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

Class: 1^{st} 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, $A=2\times10^{-4}\ m^2$, $\ell_{abcd}= 0.3$ m and $\mu_r=303$ 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 (**300**V). 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

Attached Figures and Notes

Q1

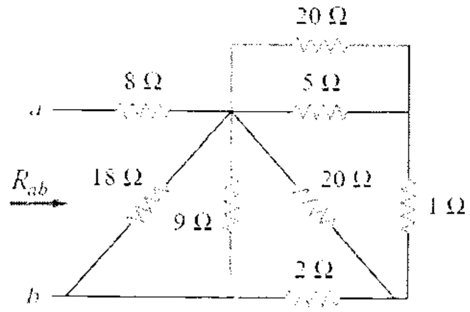


Fig. (1-A)

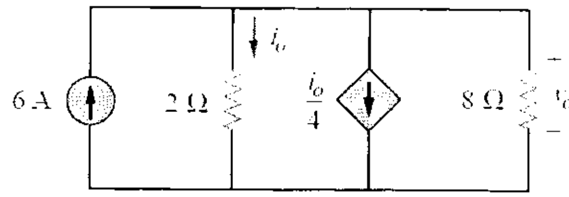


Fig. (1-B)

Q2

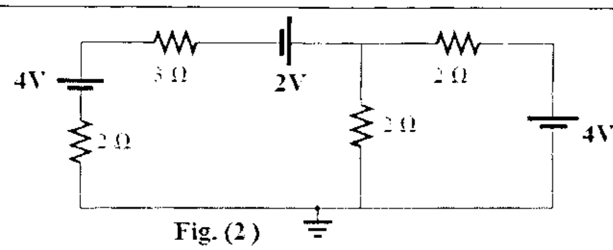


Fig. (2)

Q3

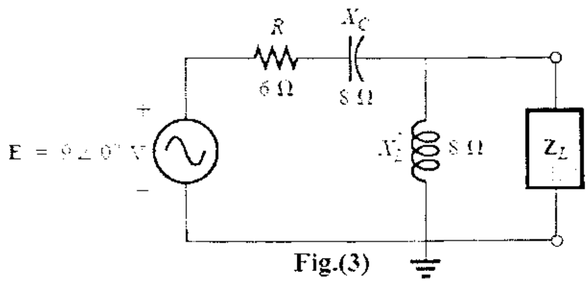


Fig.(3)

Q4

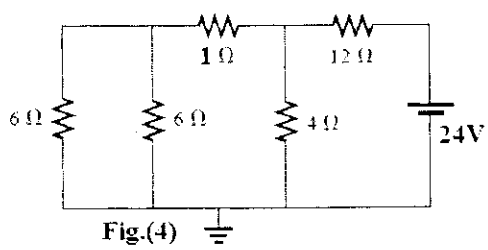


Fig.(4)

Q5

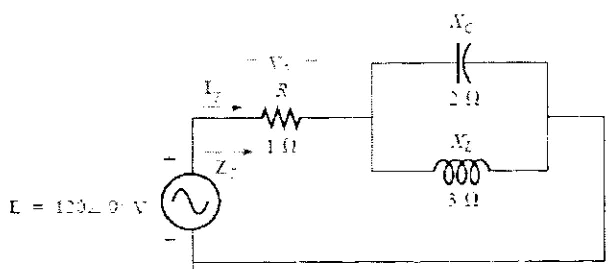


Fig.(5-A)

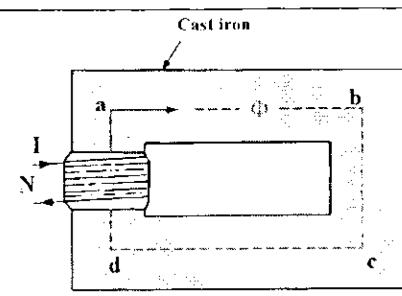


Fig (5-B)

الكترونيك

مدني

حاسبات

ميكانيك

القدرة

الاتصالات

امتحانات يوم ٦ / ٩ الميكانيك .

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.: ....

