

**Name**

**TITLE OF EXPERIMENT**

**THE MICROWAVE EXPERIMENT  
EXPERIMENT No 7**

**MODERN PHYSICS LAB**

**PHYS 393/6 COURSEWORK**

**REPORTING SHEET**

<b>PART A: SCIENTIFIC KNOWLEDGE AND PLANNING</b>	<b>15</b>
Aim:	1
<p>Methodology - Draw your set up, explaining the use of the different components you will use to achieve your aim</p> <p><b>Note:</b> You will receive 1 Mark for clear drawing  1 Mark for identifying equipment  1 Mark for explaining the role of this equipment in the experiment</p>	3

**MULTIPLE CHOICE SECTION**

8

**Q1:** According to de Broglie, electrons and protons should show \_\_\_\_\_ properties.

A) unstable B) wave C) radioactive D) explosive

**Q2:** The de Broglie wavelength of matter waves is \_\_\_\_\_ mass

A) independent of B) proportional C) inverse proportional D) equal to

**Q3:** What is the de Broglie wavelength of an electron moving at  $3.0 \times 10^6$  m/s?

A) 0.12 nm B) 0.49m C) 0.24m D) 0.24nm

**Q4:** An electron has a de Broglie wavelength of 750nm. Find the velocity of the electron

A) 970 m/s B) 180m/s C) 6600m/s D) 9700m/s

**Q5:** The Heisenberg Uncertainty principle states that it is impossible to precisely measure the \_\_\_\_\_ of a particle at the same time.

A) frequency and energy B) position and momentum C) momentum and frequency D) position and energy

**Q6:** An electron gun fires electrons through a double slit. If we place a screen on the other side we will observe

A) a diffraction pattern B) a single dot C) interference pattern D) a large number of single dots

**Q7:** If in the above double slit we place a camera to observe the electrons, how do they behave this time as:

A) matter waves B) particles C) both matter waves and particles D) plasma

**Q8:** The wave particle duality is a \_\_\_\_\_ phenomenon

A) classical B) false C) fictitious D) quantum

**LIST A NUMBER OF THE FACTORS THAT CAN AFFECT THE EXPERIMENT**

3

**PART B: OBTAINING EVIDENCE**

30

Your data. Use the correct units and convert appropriately.

<b>PART C: ANALYSING AND CONSIDERING YOUR EVIDENCE</b>	
Graph (use EXCEL)	
Calculations	
My evidence leads to the following result.	
Compare your results with theoretical values.	

**PART D: EVALUATION [10 MARKS]**

What was good or bad about the experiment you did was ...

Some ways you could improve the experiment were...

You had the following anomalies.

The explanation for your anomalies was

You believe my evidence is reliable/unreliable for the following reasons.