3 A student investigated the relationship between the resistance R of a light dependent resistor (LDR) and the light intensity I incident upon the LDR.

(a) The student determined R using a circuit that included an ammeter and a voltmeter.

Draw a circuit the student could have used.

(2)

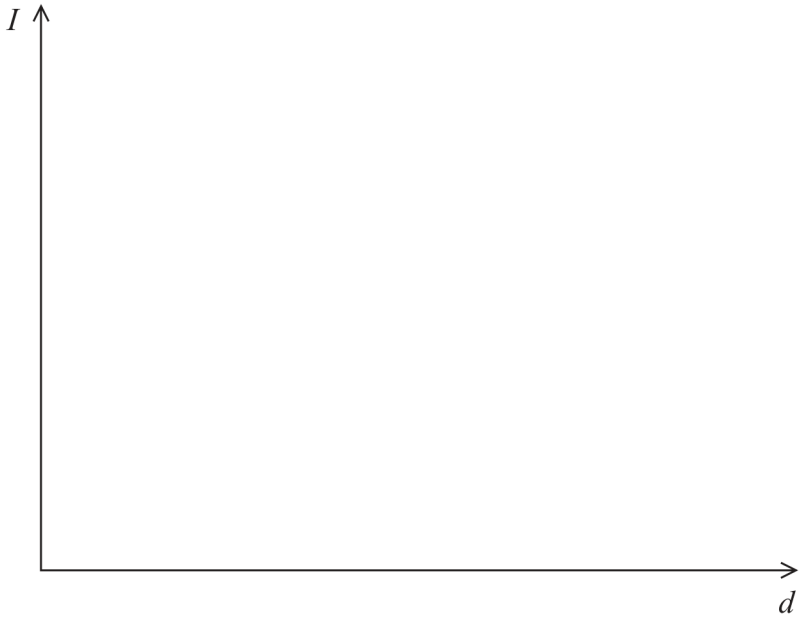
(b) She varied I by varying the distance d between the LDR and a filament bulb.

Describe a method the student could have used to obtain accurate values for R and d.

(3)

(c) Sketch the relationship between I and d on the axes below.

(2)



(d) The student calculated the intensity of light incident on the LDR at each value of d.

The output power of the filament lamp was 9.0 W.

Calculate the intensity of the light incident on the LDR when d is 20 cm.

(3)

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Light intensity = ...

(e) (i) Identify one control variable in this investigation.

(1)

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(ii) State how this variable can be controlled.

(1)

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(Total for Question 3 = 12 marks)