Effects of Forces

Question Paper

Course	CIE IGCSE Physics
Section	1. Motion, Forces & Energy
Topic	Effects of Forces
Difficulty	Medium

Time Allowed 40

Score /29

Percentage /100

Question 1a

A student stretches a spring by adding different loads to it. She measures the length of the spring for each load. She plots a graph of the results.

Fig. 2.1 shows the graph of her results.

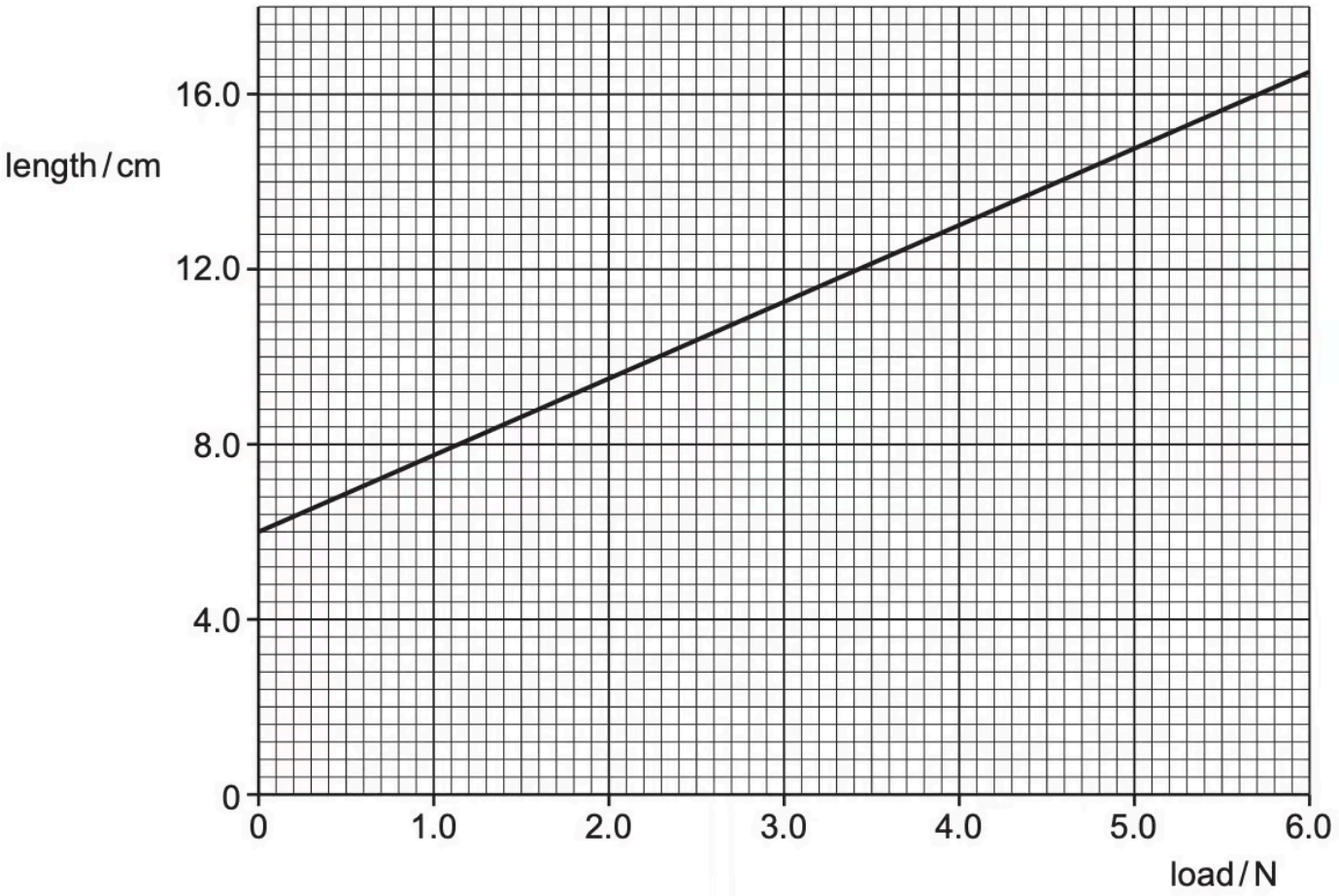

Fig. 2.1

Use the graph to determine:

