Class	Full Name	Index Number

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End of Year Examination 2019

N

5105/01

SCIENCE (Physics)
Paper 1
Secondary 3 Normal Academic

9th October 2019

1 h 15 min
(For Papers 1 & 2)

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Write your name, class and index number on the Answer Sheet in the spaces provided.

There are **twenty** questions in this section. 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.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
The use of an electronic calculator is expected, where appropriate.
Take the value of *g*, the gravitational field strength of Earth = 10 N/kg, unless otherwise specified.

You are advised to spend no more than **30 minutes** on Paper 1.

DO NOT OPEN THIS PAPER UNTIL YOU ARE TOLD TO DO SO

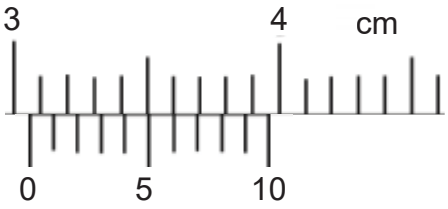
This document consists of **9** printed pages, including this cover page.

Setter: Mr. Mohd Farid

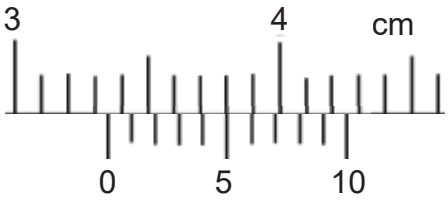
1 The diagrams below show readings taken from two micrometer screw gauges and two vernier calipers.

Which instrument shows a reading of 33.5 mm?

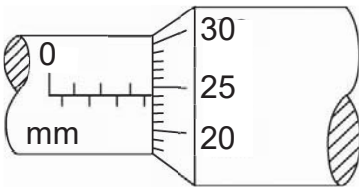
A



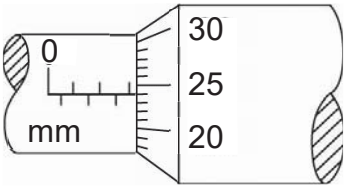
B



C



D



2 A pendulum clock uses the period of its oscillation to tell time.

Which one of the following does not affect its accuracy?

1. the length of the pendulum
2. the mass of the pendulum
3. the gravitational field strength of the clock's location
4. the material of the pendulum

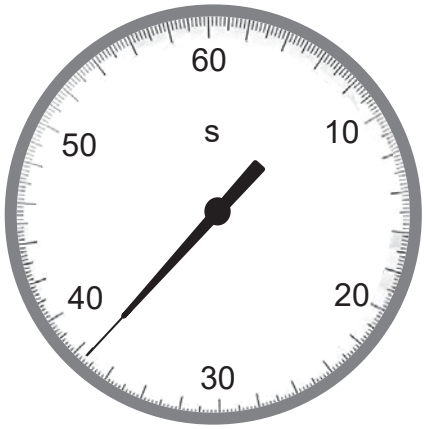
A 1 only

B 2 only

C 2 and 3

D 2 and 4

3 The diagram shows a stopwatch.



What is the reading on the stopwatch?

A 30.7 s **B** 33.6 s **C** 36.7 s **D** 37.4

[Turn over

4 Which of the following groups of physical quantities consists only of scalars?

A acceleration, force, velocity

B acceleration, mass, speed

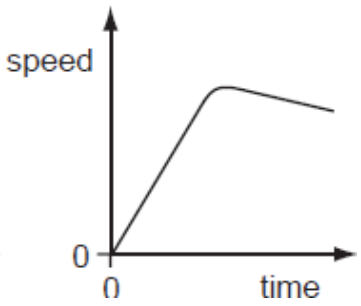
C force, time, velocity

D mass, speed, time

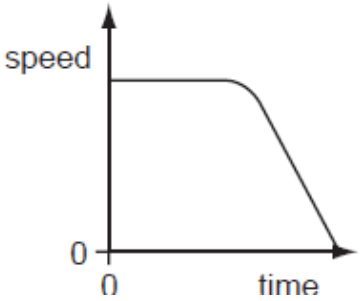
5 A ball starts to roll down a steep slope and then along rough horizontal ground.

Which graph best shows the speed of the ball?