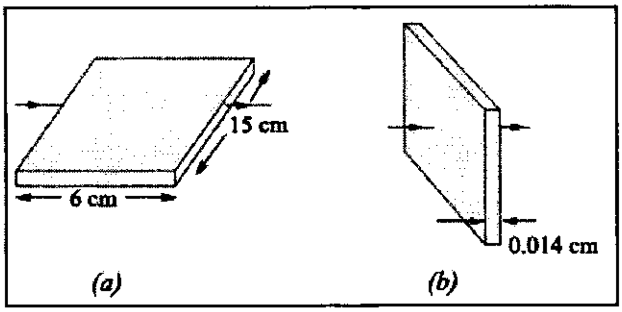
Name: Zaid Salim Hamoody

Lecturer: ....

Name: Omar Ahmed Raheem

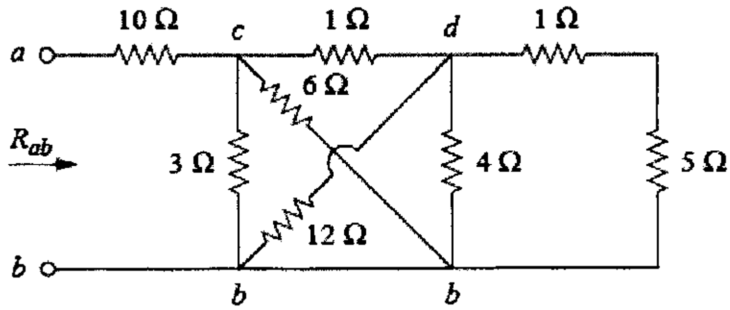
Attached Figures and Notes

Q1



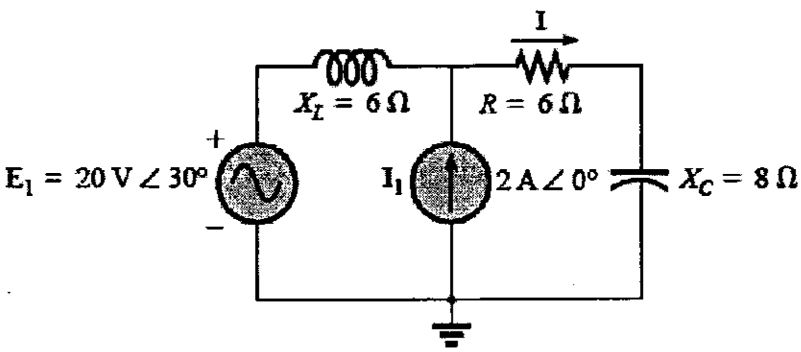
FIG(1)

Q2



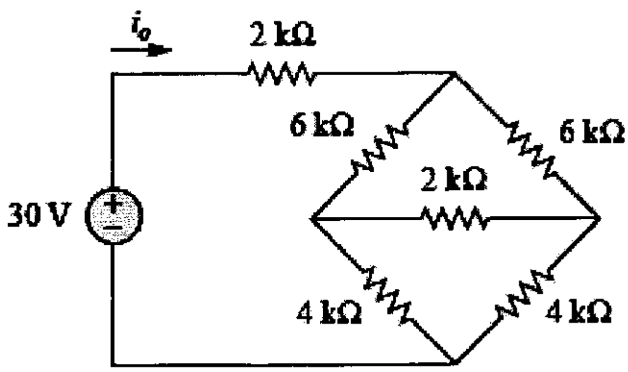
FIG(2)

Q3



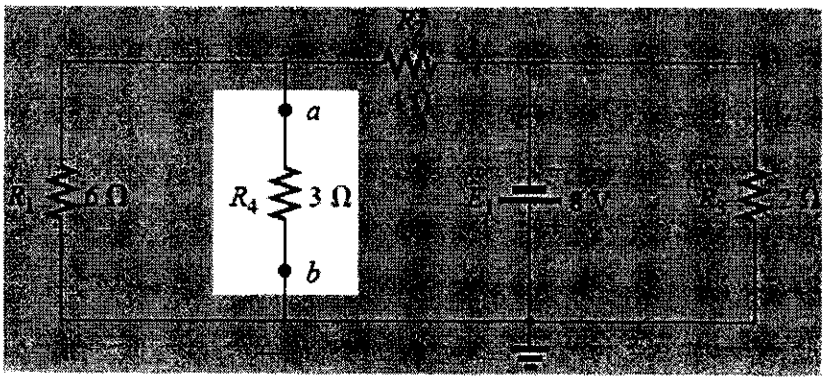
FIG(3)

