Lab-01: Study of diode and transistor basics using Multisim
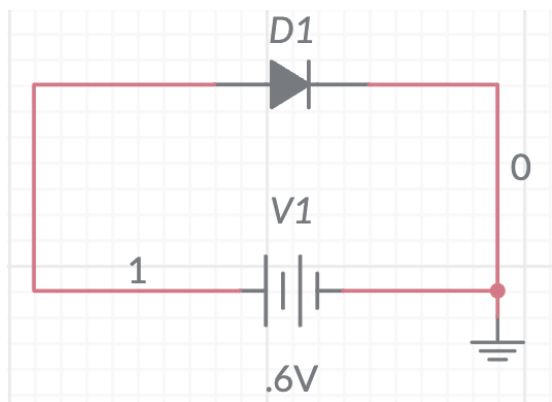
Name   :

ID (optional)   :

1. Construct the simple diode circuit as shown below and study the following.
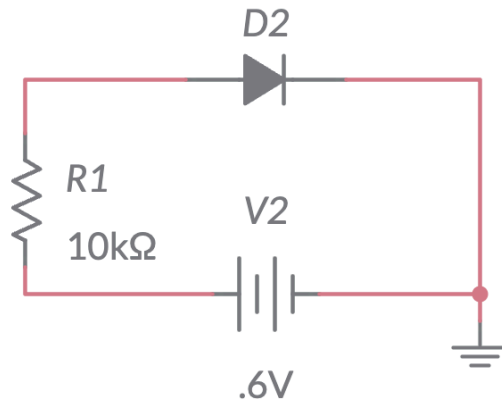

Complete the following table using data obtained in Multisim

Source voltage (V)	Diode voltage (V)	Diode current (A)	Diode resistance (Ohm)	Scale current (A)
0.2				
0.5				
0.7				
0.8				
1				
5				

i.   What does happen to this diode when the diode voltage is 1V?

ii.   Why does the diode resistance do not remain constant?

iii.   Can you compare this diode to a switch? If so, when does the diode remain ON and when does it remain OFF?

iv.   How do you compare the above switch operation with an ideal switch?

v.   What changes do you expect on the current-voltage (I-V) characteristic curve of the diode if the scale current increases and/or decreases?

vi.   What type of changes would you observe if the temperature rises or drops?

2. Construct the simple diode circuit as shown below and study the following.

Complete the following table using data obtained in Multisim

Source voltage (V)	Resistor (kΩ)	Diode voltage (V)	Diode current (A)	Diode resistance (Ohm)
	0.1			
	1			
0.75	10			
	100			
	1000			
	0.1			
	1			
5	10			
	100			
	1000			

i.   What is the function of the resistor in this circuit?

ii.   Would you use a series resistor with a diode in a practical circuit?

iii.   Can you use any value of the resistor? If not, what would be your consideration in choosing a resistor?

vii.   How does the resistor affect switching performance of the diode?

3. Construct the simple diode circuit as shown below and study the following.
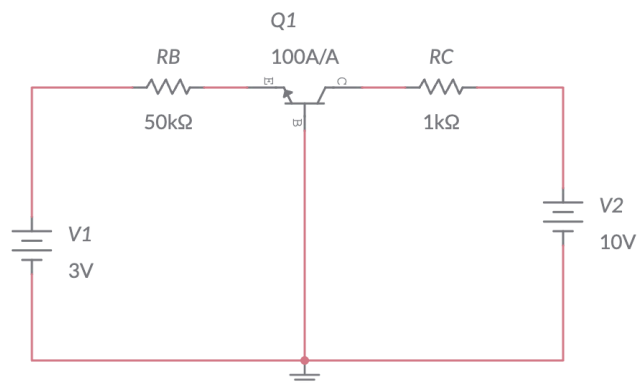
Complete the following table using data obtained in Multisim

V1 (V)	V2 (V)	V_{BE} (V)	V_{CB} (V)	I_B (µA)	I_C (µA)	I_E (µA)
0.6	10					
1.0	10					
3	0					
	2					
	4					
	8					
	12					
	16					

Answer the questions asked in the lab session.