Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4342807288

PHYSICS **0625/32**

Paper 3 Theory (Core) **October/November 2017**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m/s^2).

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **15** printed pages and **1** blank page.

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CAMBRIDGE International Examinations

1 **(a)** Nuclear power stations generate electricity.

Which of these statements describe an advantage of using nuclear power stations, and which of them describe a disadvantage?

Put a tick (✓) in the correct column for each statement. The first one is done for you.

statement	advantage	disadvantage
nuclear power stations require high levels of security		✓
nuclear power stations produce small amounts of carbon dioxide		
nuclear power stations have a small effect on climate change		
waste radioactive material can take a very long time to decay		

[3]

(b) Describe how electricity may be generated using geothermal resources.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 6]

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2 Fig. 2.1 shows a speed-time graph for a ship starting to move.

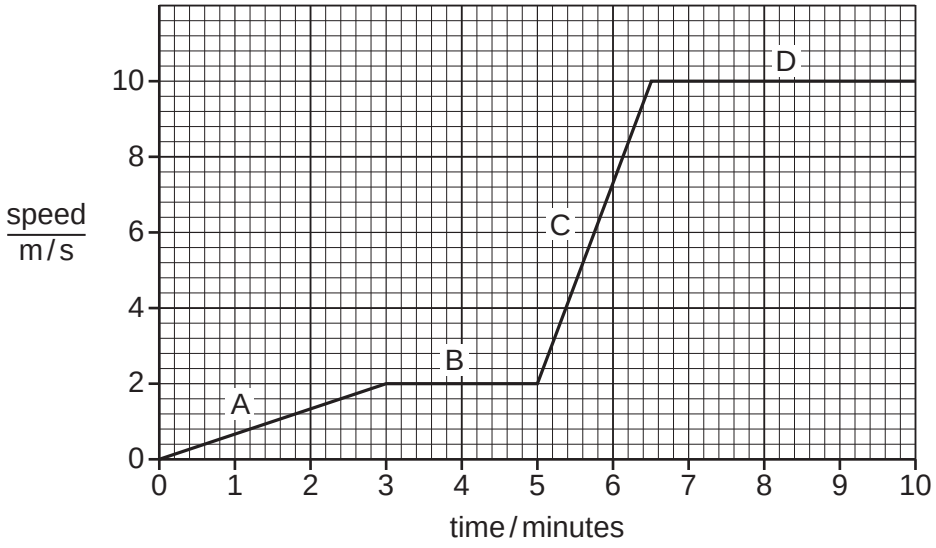


Fig. 2.1

(a) Describe the motion of the ship during each section of the graph.

A .....

.....

B .....

.....

C .....

.....

D .....

..... [4]

(b) Determine the distance travelled by the ship in section B of the graph.

distance = ... m [3]

[Total: 7]

3 Fig. 3.1 shows a glass vase used for displaying flowers.



Fig. 3.1

(a) The mass of the glass is 450 g. The volume of glass in the vase is 145 cm^3.

(i) Calculate the density of the glass.

density = ... g/cm^3 [3]

(ii) Calculate the weight of the glass.

weight = ... N [3]

(b) Another vase has a weight of 30 N. The area of the base in contact with a table is 80.0 cm^2.

Calculate the pressure this vase exerts on the table.

pressure = ... N/cm^2 [3]

[Total: 9]

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4 Fig. 4.1 shows a fairground ride.

