Cambridge Assessment International Education

Cambridge IGCSE™ (9–1)

PHYSICS **0972/11**

Paper 1 Multiple Choice (Core) **May/June 2025**

45 minutes

You must answer on the multiple choice answer sheet.

2024238160

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall = 9.8 m / s^2).

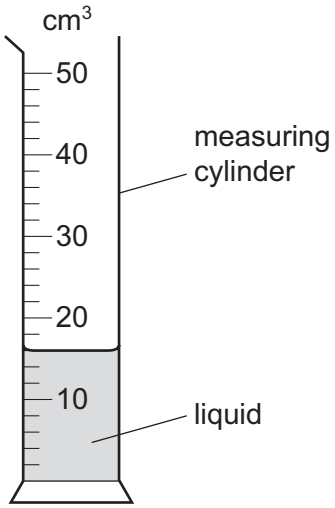
INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages. Any blank pages are indicated.

[Turn over

1 The diagram shows a measuring cylinder containing liquid.



What is the volume of liquid in the measuring cylinder?

A 13.0 cm^3 **B** 13.5 cm^3 **C** 16.0 cm^3 **D** 17.0 cm^3

2 Which statement about the speed and velocity of an object is correct?

A The speed and velocity of an object are always greater than zero.

B The speed of an object is always greater than its velocity.

C The velocity of an object is equal to its speed in a given direction.

D Speed can be measured in m / s but velocity can only be measured in km / h.

3 The table shows a student's times in three races.

race	distance / m	time / s
1	100	12
2	150	17
3	200	25

What is the order of the student's average speeds in each race, from lowest to highest?

A $1 \rightarrow 2 \rightarrow 3$ **B** $1 \rightarrow 3 \rightarrow 2$ **C** $2 \rightarrow 1 \rightarrow 3$ **D** $3 \rightarrow 1 \rightarrow 2$

4 Which row gives the correct weight for the mass shown when it is at the Earth's surface?

	mass / kg	weight / N
A	2.00	19.6
B	10.0	1.02
C	10.0	9.80
D	20.0	2.04

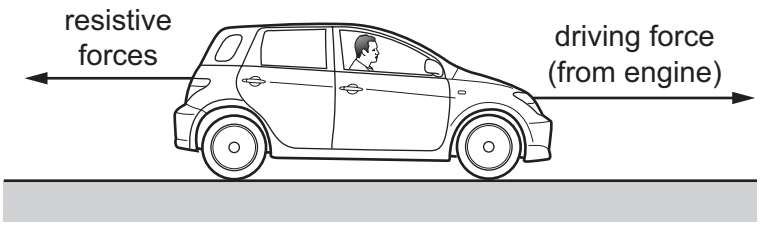
5 The masses and volumes of four objects are shown.

Which object floats in a liquid of density 1.4 g / cm^3?

	mass of object / g	volume of object / cm^3
A	1.0	0.5
B	2.0	3.0
C	6.0	4.0
D	9.0	6.0

6 A car is driven from rest on a long straight road. The car engine exerts a constant driving force.

The diagram shows the horizontal forces acting on the car. The resistive forces are proportional to the speed of the car.



Why does the car eventually reach a maximum speed?

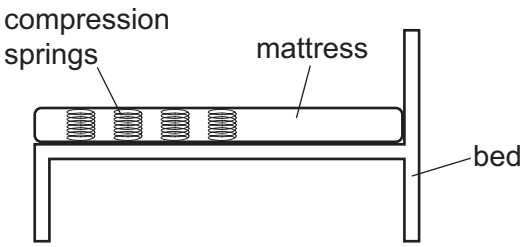
A The resistive forces decrease to make the acceleration of the car negative.

B The resistive forces decrease to make the acceleration of the car zero.

C The resistive forces increase to make the acceleration of the car negative.

D The resistive forces increase to make the acceleration of the car zero.

7 A mattress placed on a bed contains many compression springs.



Which energy store of the mattress **increases** when a person lies on the bed?

A gravitational potential

B chemical

C elastic

D kinetic

8 Which energy resource does **not** contain a store of chemical energy?

A biofuel

B coal

C nuclear fuel

D oil

9 A person carries 20 tiles from the ground to the roof of a house. Each tile has a mass of 1.2 kg. The roof of the house is 15 m above the ground.

How much work does the person do against gravity on the tiles in carrying them to the roof?