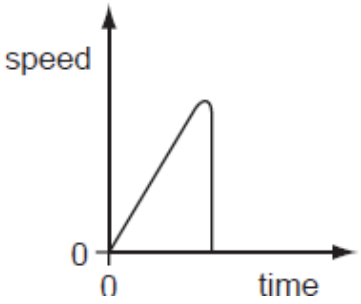
A



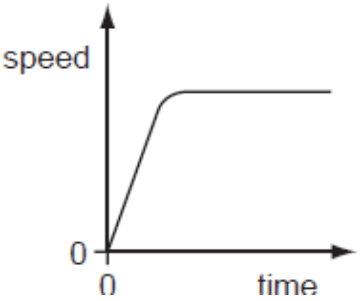
B



C

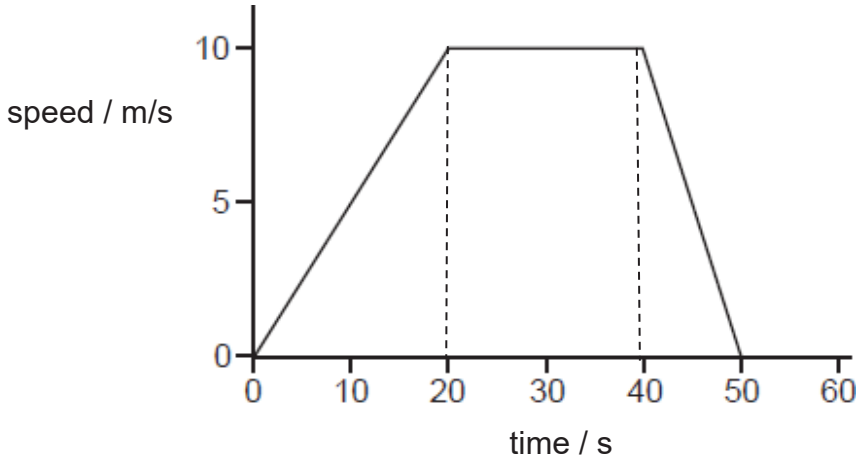


D



[Turn over

6 The graph shows the movement of a car over a period of 50 s.



What was the distance travelled by the car while its speed was increasing?

A 10 m **B** 20 m **C** 100 m **D** 200 m

7 Which vehicle has an acceleration of 5 m/s^2?

A a bicycle, when its speed changes from rest to 2.5 m/s in 2 s

B a car, when its speed changes from rest to 15 m/s in 5 s

C a lorry, when its speed changes from rest to 20 m/s in 15 s

D a motorbike, when its speed changes from rest to 50 m/s in 10 s

8 The diagram shows a block of stone on a rough horizontal surface. Force P acts on the block as shown.

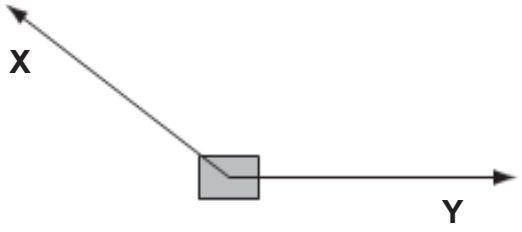
The block is at rest. A frictional force F acts on the block.

Which row shows the direction and size of F?

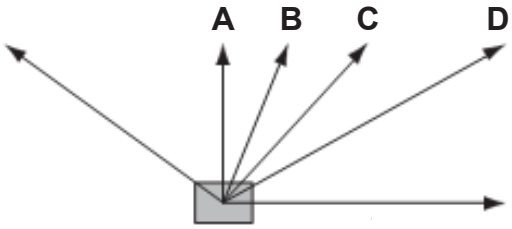
	direction of F	size of F
A	to the right	same as P
B	to the left	same as P
C	to the right	less than P
D	to the left	less than P

[Turn over

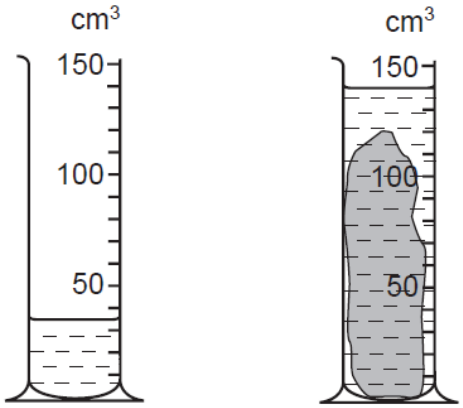
9 Forces X and Y act on a block in the directions shown on the scale diagram.