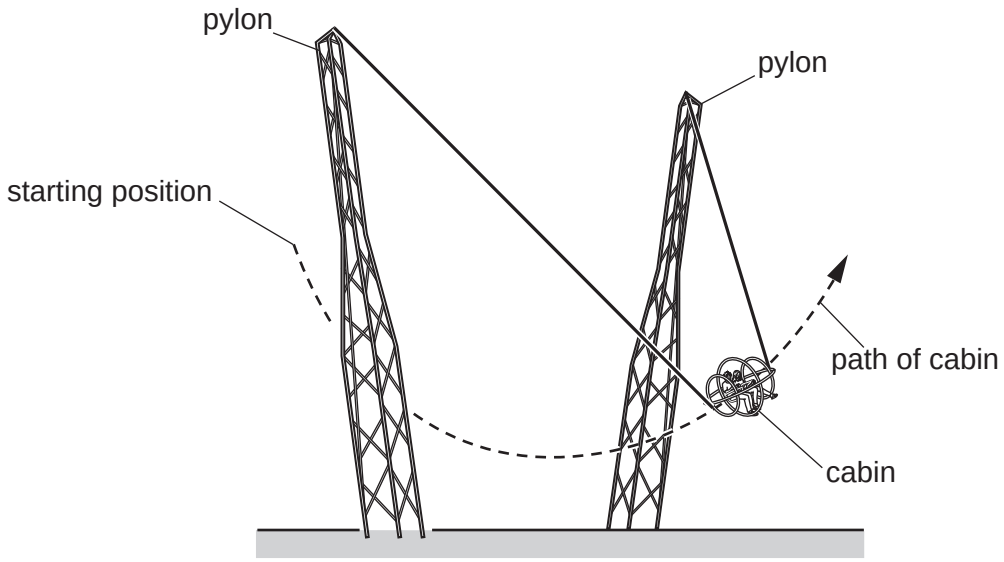


Fig. 4.1

People sit inside a cabin suspended between two pylons. The cabin is lifted to the starting position shown in Fig. 4.1.

(a) State the name of the type of energy gained by the cabin as it rises.

..... [1]

(b) The cabin is released and swings down between the two pylons. The path of the cabin is shown on Fig. 4.1. The cabin has maximum kinetic energy at one point on its path. Draw this point on Fig. 4.1 and label this point X. [1]

(c) A force opposes the motion of the cabin as it falls. State the name of this force.

..... [1]

(d) After a few swings, a brake system stops the cabin (not shown on the diagram).
Use ideas about energy transfer to suggest how the brake system stops the cabin.

.....

.....

.....

..... [3]

[Total: 6]

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[Turn over

5 A cup made from plastic, containing a hot drink, is shown in Fig. 5.1.

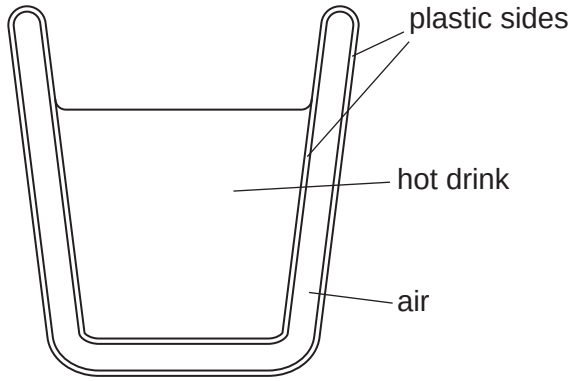


Fig. 5.1

(a) State the term given to materials that reduce the transfer of thermal energy.

..... [1]

(b) The hot drink gradually cools.

Describe and explain **two** processes by which thermal energy is transferred from the hot drink.

.....

.....

.....

.....

.....

.....

.....

..... [5]

[Total: 6]

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6 Fig. 6.1 shows a ray of light reflected from mirror 1 at point P and striking mirror 2 at point Q.