(i) the length of the spring without a load

length = ... cm [1]

(ii) the length of the spring with a load of 4.0 N

length = ... cm [1]

(iii) the extension due to a 4.0 N load.

extension = ... cm [1]

[3 marks]

Question 1b

Complete the sentence about effects of forces. Choose words from the box.

colour friction pressure shape size speed

Stretching a spring with a load is an example of how a force can change the ..... and the ..... of an object.

[2 marks]

Question 2a

Fig. 3.1 shows the vertical forces on a rocket.

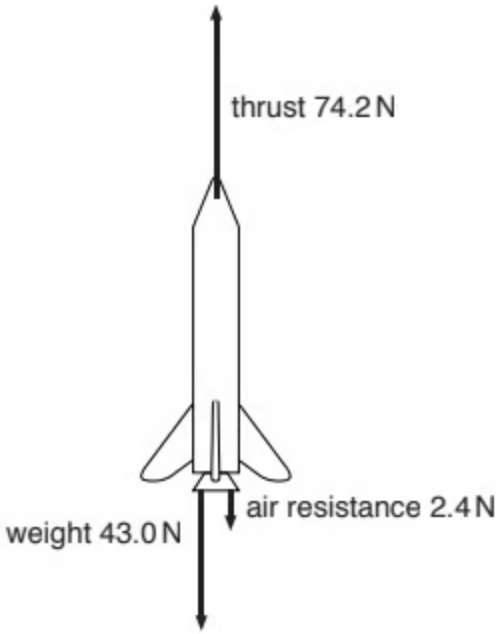

Fig. 3.1

Calculate the resultant force on the rocket.

resultant force = ... N

direction = ...

[3 marks]

Question 2b

Fig. 3.2 shows the speed and direction of motion of an object at a point in time.

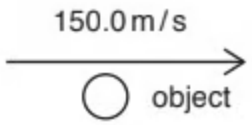

Fig. 3.2

The resultant force on the object is zero for 10 seconds.

Deduce the speed and direction of motion after 5 seconds. Indicate the speed and direction of the object by drawing a labelled arrow next to the object in Fig. 3.3.

Fig. 3.3

[1 mark]

Question 3a

Fig. 3.1 shows a spring with no load attached. Fig. 3.2 shows the same spring with a load attached.

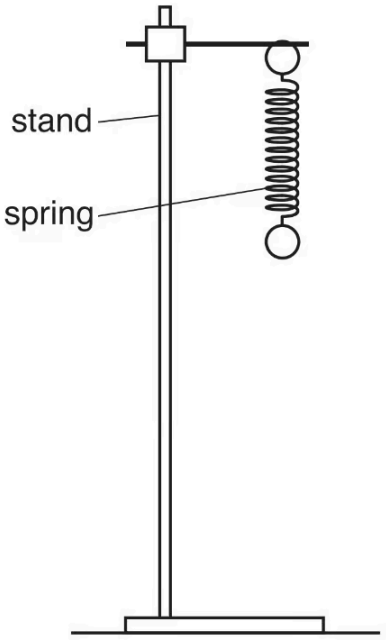

Fig. 3.1

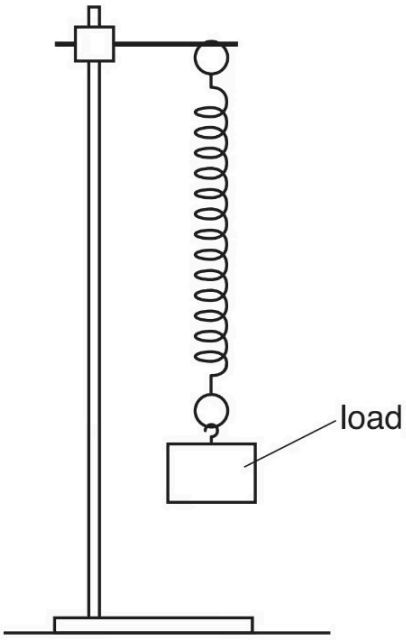

Fig. 3.2

Describe how a student can determine the extension of the spring. You may draw on Fig. 3.1 and Fig. 3.2 as part of your answer.

