Elmansoura University
Faculty Of Engineering
Electronics and Comm. Engineering Dept.

Linear systems & Networks – 2nd year
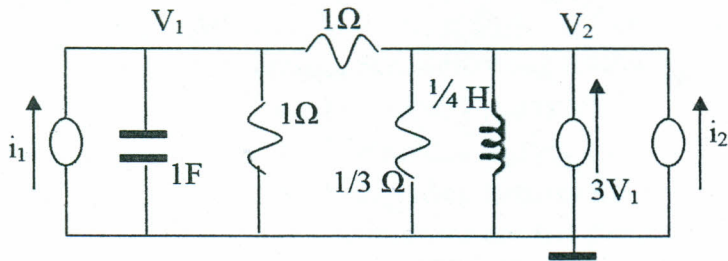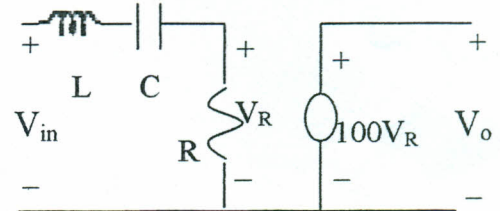June   2013
Time 3 Hours

Attempt the following.

1- For circuit (A) find the time response $v_2(t)$ given $i_1(t) = t\, U_{(t)}$, $i_2(t) = e^{-2t}\, U_{(t)}$. and the initial conditions are specified as ; $V_{0-} = 1/4$ volts and $I_{0-} = 0$. (15pts)

2- For circuit (B) find the voltage transfer function V_o/V_{in} . Choose suitable values for R , L, and C that yield a circuit suitable to select inputs within $1 - 10$ kHz frequency band . (10pts)

(A)   (B)

3-Determine the function corresponding to the Bode magnitude plot shown in Fig (1). (10pts)

4-Write the matrix state equation for the circuit shown in Fig.(2). (10pts)
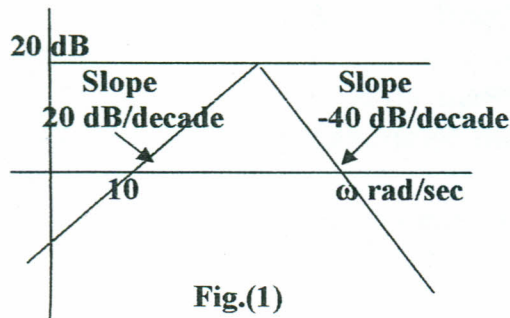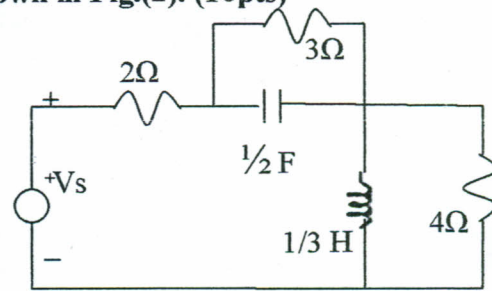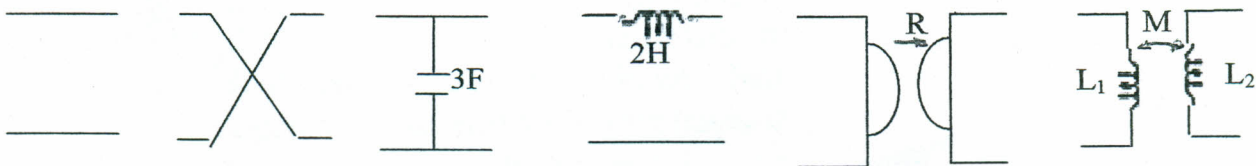

Fig.(1)   Fig.(2)

5-Find the transmission parameters (ABCD)for each of the two ports in the figure below (10pts)

6- For Fig.(3) find the scattering parameters for the two port shown when double terminated by one ohm resistances. (15pts)
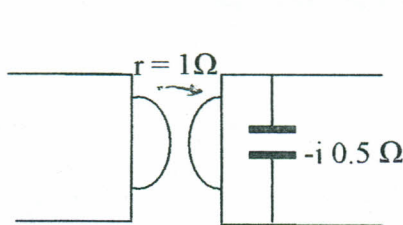
7- In Fig. (4) the two transistors are identical and each has a CE y parameters $Y_{ine} = 1$ S , $Y_{re} = 0$, $Y_{fe} = 10$ S , and $Y_{oe} = 0.1$ S . Write the IAM of the circuit, and find V_o/V_{in} (15pts)

What will be V_o/V_{in} if transistors are ideal (10pts)?

8- Find the input impedance Z_{in} for the circuit shown in Fig.(5). Assuming ideal Op Amp. (15pts)
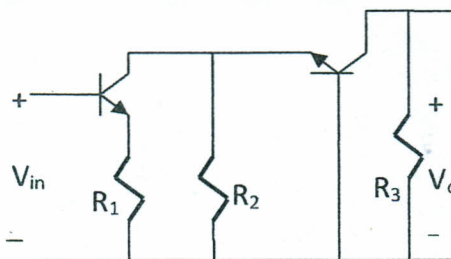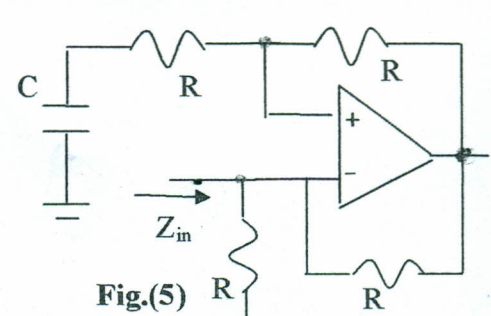

Fig.(3)   Fig.(4)   Fig.(5)

Full Mark 100 pts

Good Luck.