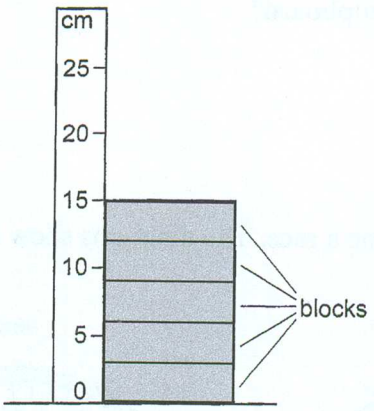
Topic 1 Physical Quantities, Units and Measurement

PAPER 1

MULTIPLE-CHOICE QUESTIONS

For each question, there are four possible answers. Choose the one you consider correct and record your choice (A, B, C or D) in the brackets provided.

1. A centimetre rule is used to measure the height of a pile of similar blocks.

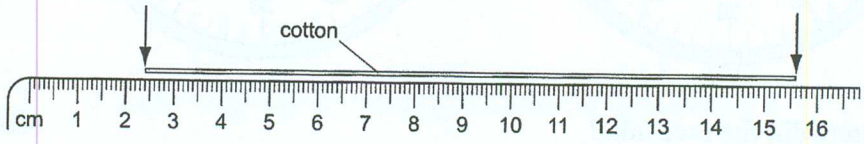


What is the height of one of these blocks? (2011/P1/Q1)

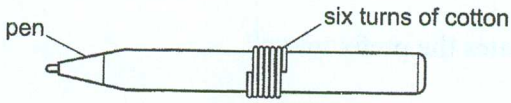
A 3 cm
B 5 cm
C 6 cm
D 15 cm

( )

2. A piece of cotton is measured between two points on a ruler.



When the length of cotton is wound closely around a pen, it goes round six times.

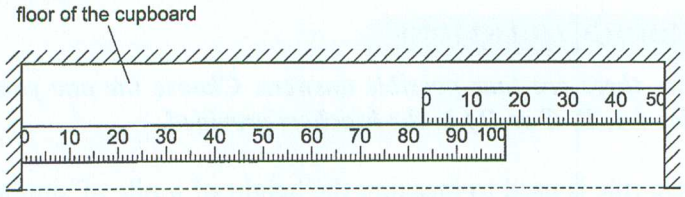


What is the distance once round the pen? (2012/P1/Q1)

A 2.2 cm
B 2.6 cm
C 13.2 cm
D 15.6 cm

( )

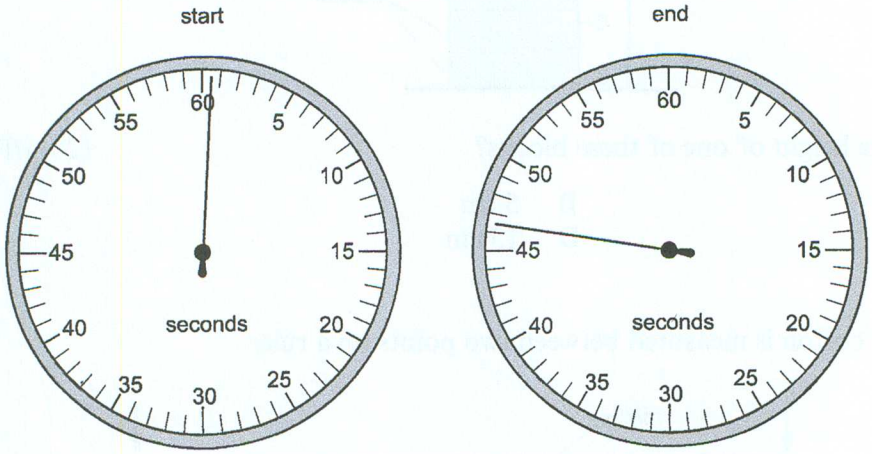
3. The width of a cupboard is measured. A metre rule and a half-metre rule are placed on the floor of the cupboard as shown.



What is the width of the cupboard? (2013/P1/Q1)

A 1.17 m
B 1.23 m
C 1.33 m
D 1.50 m ( )

4. A stopwatch is used to time a race. The diagrams show the stopwatch at the start and at the end of the race.



How long did the race take? (2014/P1/Q1)

A 45.7 s **B** 46.0 s
C 46.5 s **D** 47.0 s ( )

5. Which symbol indicates the prefix micro? (2015/P1/Q1)

A m **B** M
C n **D** μ ( )

6. Which quantity is a vector? (2015/P1/Q2)

A acceleration **B** distance
C time **D** volume ( )