[3 marks]

Question 3b

The student plots a graph of load against extension, as shown in Fig. 3.3.

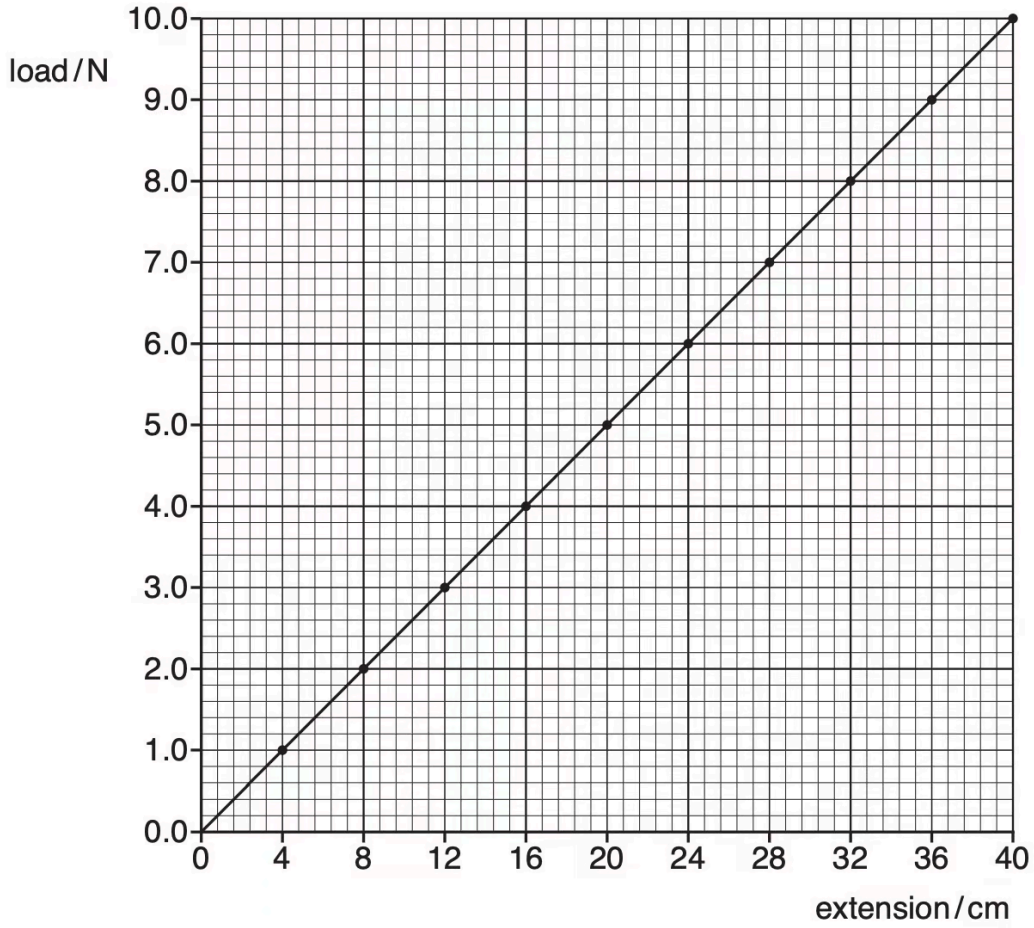

Fig. 3.3

(i) Determine the extension produced by a load of 7.5 N.

extension = ... cm [1]

(ii) Determine the load that would produce an extension of 10.0 cm.

load = ... N [1]

[2 marks]

Question 3c

Calculate the mass that has a weight of 6.0 N.

mass = ... kg

[3 marks]

Question 4a

Fig. 3.1 shows the horizontal forces acting on a swimmer.

