Anglo-Chinese School
(Barker Road)

PRELIMINARY EXAMINATION 2021

SECONDARY FOUR NORMAL ACADEMIC

SCIENCE (PHYSICS) 5105 / 01

PAPER 1 AND PAPER 2: 1 HOUR 15 MINUTES

INSTRUCTIONS TO CANDIDATES:

Write in soft pencil.

Write your name and exam index number on the Answer Sheet.

There are **twenty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** or **D**.

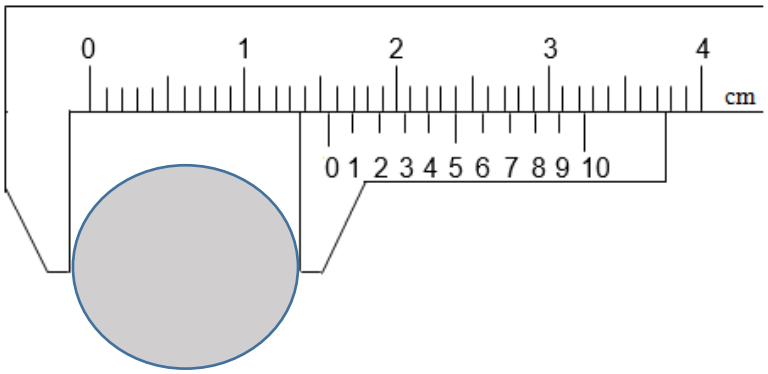
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

INFORMATION FOR CANDIDATES:

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 question paper consists of **9** printed pages.*

1 The diagram shows a vernier caliper used to measure the diameter of a cable.



What is the reading shown?

A 1.35 cm

B 1.45 cm

C 1.55 cm

D 1.65 cm

2 Which row correctly shows the correct SI units for mass and temperature?

	mass	temperature
A	gram	degree Celsius
B	gram	Kelvin
C	kilogram	degree Celsius
D	kilogram	Kelvin

3 Which length is the longest?

A 0.02 Gm

B 2 000 Mm

C 20 000 000 km

D 200 000 000 m

4 Which scenario takes the longest time?

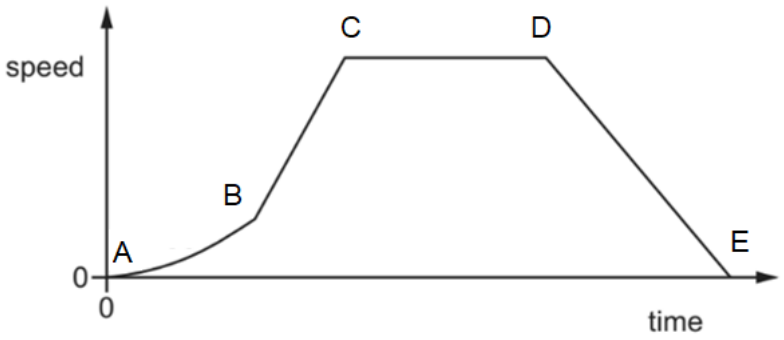
A A car accelerating at 7 m/s^2 from 5 m/s to 25 m/s

B A car accelerating at 15 m/s^2 from 10 m/s to 45 m/s

C A lorry decelerating at 6 m/s^2 from 35 m/s to 20 m/s

D A lorry decelerating at 12 m/s^2 from 55 m/s to 15 m/s

5 The graph represents the motion of a lift.



Which description of the motion of the lift is correct?

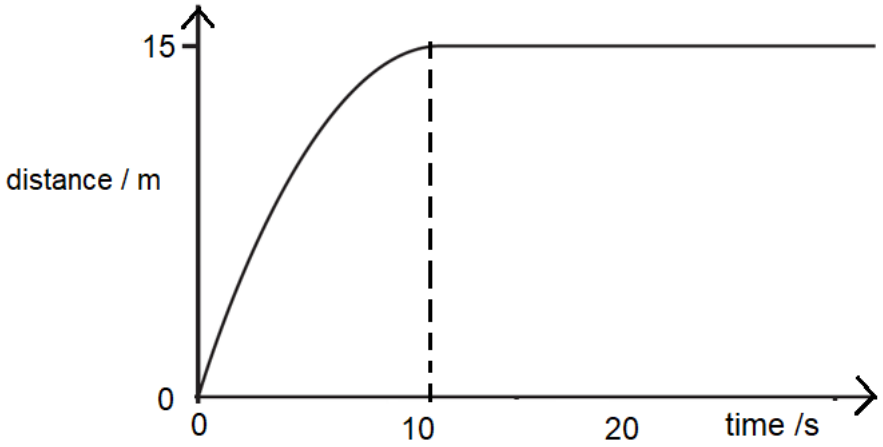
A constant speed from B to C

B decreasing deceleration from D to E

C uniform acceleration from A to B

D zero acceleration from C to D

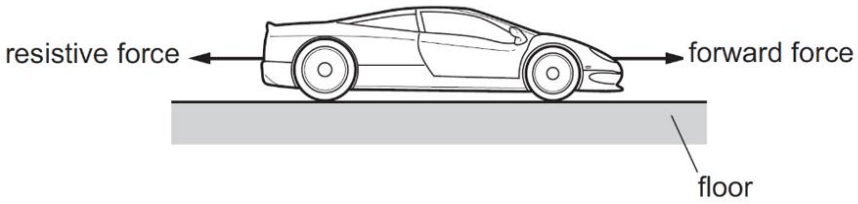
6 The diagram shows the distance-time graph of a man walking.