Q4



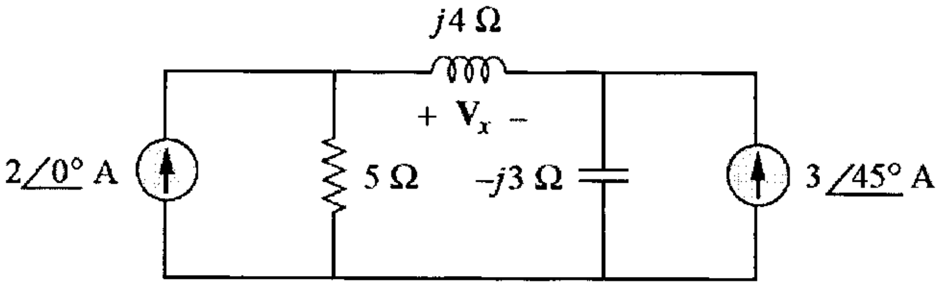
FIG(4)

Q5



FIG(5)

Q6



FIG(6)

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

الأولى

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

Attached Figures and Notes

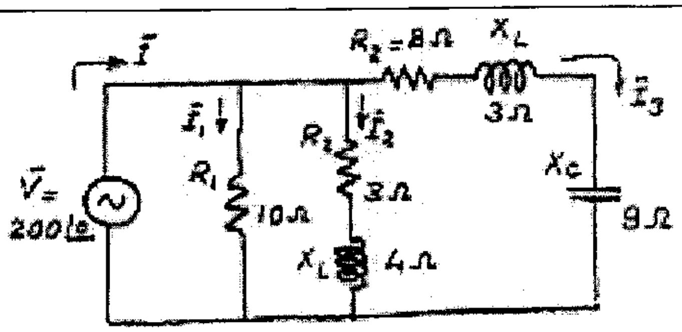


Figure (1)

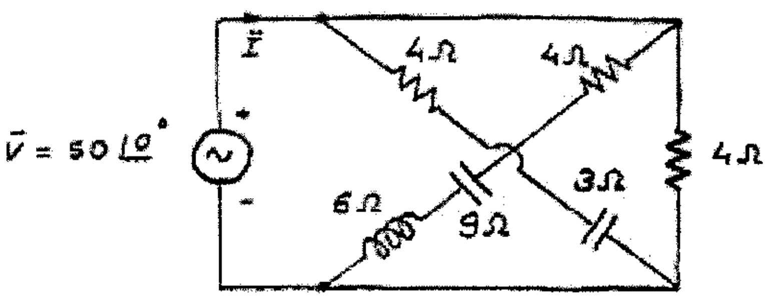


Figure (2)

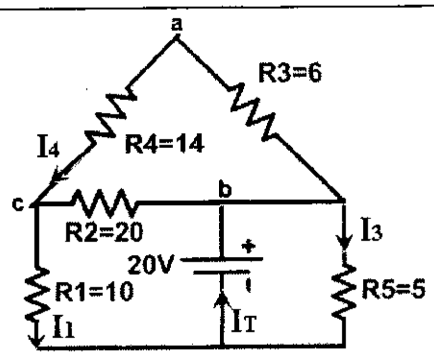


Figure (3)

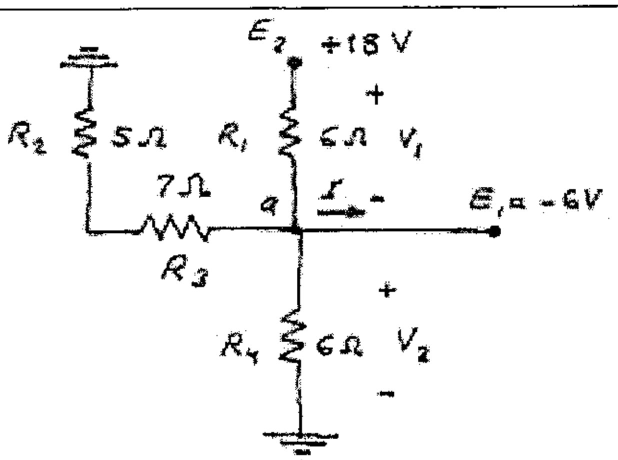


Figure (4)

