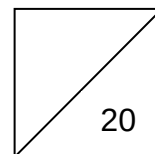




NORTH VISTA SECONDARY SCHOOL
Preliminary Examination 2024
Secondary 4 Normal Academic



CANDIDATE
NAME

CLASS

INDEX
NUMBER

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SCIENCE (PHYSICS)

5105/01

Paper 1 Multiple Choice

1 August 2024

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, Index number on the Answer Sheet in the spaces provided unless this has been done for you.

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.

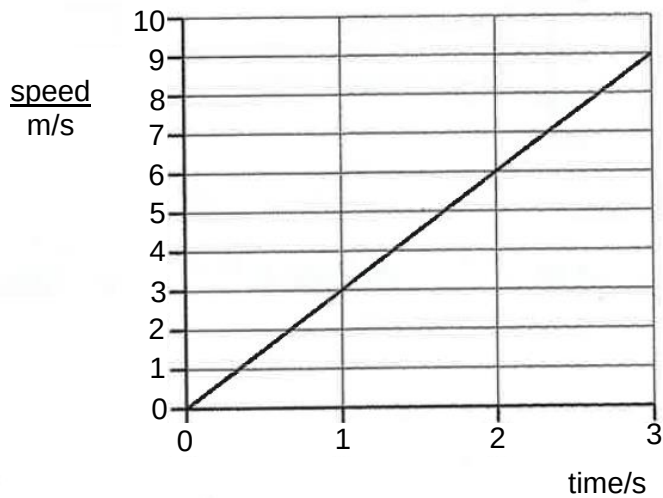
1 Which is a vector quantity?

- A mass
- B speed
- C weight
- D distance

2 What is the order of magnitude of the diameter of the Earth?

- A $1.3 \times 10^3 \text{m}$
- B $1.3 \times 10^5 \text{m}$
- C $1.3 \times 10^7 \text{m}$
- D $1.3 \times 10^9 \text{m}$

3 The speed-time graph shown is for a model car.



What is the distance travelled by the model car in 3.0s?

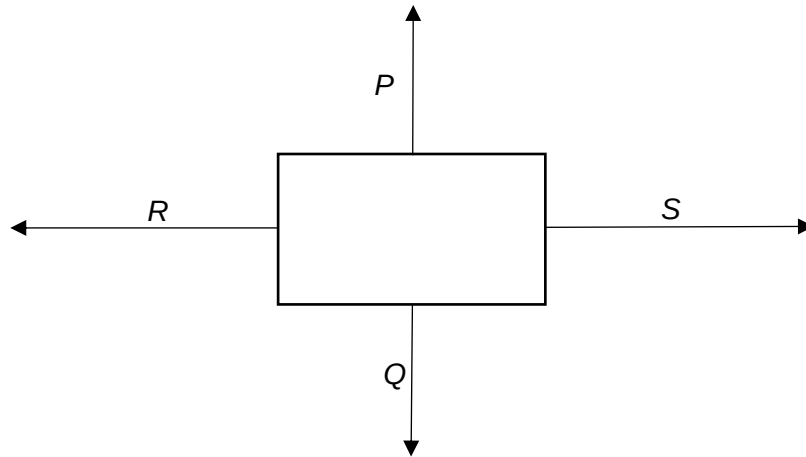
- A 3.0m
- B 9.0m
- C 13.5m
- D 27m

4 An object falls through a vacuum.

Which row describes the acceleration and velocity of the object?

	acceleration	velocity
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

- 5 Four forces, P , Q , R and S , act on an object. The directions of the forces are shown.



