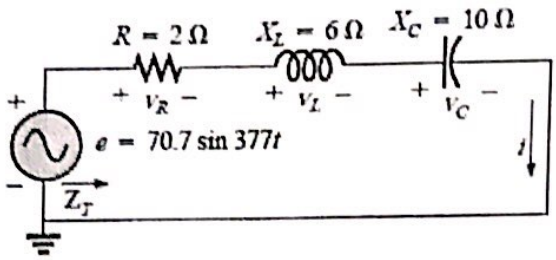
Kafrelsheikh University
Faculty of Engineering
Electrical Engineering Dept.
Subject Name: Electric Circuits
Academic Number:

Date: 20/05/2018
Time allowed: 90 minutes
Year: 1st. Year
Full Marks : 45 Degrees
Final Exam
Pages : 2

This exam measures ILOs no: a2, a3,a5,a6 ,b4 , b6,c4

Question No. 1 [12 Marks, 2 Marks per each one]

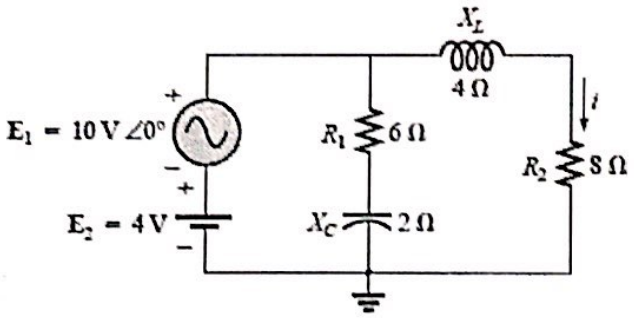


For the circuit of the following figure:

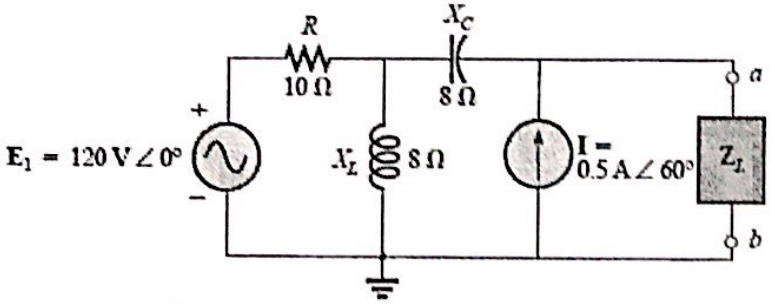
a. Find the total impedance $\mathbf{Z}_T$ in polar form.
b. Draw the impedance diagram.
c. Find the average power delivered to the circuit.
d. Find the value of C in microfarads and L in henries.
e. Find the current **I** and the voltages $\mathbf{V}_R$, $\mathbf{V}_L$, and $\mathbf{V}_C$ in phasor form.
f. Find the power factor of the circuit, and indicate whether it is leading or lagging.

Question No. 2 [13 Marks]

a. Using superposition, find the sinusoidal expression for the current i for the network of the following Fig. **[7 Marks]**



b. Find the Thévenin equivalent circuit for the portions of the networks of the following Fig. external to the elements between points a and b. **[6 Marks]**



د/ سهى عبد السلام د/ بدير يوسف.

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Question No. 3 [10 Marks, 2 Marks per each one]

A series *R-L-C* circuit is designed to resonant at $\omega_s = 10^5 rad/s$, have a bandwidth of $0.15\omega_s$, and draw 16 W from a 120-V source at resonance.

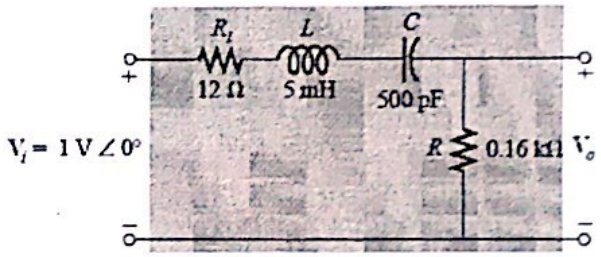
a. Determine the value of *R*.
b. Find the bandwidth in hertz.
c. Find the nameplate values of *L* and *C*.
d. Determine the *Qs* of the circuit.
e. Determine the fractional bandwidth.

