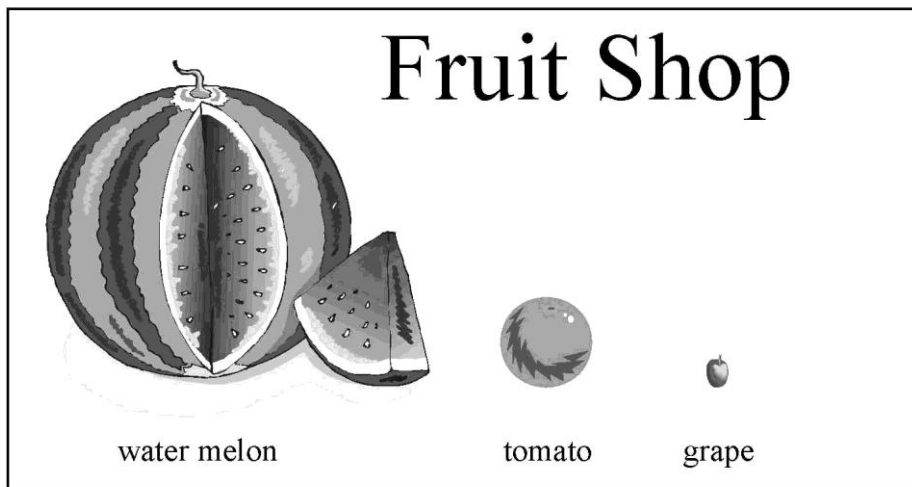


Section C: Physics

Question 1

(a) The diagram shows some fruit which can be bought in a fruit shop.



The fruit shop and the fruit can be thought of as a model of some objects in space. The shop would stand for the Solar System.

Draw a line from the name of each object in the Solar System to the fruit which best matches its size.

**object in the
Solar System**

Sun ●

Earth ●

Moon ●

fruit

● tomato

● grape

● water melon

2 marks

(b) A comet is also an object that can be seen in space. It is unlikely to hit the Earth. Suggest **two** reasons for this.

1

.....

2

.....

2 marks

Question 2

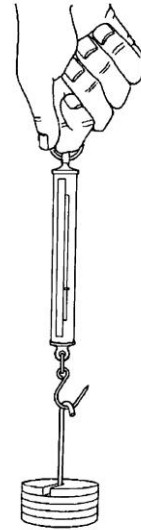
John has

- a Newtonmeter,
- a selection of masses
- a helicopter to take him to different heights.

(a) What quantity is measured using the Newtonmeter?

.....

1 mark



(b) John said:

The weight of an object varies with its height above the Earth's surface.

John

Help John to plan an investigation to test his idea by answering these questions. (i)

What is the variable John aims to change (the independent variable)?

.....

1 mark

(ii) What is the dependent variable?

.....

1 mark

(iii) How should John make it a fair test?

.....

1 mark

(c) (i) Why should John use at least six different values of the independent variable?

.....

.....

1 mark

(ii) Why should John repeat each of his readings?

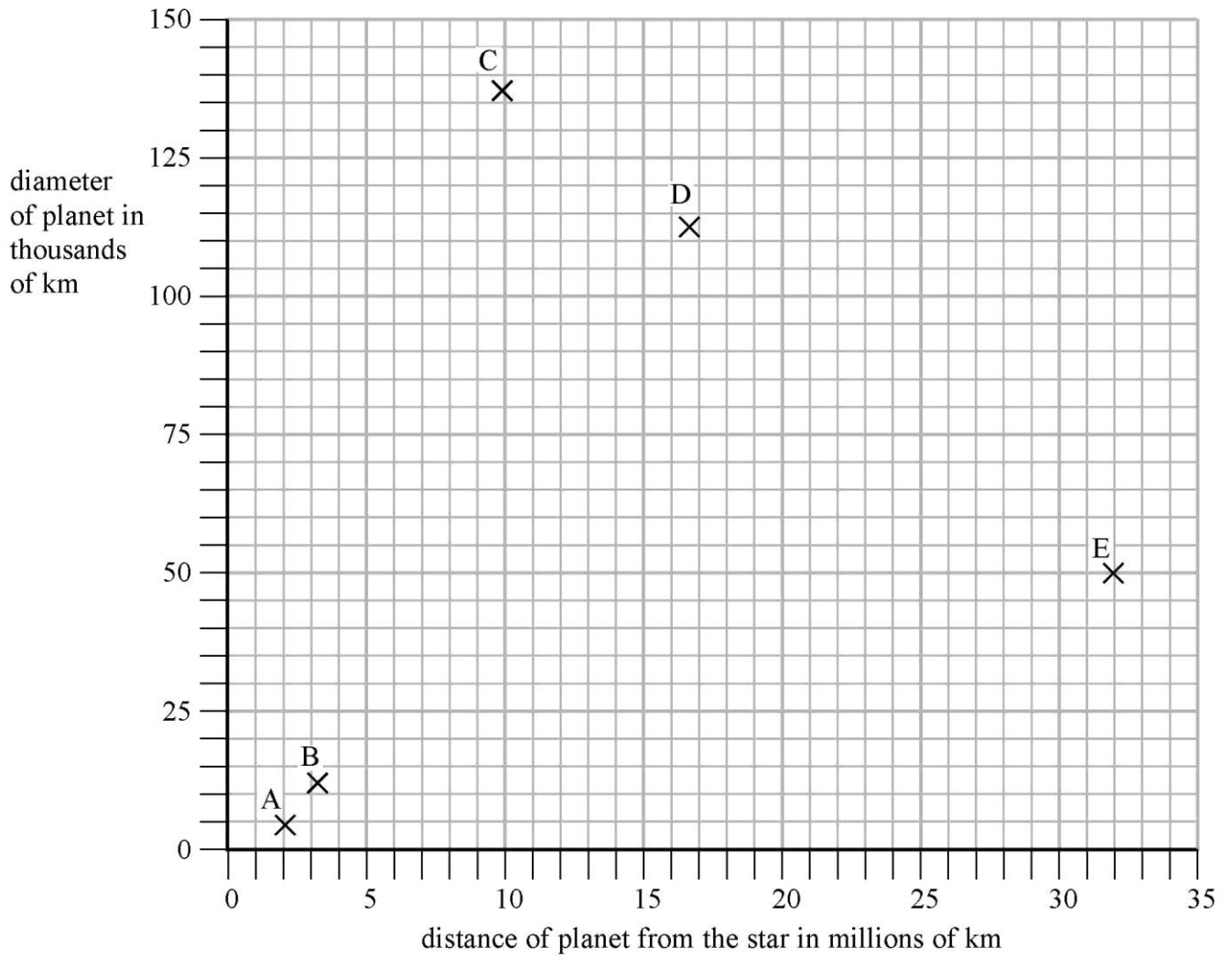
.....

