INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
DEPARTMENT OF ELECTRONICS & ELECTRICAL ENGINEERING

EE 101: Electrical Sciences

Tutorial-11

*(First question is the **Pre-Tutorial Assignment problem** to be done in the space provided.)*

Name: Roll No.: Tutorial Group:

Question 1: For the network shown below, find

(a) The resonant frequency ω_0

(b) $Z_{in}(j\omega_0)$

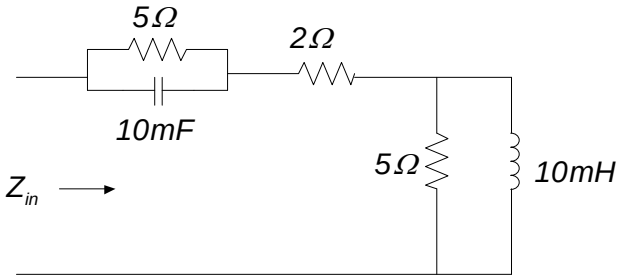

Figure 1

Question 2: A series resonant network consists of a 50Ω resistor, a $4mH$ and a $0.1\mu F$ capacitor. Calculate the values of:

(a) ω_0

(b) f_0

(c) Q_0

(d) Bandwidth

(e) ω_1

(f) ω_2

(g) Z_{in} at 45 krad/s and

(h) The ratio of magnitudes of capacitor impedance to resistor at $45krad/s$.

Question 3: An AC-coupled amplifier is shown below.

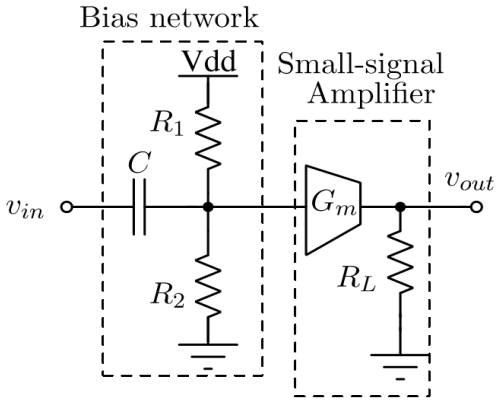

Figure 2: An AC-coupled amplifier

This circuit can be seen as a cascade of two networks. Assuming an ideal transconductor, derive the (frequency-dependent) transfer function of the above amplifier.