

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

**Pearson Edexcel
International GCSE (9–1)**

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Sample assessment material for first teaching September 2017

(Time: 1 hour 10 minutes)

Paper Reference **4SS0/1P**

Science (Single Award)

Physics

Unit: 4SS0

Paper: 1P

You must have:

Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.
- Calculators may be used.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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FORMULAE

You may find the following formulae useful.

$$\text{power} = \frac{\text{work done}}{\text{time taken}}$$

$$P = \frac{W}{t}$$

$$\text{power} = \frac{\text{energy transferred}}{\text{time taken}}$$

$$P = \frac{W}{t}$$

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Answer ALL questions.

1 This question is about astronomical objects.

Use words from the box to complete the sentences.

Words can be used once, more than once or not at all.

(6)

galaxies universe Milky Way Andromeda black holes stars
moons planets Sun Earth

The star at the centre of our Solar System is known as the

Our Solar System is part of a galaxy called the

Our Solar System consists of more than one hundred

that orbit some of the eight

Each galaxy consists of billions of

The universe consists of billions of

(Total for Question 1 = 6 marks)



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2 Different electromagnetic waves have different uses and different harmful effects on humans.

(a) Draw one straight line from each electromagnetic wave to its associated harmful effect. (5)

Electromagnetic waves

Harmful effect

visible light ●

● internal heating of cells in the body

radio ●

● burns on the skin

gamma rays ●

● damage to the retina of the eye

microwaves ●

● none

infrared radiation ●

● cell mutation

(b) State a use for these two electromagnetic waves.

(2)

1. Ultraviolet.....

2. X-rays.....

(Total for Question 2 = 7 marks)

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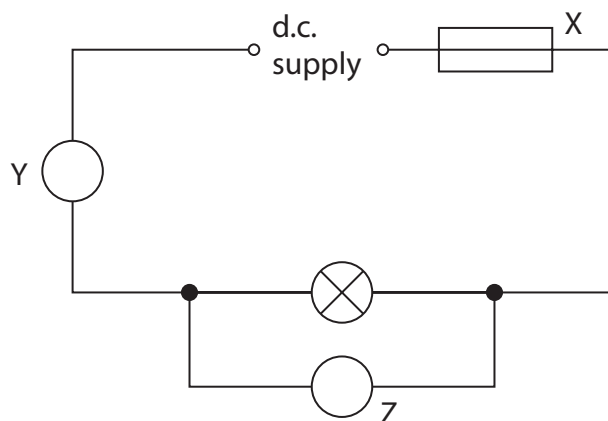
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3 A student sets up this circuit to measure the voltage and current of a filament lamp.



(a) The table shows different combinations of circuit components.

Which line shows the correct components for X, Y and Z?

(1)

	X	Y	Z
<input type="checkbox"/> A	fuse	ammeter	voltmeter
<input type="checkbox"/> B	variable resistor	ammeter	voltmeter
<input type="checkbox"/> C	fuse	voltmeter	ammeter
<input type="checkbox"/> D	variable resistor	voltmeter	ammeter

(b) The student records a current of 2.30 A and a voltage of 11.2V.

(i) State the formula linking power, current and voltage.

(1)

(ii) Calculate the power dissipated by the lamp.

(2)

power = W

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(iii) State the formula linking voltage, current and resistance.

(1)

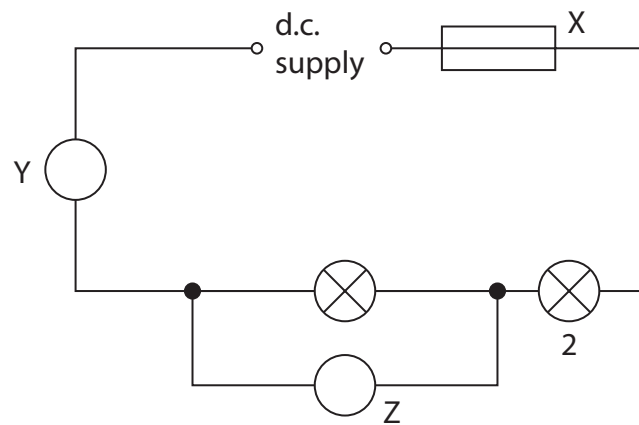
(iv) Calculate the resistance of the filament lamp.

State the unit.

(4)

resistance = unit =

(c) The student adds a second identical lamp to the circuit.



The voltage supply remains constant.

Explain what happens to the readings of Y and Z.

