ELEC 1100 Laboratory 3: Summary Sheet

Name: **Lam Pak Ho**   Student ID: | 2 | 1 | 1 | 6 | 9 | 9 | 5 | 2 |

Notes:

(1) <u>Show demo to your TA for an attendance record</u>; **bonus mark** will be given to groups who can complete all TA Checks in the first 2 hours of your enrolled lab session.

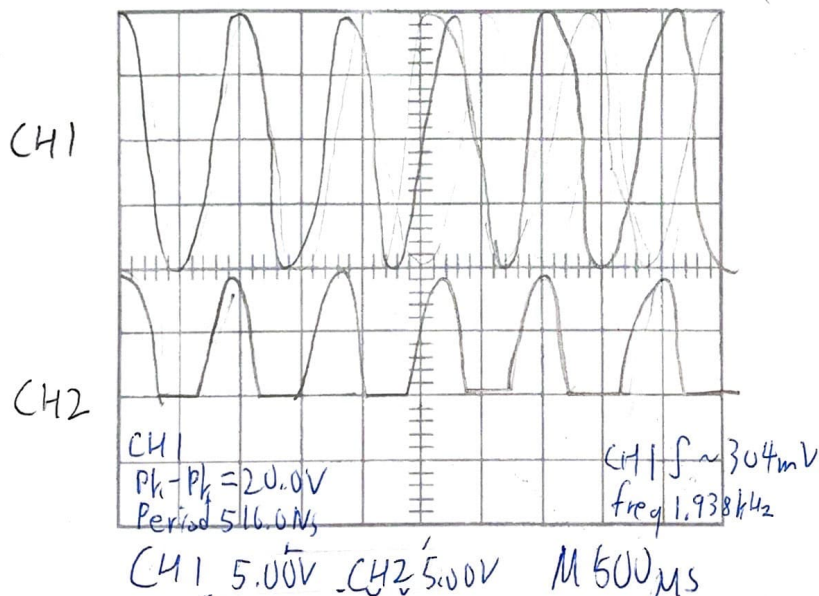LA1 (Wed, before 11:00), LA2 (Fri, before 11:00), LA3 (Wed, before 17:00)

(2) <u>Individually</u> submit your completed lab summary sheet to Canvas (LA1/LA2/LA3) "Assignments" before the deadline.

LA1 (Wed, deadline 11:50), LA2 (Fri, deadline 11:50), LA3 (Wed, deadline 17:50)

Experimental Results and Analysis

Q1: Sketch what you see on the DSO (both CH1 & CH2 waves, including the voltage & time scales and zero references displayed on the screen).

<u>Notice</u>: Do the sketching on the grid below by your hand, photos of DSO screen will NOT be accepted for grading.

CH1

CH2

CH1
$P_k - P_k = 20.0V$
Period 516.0Ns

CH1 $\int \sim 304mV$
freq 1.938kHz

CH1 5.00V CH2 5.00V   M 500 µs

Q2: What is the difference between the two waveforms? Briefly explain your answer (Explain the feature of a diode).

CH2 doesn't have voltage below zero line, indicating that no current against diode direction can pass. The diode only allow one direction of current passing, so the AC in CH2 doesn't show a negative curve below zero line.

Q3: Complete the table of experiment results (2-resistor circuit).

V_{in} (V)	1	2	3	4	5	6	7	8
V_Z (V)	0.744	1.57	2.30	3.08	3.79	4.57	5.30	6.10
V_{in} (V)	9	10	11	12	13	14	15	16
V_Z (V)	6.86	7.57	8.34	9.09	9.83	10.6	11.35	12.11

Q4: Complete the table of experiment results (Zener diode circuit).

V_{in} (V)	1	2	3	4	5	6	7	8
V_Z (V)	0.285	1.51	2.28	3.06	3.79	4.48	5.00	5.26
V_{in} (V)	9	10	11	12	13	14	15	16
V_Z (V)	5.38	5.44	5.48	5.51	5.33	5.54	5.55	5.56

Q5: Use the data you record in Q3 and Q4 to make a **line chart** of V_Z against V_{in} and fill in the space provided below.
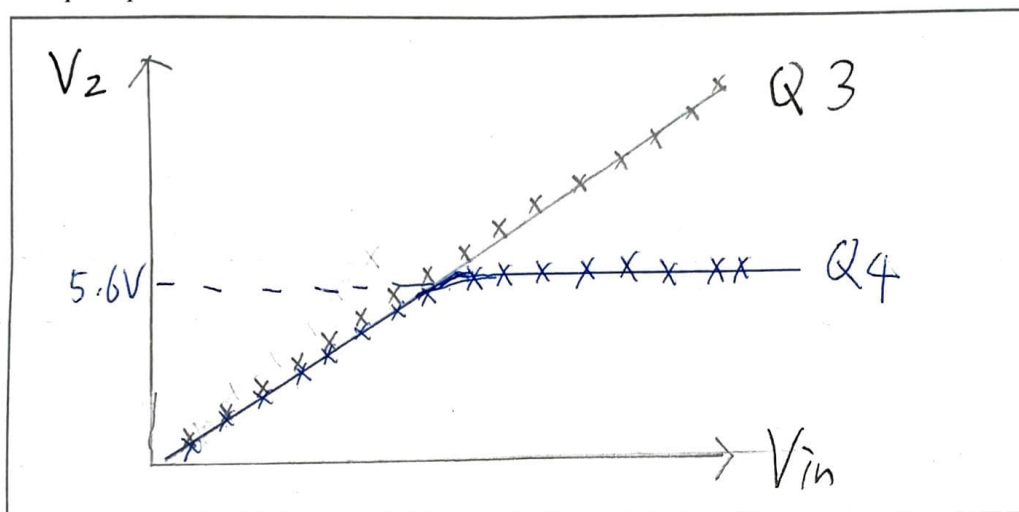
Q6: From your record in Q4, determine the breakdown voltage (give a rough number) of the Zener diode.

Breakdown voltage = ____5.6 V____

Q7: What is the multimeter reading (V_{out}) displayed when V_{in} = 8V? ____5.001 V____

Q8: What is the multimeter reading (V_{out}) displayed when V_{in} = 12V? ____5.001 V____

Q9: Use the results in Q7 and Q8, determine the <u>line regulation</u> of your LM7805 voltage regulator (Show your calculation).

$$\text{Line regulation} = \frac{\Delta V_O}{\Delta V_I} = \frac{5.001 - 5.001}{12 - 8} = 0$$

Line regulation of LM7805 = 0