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| Kaferelsheikh University<br>Faculty of Engineering<br>Electrical Engineering Dept.<br>Final Exam, 2016-2017<br>Date:2/1/2017 | | Subject: Electronic<br>Time : 90 minuets<br>Full Mark: 45 degree<br>Year: First<br>Exam in2page |

## [1] Question One: (18 Mark)

A) Distinguish between majority and minority carriers in a semiconductor. Define mobility of charge carriers.

B) Discuss how a depletion layer is formed in a P-N diode and how does it vary with biasing ? Draw V-I characteristics of P-N junction diode.

C) Derive an expression for the conductivity of a semiconductor.

D) Determine $v_o$/ ($R_L$ voltage)for each network of shown below for the same input shown.
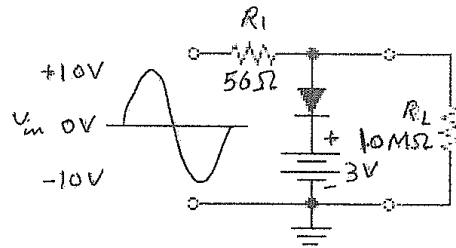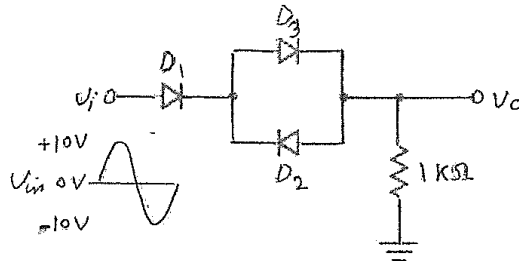


## [2] Question Two: (15 Mark)

A) sketch diagram of dc power supply (with reference to the function of each component within the diagram).

B) explain, full wave rectification using two diode? what is the difference between this method and using bridge?

C) Determine the minimum and the maximum load currents for which the zener diode as shown in Fig. will maintain regulation. What is the minimum value of $R_L$ that can be used? $V_Z=12v$, $I_{ZK}=1mA$, and $I_{zM}=50mA$. Assume an ideal zener diode where $Z_z=0\Omega$ and $V_z$ remains a constant 12 V over the range of current values, for simplicity. Explain if $R_L$ is less than 490 $\Omega$.



تابع باقی الاسئله فی خلف الورقه
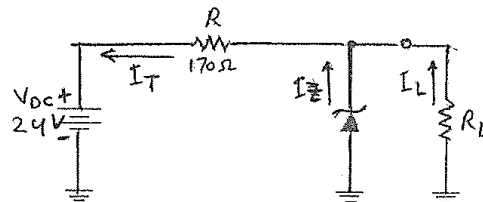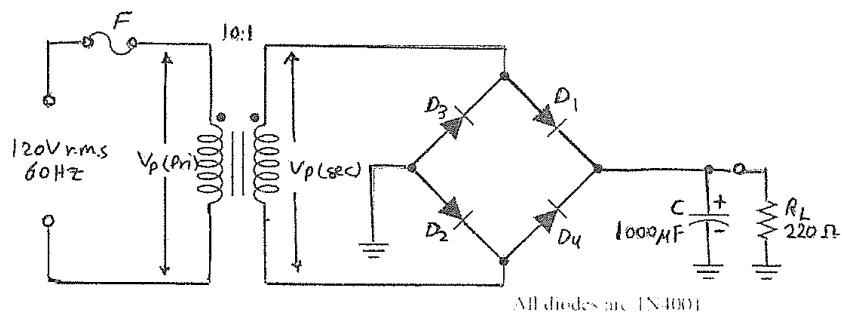
with best wishes

Dr. noha abd al salam

## [3] Question Three: (12 Mark)

A) source injects charge carriers into semiconductor bar. explain how current flow, what is this current?

B) compare between dynamic resistance and static resistance.

C) Determine the peak output voltage , what PIV rating is required for the diodes and the ripple factor for the filtered bridge rectifier with a load as indicated in Figure



All diodes are 1N4001

| Kafr Elshiekh University | | Date: 2 -1-2017 |
|---|---|---|
| Faculty of Engineering | | Time Allowed: 1:30 hr. |
| Department: Mechanical Engineering | | Full Mark: 45 Marks. |
| Year : 1st year(2007) 2016-2017 | | Final Exam: -- |
| Subject: Electrical & electronic Engineering | | Academic Code: EPM 1132 |
| (Electrical part) | | Exam: two pages |

## Answer the Following Questions:

**Q1**                                                                                                    7

For the circuit shown :
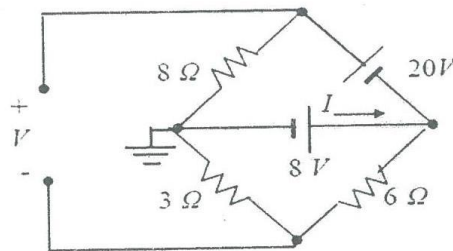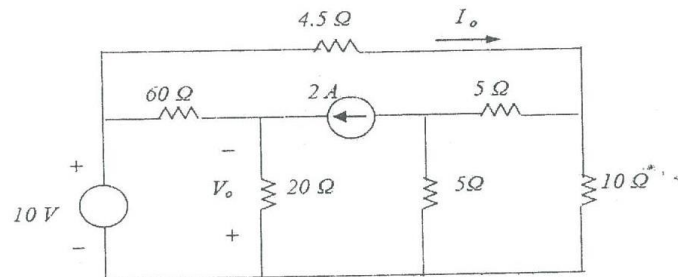   a)  Determine the current I.
   b)  Find voltage V.