Question No. 4 [4 Marks, 2 Marks per each one]

For the pass-band filter of the following Fig.

a. Determine f_s and the bandwidth.

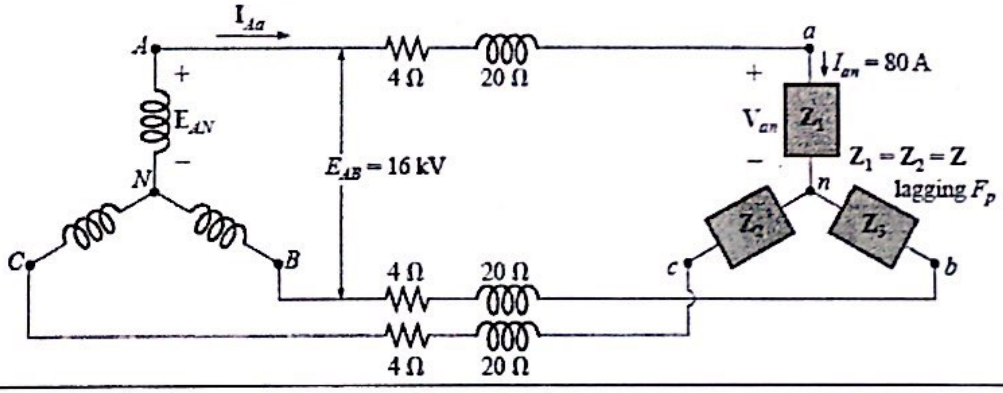
b. Find the magnitude of *Vo* at $f = f_s$.



Question No. 5 [6 Marks, 2 Mark per each one]

The Y-Y system of the following Fig. has a balanced load and a line impedance $Z_{Line} = 4\Omega + j20\Omega$. If the line voltage at the generator is 16,000 V and the total power delivered to the load is 1200 kW at 80 A, determine each of the following:

a. The magnitude of each phase voltage of the generator.
b. The magnitude of the line currents.
c. The total power delivered by the source.



You may use the following formulas:

$$BW = \frac{R}{2\pi L};\quad f_s = \frac{1}{2\pi\sqrt{LC}};\quad Q_s = \frac{X_L}{R} = \frac{f_s}{f_2 - f_1}$$

With my best wished
Dr. Sherif Imam

د/ شريف عبد السلام د/ بدير يوسف

Kaferelsheikh University
Faculty of Engineering
Department of Electrical Engineering
Year: First Subject: Electronic circuit
Name: ECE1001

Date: 20/ 5 /2018
Time allowed: 1.5 h
Full Mark: 45 degree
Final Exam: 2 page
Academic Number:

This exam measures ILOs no: a3, a4,a5,a8 ,a14, b6,c7

[1] Question One[20 degrees]:

1. Why two back to back diodes can't function as a transistor? [2 degrees]
2. Define:

-The transconductance of a transistor [2 degrees]

- The input resistance of JFET. [2 degrees]

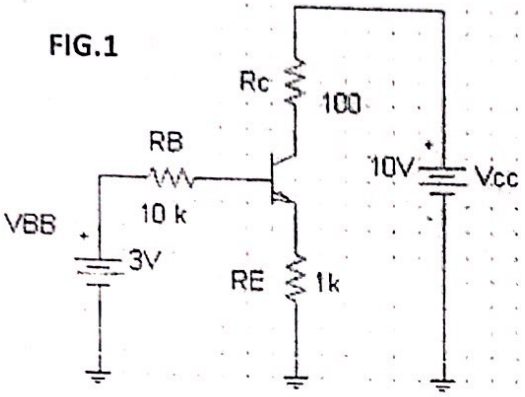
3. Explain the structure of p- channel JFET, and its characteristics. How V_{GS} controls the drain current. [5 degrees]
4. Compare between the structures of the two types of MOSFET. [6 degrees]
5. Sketch the transfer characteristics for n-channel depletion type MOSFET, I_{DSS}=10mA, V_p=-4v. Then find the value of drain current at V_{GS}=+1v. Why the enhancement region called the transfer characteristics. [5 degrees]

