1. (20 points) For the circuit shown, drive the resonance frequency, quality factor, and bandwidth. Plot the resonance frequency behavior as a function of resistance $R$.

![Circuit Diagram]

2. (10 points) A 100 MHz source with internal resistance $Z_s=25+j5$ (ohm) is to be matched to a 50 ohm load by means of and L-match network. Away from this frequency, however, the network is required to operate as a high-pass filter. Determine L-match network parameters.

3. (10 points) A 100 MHz source with 100 ohm internal resistance is to be matched to a 50 ohm load by means of π-match network. The network exhibits a -3dB bandwidth of 5 MHz. Determine the component values of π-match network.

4. (40 points) Textbook 3.2

5. (10 points) Textbook 3.12

6. (10 points) Textbook 3.14