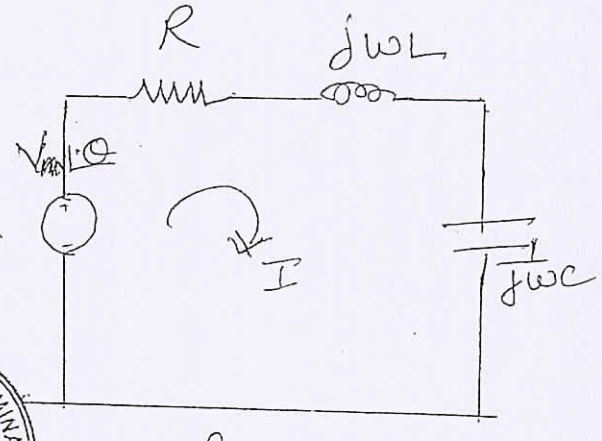


fig12