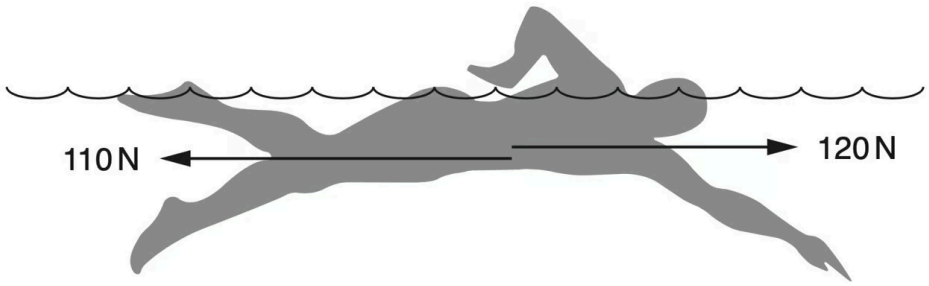

Fig. 3.1

(i) Calculate the size and direction of the resultant horizontal force on the swimmer.

size of resultant horizontal force = ... N

direction of resultant horizontal force = ...

[1]

(ii) State the name of the 110 N force on the swimmer.

[1]

(iii) Fig. 3.2 shows the horizontal forces acting on the swimmer as he moves forwards a short time later.

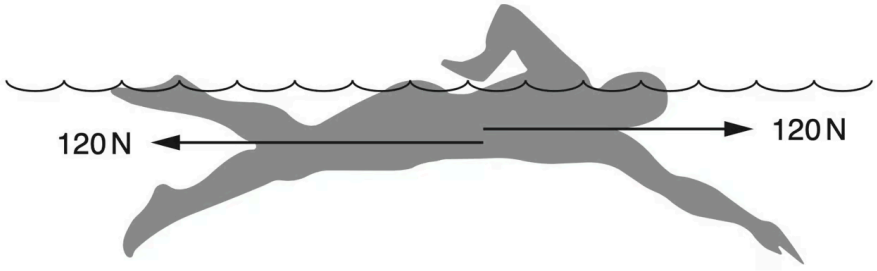

Fig. 3.2

Describe and explain the motion of the swimmer.

[2]
[4 marks]

Question 4b

Another swimmer weighs 700N. He stands on a diving board, as shown in Fig. 3.3.

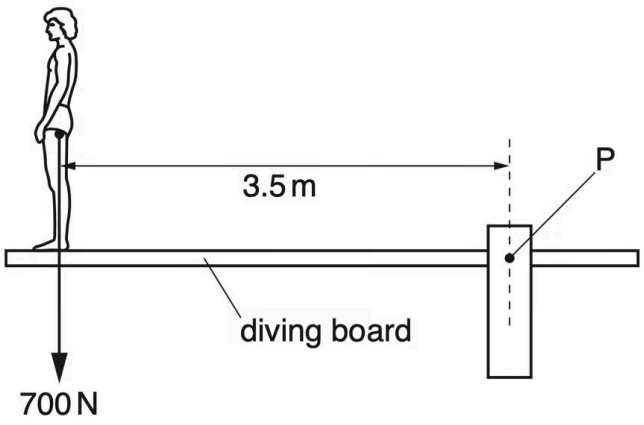

Fig. 3.3

Calculate the moment of the swimmer's weight about point P.

moment = ... N m

[3 marks]

Question 5a

Extended tier only

A car travels around a circular track at constant speed.

Explain why it is incorrect to describe the circular motion as having constant velocity.

[1 mark]

Question 5b

Extended tier only

A force is required for the car to maintain the circular motion.

Explain why a force is required.

[2 marks]

Question 5c

Extended tier only

State the direction in which the force acts for objects in circular motion.

[1 mark]

Question 5d

Extended tier only

State the name of this force for the car on the track.

[1 mark]