Electronic Circuits I – Laboratory 02

Testing diodes in DC, and AC circuits

#	Student ID	Student Name	Grade (10)	Instructor signature
1				
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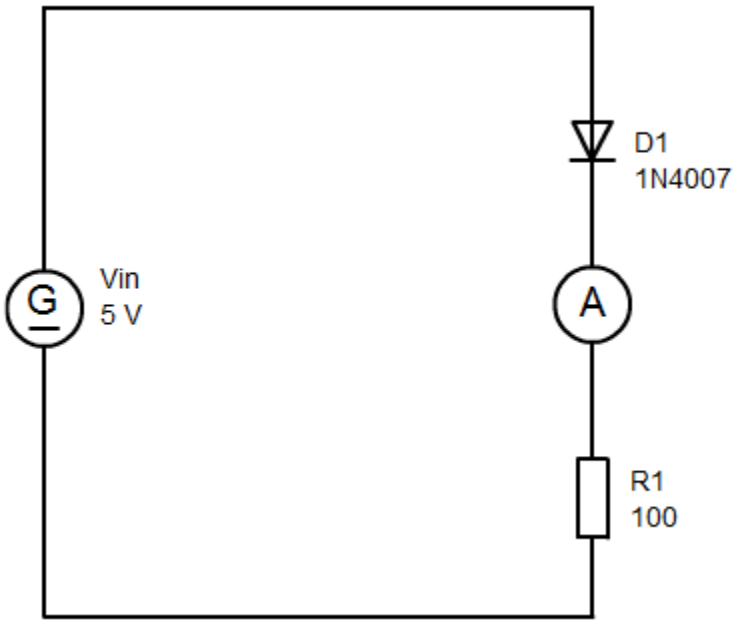
Delivery Date	

Part 1

Objectives

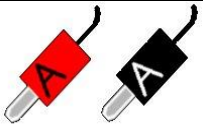
Recording a voltage-current characteristic
Determining breakdown voltage
Forward and reverse-bias response of a diode