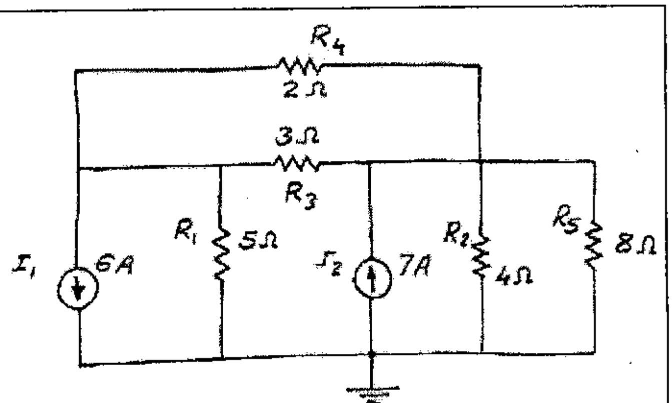


Figure (5)

Diyala University   College of Eng.

Civil Eng. Dep.

1^{st} Class 2^{nd} 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 $V= 100 \sin (200t + 40^{\circ})$ volt , is supplied with an electrical circuit , and the generated current is $i= 10 \sin(200t -5^{\circ})$ Ampers.

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

الحدري

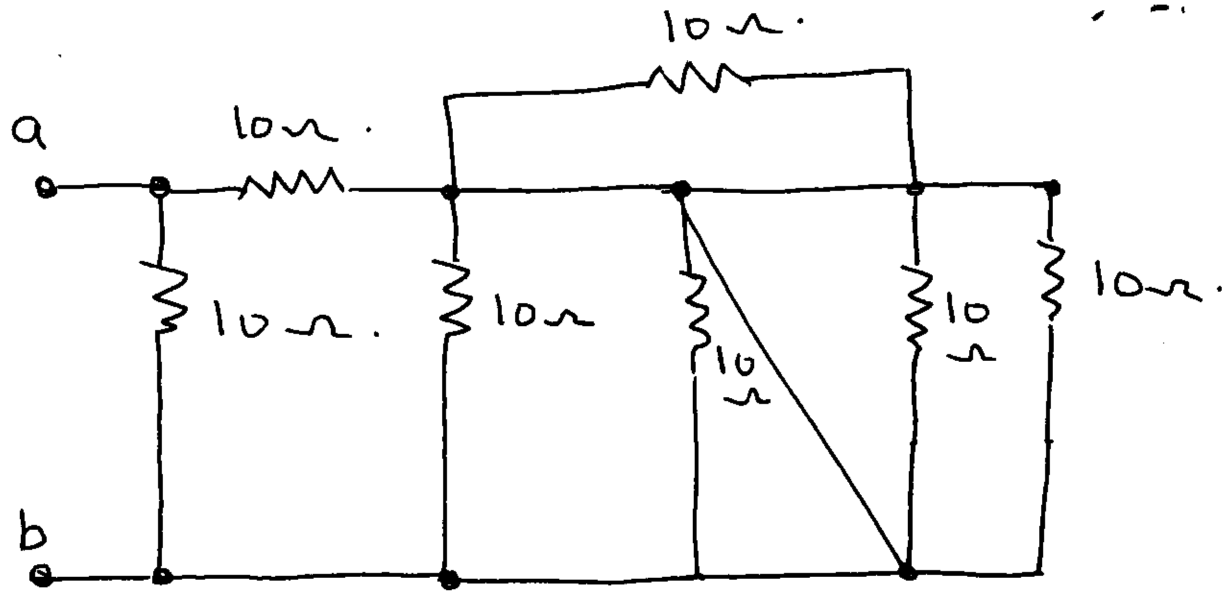


Figure (1).

