NA

MINISTRY OF EDUCATION, SINGAPORE
in collaboration with
CAMBRIDGE ASSESSMENT INTERNATIONAL EDUCATION
General Certificate of Education Normal (Academic) Level

SCIENCE (PHYSICS) 5105/01

Paper 1 Multiple Choice

September/October 2020

Papers 1 and 2: 1 hour 15 minutes

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and index number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE ON ANY BARCODES.

There are **twenty** 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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Answers to Paper 1 and Paper 2 must be handed in separately.
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
You are advised to spend no more than **30 minutes** on **Paper 1**.
You may proceed to answer Paper 2 as soon as you have completed Paper 1.
Any rough working should be done in this booklet.
The use of an approved scientific calculator is expected, where appropriate.

This document consists of **8** printed pages and **4** blank pages.

Singapore Examinations and Assessment Board

Cambridge Assessment International Education

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1 The diagram shows a digital stopwatch.

Which time is shown on the digital stopwatch?

A 1.58 seconds

B 118 seconds

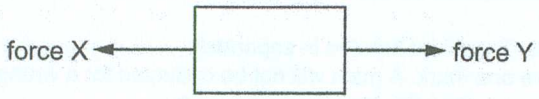
C 1.58 minutes

D 158 minutes

2 What is the approximate acceleration of free fall for a body near to the Earth?

A $0.1\,m/s^2$ **B** $1\,m/s^2$ **C** $10\,m/s^2$ **D** $100\,m/s^2$

3 An object of mass 4 kg has two forces acting on it as shown.



The object is accelerating at $2\,m/s^2$ to the right.

In which row are the forces correct?

	force X / N	force Y / N
A	4	6
B	4	12
C	6	4
D	12	4

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4 A student quickly pulls a cloth from under a dish on a table.

The dish resists the change in the state of rest and stays on the table.

What is this resistance to any change of motion known as?

A balance

B force

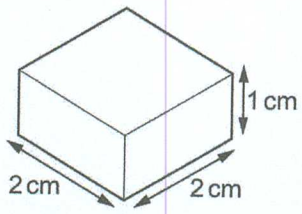
C inertia

D weight

5 Each of the solids shown has the same mass.

Which solid has the greatest density?

A



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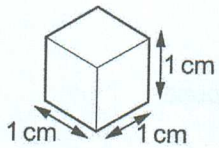

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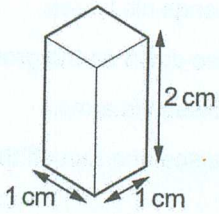

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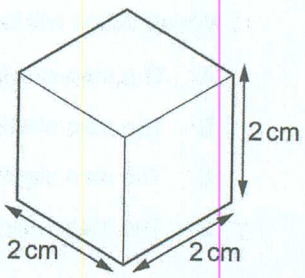
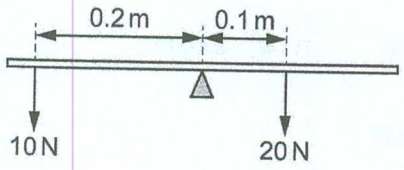


6 A uniform beam is pivoted at its centre.

In which diagram is the beam in equilibrium?

A



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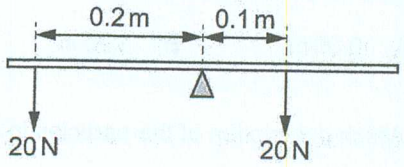

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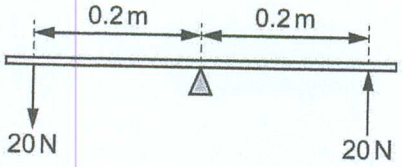

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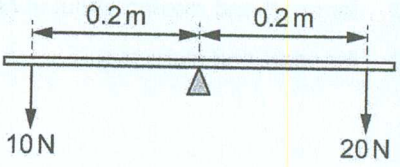

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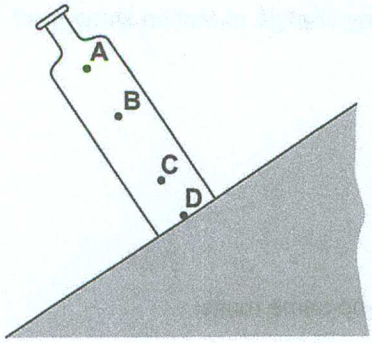
7 A bottle is **just** able to rest on the sloping surface without falling over.

