Grade	12 ENI	Subject	Term 2- Electronics II. ENI723
Name		ID	
Section	01 &51	Date	W2-WS1

This Worksheet will provide evidences for the following NQA criteria:

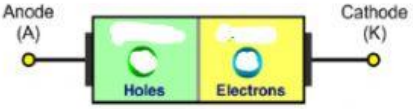
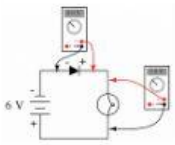
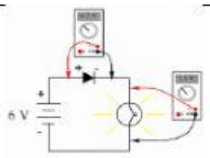
GC	GC1.4	Explain with the aid of diagrams the forward and reverse biasing in PN-junction diodes.
GC	GC1.5	Determine the forward voltage and forward current for the diode connected in series with a resistor and DC power supply for two diode models, the ideal and practical models. Also find the voltage across the limiting resistor in each case.
GC	GC1.6	Determine the reverse voltage and reverse current for the diode connected in series with a resistor and DC power supply for two diode models, the ideal and practical models. Also find the voltage across the limiting resistor in each case.
GC	GC1.8	Describe at least four different types of diodes, their function, applications, and symbols. The types include single diode, LED, Photodiode and Zener diode.

Answer all questions

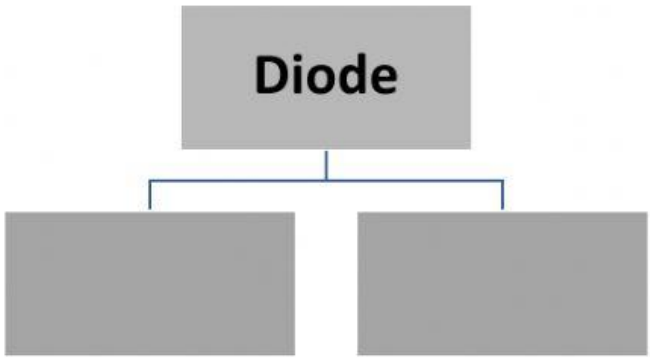
Q1) Diode structure, types and symbols.

Copy the letter, symbol or word from the list to its correct place.

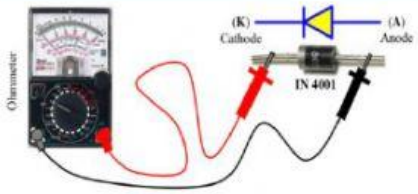
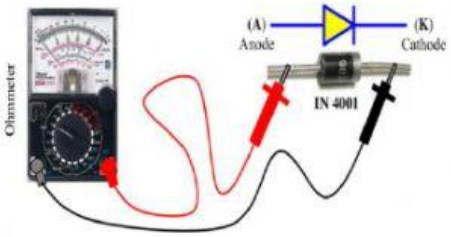
Diode symbol, Diode structure, A, K, Cathode, P-Type, N-type, + , - , Photo diode, Rectifier diode, Zener diode symbol, Zener diode, Diode packaging, forward biased diode, Reverse diode, low power diode, Light emitting diode

		
Typical diode		
		
		
		

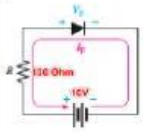
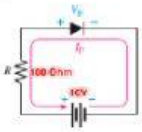
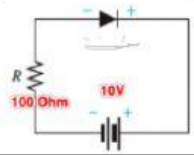
Q2) Complete the chart with diode classifications according to semiconductor types.



Q3) Match Diode testing circuit with its characteristics.