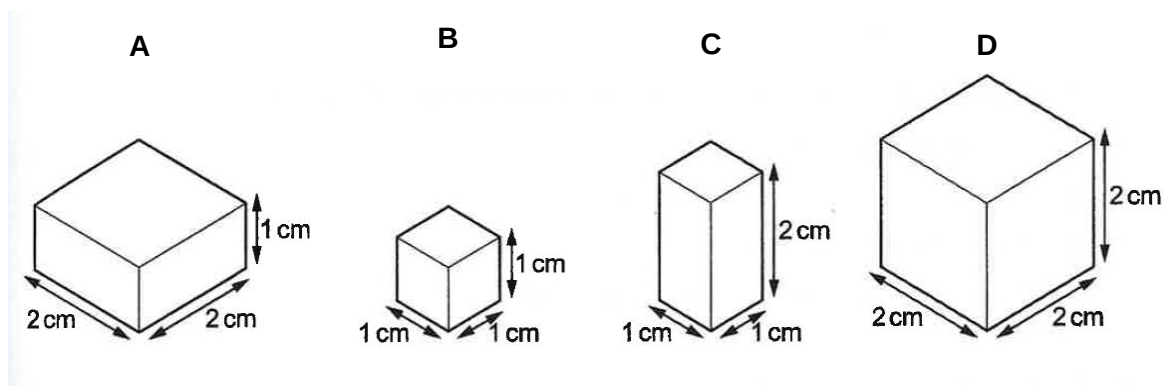
The object accelerates vertically down.

Which statement **must** be correct?

- A All four forces are of the same magnitude.
 - B R and S are equal in magnitude but Q is larger than P .
 - C P and Q are equal in magnitude but both are larger than R or S .
 - D P and Q are equal in magnitude and R and S are equal in magnitude.
- 6 Which statement concerning the mass of a body is **not** correct?
- A Mass can be measured using a spring balance.
 - B Mass experiences a force due to gravitational attraction.
 - C Mass is a measure of the amount of substance in a body.
 - D Mass is not affected by changes in the gravitational field strength.

- 7 Each of these solids has the same mass.

Which solid has the least density?



8 How is pressure calculated?

A $\frac{\text{force}}{\text{area}}$

B $\frac{\text{force}}{\text{volume}}$

C $\frac{\text{mass}}{\text{area}}$

D $\frac{\text{mass}}{\text{volume}}$

9 During a change in state, molecules continue to move at random throughout a substance and the force between the molecules increases.

What is the change in state?

A from gas to liquid

B from liquid to gas

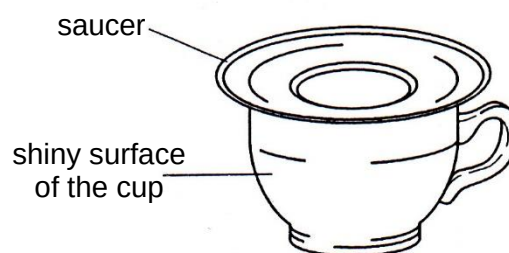
C from liquid to solid

D from solid to liquid

10 Which row describes a gas at room temperature and pressure?

	fixed shape	fixed volume
A	no	no
B	no	yes
C	yes	no
D	yes	yes

11 A cup of coffee can be kept hot by placing a saucer on top of it.



Why does this method work?

A It reduces conduction through the cup.

B It reduces convection in the air above the surface of the coffee.

C It reduces convection in the coffee.

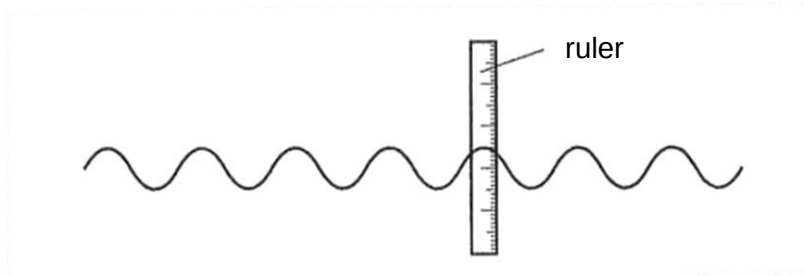
D It reduces radiation from the shiny surface of the cup.