Where is its centre of gravity?



8 A man stands on the ground.

Which action will increase the pressure that the man exerts on the ground?

A The man slowly bends his knees.

B The man slowly lies down on the ground.

C The man slowly raises his arms.

D The man slowly raises one foot off the ground.

9 A man pushes a box along the floor.

The total constant horizontal force on the box is 80 N.

The work done is 100 J. Friction can be assumed to be negligible.

How far does the box move?

A 0.80 m **B** 1.25 m **C** 1.80 m **D** 2.50 m

10 Which description of the particles in a gas is correct?

A close together and stationary

B close together and vibrating

C far apart and moving about at random

D far apart and stationary

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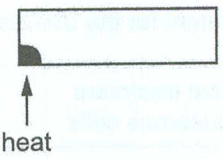
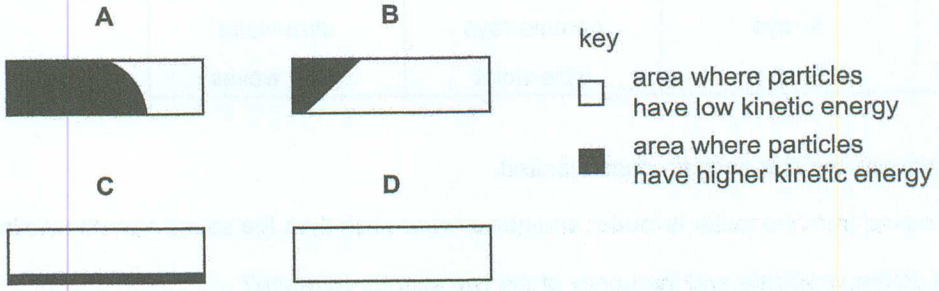
11 A solid metal rod is heated at one end.



Which diagram represents the state of the particles a short time after the heating was started?



12 Some statements about boiling and evaporation from a liquid are shown.

- Boiling occurs at the surface of the liquid.
- Boiling forms bubbles as liquid turns to gas.
- Evaporation occurs at any temperature above the melting point.
- The rate of evaporation is affected by the surface area of the liquid.
- The rate of evaporation is **not** affected by the temperature of the liquid.

How many of these statements are correct?

A 1 **B** 2 **C** 3 **D** 4

13 Which row is correct?

	name of wave	type of wave	property of wave
A	light	longitudinal	travels in a vacuum
B	light	transverse	contains compressions and rarefactions
C	sound	transverse	travels in a vacuum
D	sound	longitudinal	contains compressions and rarefactions

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14 Several components of the electromagnetic spectrum are used in hospitals.

Which row shows the correct component for the use stated?

	detection of broken bones	medical treatment for cancerous cells	sterilisation of instruments
A	gamma rays	radio waves	ultra-violet
B	ultra-violet	gamma rays	radio waves
C	X-rays	gamma rays	ultra-violet
D	X-rays	ultra-violet	radio waves

15 A violin and a guitar each produce a sound.

The sound from the guitar is louder and has a lower pitch than the sound from the violin.

How do the amplitude and frequency of the two sounds compare?

	amplitude of sound from guitar	frequency of sound from guitar
A	larger	larger
B	larger	smaller
C	smaller	larger
D	smaller	smaller

16 Electrons are charged particles.

Which row identifies the charge on an electron and the unit of charge?

	type of charge	unit of charge
A	negative	ampere
B	negative	coulomb
C	positive	ampere
D	positive	coulomb

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17 The diagrams show identical electric circuits containing a battery and two resistors.