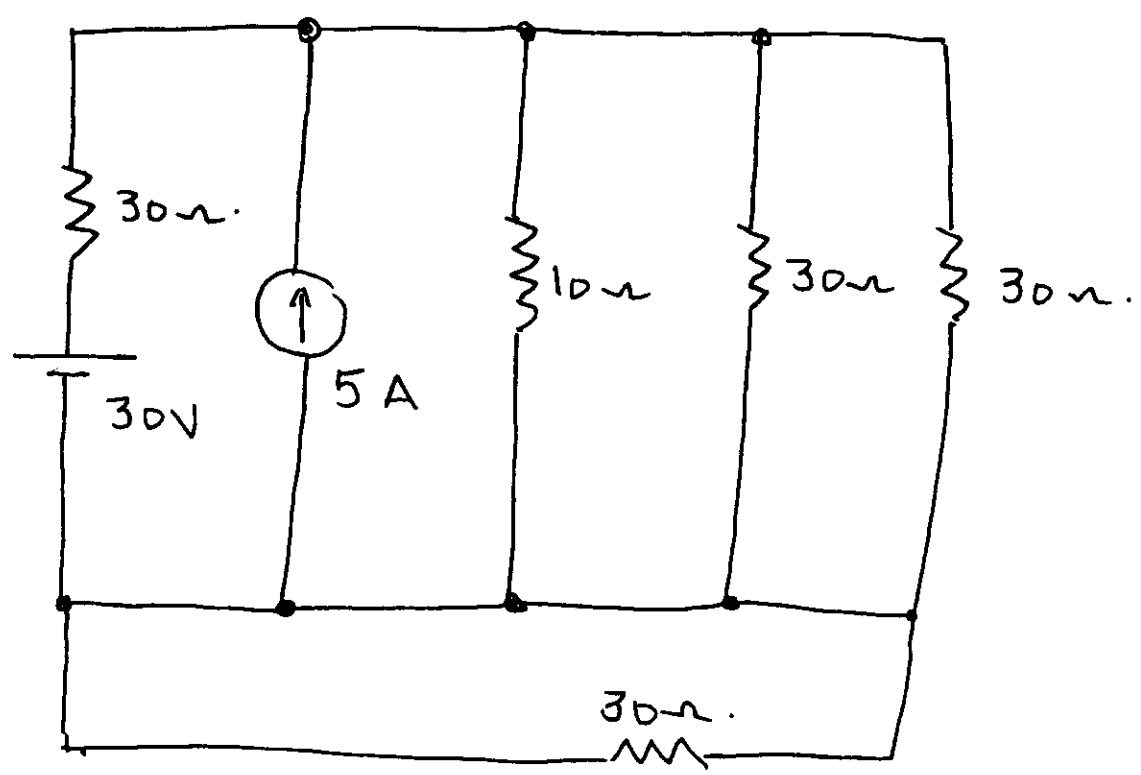


Figure (2).

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.

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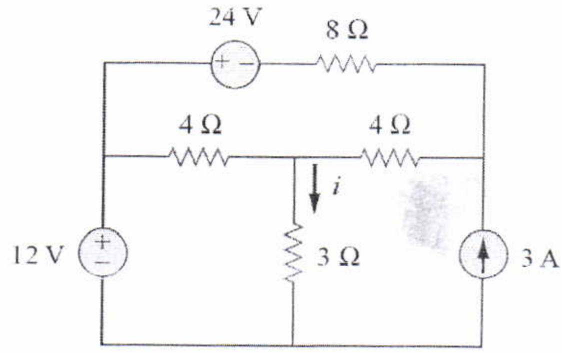
الالكترونك

Q1/ Use the superposition theorem to find i.



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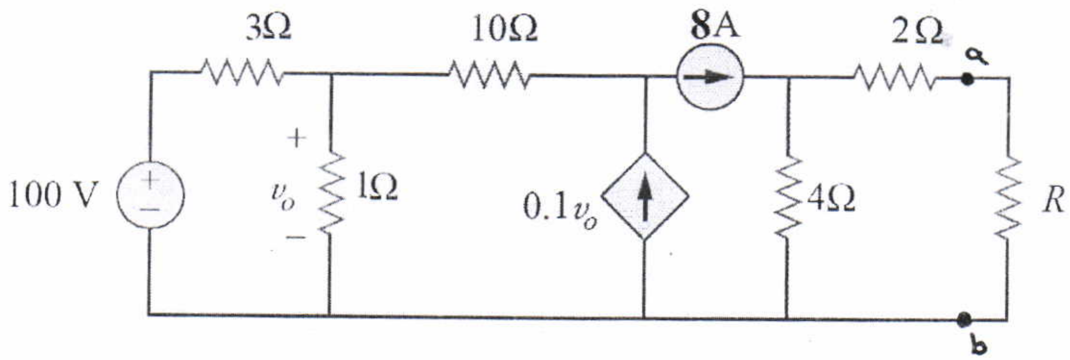
Q2/ Find the maximum power transferred to resistor R in the circuit shown.