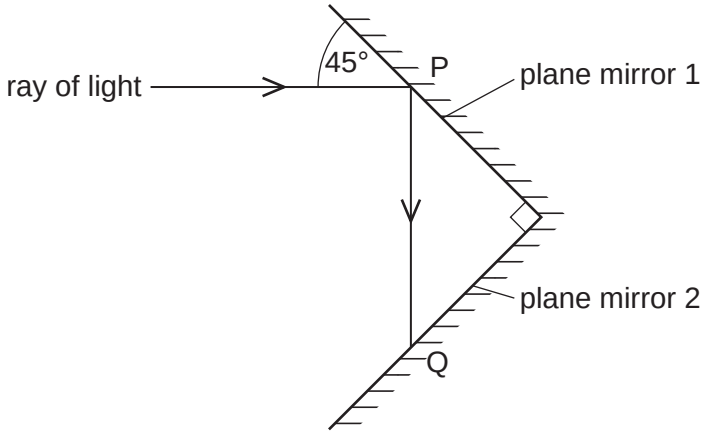


Fig. 6.1

(a) On Fig. 6.1,

- clearly mark the position of the normal at Q,
- draw the ray reflected from point Q,
- mark the angle of reflection at Q using the letter *r*,

State the law you used to draw the reflected ray.

.....

[4]

(b) Compare the direction of the ray reflected from mirror 2 at Q with the direction of the ray incident on mirror 1 at P. Tick **one** box.

The ray of light reflected from mirror 2 is

☐ parallel to the incident ray at P,

☐ perpendicular to the incident ray at P,

☐ at an angle of 45° to the incident ray at P. [1]

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(c) A thin, converging lens forms an image, I, of an object, O, as shown in Fig. 6.2.

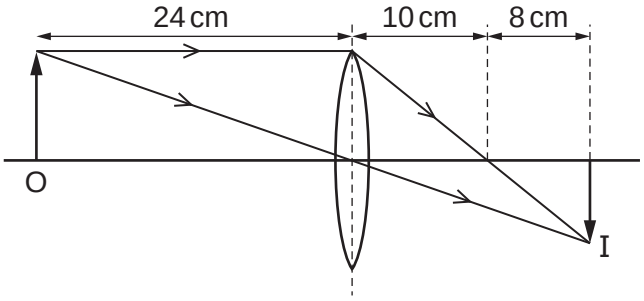


Fig. 6.2

(i) On Fig. 6.2, label a principal focus of the lens, using the letter **F**. [1]

(ii) State the focal length of the lens.

focal length = ... cm [1]

[Total: 7]

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7 Fig. 7.1 shows the regions of the electromagnetic spectrum.

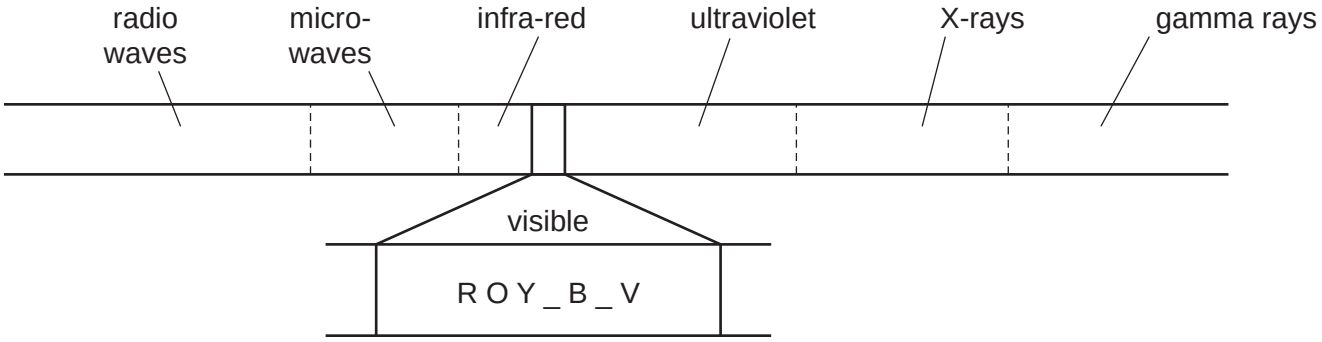


Fig. 7.1

(a) Fig. 7.1 shows the first letter of some colours in the visible part of the spectrum.

State which colours are missing.