.....

1 mark

Question 3

The graph gives data about five planets (A, B, C, D and E) orbiting a star. It shows the diameter of each planet and its distance from the star.



- (a) Use the graph to estimate the diameter of planet C.

.....
1 mark

- (b) Another planet P of diameter 30 thousand km orbits the star at a distance of 25 million km.
Plot the point for planet P on the graph.
Label it P.

1 mark

(c) This star and its six planets are similar in arrangement to our Solar System. It is not sensible to include the diameter of the star on this graph. Suggest a reason why.

.....
.....

1 mark

(d) Janet thinks she would be weightless if she was between planets **A** and **B**. Suggest **two** other conditions she might notice there.

1

.....

2

.....

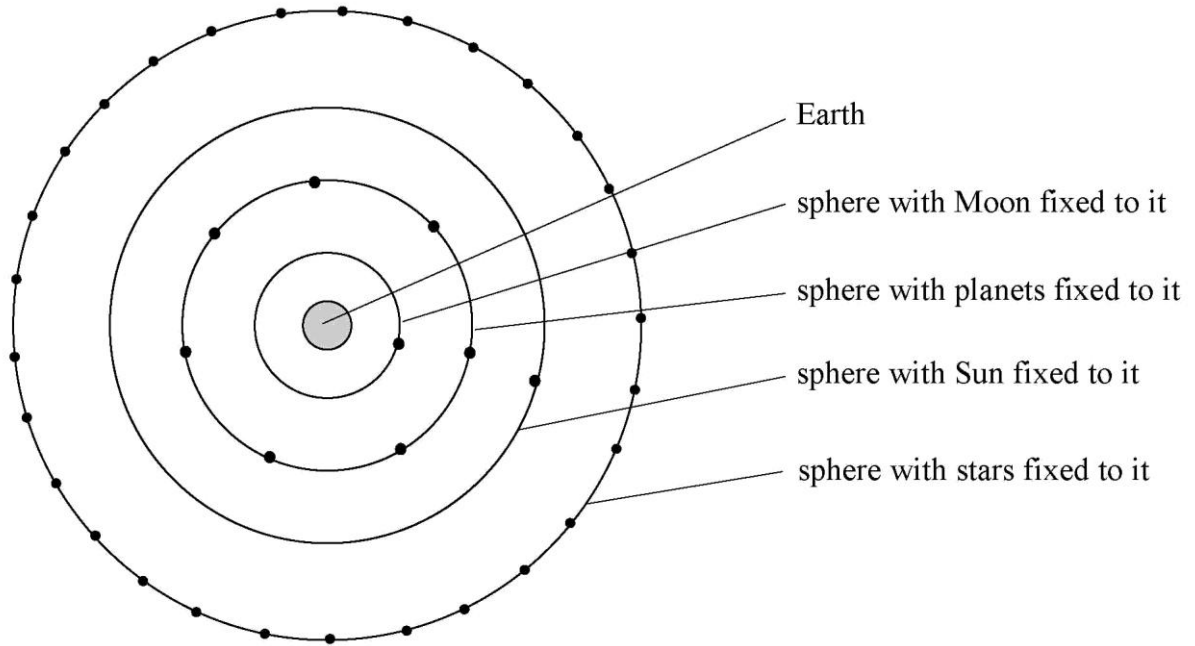
2 marks

Question 4

Over 2000 years ago, a man called Aristotle suggested a model for the Universe.
The model states that:

- the objects in the sky are on transparent spheres
- the Earth is at the centre
- the Sun, Moon and planets are on rotating inner spheres
- most of the stars are on the outer fixed sphere

Aristotle model is drawn below.



(a) Actually the planets move at a variety of speeds.

Suggest how the model could be changed to allow for this.

.....
.....

1 mark

(c) Aristotle did not include black holes in his model.

Explain what is meant by a 'black hole' and suggest why Aristotle did not include black holes in his model.

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4 marks