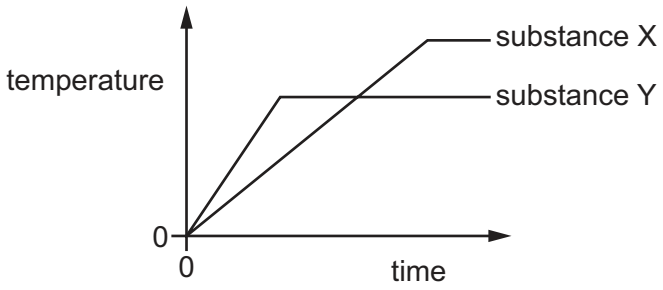
A 37 J **B** 180 J **C** 360 J **D** 3500 J

10 Which pair of changes, applied at the same time, always increases the pressure that a brick exerts on the ground?

	weight of brick	area of brick in contact with ground
A	increase	increase
B	increase	decrease
C	decrease	increase
D	decrease	decrease

11 Two different pure substances, X and Y, are heated. Both substance X and substance Y are initially in the solid state.

The graph shows how the temperature of each substance changes with time.



What does the graph tell us about the substances?

A Substance X has a lower boiling point than substance Y.

B Substance X has a lower melting point than substance Y.

C Substance Y has a lower boiling point than substance X.

D Substance Y has a lower melting point than substance X.

12 A liquid substance changes into a gas.

Which property of the substance remains the same?

A ability to flow

B compressibility

C shape

D volume

13 At room temperature, iron is difficult to compress.

At the same temperature, oxygen is much easier to compress.

Which comparison of the particles in iron and the particles in oxygen explains this?

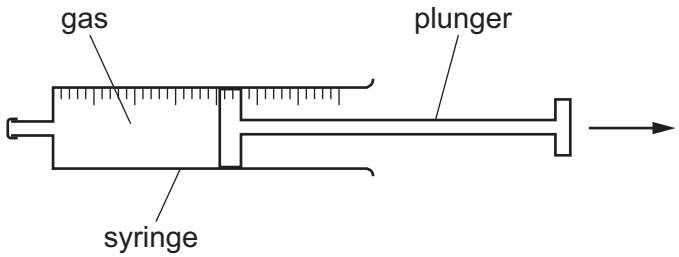
A The iron particles are closer together.

B The iron particles have a greater mass.

C The iron particles can be magnetised.

D The iron particles have less average kinetic energy.

14 A teacher has a gas in a sealed syringe with a movable plunger.



The teacher slowly moves the plunger out of the syringe. The temperature of the gas remains constant.

Which row explains what happens to the pressure of the gas in the syringe?

	pressure of gas	explanation
A	decreases	gas particles collide with the syringe wall less frequently
B	decreases	gas particles collide with the syringe wall more frequently
C	increases	gas particles collide with the syringe wall less frequently
D	increases	gas particles collide with the syringe wall more frequently

15 Evaporation occurs from the surface of a pool of water.

Which statement describes this change of state?

A Electrons move from the liquid and become a gas.

B Molecules that move from the liquid have the same energy as the molecules that stay in the liquid.

C The more-energetic molecules escape the liquid.

D The more-energetic molecules remain in the liquid.

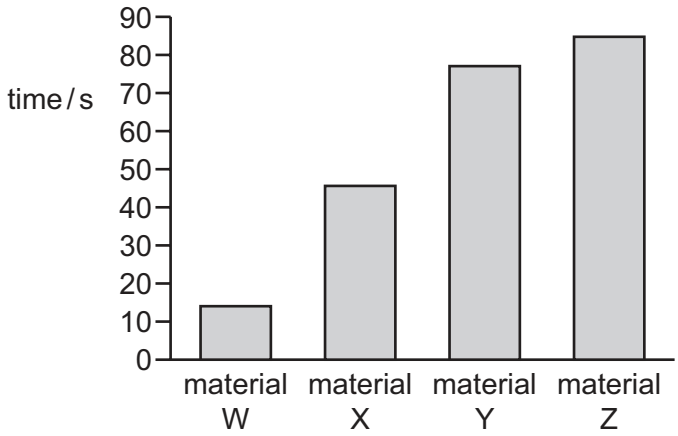
16 Students test four rods of different materials, W, X, Y and Z, to compare how well the materials conduct thermal energy.

The rods are all the same size and shape.

The students use wax to stick a pin to one end of the first rod. The wax melts when it is warm. The other end of the rod is heated and the time taken for the pin to fall is recorded.

