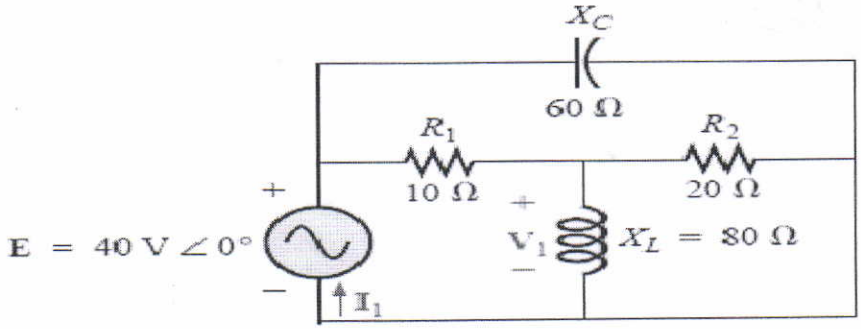
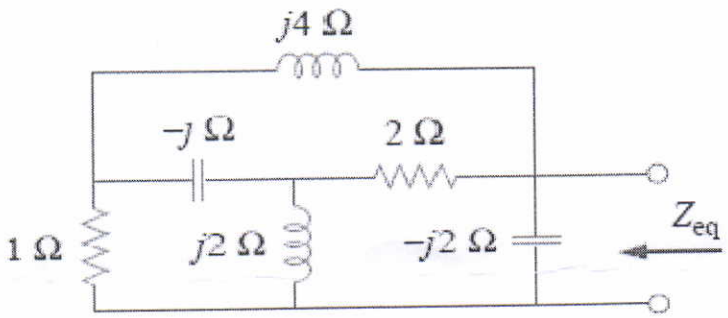
Q5: For the network of figure below.

a) Find the current $\mathbf{I_1}$. **b)** Find the voltage $\mathbf{V_1}$. **c)** Find the average power delivered to the network. (10 Marks)



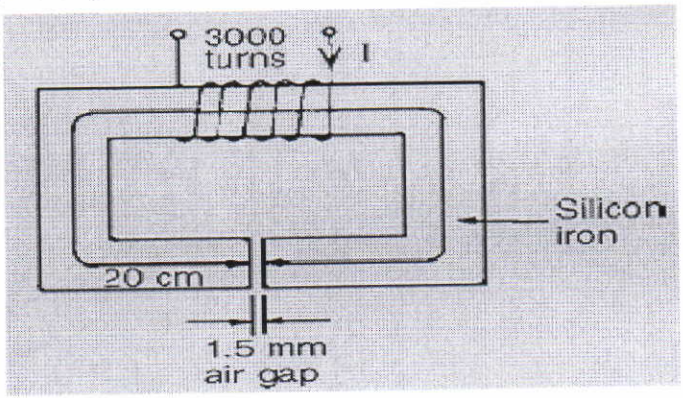
Q6: A) Prove that $I_{rms} = I\sqrt{\frac{3}{2}}$ if $i = (I + I\sin\theta)$, assuming $\theta = (0 - 2\pi)$. (5 Marks)

B) Find the equivalent impedance of the circuit in figure below. (5 Marks)



Q7: A series resonant circuit with an input voltage of 5 V ∠0°, peak current of 0.5 A at resonance, bandwidth of 120 Hz and resonant frequency of 8400 Hz. Find the value of *R*, *L* and *C* and the cutoff frequencies. (10 Marks)

Q8: For the magnetic circuit shown in figure below find the current **I** in the coil needed to produce a flux of0.45mWb in the air gap. The silicon iron magnetic circuit has a uniform cross sectional area of 3 cm^2(assume μ_{rs}= 500). (10 Marks)



Good Luck

M.Sc.: Gh. A. Salman

University of Diyala.
College of Engineering.
Electrical Power and Machines Department.

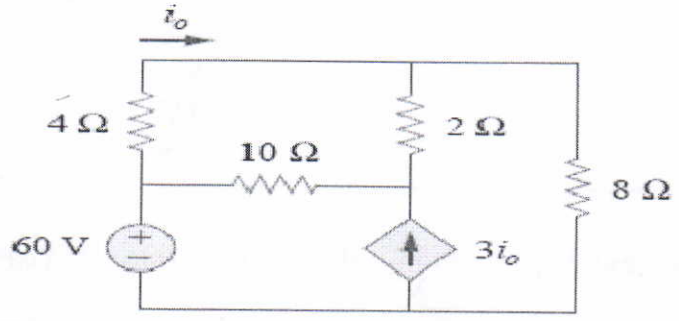
Final Year Exam.
2011-2012
Second Attempt

Subject: Basics of Electrical Eng.
1st Year Class
Time: 3 Hours
Date: / /2012

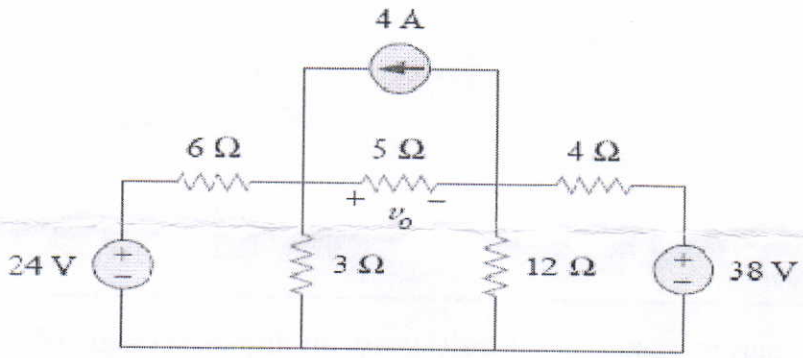
الدورة

Note: Answer Six Questions.