- 12 A wave travels across the surface of water.

Which name is given to a line joining points in phase?

- A wavefront
- B wavelength
- C wave speed
- D wave frequency

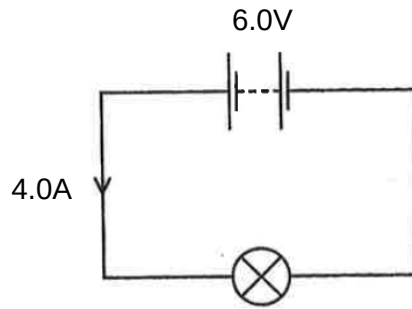
- 13 A student places a ruler in a ripple tank containing a wave.



What can be measured by the ruler in this position?

- A the period of the wave
 - B the speed of the wave
 - C the amplitude of the wave
 - D the wavelength of the wave
- 14 Which type of electromagnetic waves is deliberately used in some circumstances to cause damage to living cells in the human body?
- A infrared radiation
 - B gamma rays
 - C microwaves
 - D radio waves

- 15 The circuit shows a lamp connected to a 6.0V battery.

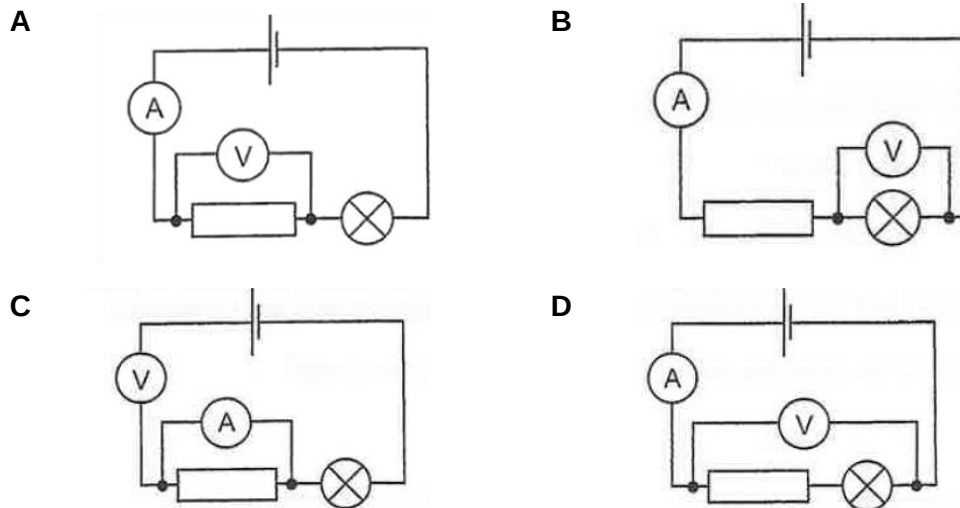


A current of 4.0A flows in the circuit for 30s.

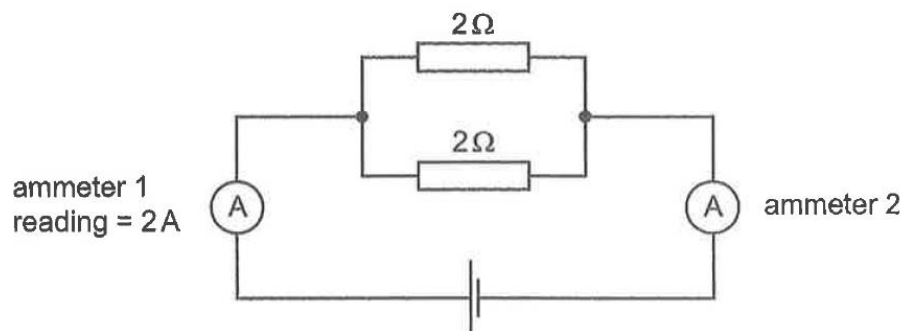
How much charge flows through the lamp?