..... and ..... [1]

(b) State the names of the regions of the electromagnetic spectrum that are used in

(i) communications,

..... and ..... [1]

(ii) remote controls for televisions and DVD players.

..... [1]

(c) Describe how high levels of microwave energy can be dangerous to people.

.....

..... [1]

(d) State **two** safety precautions required when using X-rays.

1. .....

2. ..... [2]

[Total: 6]

8 **(a)** An atom of carbon contains protons, neutrons and electrons.

Indicate where each particle is found in the atom. Place a tick in the appropriate box.

particle	in the nucleus	orbiting the nucleus
electron		
neutron		
proton		

[3]

(b) An atom of carbon contains 6 protons, 7 neutrons and 6 electrons.

(i) State the proton number of the carbon.

..... [1]

(ii) State the nucleon number of the carbon.

..... [1]

(c) Carbon has many different isotopes.

(i) Explain the meaning of the term *isotope*.

.....

.....

..... [2]

(ii) The nuclide notation for the carbon in **(b)** is $^{13}_{6}C$.

Suggest the nuclide notation for another possible isotope of carbon.

..... [1]

[Total: 8]

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9 Some metals can be used to make permanent magnets.

(a) Identify the metal that can form a permanent magnet.
Tick **one** box.

☐ copper ☐ iron ☐ steel [1]

(b) Fig. 9.1 shows a circuit that is used to make a permanent magnet.

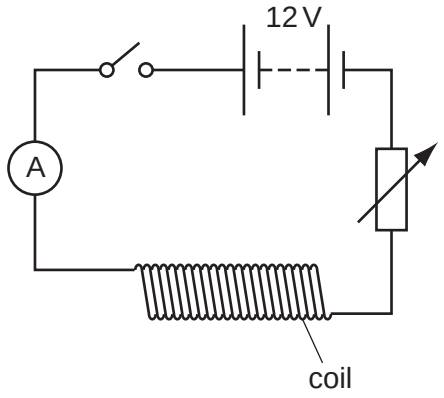


Fig. 9.1

(i) On Fig. 9.1, label the variable resistor with the letter X. [1]

(ii) Describe how the circuit is used to make a permanent magnet.

.....

.....

..... [3]

(c) Fig. 9.2 shows the coil from Fig. 9.1.

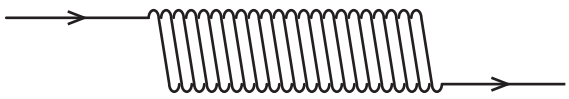


Fig. 9.2

On Fig. 9.2 carefully sketch the pattern of the magnetic field produced by the coil. [2]

[Total: 7]

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10 Fig. 10.1 shows a series circuit.

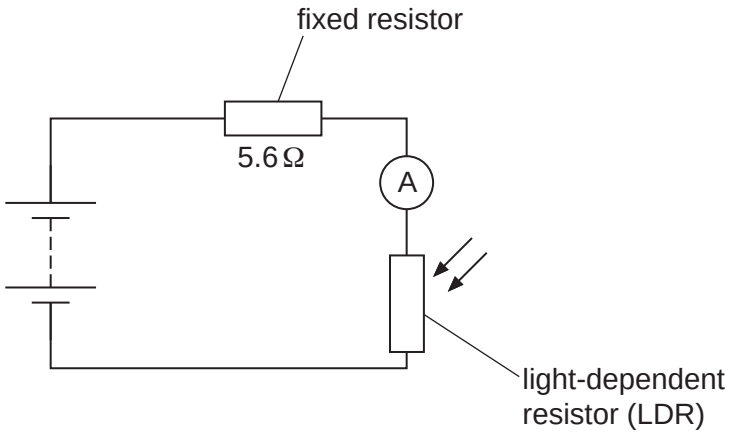


Fig. 10.1

(a) In dim light, the resistance of the LDR is 20.0 Ω.

(i) The resistance of the battery and ammeter can be ignored.