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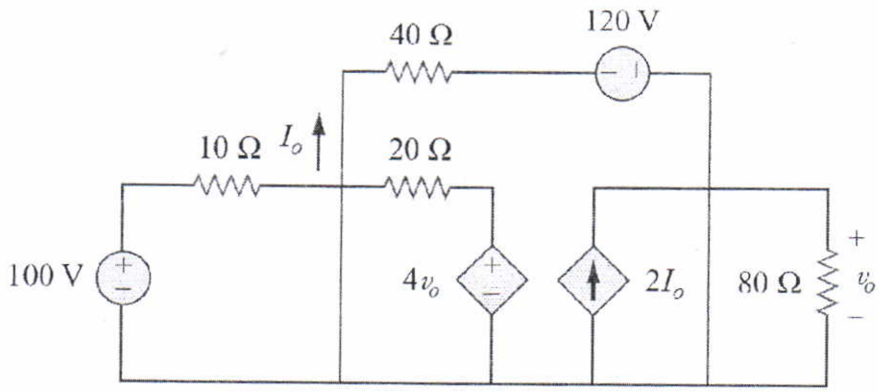
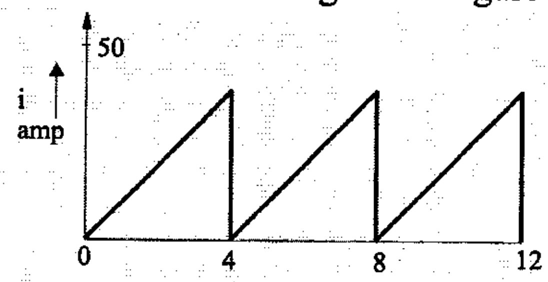
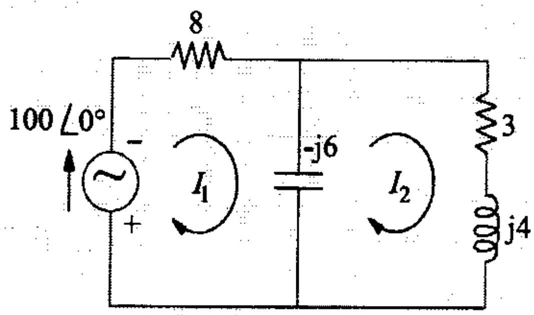
Q3/ Using nodal analysis, find v_o and i_o in the circuit shown.



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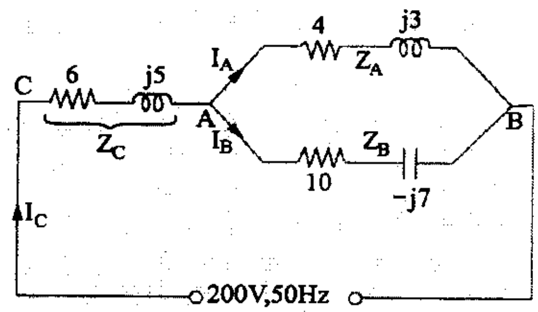
Q5/ In a series-parallel circuit shown in figure, calculate : (a) current I_A, I_B and I_C; (b) the power factor for each branch and the total power factor for the whole circuit.



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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.

****

GOOD LUCK

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

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** $f(t)=0 \quad 0\leq t\leq 1$ $=0.5 \quad 1\leq t\leq 2$ $=1 \quad 2\leq t\leq 3$ $=0.5 \quad 3\leq t\leq 4$	**12.5%**