#	Circuit	#	Results
1			• Forward direction test. As Red(+ve) lead is connected to A and Black (-ve) lead is connected to K. • The test will measure the internal resistance of the diode. • Typica reading is <10 ohms for good diodes. And 0.3V for Ge and 0.7 for Si diode when tested by Digital Multimeter.
2			• Reverse direction test. As Red(+ve) lead is connected to K and Black (-ve) lead is connected to A. • The test will measure the internal resistance of the diode. • Typica reading is >1000M ohms for good diodes. And 1 or OL when tested by Digital Multimeter

Q4) Calculate the circuit parameters in the diode approximation circuits (models) below:

Item	Ideal Diode model	Practical Diode model	Practical Diode model
			
V_f			
I_f			
V_R			

Q5) Match the item to its correct place in Diode Chrematistics chart.

Current

Voltage

Leakage Current
<20uA Silicon
<50uA Germanium

"Zener"
Breakdown
or Avalanche
Region

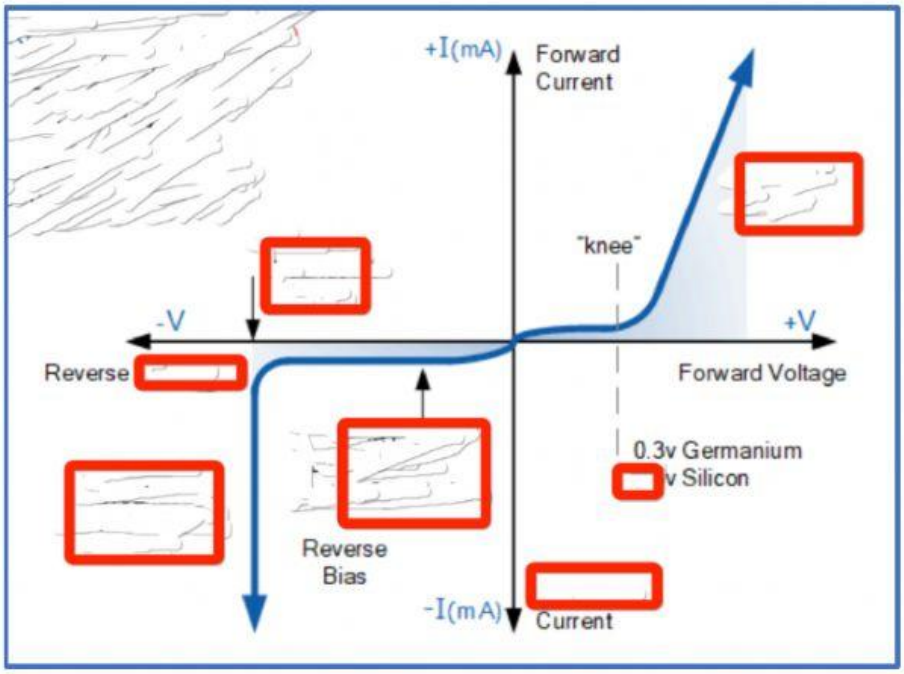
"knee"

0.3

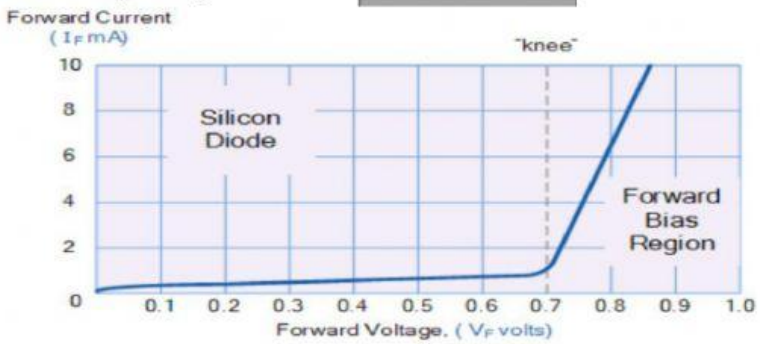
Forward

Reverse

0.7



Q6) The below characteristic curve is for a Silicon Diode. What is the minimum bias voltage required to ensure that the forward current is passing the diode?



Q7) The below characteristic curve is for a Silicon Diode. What is the minimum reverse bias voltage required to breakdown the diode PN junction?