COLLEGE OF ENGINEERING & TECHNOLOGY

Department	:	Electrical & Computer Control Engineering	
Lecturer	:	Dr. M. Abdel-Rahim	
Course	:	Network Analysis	
Course Code	:	EE 332	Marks : 40
Date	:	10 / 1 / 2015	Time : 2 hours

Final Exam

Answer the following questions:-

1- For the circuit shown in fig.(1), let $v_s(t) = 120\, e^{-2t} \cos(5t + 30^\circ)$ V.

(i) Using the concept of the complex frequency, find the phasor value V_x.

(ii) Find the time domain expression $v_x(t)$.

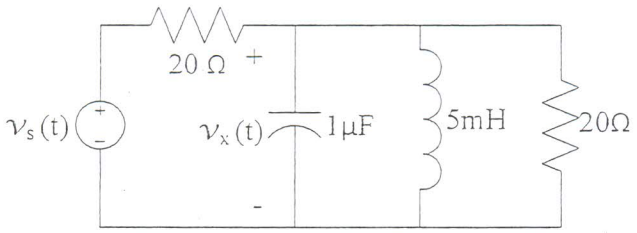

fig.(1)

b) For the circuit shown in fig.(2).

(i) Find $|Z_{AB}(\sigma)|$ as a ration of polynomials of σ.

(ii) Determine all the critical frequencies of $Z_{AB}(\sigma)$.

(iii) Sketch $|Z_{AB}(\sigma)|$ versus σ.

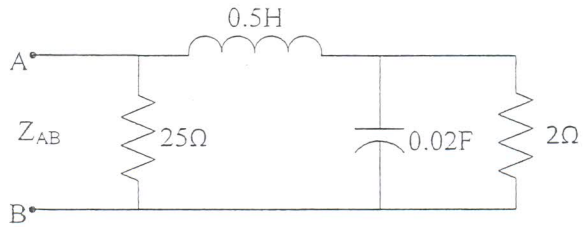

fig.(2)

(10 marks) (*A1*)

2- Draw the Bode amplitude and phase plots for the following transfer function

$$H(s) = \frac{5x10^6\,(S+10)}{(S+50)(S+100)^2}$$

(6 marks) (*A1*)

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3- The switch in the circuit shown in fig.(3) has been in position a for a long time.

At t = 0, the switch is moved to position b.

(i) Construct the s-domain equivalent circuit for t > 0.

(ii) Find I, V_1, V_2, and V_3.

(iii) Find i(t), $v_1(t)$, $v_2(t)$, and $v_3(t)$.

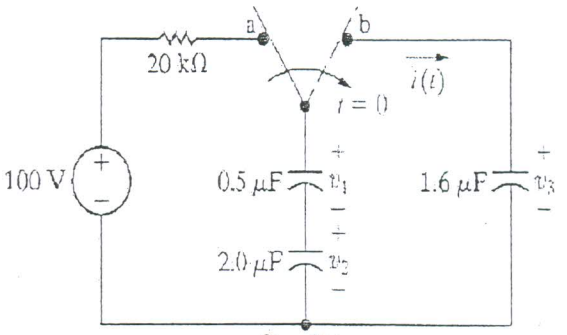

fig.(3)

(8 marks) (*B2*)

4- For the circuit shown in fig.(4), find the ratio $I_L(s) / Vs(s)$.
Let $V_s = 100\angle 0^o\ V$ and $\omega = 50\ rad/sec$, find $I_L(j50)$.

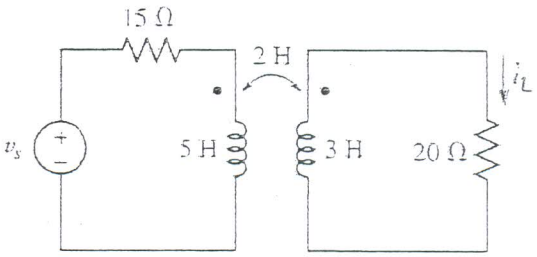

fig.(4)

(8 marks) (*A25*)

5 - The *z* parameters for the two-port network shown in fig.(5) are:

$z_{11} = 500\ \Omega$; $z_{12} = -500\ k\Omega$

$z_{21} = 10\ \Omega$; $z_{22} = 20\ k\Omega$.

Find the value of Z_L so that the power transferred to Z_L is maximum, and find the value of this power if $V_g = 100\angle 0^0\ V$, and $Z_g = 2500\ \Omega$.

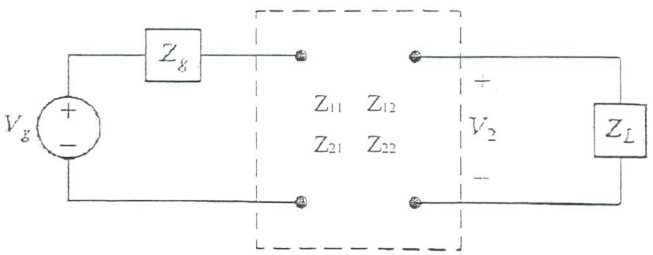

fig.(5)

(8 marks) (*A25*)

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