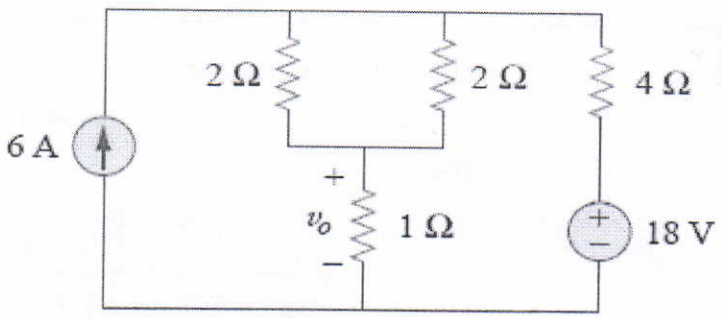
Q1: Using mesh analysis, find i_o in the circuit of figure below. (10 Marks)



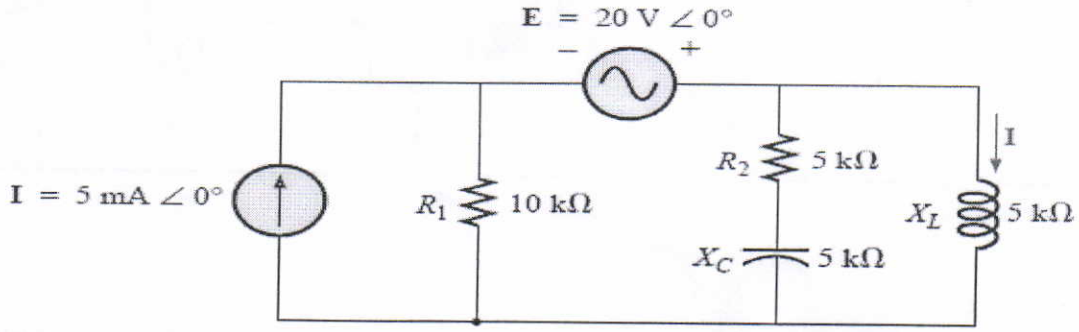
Q2: Using Thevenin's theorem, find v_o in the circuit of figure below. (10 Marks)



Q3: Using superposition principle find v_o in the circuit of figure below. (10 Marks)



Q4: Determine the current **I** in the network of figure below. (10 Marks)



