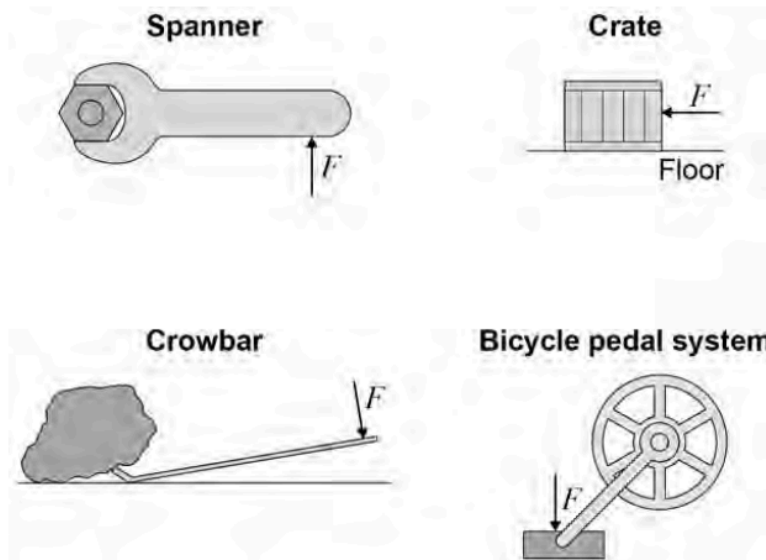


Q1.(2019)

Figure 17 shows four examples of a force causing an object to move.

Figure 17



Which object is **not** likely to rotate?

[1 mark]

Tick (✓) **one** box.

Bicycle pedal system	☐
Crate	☐
Crowbar	☐
Spanner	☐

Q2.(2019)

a)

Figure 18 shows a simple device that can be used as a weighing scale.

Figure 19 shows the device being used to measure a quantity of rice.

The weight of the device is balanced by the weight of the rice and basket.

Figure 18

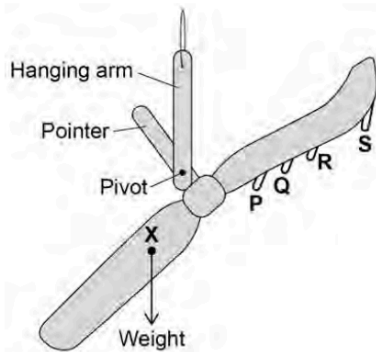
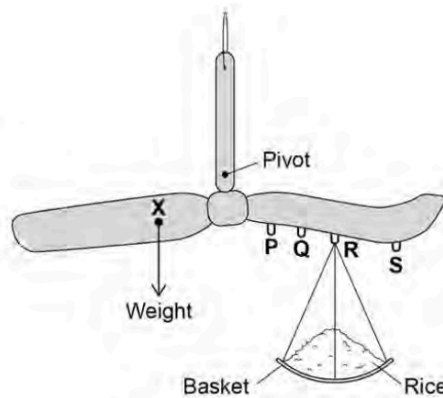


Figure 19



The weight of the device acts through the point labelled **X**.

What is point **X** called?

[1 mark]

Tick (✓) **one** box.

Centre of balance

☐

Centre of mass

☐

Centre of weight

☐

b)

How does **Figure 19** show that the weight of the device is balanced by the weight of the rice and basket?

[1 mark]

c)

The basket can hang from different points on the device.

Where should the basket hang to measure the largest quantity of rice?

[1 mark]

Tick (✓) **one** box.

P	☐	Q	☐	R	☐	S	☐
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d)

Write down the equation which links distance, force and moment of a force.

[1 mark]

e)

In **Figure 19**, the weight of the device causes an anticlockwise moment of 0.15 Nm about the pivot.

The weight of the rice and basket acts 0.06 m from the pivot.

Calculate the weight of the rice and basket.

[3 marks]

Weight of rice and basket = _____ N

f)

Write down the equation which links gravitational field strength, mass and weight.

[1 mark]

g)

The basket has a mass of 0.04 kg

gravitational field strength = 9.8 N/kg

Calculate the mass of rice in the basket.

[3 marks]

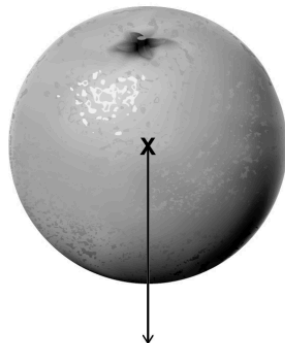
Mass = _____ kg

Q3.(2022)

a)

Figure 6 shows the weight of an orange acting from a point labelled **X**.

Figure 6



What name is given to point **X** in **Figure 6**?

[1 mark]

Tick (✓) **one** box.

Centre of force

☐

Centre of mass

☐

Centre of balance

☐

Centre of weight

☐

b)

Weight and mass are not the same.

The relationship between weight and mass for an object can be written as:

$$\text{weight} \propto \text{mass}$$

Which sentence describes the relationship between weight and mass?

[1 mark]

Tick (✓) **one** box.

Weight is approximately equal to mass.

☐

Weight is directly proportional to mass.

☐

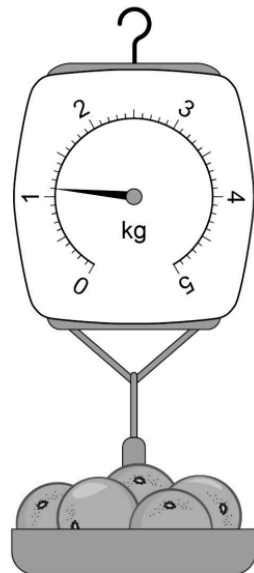
Weight is less than mass.

☐

c)

Figure 7 shows a balance used to measure the mass of 5 oranges.

Figure 7



All 5 of the oranges have the same mass.

Determine the mass of 1 orange.

[2 marks]

Mass = _____ kg

d)

Calculate the weight of 1 orange.

gravitational field strength = 9.8 N/kg

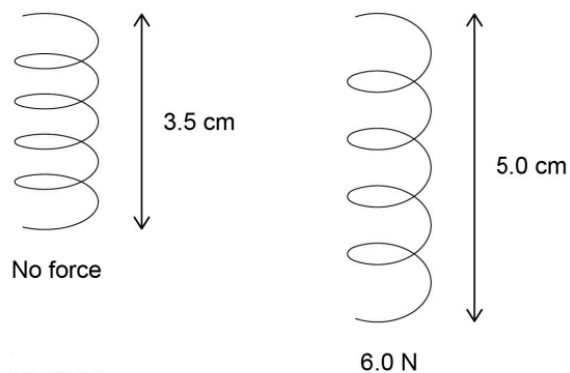
Use the equation:

$$\text{weight} = \text{mass} \times \text{gravitational field strength}$$

[2 marks]

Weight = _____ N

e)

The balance shown in **Figure 7** contains a spring.**Figure 8** shows the spring with no force acting on it and with a force of 6.0 N acting on it.**Figure 8**

What is the extension of the spring when a force of 6.0 N acts on it?

[1 mark]

Tick (✓) **one** box.

- | | |
|---------|--------------------------|
| 0.015 m | ☐ |
| 0.035 m | ☐ |
| 0.050 m | ☐ |
| 0.085 m | ☐ |

f)

Calculate the spring constant of the spring.

Use the equation:

$$\text{spring constant} = \frac{\text{force}}{\text{extension}}$$

[2 marks]

Spring constant = _____ N/m

g)

What will happen to the spring when the force is removed?

[1 mark]