The experiment is repeated for each rod.

The students plot a chart of the time taken for each pin to fall.



Which statement is correct?

A X is a better thermal conductor than Y.

B Y is a better thermal conductor than W.

C Z is a better thermal conductor than W.

D Z is a better thermal conductor than X.

17 A student has four metal containers filled with the same volume of water at a temperature of 80 °C.

The metal containers are put in a room at a temperature of 20 °C.

The metal containers are identical except for the texture and colour of their surfaces.

Which surface will emit energy at the greatest rate?

A dull black

B shiny black

C dull white

D shiny white

18 A water wave has a speed of 2.0 m / s.

4.0 complete waves pass a point every 10 seconds.

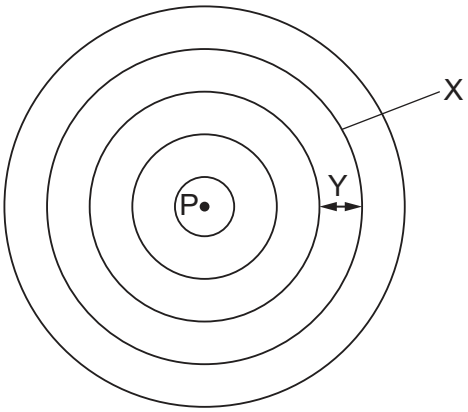
What is the wavelength of the wave?

A 0.50 m **B** 0.80 m **C** 5.0 m **D** 8.0 m

19 Which row correctly describes the vibrations of a transverse wave and also gives a correct example of a transverse wave?

	description of vibrations	example of a transverse wave
A	at right angles to the wave direction	sound
B	at right angles to the wave direction	water wave
C	parallel to the wave direction	sound
D	parallel to the wave direction	water wave

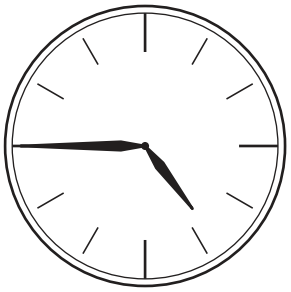
20 The diagram shows a view from above of waves on the surface of a pond after the water has been disturbed at point P.



What are the correct labels for X and Y?

	X	Y
A	amplitude	wavelength
B	wavefront	wavelength
C	amplitude	wavefront
D	wavefront	amplitude

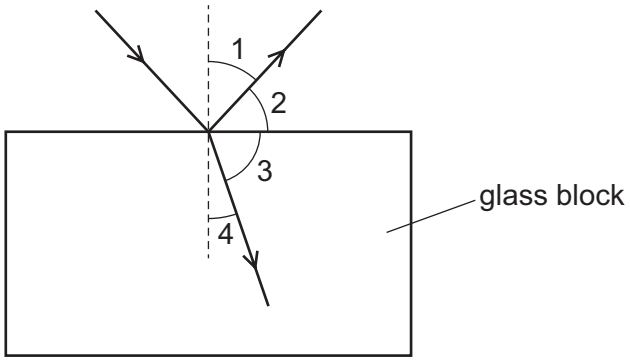
21 The diagram shows the image of a clock as seen by a person standing in front of a plane mirror.



What is the actual time?

A 4:15 **B** 4:45 **C** 7:15 **D** 7:45

22 The diagram shows a ray of light incident on the surface of a glass block.



The ray of light is partially reflected back into the air and partially refracted into the glass block.

Which row correctly identifies the angle of reflection and the angle of refraction?

	angle of reflection	angle of refraction
A	1	3
B	1	4
C	2	3
D	2	4

23 The amplitude and the frequency of a sound wave both increase.

What happens to the loudness and what happens to the pitch of the sound?

	loudness	pitch
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

24 Which statements about sound and ultrasound are correct?

	sound	ultrasound
A	humans can hear frequencies between 20 Hz and 20 000 Hz	the speed in air is 330 m / s
B	humans can hear frequencies less than 20 000 Hz	the speed in air is 100 m / s
C	the speed in air is 100 m / s	has a frequency greater than 20 000 Hz
D	the speed in air is 330 m / s	has a frequency less than 20 Hz

25 Which row describes the magnetic properties of soft iron and steel?

	soft iron	steel
A	easy to demagnetise	easy to demagnetise
B	easy to demagnetise	hard to demagnetise
C	hard to demagnetise	easy to demagnetise
D	hard to demagnetise	hard to demagnetise

26 Two charged rods, X and Y, are brought, in turn, near to a negatively charged rod.

X is attracted by the negatively charged rod, and Y is repelled.