Circuit diagram

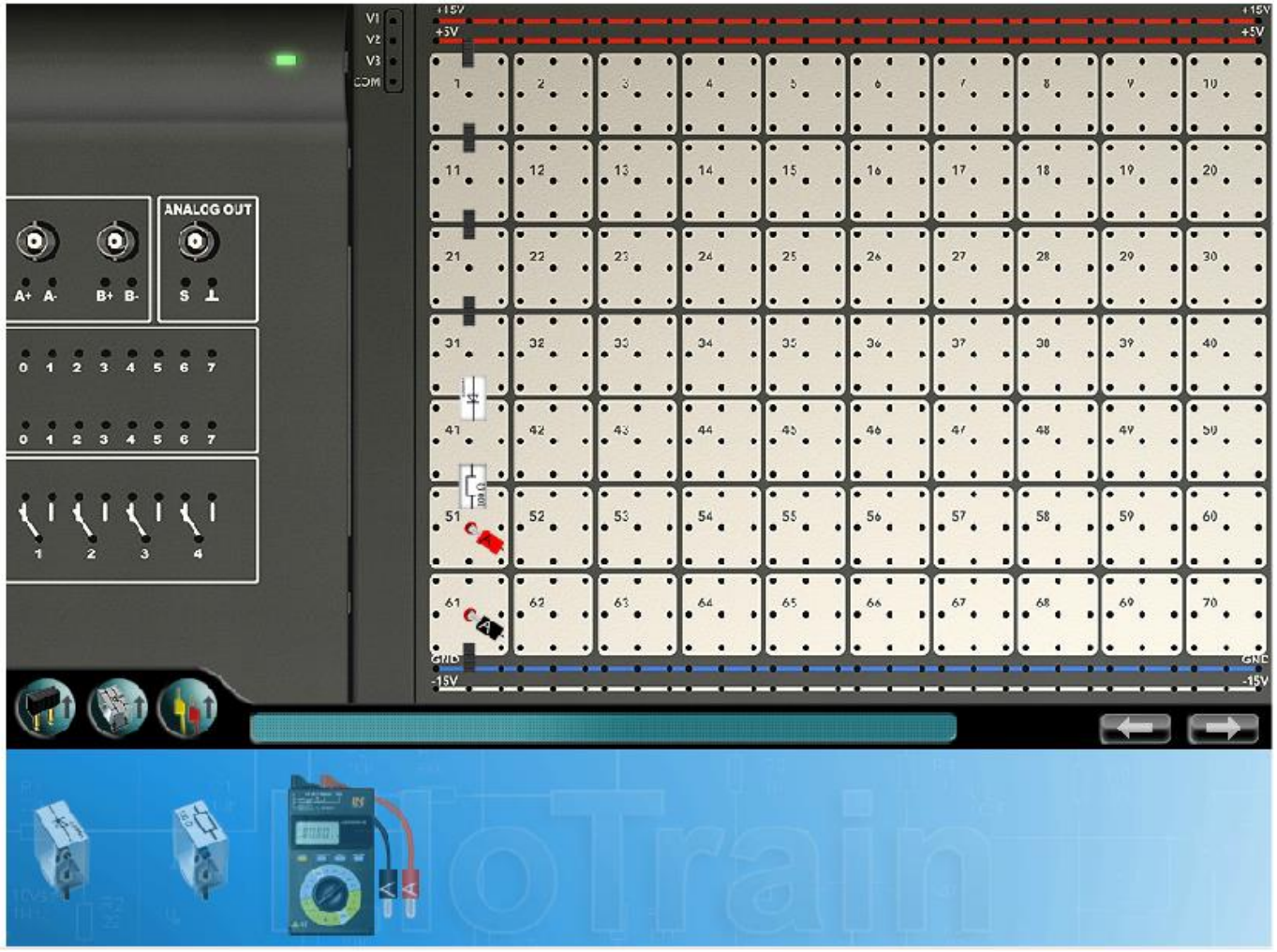


Equipment

The following equipment is needed for this experiment and should be configured as shown:

Equipment	Settings	
	Black lead	Ground
	Red lead	400 mA input
	Selector knob	mA =
		Plug the red and black leads into the sockets indicated.

Experiment set-up



Experiment procedure and exercises

What current flows through the diode in the forward-bias direction?

$I_{forward}$ (mA)	

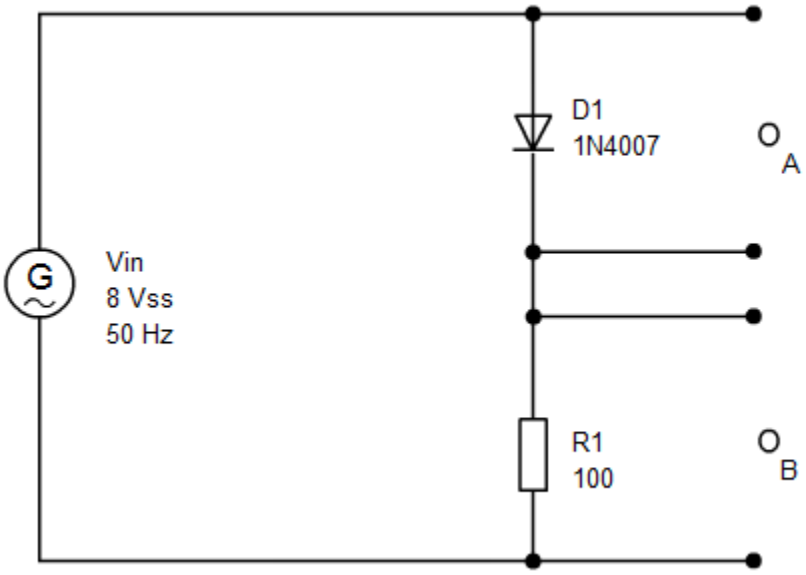
Now use the diode in the reverse-bias direction. What is the current now?

$I_{reverse}$ (mA)	

Part 2

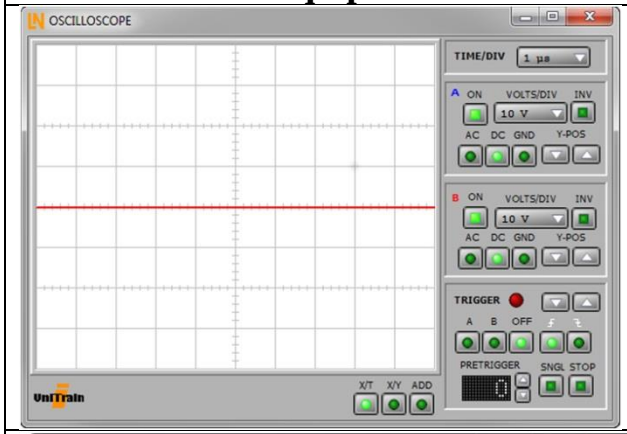
Circuit diagram

This experiment is based on the following circuit:

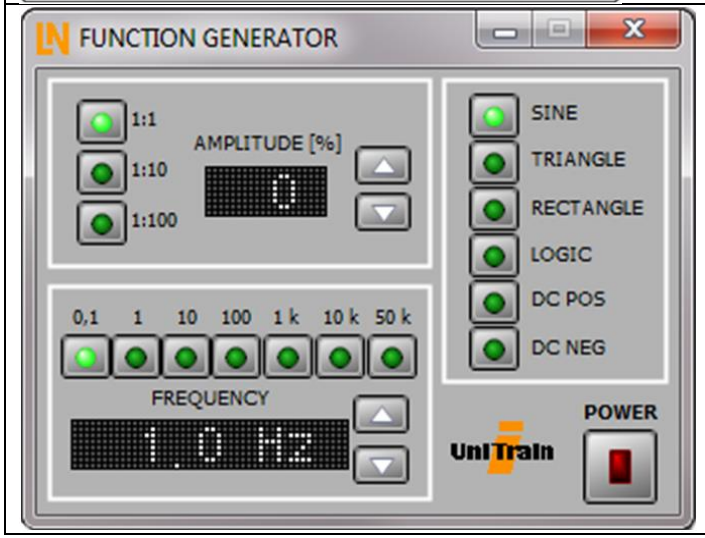


Equipment

Equipment	Settings

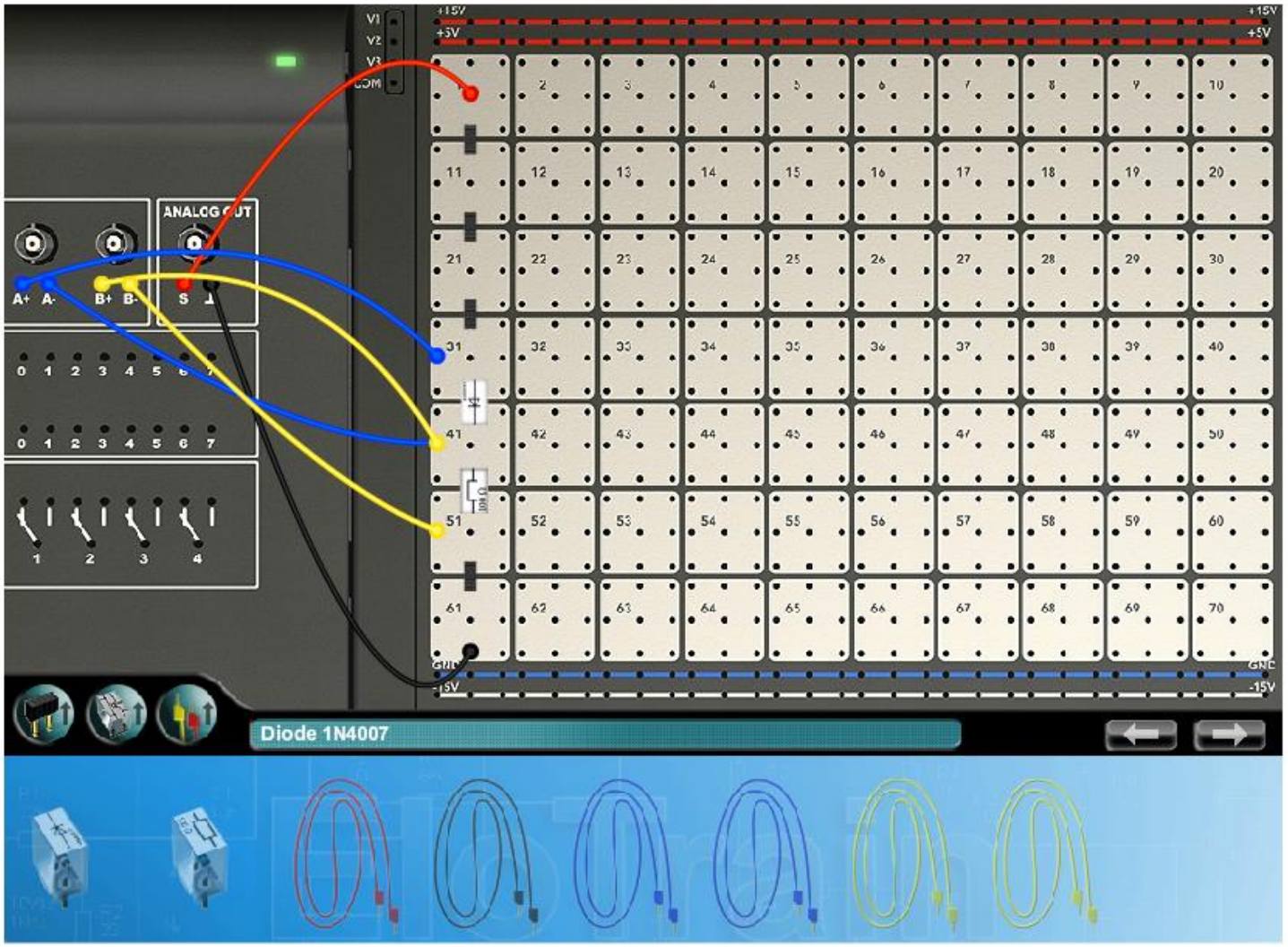


	Channel A	Channel B
Sensitivity	1 V/div	1 V/div
Coupling	DC	DC
Polarity	Normal	Normal
Y position	0	0
Time base	2 ms/div	
Mode	X/T	
Trigger channel	A	
Trigger edge	Pos	



