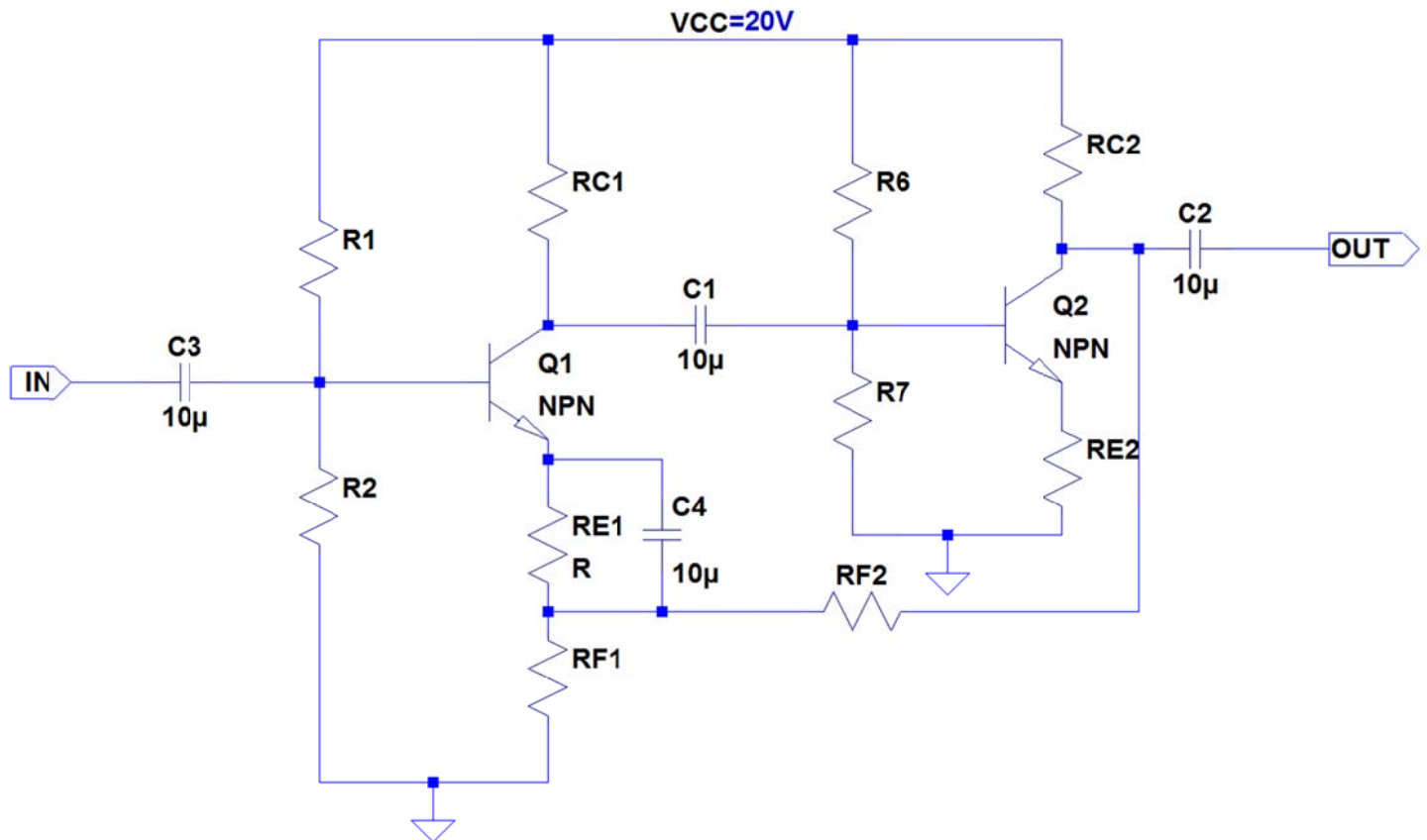


ELE 313 ELECTRONICS LABORATORY 2

FINAL PROJECT (Due Date 28.01.2011)

In this project, participants are supposed to design and implement a two stage AC coupled feedback amplifier. The circuit scheme can be seen at the following figure.



