Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

(a) (i) turning effect

accept force multiplied by perpendicular distance from the line of action of the force to the pivot

1

(ii) moments are equal (in size) and opposite (in direction)

both parts are required

allow clockwise moment = anticlockwise moment

1

(iii) 0.9 (N)

*allow **2** marks for F = 0.18 ÷ 0.2 provided no subsequent steps*

*allow **1** mark for (anticlockwise moment) = 0.18 (Nm)*

*allow **1** mark for correct substitution i.e. 1.5 × 0.12 = F × 0.20*

3

(b) a longer drumstick lever gives a quieter sound

1

a longer drumstick lever allows a greater range of volumes

1

a greater force gives a louder sound is insufficient

[7]

Q2.

(a) (i) the point where the mass is (thought to be) concentrated

1

(ii) the centre of mass is higher

1

the base (area) is smaller / narrower

1

(b) (the blocks at A and B) create equal and opposite moments

1

the resultant moment is zero

accept (moments are in) equilibrium / balanced

or

the block at A creates an anti-clockwise moment (1)
so this must be balanced by an equal clockwise moment from the block at B (1)

1

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[5]

Q3.

(a) rate of flow of water less

1

because pressure is less
or
because force acting is less
or
because height of water above tap is less

1

(b) (i) at short lengths water collected is the same

accept rate of flow for water collected

1

at longer lengths water collected decreases as the length of pipe increases

*if no other mark gained allow as the length increases the flow decreases for **1** mark*

1

(ii) **max 4 marks**

take more readings to calculate a mean (1)

take more readings is insufficient

to reduce effect of random errors (1)
or
take more readings between 5.0 m and 10.0 m (1)
see where the change occurs (1)
or
take more readings above 15.0 m (1)

accept take more readings at longer lengths

to see if trend continues (1)

*maximum of **2** marks for more readings and max **2** for reasons*

4

(c) Marks awarded for this answer will be determined by the Quality of Communication (QC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.

0 marks
No relevant content

Level 1 (1−2 marks)
There is a basic description of the measurement of time **or** volume **or** diameter of pipe

Level 2 (3−4 marks)
There is a description of the measurement of the time taken to collect a fixed volume **or** the volume collected in a fixed time
and a description of an additional control variable

Level 3 (5−6 marks)
There is a description of the measurement of the time taken to collect a fixed volume
or the volume collected in a fixed time
and a description of an additional control variable
and a description of appropriate equipment

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examples of the points made in the response

equipment

- tape measure or rule
- stopwatch
- container for collecting water
- measuring cylinder.

measurements

- diameter of hosepipe
- length of hosepipe
- volume of water collected
- time taken for collecting water
- repeat for different diameters.

control factors

- height of water in water butt (achieved by using a tap)
- length of hosepipe and how it is achieved by measuring and cutting.

6

[14]

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