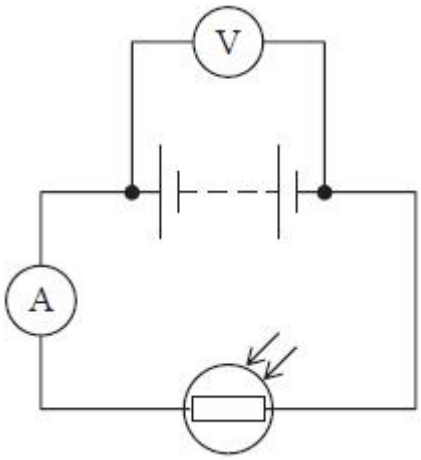
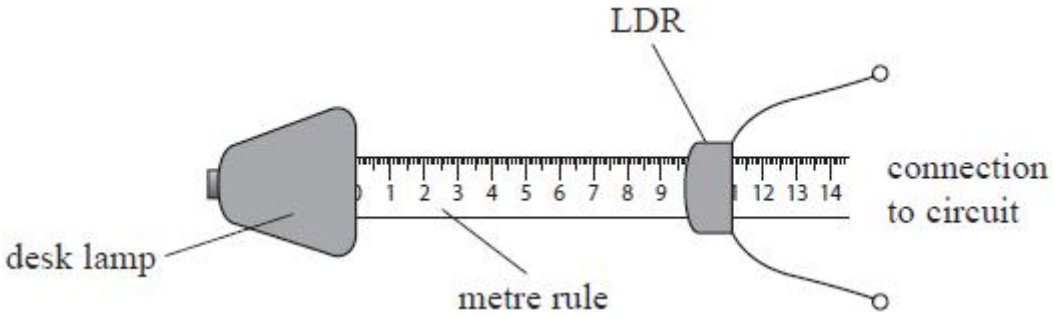
Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

A student carried out an experiment with a light dependent resistor (LDR). He connected the LDR in series with an ammeter and a power supply, as shown in the circuit diagram.



The student placed the LDR a known distance from a desk lamp, as shown.



The student noted the reading on the ammeter as he brought the LDR closer to the lamp.

The student planned to vary the intensity of light incident upon the LDR by adjusting the distance *x* between the LDR and the lamp.

He thought that the intensity of light on the LDR would increase uniformly if he decreased *x* by equal intervals. He therefore planned to take ammeter readings as he decreased *x* from 20.0 cm to 10.0 cm in equal intervals.

(i) Criticise the student's plan for data collection.

(3)

.....

.....

.....

.....

.....

.....

.....

(ii) Explain one precaution that the student should take to ensure that results are accurate.

(2)

.....

.....

.....

.....

.....

.....

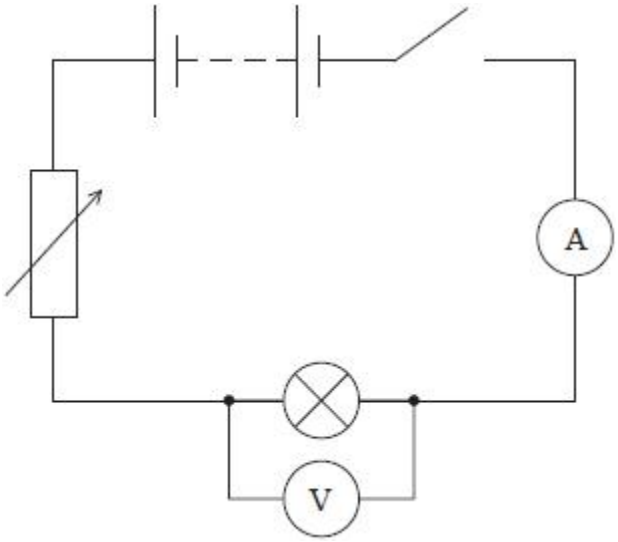
.....

.....

(Total for question = 5 marks)

Q2.

A student set up the circuit shown and measured the current *I* through the filament lamp for a range of values of potential difference (p.d.) *V*.