Which row describes the speed of the man?

	0 s to 10 s	10 s to 20 s
A	constant	constant
B	constant	zero
C	decreasing	zero
D	increasing	constant

7 The diagram shows the two horizontal forces acting on a toy car.



Which toy car will experience the smallest acceleration?

	mass of toy car / kg	resistive force / N	forward force / N
A	4	10	19
B	5	16	24
C	6	21	30
D	7	23	41

8 The table shows the density of three substances.

	density / g/cm^3
A	14
B	7
C	21

Which statement is correct?

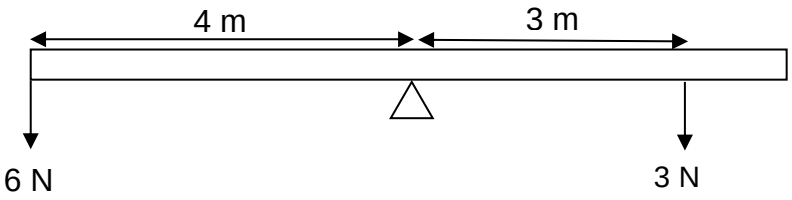
A 1 kg of A will occupy a larger volume than 1 kg of B.

B 1 kg of B will have twice the weight of 1 kg of A.

C 1 cm^3 of B will have a smaller mass than 1 cm^3 of C.

D The density of all three liquids will decrease if brought from Earth to Moon.

9 A uniform bar is pivoted at its middle.



Which force will balance the bar?

A 4 N downward force acting 2 m to the right of the pivot.

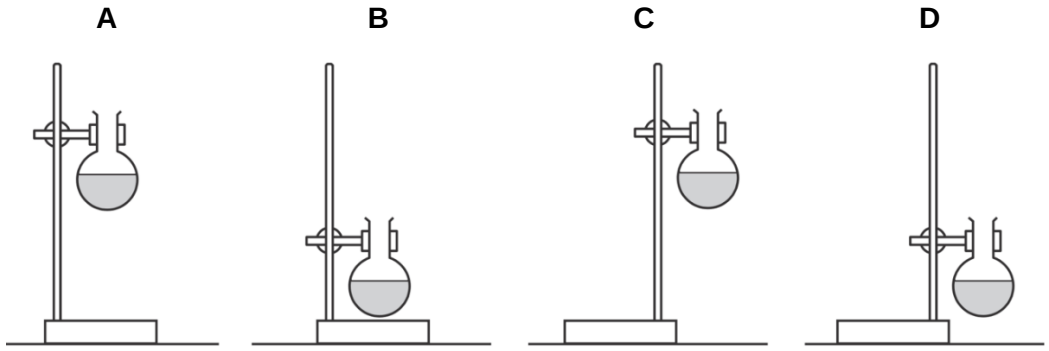
B 4 N upward force acting 3 m to the left of the pivot.

C 5 N downward force acting 2 m to the right of the pivot.

D 5 N upward force acting 3 m to the left of the pivot.

10 A student uses a stand and clamp to hold up a flask of liquid.

Which diagram shows the most stable arrangement?



11 Which scenario gives the largest power developed?

A A lift of mass 400 kg moving upwards by 80 m in 22 s.

B A lift of mass 400 kg moving upwards by 140 m in 25 s.

C A lift of mass 700 kg moving upwards by 100 m in 33 s.

D A lift of mass 700 kg moving upwards by 160 m in 55 s.

12 Which row correctly describes the properties of liquids and solids?

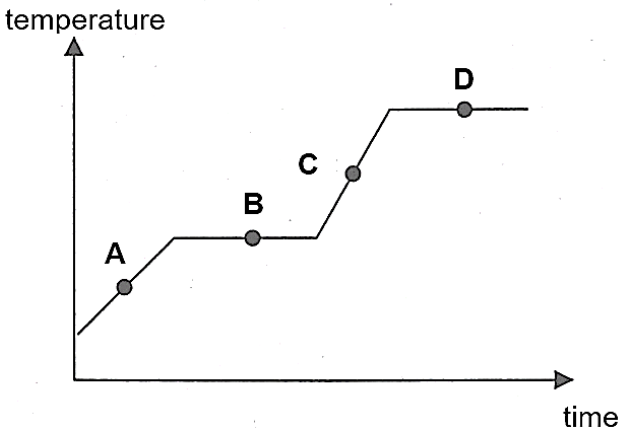
	liquids	solids
A	definite volume and definite shape	definite volume but no definite shape
B	definite volume and no definite shape	definite volume and definite shape
C	no definite volume but definite shape	definite volume but no definite shape
D	no definite volume but definite shape	no definite volume and no definite shape