7. Which statement about scalar quantities and vector quantities is correct? (2016/P1/Q1)

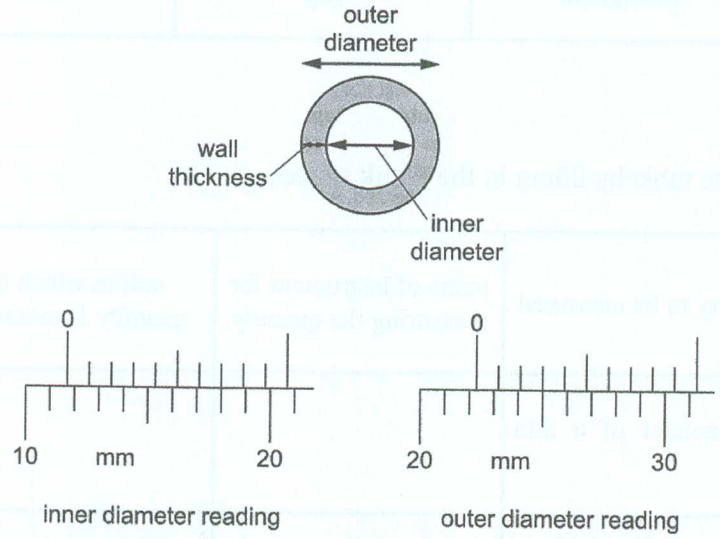
A Scalars have direction only.
B Scalars have size and direction.
C Vectors have direction only.
D Vectors have size and direction. ( )

8. Why is the force of gravity a vector quantity? (2017/P1/Q1)

A It acts on a body in a downward direction.
B It has direction and size.
C It has direction but no size.
D It is a force of attraction. ( )

9. Vernier calipers are used to measure the inner diameter and outer diameter of a tube.

A cross section of the tube and the two vernier caliper readings are shown.



What is the thickness of the wall of the tube? (2018/P1/Q2)

A 5.3 mm **B** 5.4 mm
C 10.6 mm **D** 10.8 mm ( )

10. What is 1 μs, expressed in seconds? (2019/P1/Q1)

A 0.000000001 s
B 0.000001s
C 0.001s
D 0.01s ( )

PAPER 2

STRUCTURED QUESTIONS

Section A

Answer the following questions.

1. Complete the table by filling in the blank spaces.

unit	symbol	multiple
gram	g	1
kilogram		1000
	μg	1×10^{-6}
milligram	mg	

[2]
(2011/P2/A1)

2. Complete the table by filling in the blank spaces.

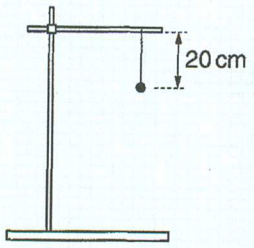
quantity to be measured	name of instrument for measuring the quantity	unit in which the quantity is measured
the diameter of a thin wire		
the current through a lamp		
the weight of a brick		

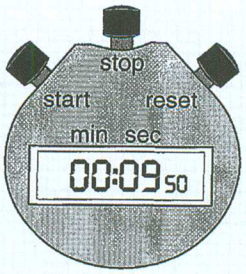
[4]
(2012/P2/A1)

3. A student investigates a simple pendulum.

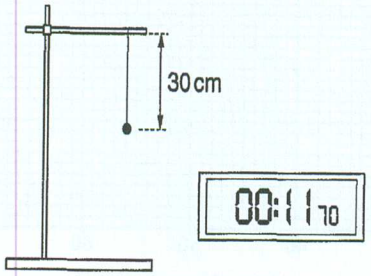
He measured the time for 10 full swings using different pendulum lengths. The stopwatch is reset to zero at the start of each experiment.

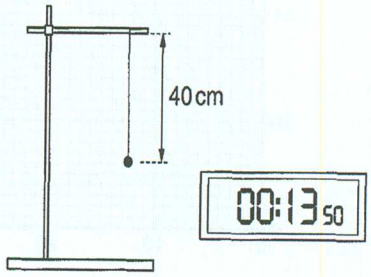
At a pendulum length of 20 cm the time taken is 9.50 s.

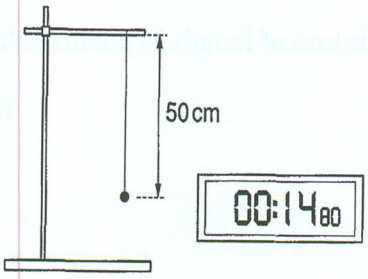


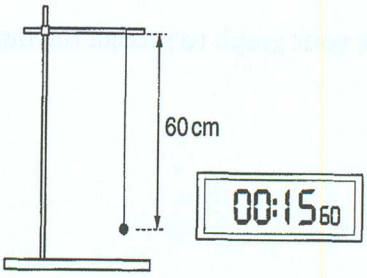


The results for four more lengths are shown below.