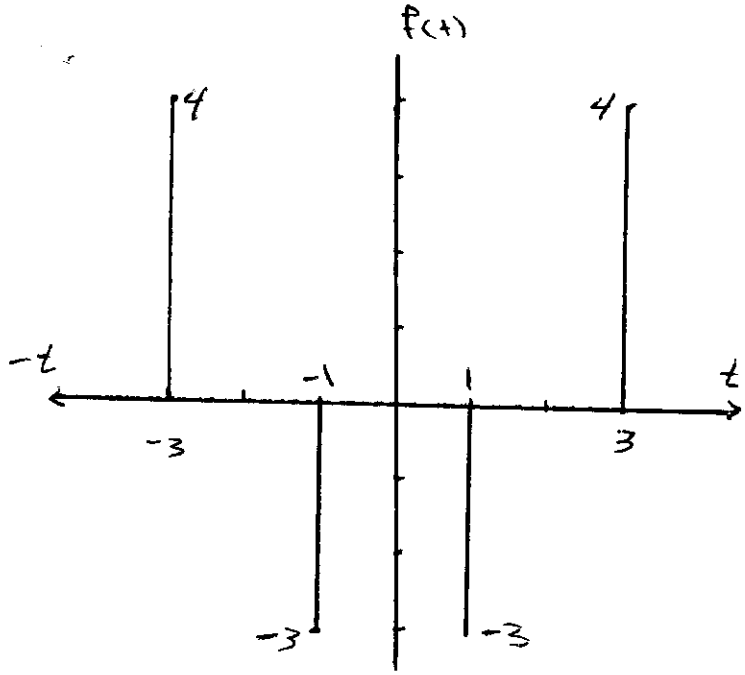


Fig. - 1 -

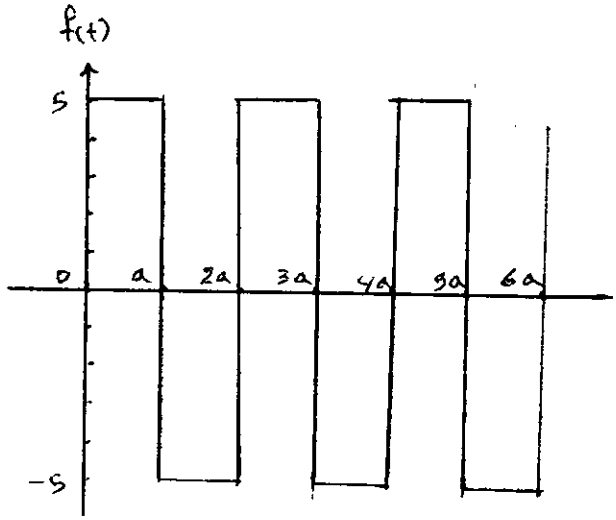


Fig. - 2 -

Q4	**Solve the following partial differential equation:** $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$, u(x, 0) =$4e^{-x}$	12.5%
Q5	**Apply the Laplace transforms to solve the following partial differential equation:** $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$, **u(x,0)= 3sin 2π , u(0,t)=0 , u(1,0) =0 , where 0≤ x ≤1 , u is bounded .**	12.5%
Q6	**Show that** $\int_x^1 p_n(x)dx = \frac{1}{2n+1}[p_{n-1}(x) - p_{n+1}(x)]$	12.5%
Q7	**Obtain the root of $x^3 + x - 1 = 0$ by fixed point method given that the root lies near 1 .**	12.5%
Q8	**Solve the following differential equation by using improved Euler's method.** $\frac{dy}{dx} = x^2 + y$ **for x=0.02 by taking h=0.01 , given that y = 1 at x =0**	12.5%
Q9	**Evaluate** $\int_0^{2\pi} \frac{d\theta}{5+3\sin\theta}$	12.5%
Q10	**Show that** $\int_0^{2\pi} \frac{\cos 3\theta}{5-4\cos\theta} d\theta = \frac{\pi}{12}$	12.5%

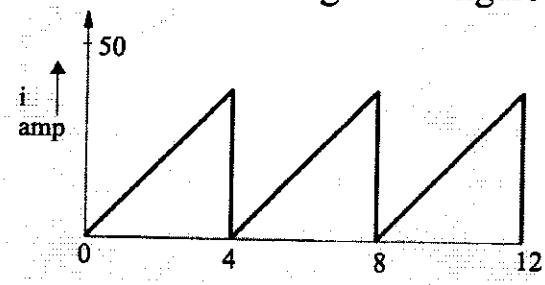
University of Diyala
College of Engineering
Dep. Of pow & ele mach..
Final Exam/2st Attempt

Class:3ed stage
Subject: engineering analyses
Year: 2011-2012
Time:3 hour

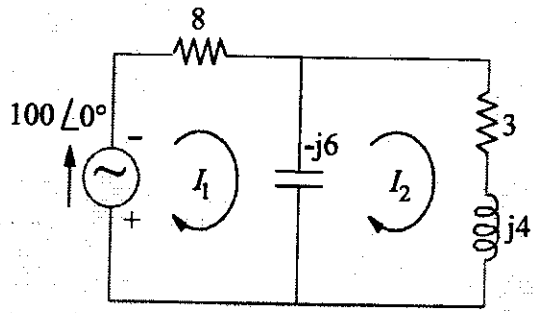
Note:-Answer eight questions only

Q1	A-Find the Fourier transform of the spectrum represented in figure (1). B-Obtain the Fourier transform of the single sided exponential pulse $e^{-at}u(t)$.	12.5%
Q2	A-Find the Z transform by residue theorem for F (t) $=e^{at}\cos wt$. B- by using power series method evaluate $Z^{-1}\left[\frac{z^2}{z^2+3z+2}\right]$ C- Determine $Z^{-1}\left[\frac{(1-e^{-a})z}{(z-1)(z-e^{-a})}\right]$	12.5%
Q3	A-find the Laplace –transform of the rectangular wave shown in figure (2). B-Determine the $\int$ f(t) such that $f(t)=0 \quad 0\le t\le 1$ $=0.5 \quad 1\le t\le 2$ $=1 \quad 2\le t\le 3$ $=0.5 \quad 3\le t\le 4$	12.5%

Q4/ (a) Find the form-factor of the wave form given in figure shown.



(b) For the figure shown, write the mesh equations and simplify it without finding the results.



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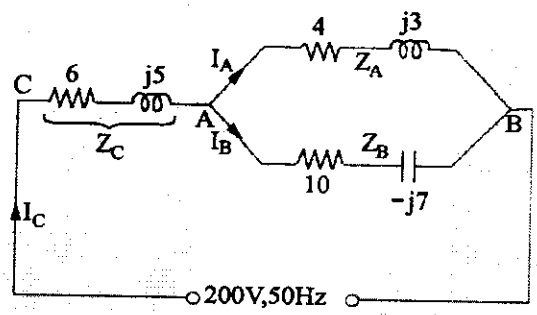
Q5/ In a series-parallel circuit shown in figure, calculate : (a) current I_A, I_B and I_C; (b) the power factor for each branch and the total power factor for the whole circuit.



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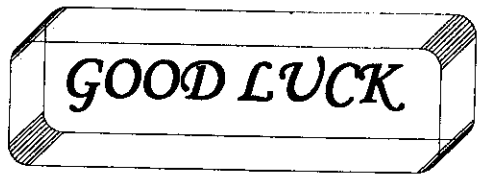
Q6/ A current of 5 A flows through a non-inductive resistance in series with a choking coil when supplied at 250-V, 50-Hz.
If the voltage across the resistance is 125 V and across the coil 200 V, calculate **(a)** impedance, reactance and resistance of the coil **(b)** the power absorbed by the coil and **(c)** the total power. Draw the vector diagram.

****



Examiner : Asst., Lecturer Wisam N. AL-Obaidi

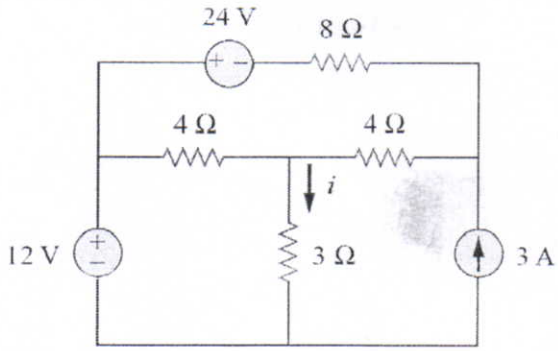
University of Diyala
Engineering College
Electronic Department

Final-Year Examination
Year (2011-2012)

Electrical Engineering Fundamentals
1st Class
Time : 3 Hours
Date : / /2012

Note: Answer five questions only.

