

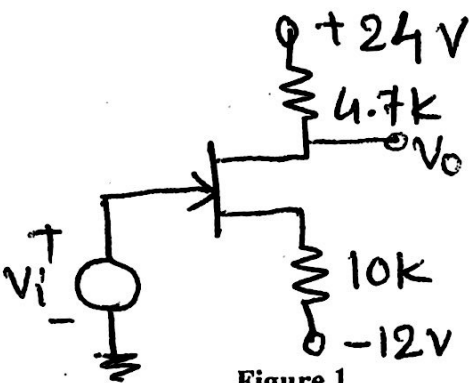
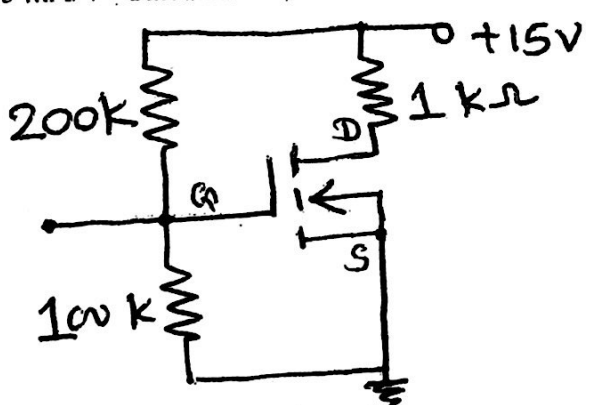
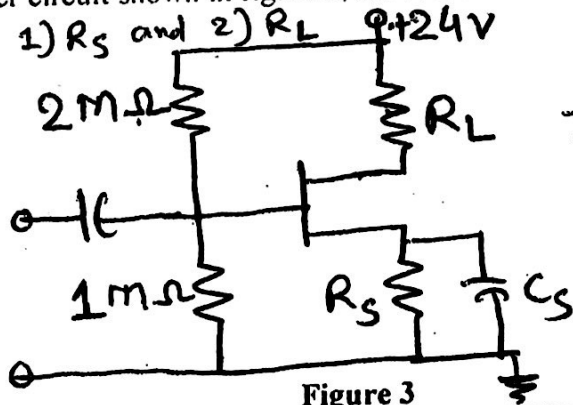
NATIONAL INSTITUTE OF TECHNOLOGY-SURAT
B.Tech. II (EC) 3RD Sem.
Sub: Electronic Devices and Circuits
MIDSEM EXAM September 2012

Marks: 30

Time: One Hour

Instructions:

1. Attempt all questions.
2. Draw neat & clean circuit diagram/block diagram and waveforms.
3. Figure to the right indicates full marks.
4. Assume data if necessary with proper justification.

Q.1	Attempt Any Two:	10
[A]	<p>The JFET circuit shown in figure 1 has $I_{DSS} = 5.6 \text{ mA}$, $V_p = -4 \text{ V}$. Find (1) V_o if $V_i = 10 \text{ V}$ (2) Find V_i if $V_o = 0 \text{ V}$.</p>  <p style="text-align: center;">Figure 1</p>	05
[B]	<p>An n-channel enhancement mode MOSFET, biased as shown in figure 2. The given parameters are $V_{th} = 2 \text{ V}$, and $K = 0.5 \text{ mA/V}^2$. Calculate I_D, V_{GS} and V_{DS}. Find out the mode of operation.</p>  <p style="text-align: center;">Figure 2</p>	05
[C]	<p>In the voltage divider circuit shown in figure 3, the JFET has $I_D = 4 \text{ mA}$ and $V_{DS} = 8 \text{ V}$ at the Q-point. Find out 1) R_S and 2) R_L.</p>  <p style="text-align: center;">Figure 3</p> <p style="margin-left: 600px;">$I_{DSS} = 10 \text{ mA}$ $V_p = -5 \text{ V}$</p>	05
Q.2	Draw and explain the static VI characteristics of SCR. Explain all the modes of its working with detail layer diagrams.	05

(a) Find if the silicon transistor is in cutoff, saturation or in the active region.

