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BRAC UNIVERSITY
Department of Computer Science & Engineering
Classtest 4, 26th August 2023
CSE 350: Digital Electronics and Pulse Techniques

Inspiring Excellence

Total Marks: 20
Time: **25 Minutes**

- Use activation voltage $V_\gamma(diode) = 0.6\ V$, $V_\gamma(transistor) = 0.5\ V$, $V_{BE}(forward\ active) = 0.7\ V$ and $V_D(conducting\ voltage\ of\ Diode) = 0.7\ V$, for all the questions.
- There is no need to draw circuits in your answer sheet. However, you may draw them if you wish to.

Name:	ID:	Section:

Question 1

Consider the ECL circuit in the **figure 1** where v_{O1} represents buffer output and v_{O2} represents inverter output for the input voltage v_{in}. Ignore the base currents and suppose **logical Low** voltage is $-1.8\ V$. **[20]**

CO1	(a)	**Determine** the value of i_E [*Hint: consider v_{in} is logically Low and so Q_R is on and Q_1 is off*].	[8]
CO2	(b)	If v_{in} is logic High, **Determine** the value of R_{c1}.	[8]
CO2	(c)	**Find out** the value of Reference voltage V_R [*Hint: Reference voltage is the average of logic Low and logic High values*]	[4]
CO1	(d)	**Calculate** the total power dissipated in the circuit if v_{in} is **Low**.	[3, bonus]

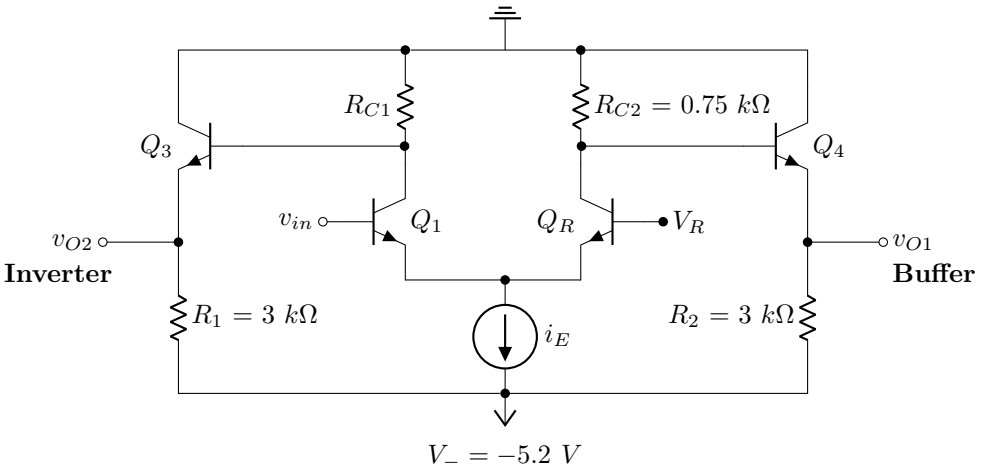

Figure 1