Q1/ Use the superposition theorem to find i.



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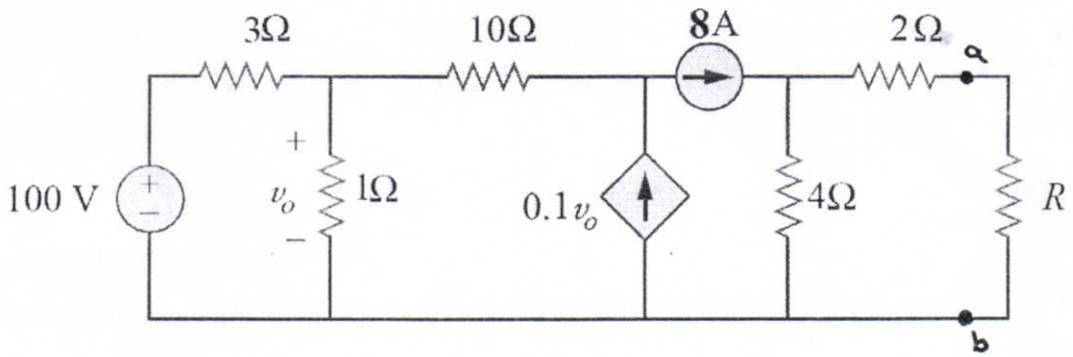
Q2/ Find the maximum power transferred to resistor R in the circuit shown.



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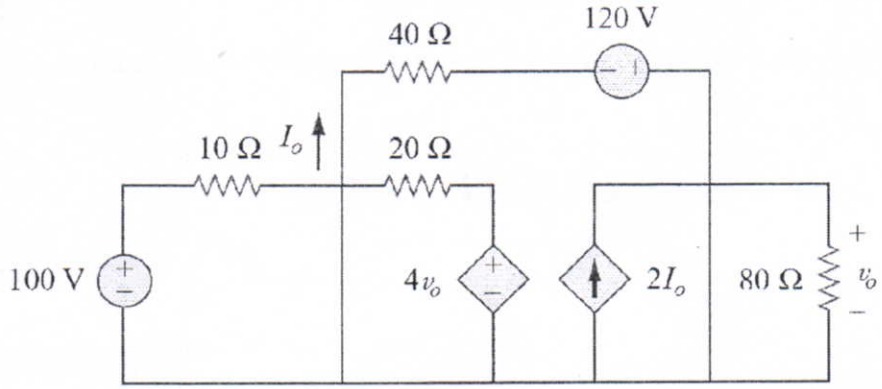
Q3/ Using nodal analysis, find v_o and i_o in the circuit shown.



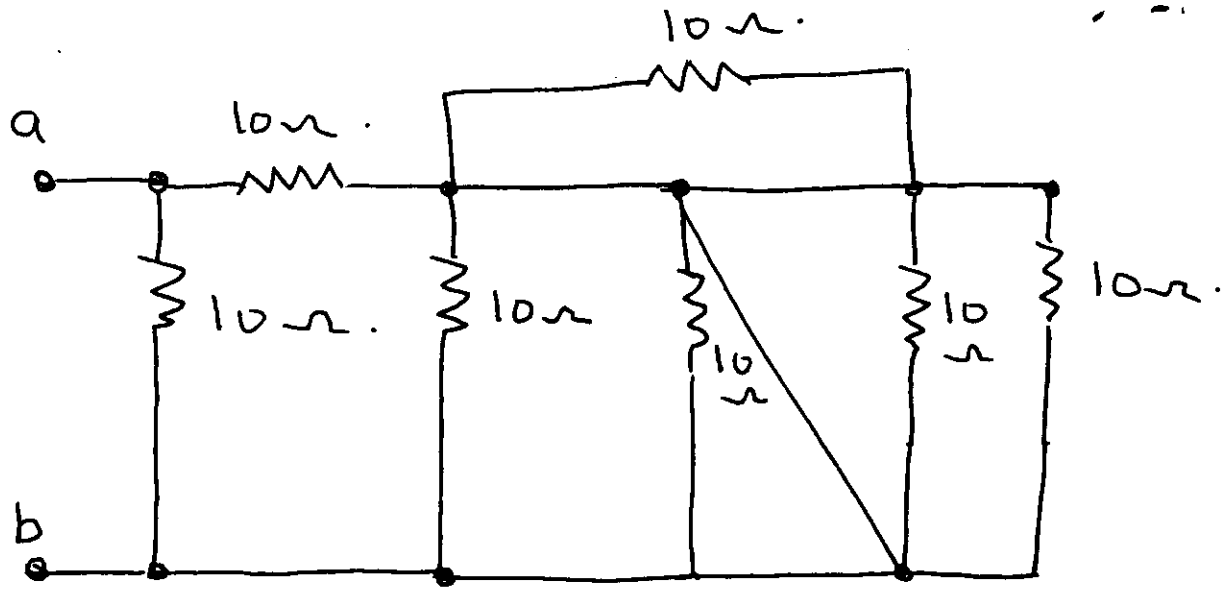


Figure (1).