(3)

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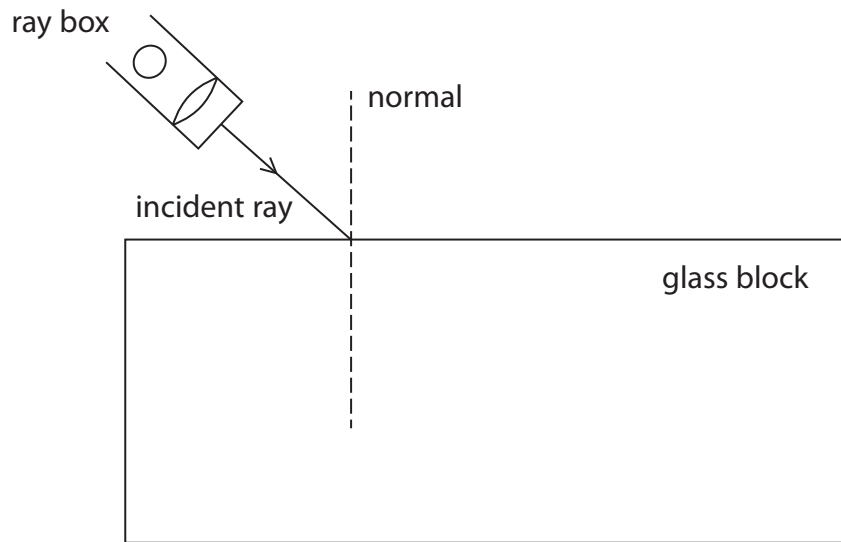
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(Total for Question 3 = 12 marks)



- 4 A student investigates how the angle of refraction varies with the angle of incidence. She uses this apparatus.



- (a) State a measuring device the student needs to obtain her results.

(1)

- (b) Describe a method the student should use for this investigation.

You may add to the diagram to help your answer.

(5)

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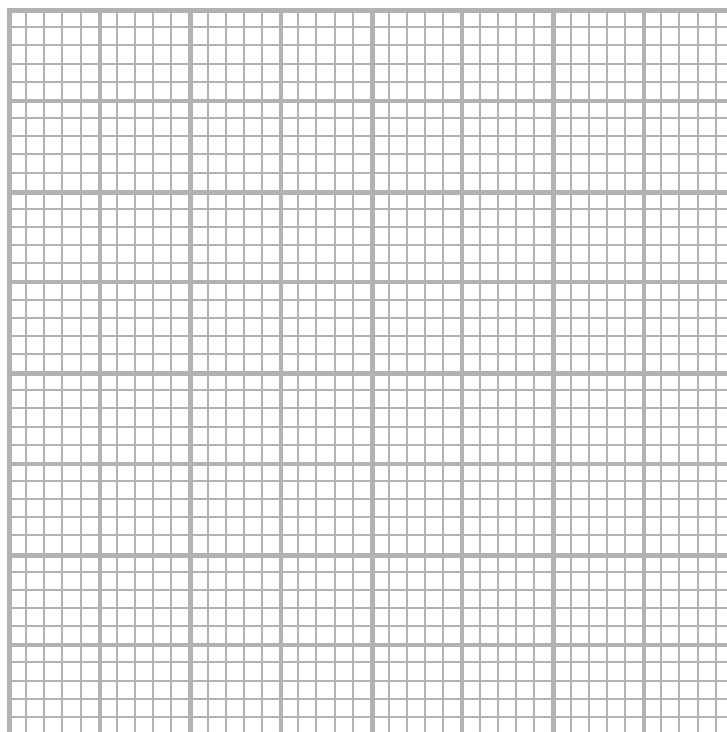


(c) The table gives the student's results.

Angle of incidence in degrees	10	20	30	40	50	60	70
Angle of refraction in degrees	7	13	20	31	31	35	39

(i) Plot a graph of these results on the grid.

(3)



(ii) Explain whether any of the results are anomalous.

(2)

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(iii) Draw the curve of best fit on your graph.

(1)

(Total for Question 4 = 12 marks)



5 A student investigates the efficiency of two electric motors, X and Y.

(a) (i) The student finds that motor X has an efficiency of 60%.

Explain in terms of energy what is meant by an efficiency of 60%.

(2)

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(ii) Which statement is the correct definition of power?

(1)

- A the rate of transfer of charge
- B the rate of transfer of current
- C the rate of transfer of energy
- D the rate of transfer of voltage

(iii) Motor X has a power rating of 20W.

The student uses the motor for 15 s.

Calculate the energy supplied to the motor.

(2)

energy supplied = J

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(b) Motor Y has a useful output power of 18W when the input power is 24W.

Calculate the efficiency of motor Y.

(2)

efficiency = %

(c) The student states that all the energy supplied to a motor is transferred into other stores.

Which of these ideas supports the student's statement?

(1)

- A conservation of energy
- B non-renewable energy
- C renewable energy
- D sustainable energy

(Total for Question 5 = 8 marks)



6 (a) Doctors use radioactive iodine to trace the flow of blood round a patient's body.
The radioactive iodine emits gamma radiation.

(i) Describe gamma radiation.

(2)

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(ii) Explain why alpha radiation is not used to trace blood flow.

(2)

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(b) A sample of radioactive iodine is tested in a laboratory.

(i) State the names of the instruments used to measure the count rate of the sample. (1)

(ii) These instruments detect a corrected count of 1500 in one minute from the sample. Calculate the number of counts per second from the sample. (1)

number of counts per second =

(c) Four days later the corrected count is 750 in one minute.

One of the reasons radioactive iodine is chosen as a medical tracer is because of the time it takes to decay.

(i) State the half-life of this sample of iodine. (1)

half-life = days

(ii) Explain why doctors do **not** use an isotope that has a much longer half-life than this sample of iodine. (3)

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(Total for Question 6 = 10 marks)

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