Calculate the resistance of the circuit.

resistance = ... Ω [1]

(ii) The current in the circuit is 0.23 A.

Calculate the potential difference across the fixed resistor.

potential difference (voltage) = ... V [3]

(b) A bright light shines on to the LDR.

State and explain what happens to the current in the circuit.

.....

..... [2]

[Total: 6]

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11 Fig. 11.1 shows a charger for a mobile (cell) phone. The charger contains a transformer.

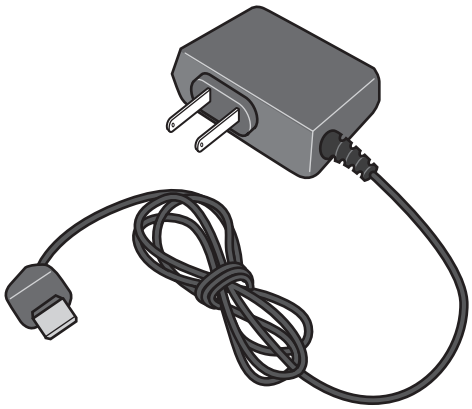


Fig. 11.1

(a) The primary coil of the transformer has 900 turns and the secondary coil has 49 turns. The input voltage to the transformer is 220 V.

Calculate the output voltage.

output voltage = ... V [3]

(b) State the name of the metal used to make the coils of the transformer.

..... [1]

(c) A transformer uses an alternating current (a.c.).

Describe the difference between alternating current (a.c.) and direct current (d.c.).

.....

.....

..... [1]

[Total: 5]

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12 Fig. 12.1 shows some equipment used in a demonstration.

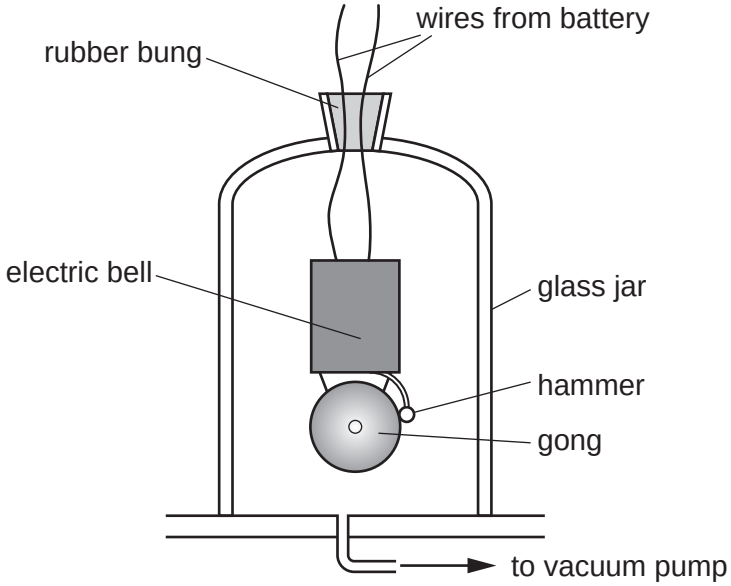


Fig. 12.1

The glass jar is connected to a vacuum pump. The electric bell is switched on. The observers see and hear the bell working.

(a) (i) The vacuum pump removes air from the glass jar. State what the observers see and what they hear after the air is removed.

observers see .....

.....

observers hear .....

..... [2]

(ii) State what the demonstration in **(a)(i)** shows about the transmission of sound waves.

.....

.....

..... [2]

(iii) When the bell is working, the hammer strikes the gong. Describe how the gong produces the sound.

.....

..... [1]

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(b) Indicate the lowest and highest frequencies that can be heard by the human ear.

Tick **one** box from each column.

lowest frequency	highest frequency
☐ 2 Hz	☐ 20 kHz
☐ 20 Hz	☐ 200 kHz
☐ 200 Hz	☐ 2 MHz
☐ 2 kHz	☐ 20 MHz

[2]

[Total: 7]

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