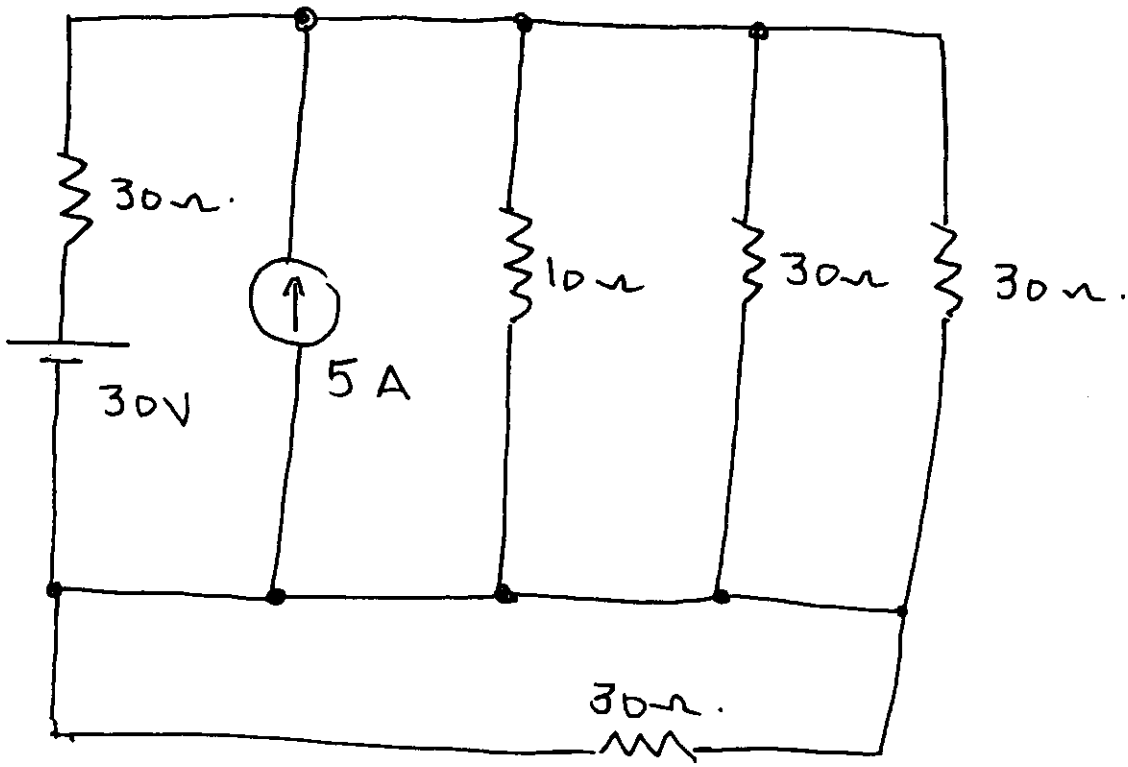


Figure (2).

Diyala University College of Eng.

Civil Eng. Dep.

1st Class 2nd Attempt (2011-2012) time : 3hrs

Note :- Answer four Questions only (12.5 mark for each question)

Q1 :

Find the total resistance between points (a,b) in the circuit shown in figure (1).

Q2:

find the current passing through the resistor (10 ohms) using Thevenin's theorem in the circuit shown in figure (2) .

Q3:

Repeat Q2 using Norton's theorem .

Q4 :

Three impedances Z1= (3+j4) ohms , Z2=(3 –j4) ohms , Z3= (6+j8) ohms are connected in parallel to a voltage source (V=20 sin 1000t) . Find all branch currents , total current , total impedance and draw the impedance diagram .

Q5:

If a voltage source V= 100 sin (200t + 40^{o}) volt , is supplied with an electrical circuit , and the generated current is i= 10 sin(200t -5^{o}) Ampers.

Find the impedance of this circuit and the components of this impedance

Attached Figures and Notes

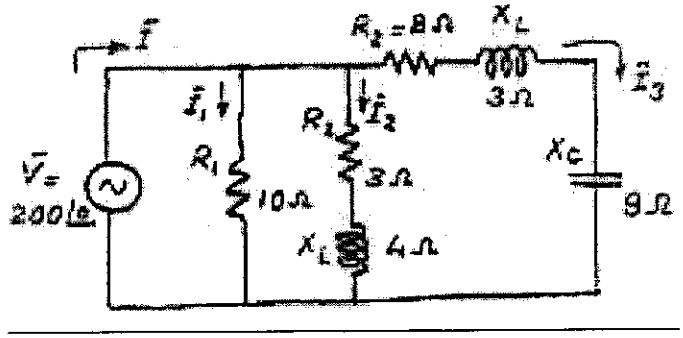


Figure (1)

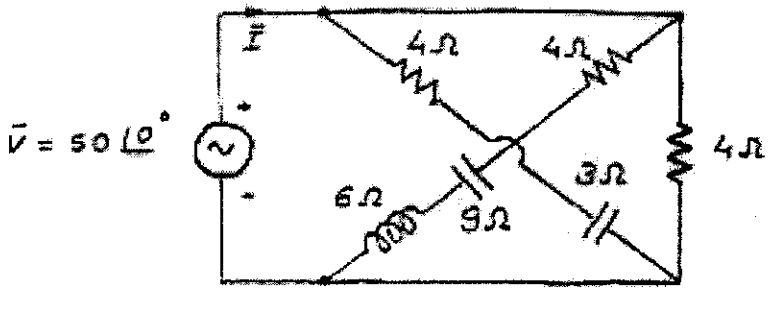


Figure (2)