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%

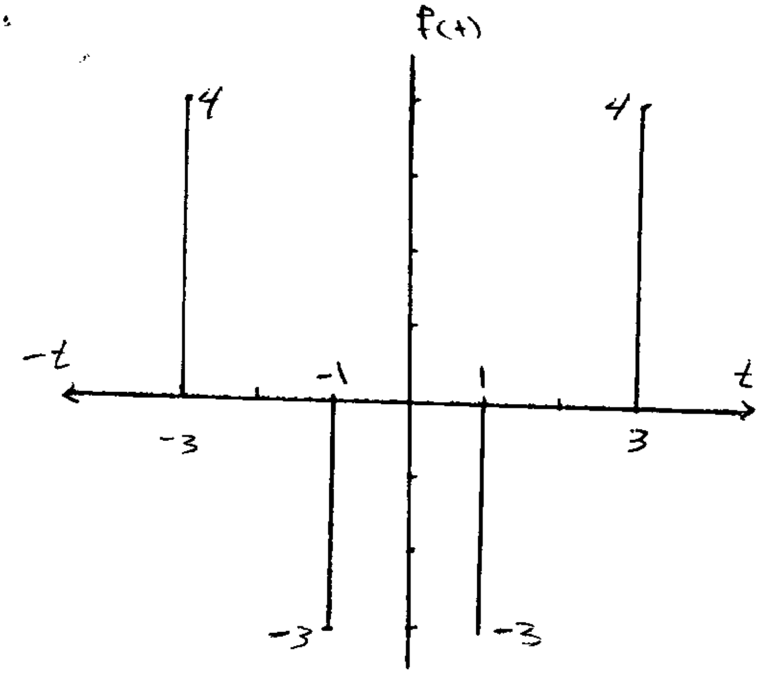


Fig. - 1 -

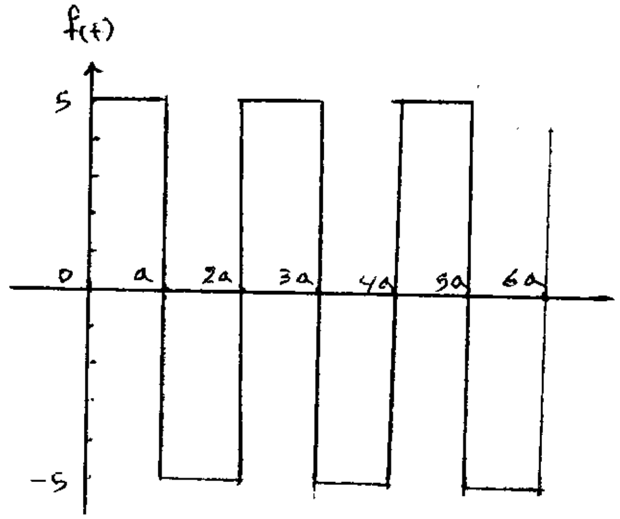


Fig. - 2 -

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

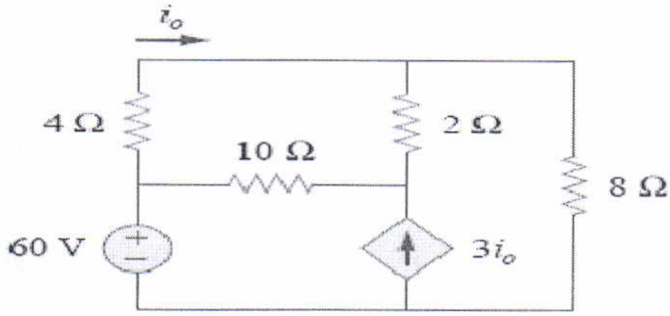
Final Year Exam.
2011-2012
Second Attempt

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

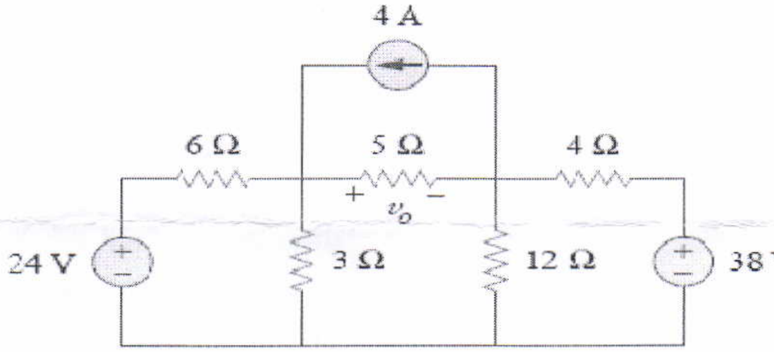
القدرة

Note: Answer Six Questions.

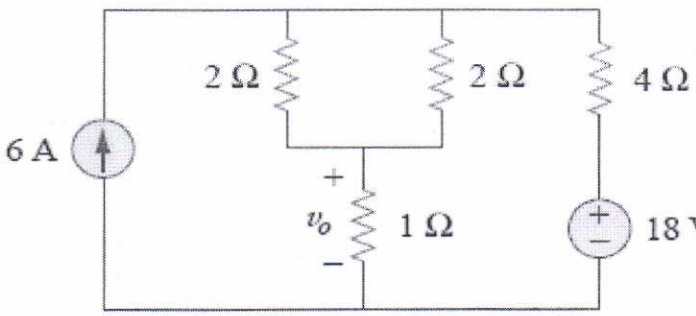
Q1: Using mesh analysis, find i_o in the circuit of figure below. (10 Marks)