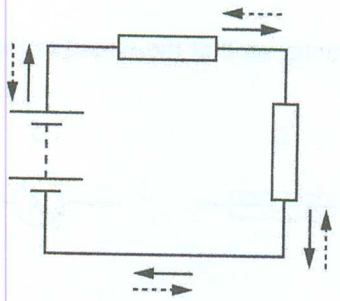
Which diagram correctly indicates the direction of conventional current and the direction of electron flow?

key

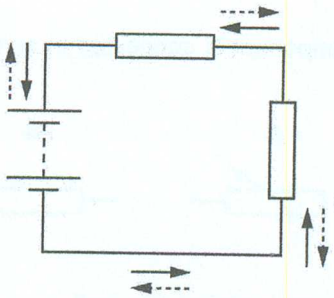
→ conventional current

⇢ electron flow

A



B



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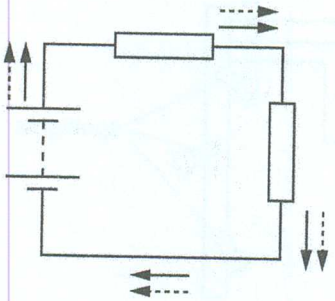

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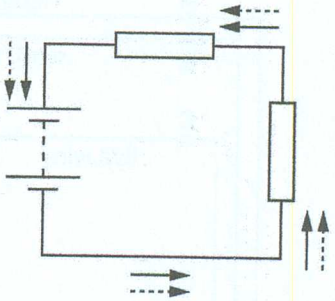

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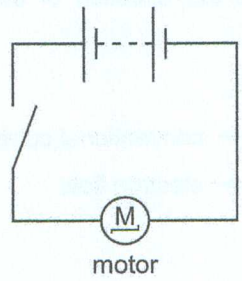
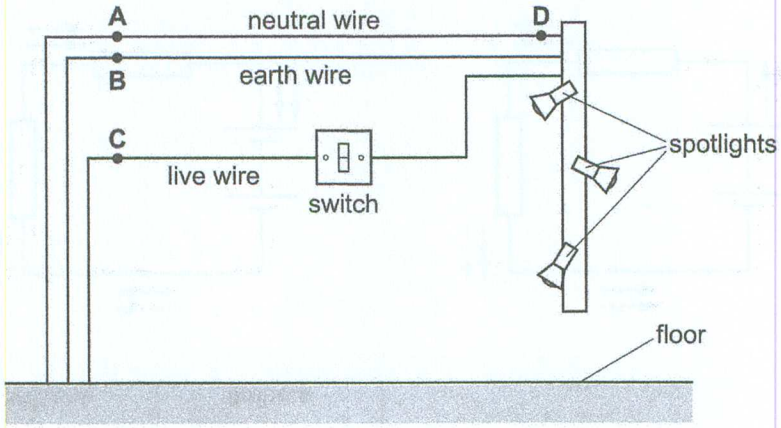
18 A battery is connected to a switch and a motor. The speed of the motor depends on the potential difference across the motor.



Which component is connected in series with the motor so that the speed of the motor can be varied?

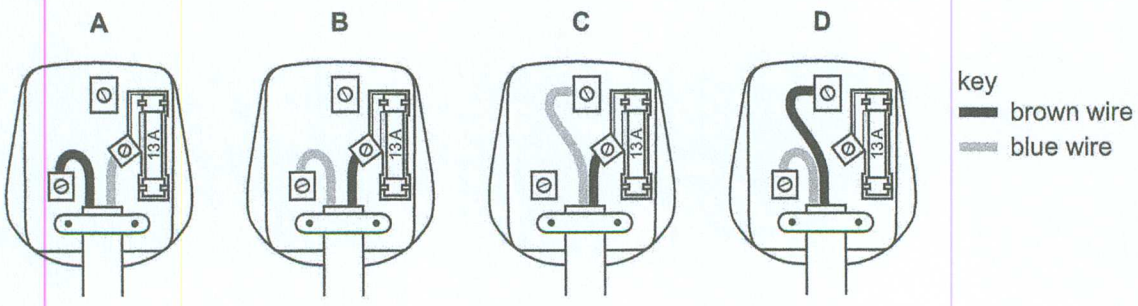
19 Spotlights are installed on a wall.

In which position must the fuse be fitted in this circuit?



20 An electric drill is double-insulated.

Which diagram shows the correctly wired mains plug for use with this drill?



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