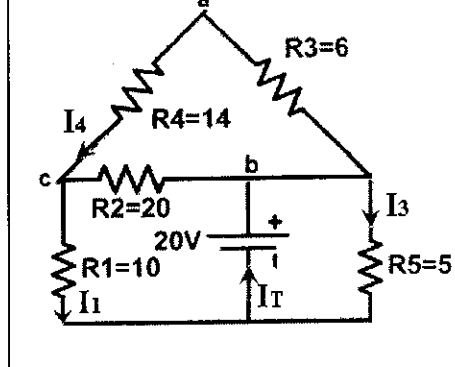


Figure (3)

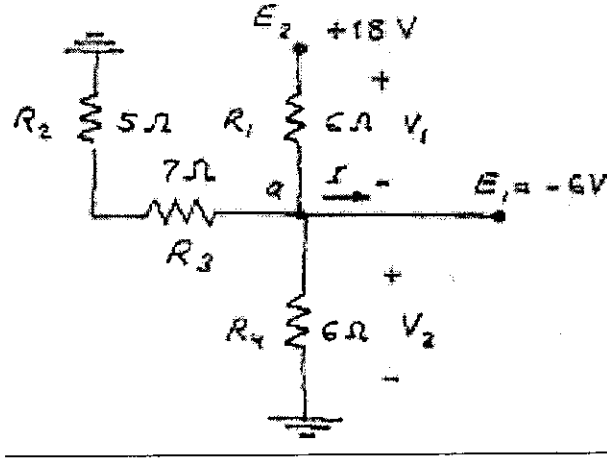


Figure (4)

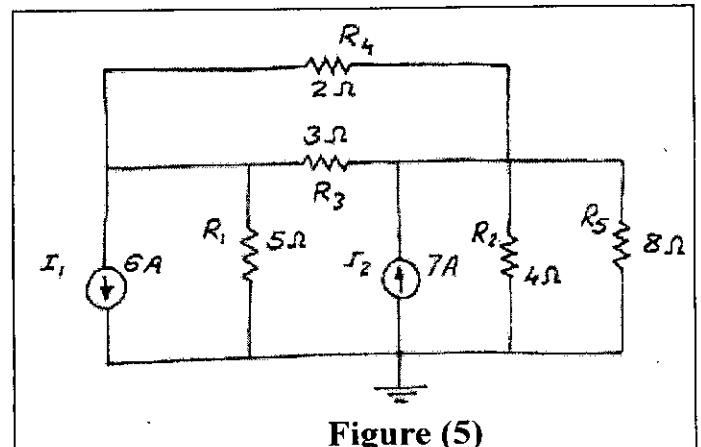


Figure (5)

University of Diyala
College of Engineering
Dep. of Computer & Software Engineering
Final Exam/2nd Attempt

Class: 1st stage
Subject: Basics of Electrical Engineering
Year: 2011-2012
Time: 3 hour
Date : 3 – 9 - 2012

Note:-Answer All Questions

Q1	**Explain Five of the Following:** (1) Power. (2) Ohm's Law. (3) Open Circuit. (4) Thevenin's theorem. (5) The cycle in AC waveform. (6) Peak to Peak Value.	10 Marks
Q2	**For the circuit shown in Figure (1), determine:** 1. Compute I. 2. Find I1, I2 and I3. 3. Verify Kirchhoff's law by showing that I=I1+I2+I3. 4. Find the Total Impendence of the circuit.	10 Marks
Q3	Find the Current I in the Circuit Shown in **Figure (2).**	10 Marks
Q4	**For the network shown in Figure (3), find:** 1. The currents IT, I1, I3 and I4. 2. Calculate Va and Vbc.	10 Marks
Q5	**For the network shown in Figure (4):** determine the voltage V1, V2 and the current I.	10 Marks
Q6	**For the circuit shown in Figure (5):** 1. Write the nodal equations and solve for nodal voltages. 2. Determine the magnitude and polarity of the voltage across each resistor.	10 Marks

Good Luck

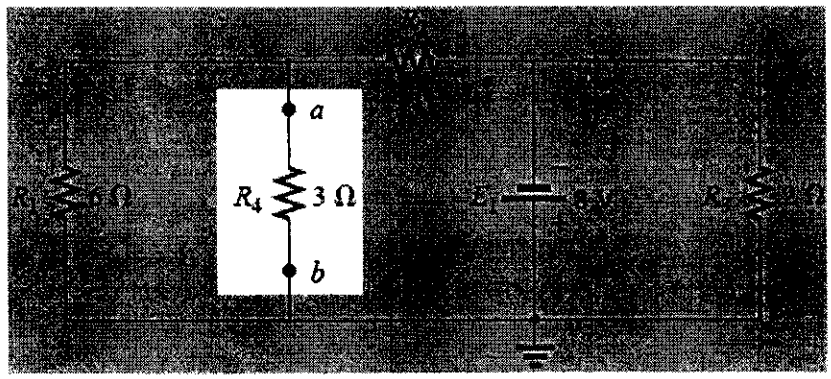
Head of Dep.: .....

Name: Dr. Saad A. Salman

Lecturer:.....

