

Practice Question Set For A-Level
Subject : Physics
Paper-3 Topic : Practical Skills

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

A volt can be defined as a

(1)

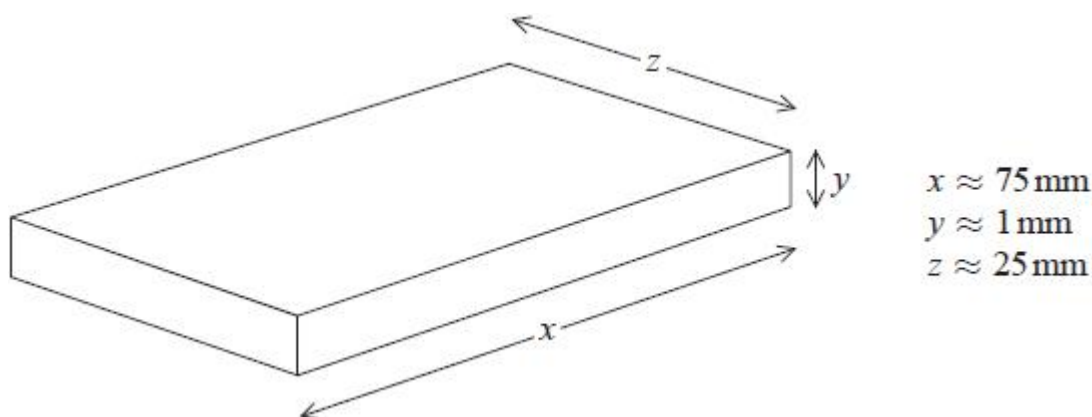
- ☐ **A** coulomb per joule.
- ☐ **B** coulomb per second.
- ☐ **C** joule per coulomb.
- ☐ **D** joule per second.

(Total for question = 1 mark)

Q2.

A student carries out measurements to determine the density of glass. The student has 20 glass microscope slides available.

The approximate dimensions of one slide are shown.



(a) The density is calculated using the equation

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Describe how the student can determine an accurate value for the density of the glass.
Your answer should include the measuring instruments required.

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(b) State one precaution that the student should take to ensure the measurements are accurate.

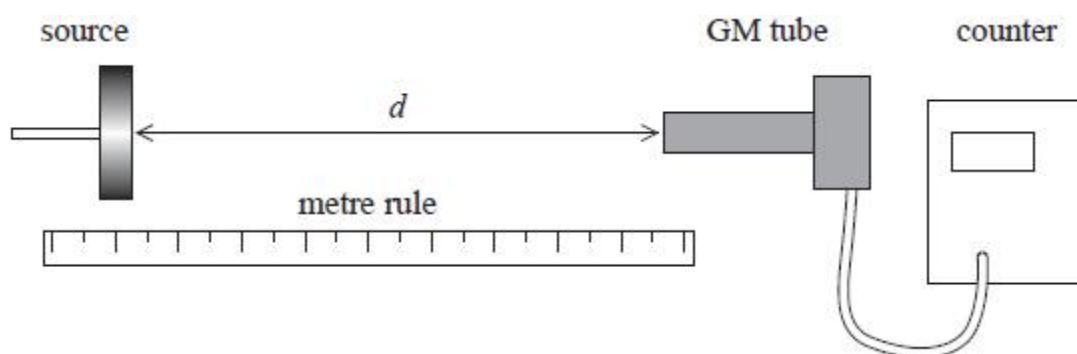
(1)

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(Total for question = 5 marks)

Q3.

A student investigated the way in which gamma radiation spreads out from a source. He placed a cobalt-60 source in a source holder and set up a Geiger-Müller (GM) tube a short distance d away. He connected the GM tube to a counter as shown.



The student recorded the count for 2 minutes.

Describe how to determine the corrected count rate from the source.

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(Total for question = 2 marks)

Q4.

Photograph 1 shows a toy known as a popper. It is a hollow hemisphere made of rubber.



Photograph 1

When the top of the popper is pushed down, it changes shape as in Photograph 2.



Photograph 2

It remains in this shape for two to three seconds. It then returns to its original shape and is launched from the surface, rising nearly a metre.

The initial speed of the popper can be determined using only a metre rule to measure the maximum height reached by the popper.

- (i) Describe how the maximum height measurement can be used to determine the launch speed.

(3)

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- (ii) Comment on using the maximum height measurement as a means of determining an accurate value for the launch speed.

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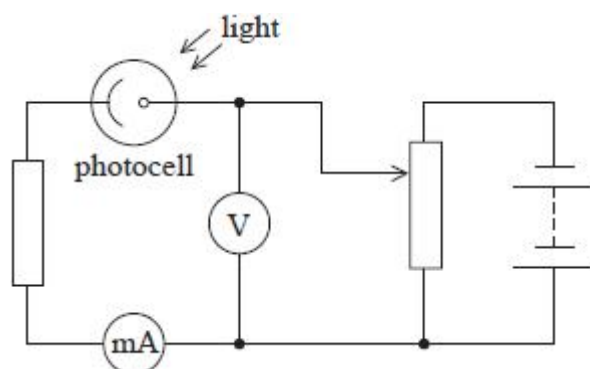
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Q5.

(Total for question = 6 marks)

A student has been learning about the photoelectric effect.

The student sets up a circuit to investigate the photoelectric effect.



The student illuminates the photocell with light of known frequency f . A current is produced in the circuit due to the emitted electrons. He adjusts the potential difference, using a potential divider, until the reading on the milliammeter is zero and records the corresponding reading V_s on the voltmeter. He repeats this procedure for other frequencies of light.

When the reading on the milliammeter is zero the maximum kinetic energy of the emitted electrons is given by eV_s .

Explain how the student can use his results to determine a value for the Planck constant h using a graphical method.

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(Total for question = 5 marks)