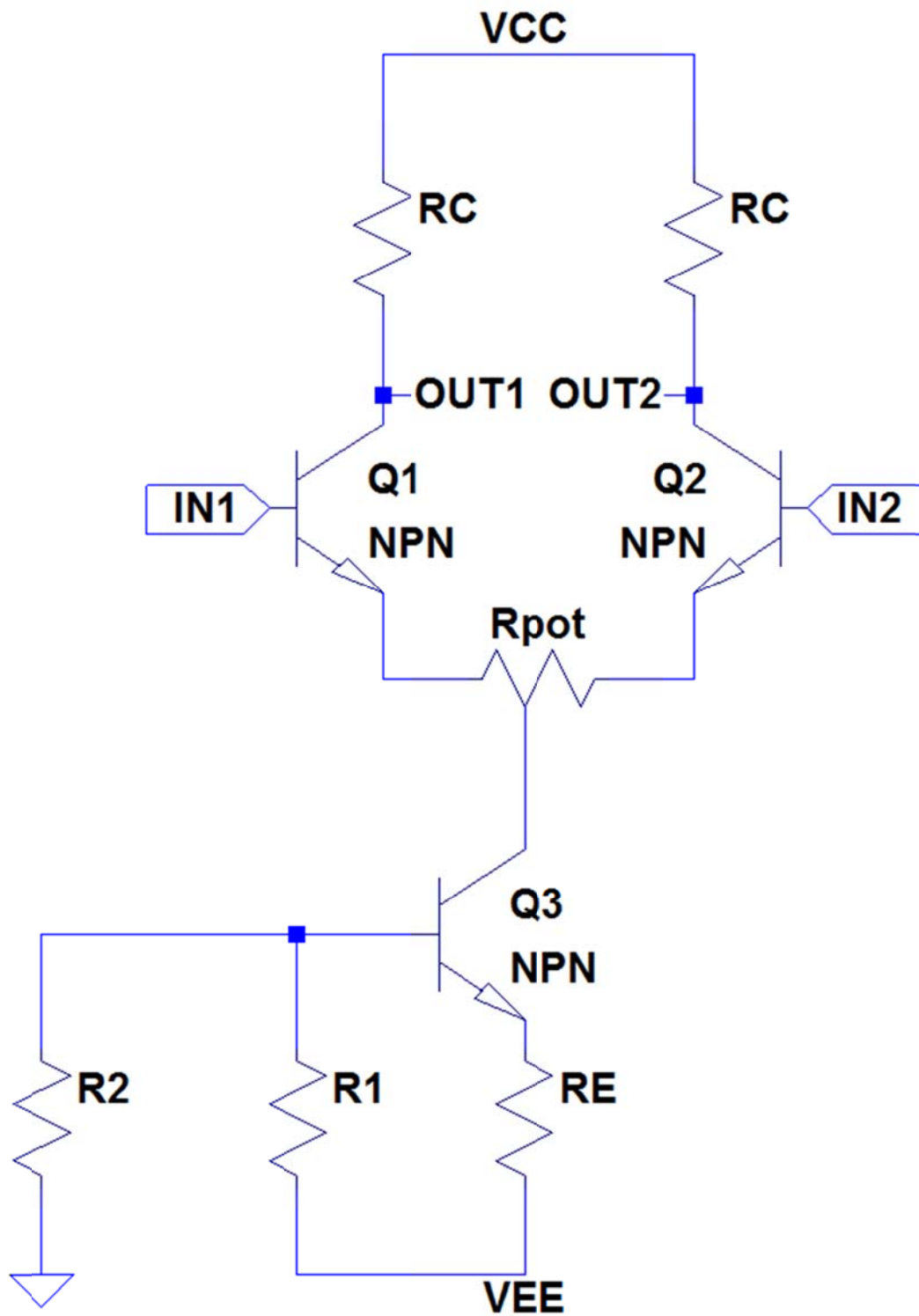
Design criterias are :

Open loop gain is to be 1000

Closed loop gain is to be 20

Maximum V_{CC} current is to be 10mA.

All parts in the circuit (except the supply voltages) should be determined by the participants. Any transistor can be used in the circuit, but it is suggested to check the availability of your transistor in the market.



Design criterias are :

Common mode gain (A_c) is to be less than or equal to 0.01

Differferential mode gain (A_d) is to be more than 20

VCC=15V and VEE=-15V.

All parts in the circuit (except the supply voltages) should be determined by the participants. Any transistor can be used in the circuit, but it is suggested to check the availability of your transistor in the market. It is strongly recommended to choose similar transistors and tune the R_{pot} to have a balanced symmetric amplifier.

Suggested Design Steps

1. Design of the circuit with simulation programs

Participants should give a report of their design with all details and simulation results. In the report you should indicate the transistor type, its characteristics, capacitor values etc. As you won't be able to use ideal resistors (which will be pricy), you may use an E12 standart resistor table (1.0x, 1.2x, 1.5x, 1.8x, 2.2x, 2.7x, 3.3x, 3.9x, 4.7x, 5.6x, 6.8x, 8.2x).

This practical values of circuit parts should also be used in the simulation and outputs should be included in the report

2. Testing the circuit with the board in the laboratory

In this phase participants are supposed to test their circuits in the laboratory on boards. You can use supply voltages, boards, signal generators, oscilloscopes, all other parts like connection wires, resistors, capacitors, transistors, etc. should be obtained by the participants.

3. Implementing the circuit on the PCB (printed circuit board)

In this phase, participants are supposed to implement their circuits on the board and test them in the lab. You should supply your own PCB and chemicals. After soldering the circuit should satisfy the design criterias.

4. Final report

Participants should supply their results after the steps above. Reports should include, original design, modifications if made, frequency responses, design goals, etc.