[2] Question Two[25]:

1. Define the overall gain of the transistor amplifier from the source voltage to the collector. Explain how can get the amplifier more stability voltage gain and high overall gain? [5 degrees]
2. Design voltage buffer circuit, then analysis the circuit (assuming values), what is its function? [4 degrees]
3. Prove that $I_{CE0} = I_{CB0} / (1-\alpha)$ at I_B=0μA. [4 degrees]
4. Design BJT as an electronic switch? [3 degrees]
5. For the amplifier in Figure1: Determine whether or not the transistor is in saturation. Assume $V_{CE(sat)}$ = 0.2 V. [4 degrees]

6. Find Q-point when V_{BB} = 1V and 3V. And then construct DC load line for this transistor. Assume $V_{CE(sat)}$ = 0 V, in Figure2. [4 degrees]

FIG.1



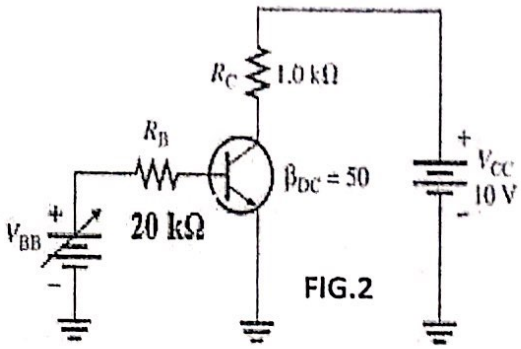


FIG.2

7. Determine the following ac values for the amplifier in Figure 3. [5 degrees]

(a) R_{in}*(base)* *(b)* R_{in} *(c) over all gain Av (d) current gain Ai (e)power gain Ap*

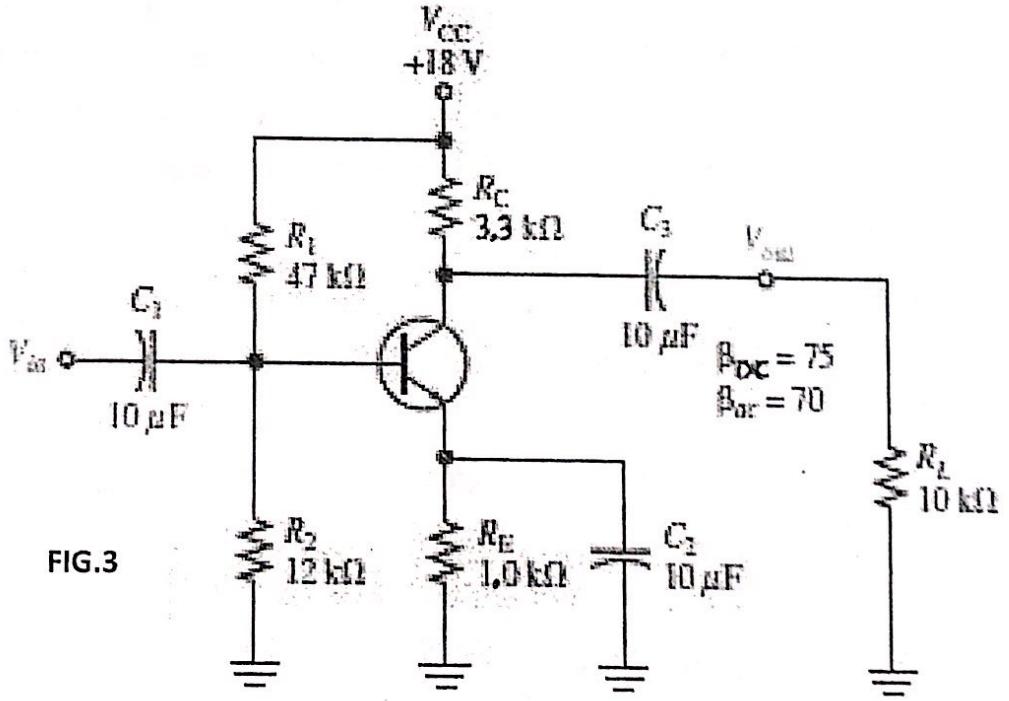


FIG.3