ELECTRONICS LAB REPORT
EXPERIMENT (4)
DIODE AND TRANSISTOR
CHARACTERISTICS

Date:----------------------------------

Name:----------------------------------   Partner's Name:-------------------

Registration No:-------------------   Registration No:---------------------

Physics Section:-------------------   Instructor's Name:-----------------

DATA AND DATA ANALYSIS

1st.   DIODE CHARACTERISTICS

1- Connect the circuit shown in *figure 1*.
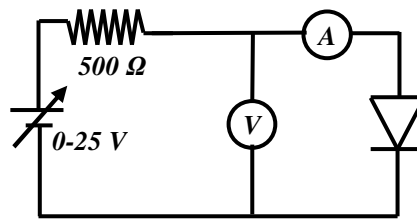

Fig. 1

2- Measure the current *I* versus forwared voltage *V*. Enter your data in *Table 4.1*

<div align="center">Table (4.1)</div>

Power supply voltage (V)	0.2	0.4	0.6	0.8	1	2	3	4	5	6	7	8	9	10
Forward voltage (V)														
Current (mA)														

3- Reverse the diode connections and measure the current *I* versus reversre voltage *V*. Enter your data in *Table 4.2*

Table (4.2)

Power supply voltage (V)	2	4	6	8	10	12	14	16	18	20	22	24
Reverse voltage (V)												
Current (µA)												

4- Plot agraph for the current **I** versus voltage **V** for both of the two regions (forward biase and reverse biase) on the same sheet of graph paper.

5- From the graph determine the forward voltage at which the diode begins to conduct.
The forward voltage = ………………………….

6- Determine whether the diode is a silicon or germanium diode.

B. TRANSISTOR CHARACTERISTICS
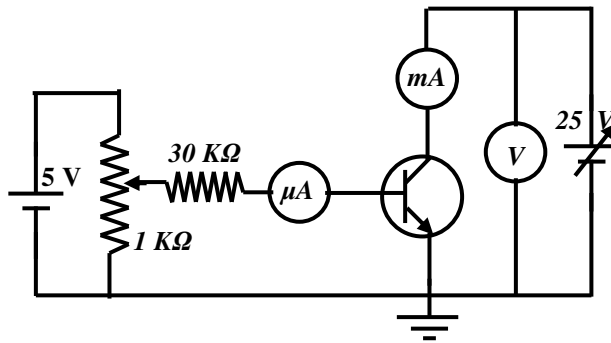
1- Connect the circuit shown in *figure 2*.

Fig. 2

2- For a base current $I_B = 0$, take a set of readings of I_C versus V_{CE} . Repeat for $I_B = 20, 40, 60, 80$ and *100 µA*. Inter your values in table 4.3

Table (4.3)

V$_{CE}$ (V)	I$_C$ (mA)					
	I$_B$=0 μA	I$_B$=20 μA	I$_B$=40 μA	I$_B$=60 μA	I$_B$=80 μA	I$_B$=100 μA
0.2						
0.4						
0.6						
0.8						
1						
2						
4						
6						
8						
10						
12						
14						
16						
18						
20						

3- Plot the characteristics of a common emitter *npn* transistor by plotting I_C versus V_{CE} for constant I_B.

4- From the transistor characteristics obtained determine the common emitter current gain B_{dc}, where $B_{dc} = I_C / I_B$, for $V_{CE} = 6$ *Volts* and $I_B = 60$ *μA*.

Questions:-

1- Figure 3 shows the collector characteristics curves. Show on the graph the following operation regions in transistor:-

a- cut off region.

b- active region.
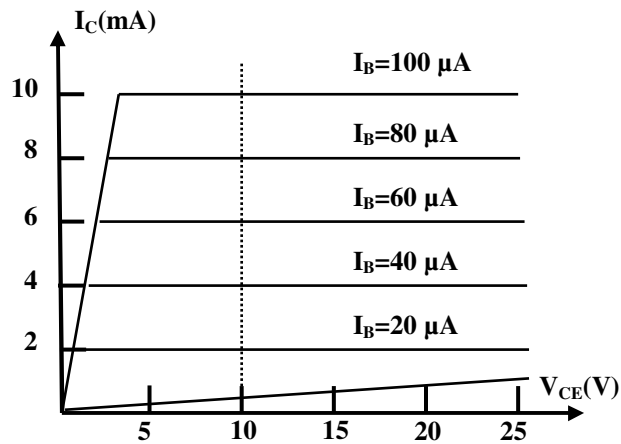
c- saturated region.

d- break down region.

Fig. 3

2- Determine $I_B, I_C, I_E, V_{BE}, V_{CE}$ and V_{CB} in the circuit shown in *figure 4*. The transistor has $B_{dc} = 150$.
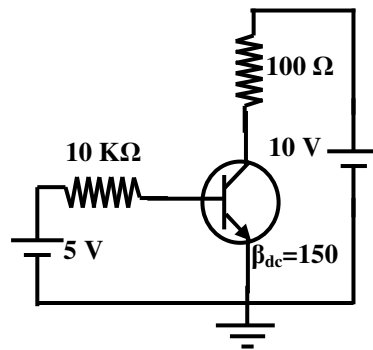

Fig. 4