- A** 120C **B** 80C **C** 24C **D** 0.20C
- 16 A student measures the current in a lamp and the potential difference across a lamp.

Which is the correct circuit to use?



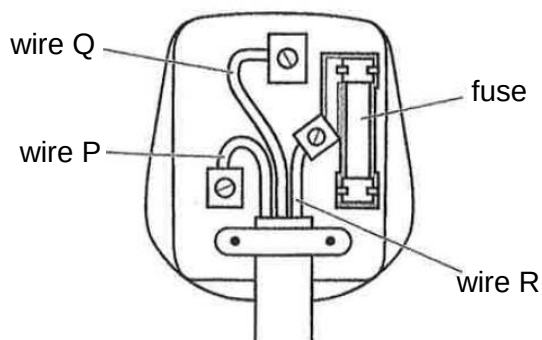
- 17 In the circuit, the reading on ammeter 1 is 2A.



What is the reading on ammeter 2?

- A** 0A **B** 1A **C** 2A **D** 4A

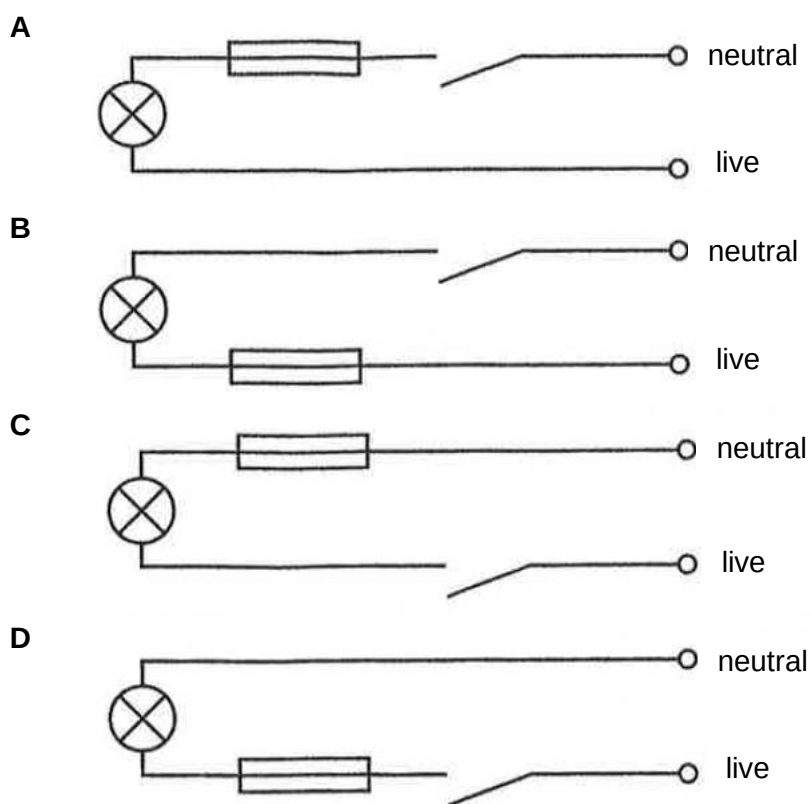
- 18 The wiring in a mains plug is shown.



Which row is correct?

	wire P	wire Q	wire R
A	blue	brown	green and yellow stripes
B	blue	green and yellow stripes	brown
C	brown	green and yellow stripes	blue
D	green and yellow stripes	blue	brown

- 19 Which circuit is the safest to use?



20 What is the order of the penetrative effects of α -radiation, β -radiation and γ -radiation?

	most penetrative $\rightarrow$ least penetrative
A	$\alpha \rightarrow \beta \rightarrow \gamma$
B	$\alpha \rightarrow \gamma \rightarrow \beta$
C	$\beta \rightarrow \alpha \rightarrow \gamma$
D	$\gamma \rightarrow \beta \rightarrow \alpha$

End of Paper