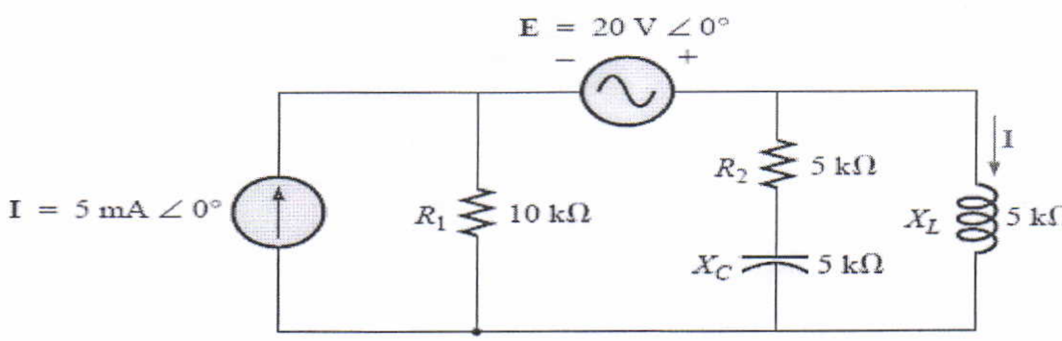
Q2: Using Thevenin's theorem, find v_o in the circuit of figure below. (10 Marks)



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

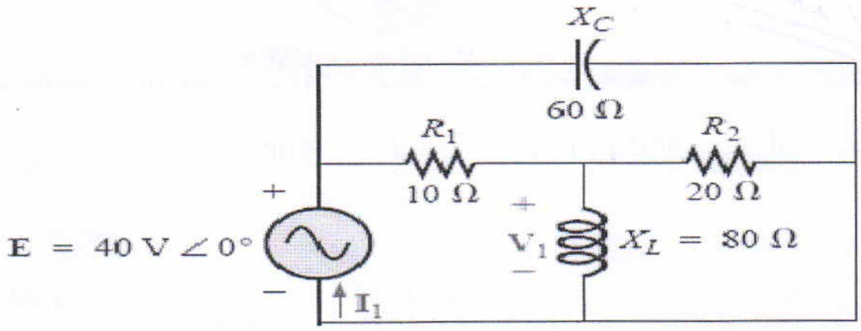


Q4: Determine the current **I** in the network of figure below. (10 Marks)



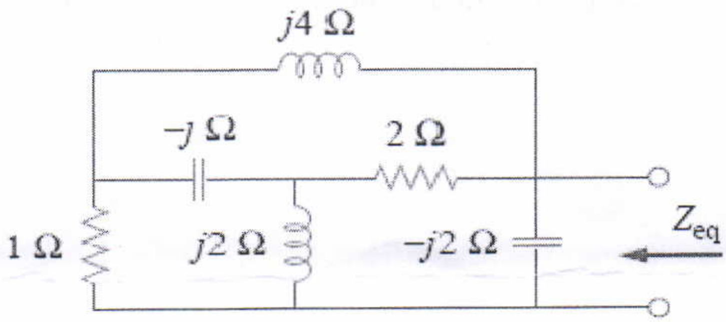
Q5: For the network of figure below.

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)



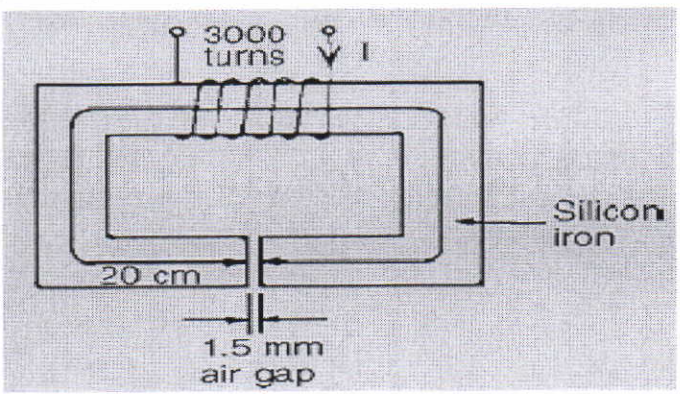
Q6: A) Prove that $I_{rms} = I\sqrt{\frac{3}{2}}$ if $i = (I + I\sin\theta)$, assuming $\theta = (0 - 2\pi)$. (5 Marks)

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*