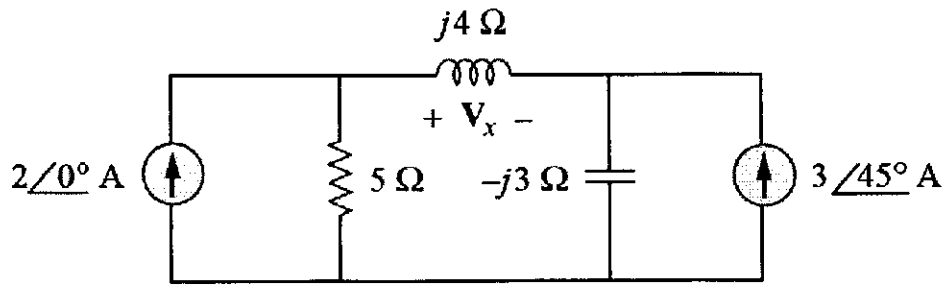
Name:...MSc, Zeyad Assi Obaid

Q5



FIG(5)

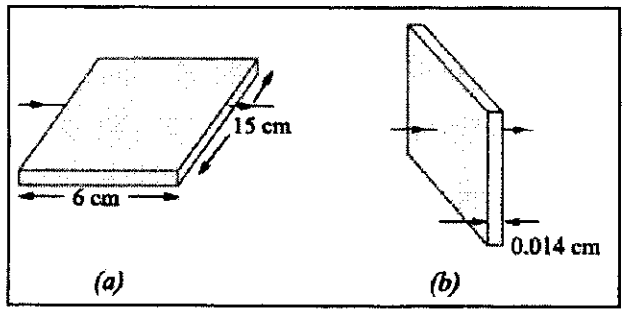
Q6



FIG(6)

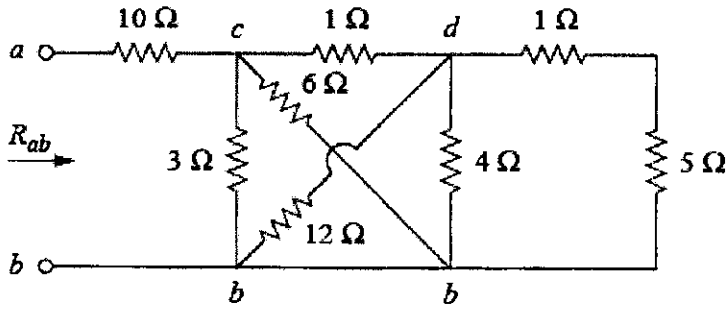
Attached Figures and Notes

Q1



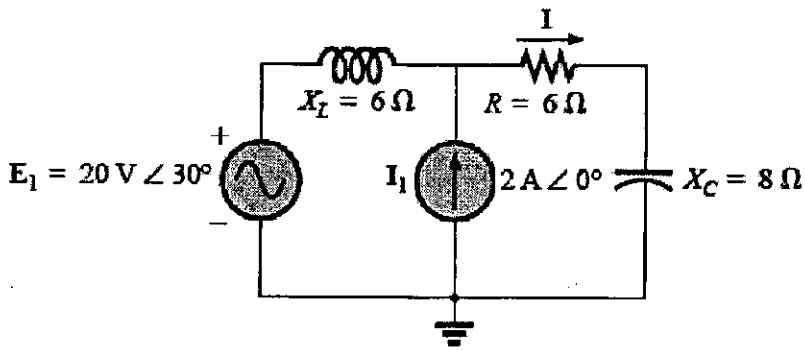
FIG(1)

Q2



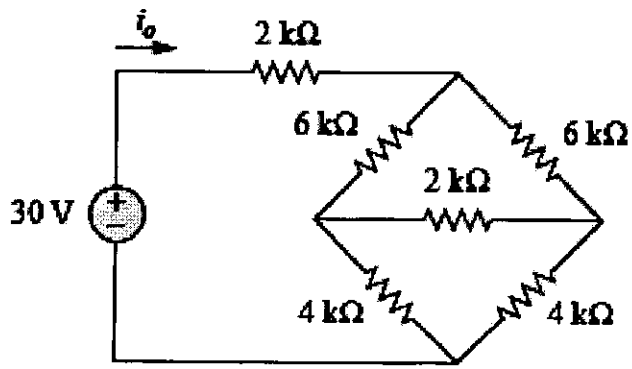
FIG(2)

Q3



FIG(3)

Q4



FIG(4)

امتحانات يوم ٩/٦ : العطلة .

University of Diyala
College of Engineering
Dep. Of mechanical engineering
Final Exam/ 2nd Attempt

Class:1st stage
Subject: Electrical. Fun
Year: 2011-2012
Time: 3 hour

Note:-Answer five questions only

Q1	The resistivity of a ferric-chromium-aluminum alloy shown in **FIG(1)** is 51×10^{-8} Ω-m. A sheet of the material is 15 cm long, 6 cm wide and 0.014 cm thick. Determine resistance between (A) Opposite ends, and (B) Opposite sides.	**20%**
Q2	Calculate the equivalent resistance R_{ab} in the circuit in **FIG (2).**	**20%**
Q3	Use superposition theorem to find the current **I** through the **6Ω** resistor in **FIG (3).**	**20%**
Q4	For the bridge network in **FIG (4)**, find i_0 by using mesh analysis.	**20%**
Q5	Find the **Thévenin** equivalent circuit for the network in the shaded area in **FIG (5)**.	**20%**
Q6	Use nodal analysis to find V_x in the circuit shown in the **FIG (6)**.	**20%**

Good Luck

Head of Dep.: .....

Name: Zaid Salim Hamoody

Lecturer:.....

