1. The V_{BE} multiplier. Find the values of V and the incremental resistance between x and ground?
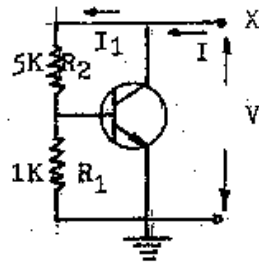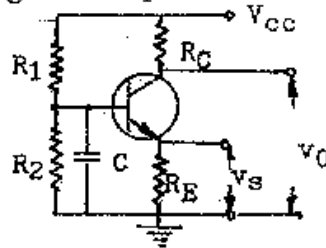
$V_{BE} = 0.7V$　　　　　(20%)

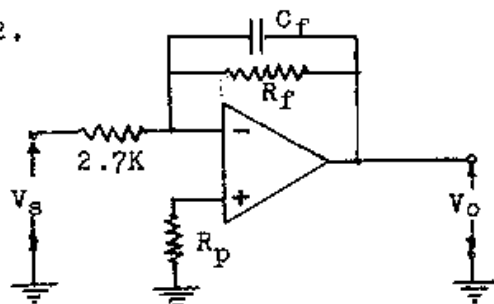$I = 10$ mA　$h_{fe} = 500$

$h_{ie} = 10K$

$h_{re} = h_{oe} = 0.$

2. The amplifier as shown. Find voltage gain. input and output impedance.　(20%)

Assume: $h_{re} = h_{oe} = 0$

3. Design the OP-amp. RC circuit to realize a low-pass filter with a corner frequency of 20 KHz. and low-frequency gain of 12.　(20%)

4. An OP-amp has a rated output voltage of ± 12 V and a slew rate of 1 V/μs. What is its full-power bandwidth? If an input sinusoid with frequency $f = 5f_M$ is applied to a unity-gain follower constructed this OP-amp. What is the maximum possible amplitude that can be accommodated at the output without incurring slew-induced distortion?　(20%)

(f_M = full-power bandwidth.)

5. The difference amplifier as shown. Find voltage gain.　(20%)