What are the charges on X and Y?

	charge on X	charge on Y
A	negative	negative
B	negative	positive
C	positive	negative
D	positive	positive

27 The table gives data for four different electrical devices.

Which device develops the greatest power?

	device	voltage	current
A	car headlight	12 V	3.0 A
B	cooling fan	110 V	0.40 A
C	electric spark generator	400 kV	0.10 mA
D	mains lamp	240 V	0.20 A

28 A mains-operated radio is a double-insulated appliance.

Which statement is correct?

A The radio does **not** need a neutral connection.

B The radio **must** be earthed.

C The radio circuit is safe **without** a fuse or trip switch.

D The outer casing of the radio **cannot** become live.

29 Which statement describes a magnetic field?

A It is a region where all objects experience a force.

B It is a region where all electric charges experience a force.

C It is a region where all magnetic poles experience a force.

D It is a region where all metals experience a force.

30 A plastic rod is charged by friction. The plastic rod becomes positively charged.

Which particles are transferred in this process?

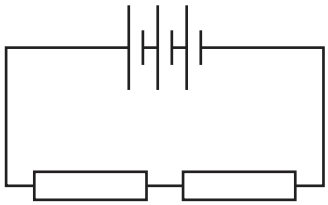
A atoms

B electrons

C protons

D neutrons

31 A teacher makes a circuit using three 1.5 V cells and two 20 Ω resistors connected in series.



Which row gives the combined electromotive force (e.m.f.) of the cells and the combined resistance of the resistors?

	combined e.m.f. / V	combined resistance / Ω
A	1.5	10
B	1.5	40
C	4.5	10
D	4.5	40

32 A student investigates the turning effect on a current-carrying coil placed in a magnetic field.

The student changes the current in the coil and the number of turns on the coil.

Which two changes together **must** increase the turning effect?

A decreasing the current and decreasing the number of turns

B decreasing the current and increasing the number of turns

C increasing the current and decreasing the number of turns

D increasing the current and increasing the number of turns

33 There is a current of 3.0 A in a conductor.

The current is changed to 6.0 A in the opposite direction.

Which effect does this have on the magnetic field around the conductor?

A It decreases and it acts in the opposite direction.

B It decreases and it acts in the same direction.

C It increases and it acts in the opposite direction.

D It increases and it acts in the same direction.

34 The table shows the contribution to background radiation from the four most common sources.

source	percentage of total background radiation / %
radon gas (in the air)	48
rocks and buildings	13
food and drink	10
cosmic rays	11

Which percentage of background radiation comes from all other sources?

A 14% **B** 18% **C** 21% **D** 82%

35 The unstable nucleus of an element undergoes radioactive decay. The proton number remains unchanged.

Which description of this radioactive decay event is correct?

A The nucleus emits an α-particle.

B The nucleus emits a β-particle.

C The nucleus emits γ-radiation.

D The nucleus emits an α-particle, a β-particle and γ-radiation together.

36 When they lose electrons, ...1..... form .....2..... charged .....3..... .

Which words correctly complete the sentence?

	1	2	3
A	atoms	negatively	ions
B	ions	negatively	atoms
C	atoms	positively	ions
D	ions	positively	atoms

37 An isotope of krypton has an atomic number of 36 and a mass number of 78.

What is the number of protons in a krypton nucleus?

A 36 **B** 42 **C** 78 **D** 114

38 What is the time taken for the Earth to spin once on its axis and the time taken for the Earth to orbit the Sun?

	spin on its axis	orbit the Sun
A	24 hours	1 month
B	24 hours	365 days
C	1 month	1 month
D	1 month	365 days

39 Electromagnetic radiation from distant galaxies is redshifted when observed from the Earth.

This is evidence that supports the Big Bang Theory.

Which statement is correct?

A Light from galaxies that are moving towards the Earth is redshifted.

B Redshift is an increase in the wavelength of electromagnetic radiation.

C The Big Bang Theory says that the Solar System is expanding out into the Universe.

D The Big Bang Theory says that, billions of years ago, the Universe expanded to its current size in a few seconds.

40 Which statement about the Milky Way is correct?

A It is a galaxy made up of billions of stars.

B It is a group of galaxies in our Solar System.

C It is all the stars that we can see in the night sky.

D It is the path taken by a comet when it gets close to the Sun.

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