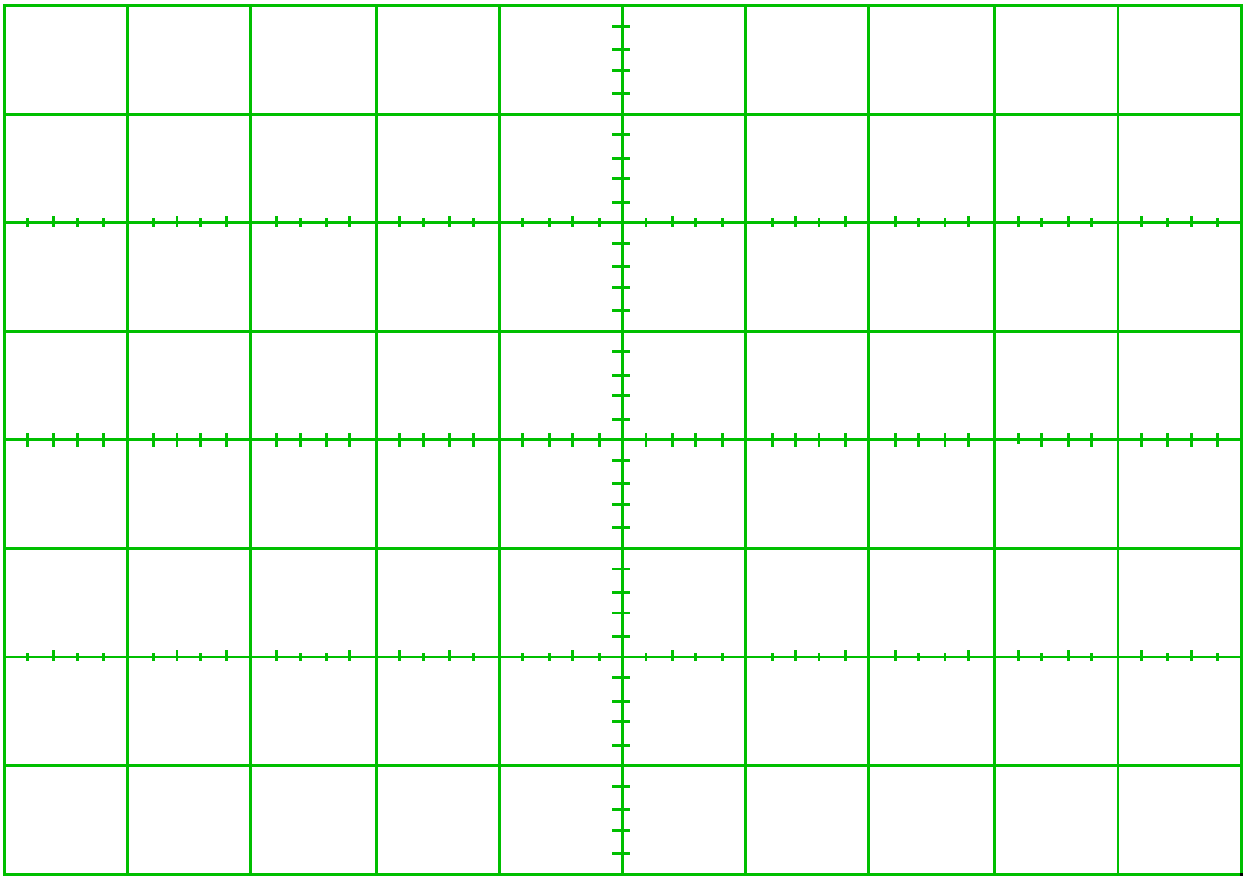
Waveform	Sine
Amplitude	8 Vpp (40%, 1:1)
Frequency factor	10
Frequency	50 Hz

Experiment set-up



Experiment procedure and exercises

Connect the AC power supply to the terminals labelled ~ in the set-up iilustration. Set a value of approximately 4 Vp for the peak voltage at the output of the function generator. Connect the measuring input of the oscilloscope to the indicated positions and enter the parameters as shown above. To begin with, only switch on channel A of the oscilloscope. Copy the oscilloscope trace into the diagram provided.



What is the breakdown voltage of the diode?

V_{break} (V)	

Swap out the 100-ohm resistor for one of 330 ohms. How does this change the reverse-bias voltage?

	It remains roughly constant.
	The reverse-bias voltage is three times higher.
	The reverse-bias voltage is a third of what it was.

Now switch the oscilloscope to X/Y mode and turn on channel B as well.