13 Which row best describes the forces of attraction and the average speed of gas molecules?

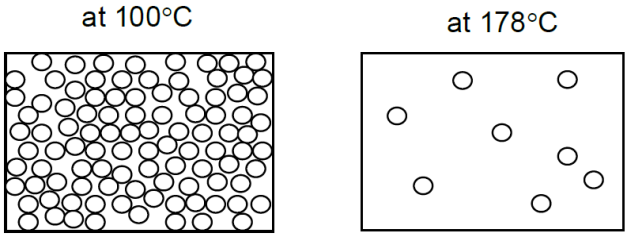
	forces	average speed of molecules
A	strong	low
B	strong	high
C	weak	low
D	weak	high

14 A solid substance is heated in a tube. The diagram shows how the temperature of the substance varies with time.

At which point would the substance be a mixture of liquid and gas?



15 The diagrams show the arrangement of particles in a substance at two different temperatures.



Which row correctly shows the melting and boiling point of the substance?

	melting point/ °C	boiling point/ °C
A	45	98
B	77	120
C	82	180
D	115	170

16 Which is a use of infra-red radiation?

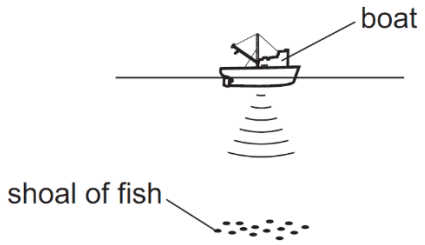
A intruder alarm

B kill cancer cells

C optical fibres

D satellite television

17 A pulse of sound is produced at the bottom of a boat. The sound travels through the water and is reflected from a shoal of fish. The sound reaches the boat again after 1.2 s. The speed of sound in the water is 1500 m/s.



How far below the bottom of the boat is the shoal of fish?

A 450 m

B 900 m

C 1800 m

D 3600 m

18 An electrical source uses 8 kJ of energy to drive 400 C of charges around a complete circuit.

What is the electromotive force?

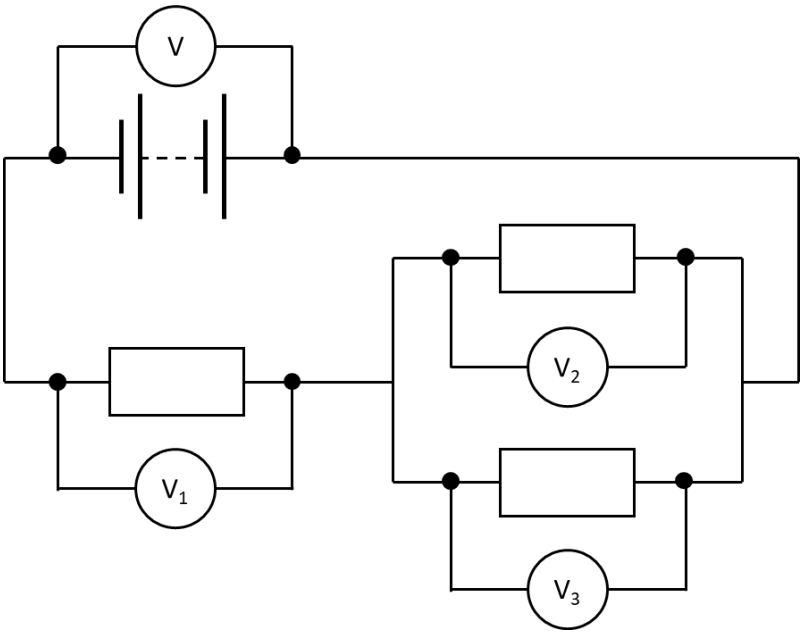
A 2 V

B 20 V

C 50 V

D 3200 V

19 The diagram shows a circuit where three identical resistors are connected to a battery. Four voltmeters are connected in different parts of the circuit.



Which row correctly shows the relationship between the voltages?

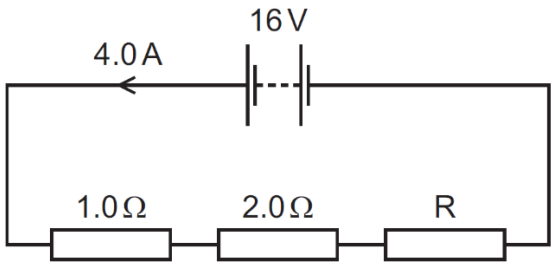
A $V = V_1 = V_2 = V_3$

B $V = V_1 \times V_2$

C $V = V_1 + V_3$

D $V = V_1 + V_2 + V_3$

20 The diagram shows a 16 V battery connected to three resistors.



What is the value of resistor R?

A 1.0 Ω

B 3.0 Ω

C 4.0 Ω

D 7.0 Ω