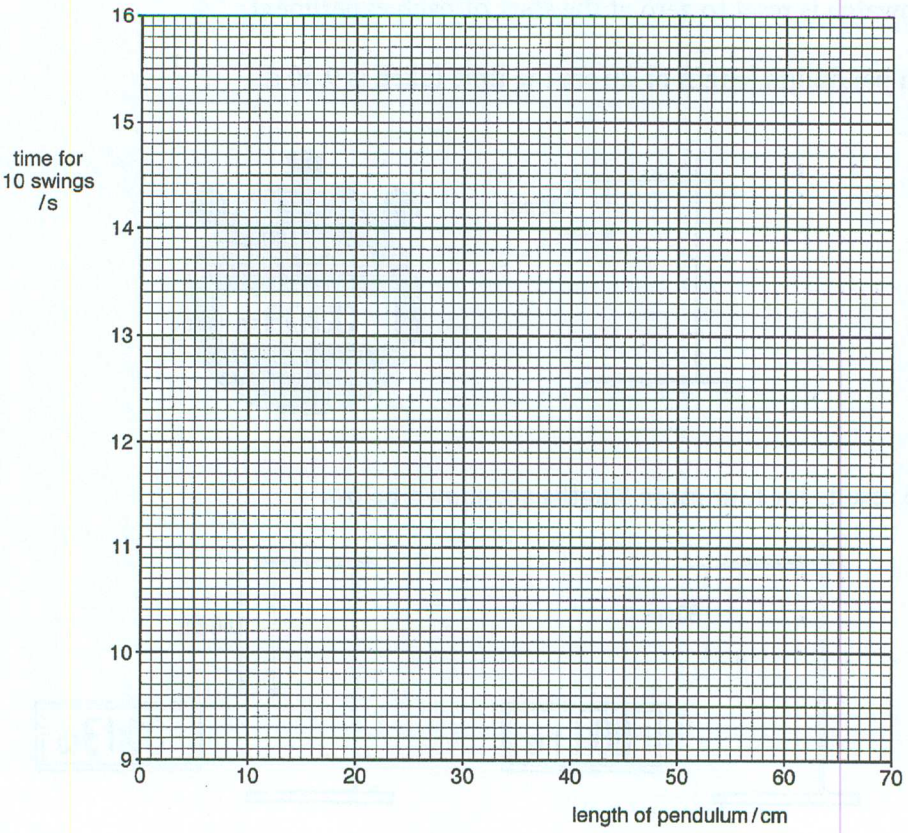






(a) In the space below, construct a table in which to record all five results. Enter the results in your table. [2]

(b) On the grid below, plot these results, marking each point with a cross (×).
Draw a curved line of best fit.



[2]

(c) Use your graph to predict the time a pendulum of length 35 cm takes for 10 swings.

[1]

(2012/P2/A4)

4. Read each of the statements in the first column of the table.

   Underline the word in the second column that the statement in the first column refers to.

This needs to be measured, together with distance moved, to calculate work done.	acceleration force time velocity
This is the symbol for the prefix micro.	μ m M n
This instrument is used to measure potential difference.	ammeter newton meter thermometer voltmeter

[3]
(2013/P2/A1)

5. Name the apparatus used to measure the

   (a) diameter of a thin piece of wire,

   (b) mass of a brick,

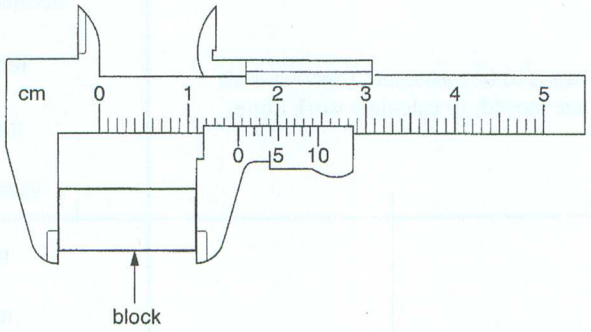
   (c) period of a simple pendulum.

[2]
(2015/P2/A1)

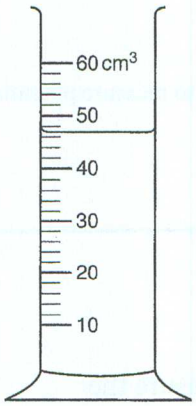
6. Physicists use a wide range of measuring instruments.

(a) Vernier calipers may be used to measure the length of an object.

Read and record the length of the block shown.



(b) Read and record the volume of liquid in the measuring cylinder.



[3]
(2016/P2/A1)

7. The list shows four quantities used in physics.

charge e.m.f. resistance speed

Each quantity is measured in an appropriate unit. Complete the table to show the quantity against their unit.

unit	quantity
coulomb	
metres per second	
ohm	
volt	

[3]
(2019/P2/A1)