In which direction is the resultant force acting?



10 A lump of metal has a mass of 210 g. It is lowered into a measuring cylinder containing water. The level of the water rises from 35cm^3 to 140cm^3.



What is the density of the metal?

A 0.67 g/cm^3 **B** 1.5 g/cm^3 **C** 2.0 g/cm^3 **D** 6.0 g/cm^3

11 A student made some revision notes on gravity, mass and weight.

Which statement made by the student is not correct?

A Gravitational field strength has the unit N/kg.

B Mass is a measure of the amount of matter in a body.

C Mass is equal to weight multiplied by gravitational field strength.

D A gravitational field is a region in which a mass experiences a gravitational force.

[Turn over

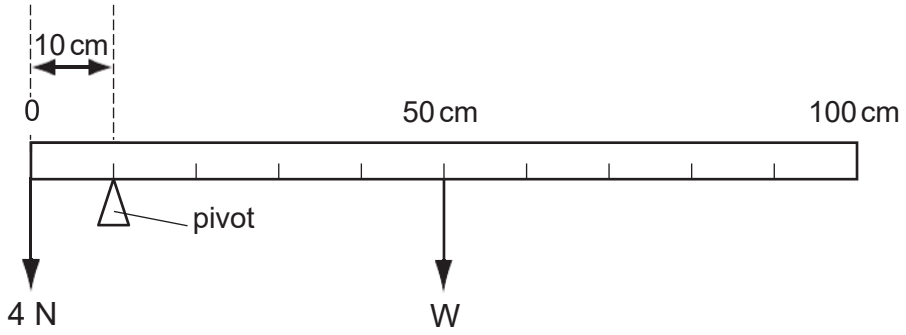
12 A stone has a mass of 390 g and a density of 2.7 g/cm^3.

Cooking oil has a density of 0.90 g/cm^3.

Which mass of oil has the same volume as the stone?

A 130 g **B** 160 g **C** 900 g **D** 1200 g

13 A uniform metre rule is balanced by a 4 N weight as shown in the diagram.

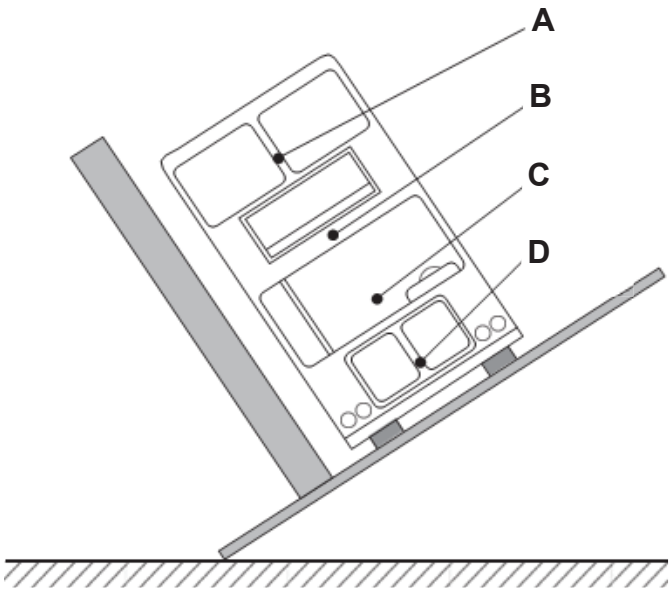


What is the weight W of the metre rule?

A 1 N **B** 4 N **C** 16 N **D** 40 N

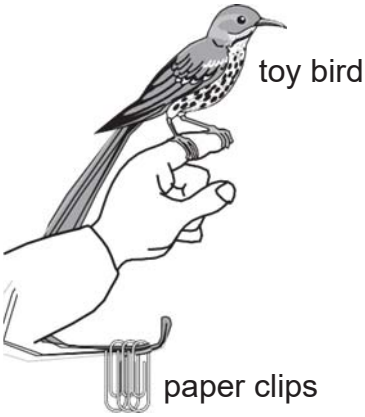
14 The stability of a bus is tested by tilting it on a ramp. The diagram shows a bus in a stable equilibrium position.

Where is the centre of gravity of the bus?



[Turn over

15 A girl uses paper-clips to balance a toy bird on her finger as shown.



What is the effect of the paper-clips?

A They help to raise the centre of mass above her finger.