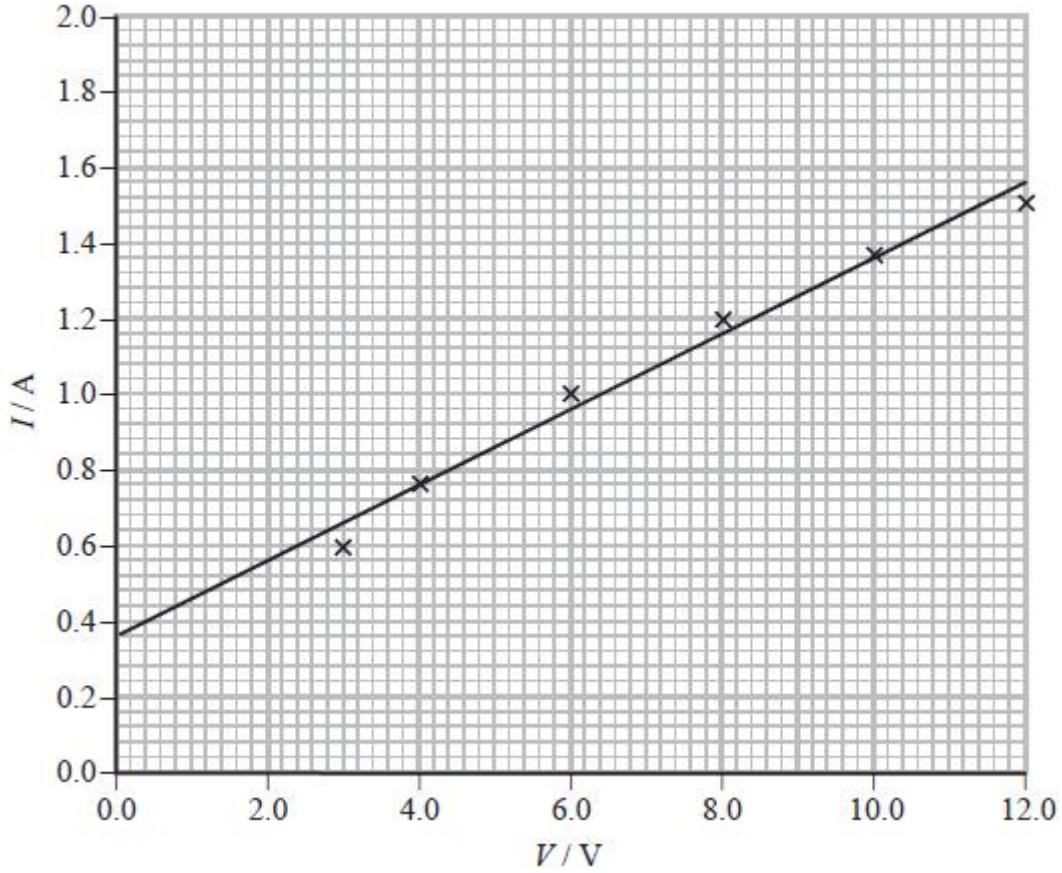


The student's data is shown in the table.

V / V	*I* / A
3.0	0.6
4.0	0.75
6.0	1.00
8.0	1.20
10.0	1.35
12.0	1.5

The student drew a graph of how current varies with p.d. She drew a straight line on the graph and claimed that

the data demonstrates that the filament lamp obeys Ohm's law because the graph is linear.



Assess the validity of the student's statement.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for question = 4 marks)

Q3.

A student used a Geiger-Müller (GM) tube to determine the activity of a radium source. Radium emits α, β, and γ radiation.

He positioned the source 20 cm from the GM tube, as shown, and recorded the count for 1 minute. He repeated the measurement and calculated a mean count.

The student recorded the following results.

Count 1	Count 2	Mean count
183	178	181

Criticise the student's method for determining the count at this position.

(3)

.....

.....

.....

.....

.....

.....

(Total for question = 3 marks)

Q4.

A student used a Geiger-Müller (GM) tube to determine the activity of a radium source. Radium emits α, β, and γ radiation.

He positioned the source 20 cm from the GM tube, as shown, and recorded the count for 1 minute. He repeated the measurement and calculated a mean count.

The student recorded the following results.

Count 1	Count 2	Mean count
183	178	181

From his results the student determined that the activity of the source was 3.0 Bq.

Comment on his value for the activity of the source.

(5)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for question = 5 marks)