Name: Omar Ahmed Raheem

الكترونيك

مدخل

حاسبات

ميكانيك

القدرة

الاتصالات

Attached Figures and Notes

Q1

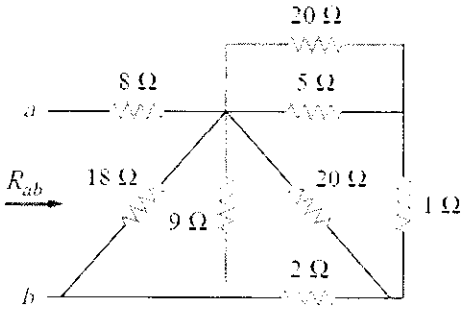


Fig. (1-A)

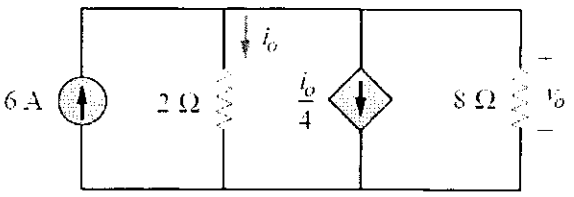


Fig. (1-B)

Q2

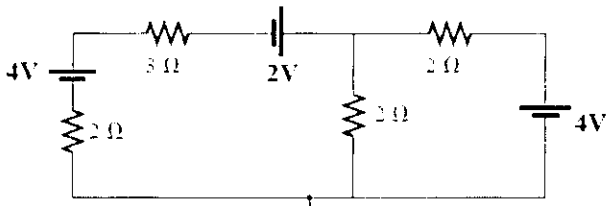


Fig. (2)

Q3

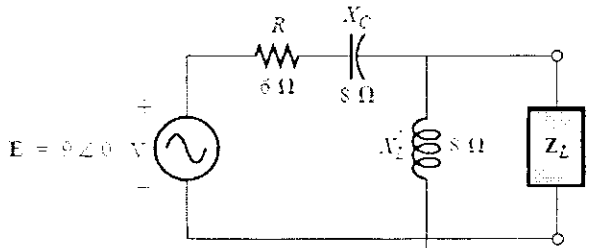


Fig.(3)

Q4

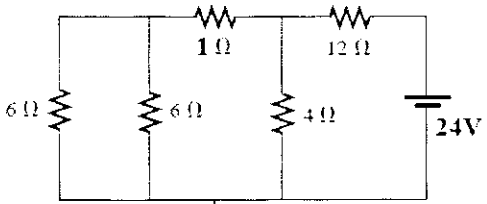


Fig.(4)

Q5

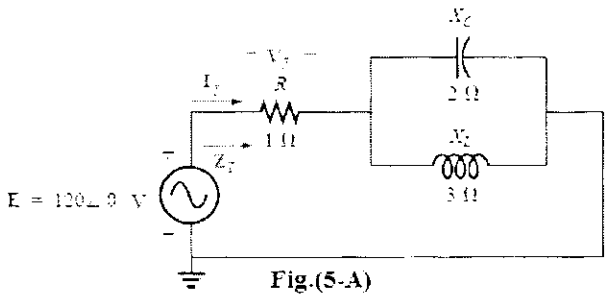


Fig.(5-A)

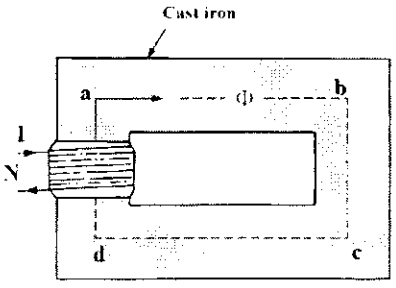


Fig (5-B)

University of Diyala
College of Engineering
Dep. Of Communication
Final Exam/2st Attempt

Class:1st stage
Subject: Electrical . Fun
Year: 2011-2012
Time:3 hour

Note:- Answer five questions only

Q1	**A /**: Find the total resistance (R_{ab}) of the network of **Fig.(1-A).** **B /**: Find v_o and i_o in the circuit of **Fig. (1-B)**	20%
Q2	For the circuit shown in **Fig.(2)**, find the current in the (3Ω) resistor using:- 1- Loop current method. 2- Nodal voltage method.	20%
Q3	Find the load impedance in **Fig. (3)** for maximum power transfer to the load, and find the maximum power.	20%
Q4	For the circuit shown in **Fig.(4)**, find the current in the (4Ω) resistor using:- 1- Thevenin's theorem. 2- Norton's theorem.	20%
Q5	**A /**:For the network of **Fig.(5-A)**, determine:- Z_T , I_T , V_R, P , p.f **B /**:- Calculate the magnetic flux for the magnetic circuit shown in **fig (5-B).** If the current I=5A, N=60 t, $A=2\times10^{-4}\ m^2$, ℓ_{abcd}= 0.3 m and μ_r=303 for the cast iron.	20%
Q6	**A /**: For a series (R-L-C) circuit, the inductor is variable. The source voltage is ($\sqrt{2}$ 200 sin 100 πt) volt. Maximum current obtained by varying the inductance is (0.314 A), and the voltage across the capacitor is (300V). find the circuit elements (R-L and C). **B /**: A coil having an inductance of (50 mH) and a resistance of (10 Ω) is connected in series with a (25 μF) capacitor across a (200 V) ac supply. Calculate :- 1- Resonance frequency. 2- Current flowing at resonance. 3- The value of Q_o using different expressions.	20%

Good Luck

Head of Dep.

Name: Lecture. Saib. T. Alwan

Lecturer:

Name: Ass. Lecture. Ahmed. S. Abdulla