**Q2**                                                                                                    8

Using the principle of superposition to find I0 and V0



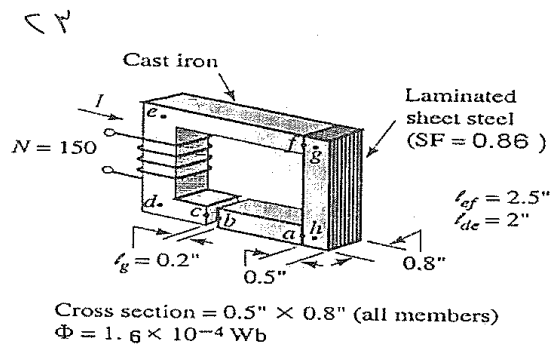**Q3**                                                                                                    15

  1- By drawing define the phase relation of between (which leading and by angle?):

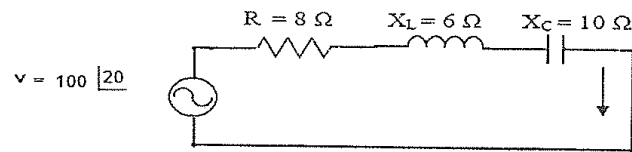   $v(t) = 40 \sin (\omega t + 50°)$   and   $v(t) = 20 \cos (\omega t - 30°)$

  1- The laminated sheet steel section in the figure has a stacking factor 0.86. Compute

   the current required to establish a flux $\phi = 1.6 \times 10^{-4}$ Wb. Neglect fringing.(Take

   1"=2.54 cm)

٢ر

Cast iron

Laminated
sheet steel
(SF = 0.86 )

$N = 150$

$\ell_{ef} = 2.5"$
$\ell_{de} = 2"$

$\ell_g = 0.2"$    0.5"    0.8"

Cross section = 0.5" × 0.8" (all members)
$\Phi = 1.6 \times 10^{-4}$ Wb

## Q4

For the circuit shown below with f = 50 HZ:

15

R = 8 Ω    $X_L = 6$ Ω    $X_C = 10$ Ω

v = 100 |20

a- Find the total impedance Z in polar form.

b- Draw the impedance diagram.

c- Find the value of C in μF and the value of L in henery.

d- Find the current I and the voltages $V_R$, $V_L$ and $V_C$ in polar form.

e- Draw the phasor diagram of voltages $V_R$, $V_L$ and $V_C$ and the current I.

f- Verify Kirchhoff's voltage law around the closed loop.

g- Find the average power delivered to the circuit.

h- Find the power factor of the circuit and indicate whether it is leading or lagging.

i- Find the sinusoidal expressions for the voltages and current.

j- Plot the waveforms for the voltages and current on the same set of axes.



B (T)

Sheet steel
Cast steel

Cast iron

H (A/m)
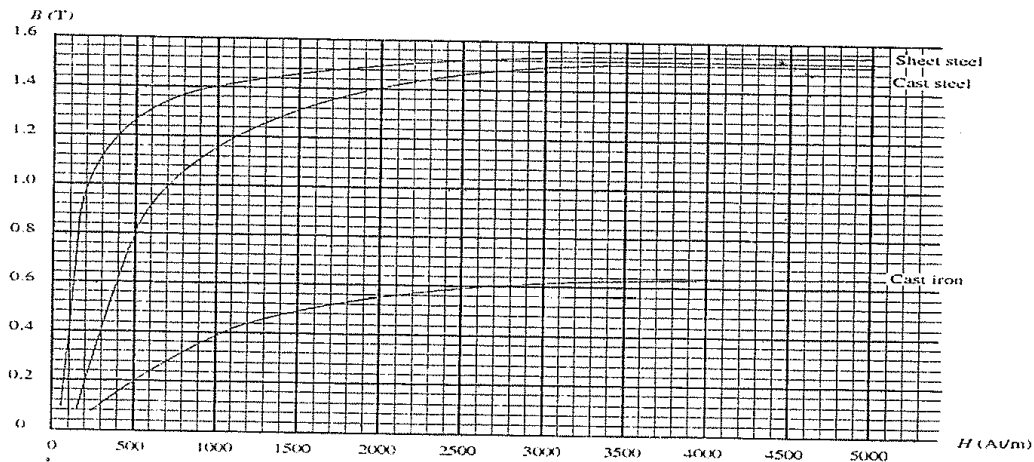
End of Exam Questions, Good Luck
Dr. fathalla selim
Electronic part in other papers