(b) Find V_0

(c) Find the minimum value for the emitter resistance R_E for which the transistor operates in the active region.

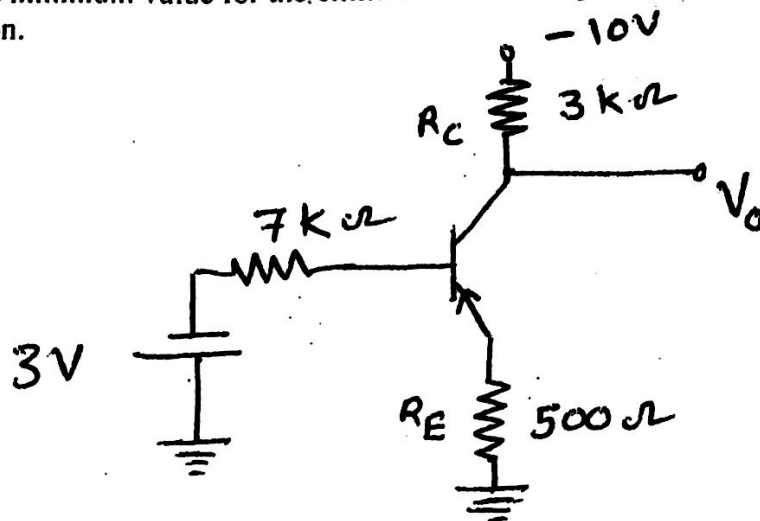


Fig.4

Q.4 In the circuit shown below [Fig.5], find R_E , take $V_{BE} = -0.7V$, $\beta = 50$, and $V_{CEQ} = -4V$.

03

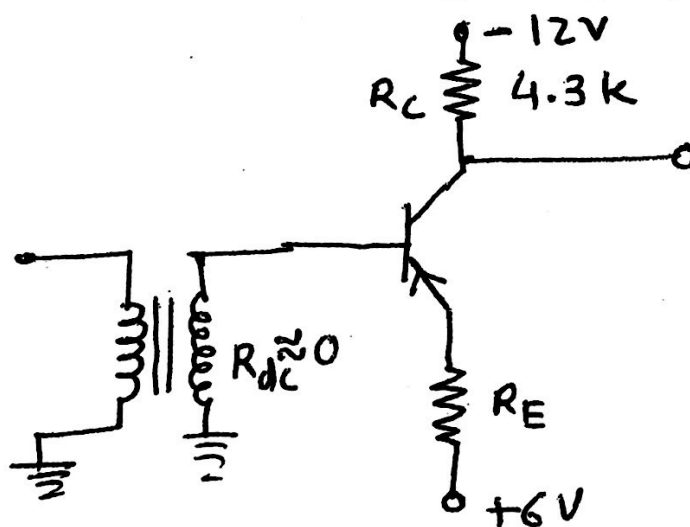


Fig.5

5 The circuit shown below [Fig.6] uses silicon transistor and is designed to make $V_0 = 0V$ and $V_{CEQ} = 3V$, determine R_C and R_E .

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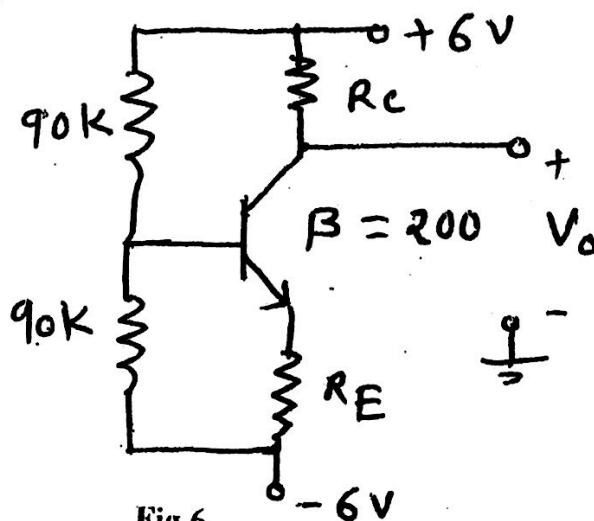


Fig.6