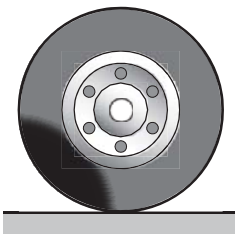
B They help to raise the centre of mass to her finger.

C They help to lower the centre of mass below her finger.

D They do not affect the centre of mass but increase the weight.

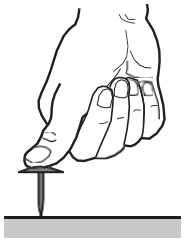
16 The same downward force is applied to four objects resting on a horizontal surface.
Which exerts the greatest pressure on the surface?

A



car wheel

B



drawing pin

C

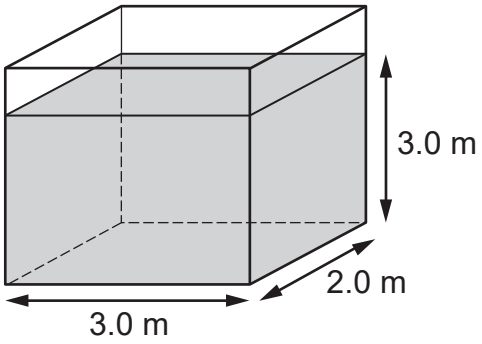
table fork

D

stiletto heel

[Turn over

17 The base of a rectangular storage tank is 2.0 m by 3.0 m. The tank is filled with paraffin to a depth of 3.0 m.

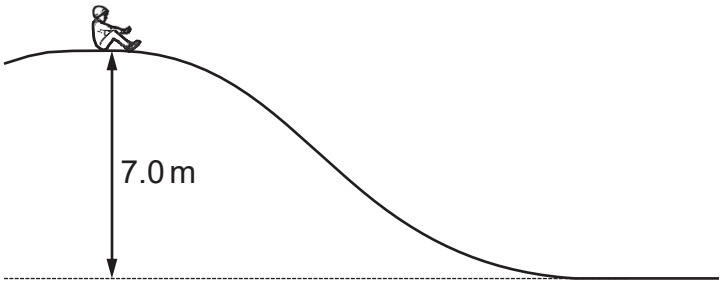


The density of paraffin is 800 kg/m^3 and the gravitational field strength is 10 N/kg.

What is the pressure at the bottom of the tank due to the paraffin?

A 2400 Pa **B** 14 400 Pa **C** 24 000 Pa **D** 144 000 Pa

18 A boy slides down a slide.



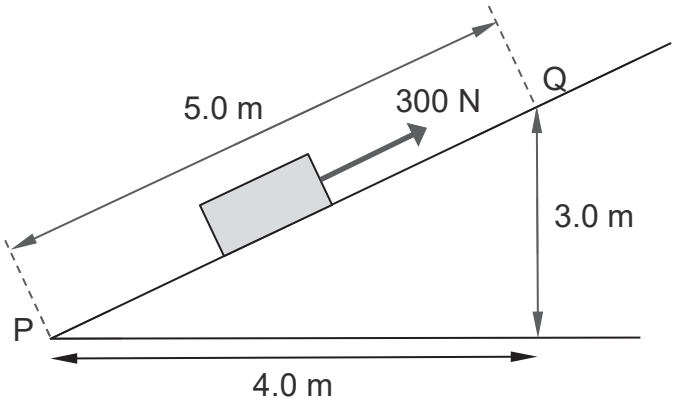
The weight of the boy is 250 N. The height of the slide is 7.0 m. The work done against friction as the child travels down the slide is 1300 J.

What is the change in gravitational potential energy and what is the final kinetic energy of the boy?

	change in gravitational potential energy	final kinetic energy
A	1750	450
B	1750	1750
C	17 500	16 200
D	17 500	17 500

[Turn over

19 A 300 N force is applied to a box to move it up a smooth ramp, as shown.



How much work is done by the force when moving the box from P to Q?

A 900 J **B** 1200 J **C** 1500 J **D** 3000 J

20 A boy, who weighs 50 N, runs up a flight of stairs 6.5 m high in 7 seconds.

How much power does he develop?

A $\frac{6.5}{50 \text{ X } 7}$ W

B $\frac{7 \text{ X } 6.5}{50}$ W

C $\frac{50}{70 \text{ X } 6.5}$ W

D $\frac{50 \text{ X } 6.5}{7}$ W

End of Paper