Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)

J259/02 Depth in physics (Foundation Tier)

Question Set 15

1 A delivery company uses GPS tracker devices to monitor the position and the speed of their vans.

(a) The distance against time graph of one van travelling along a straight road is shown in **Fig. 1.1**.

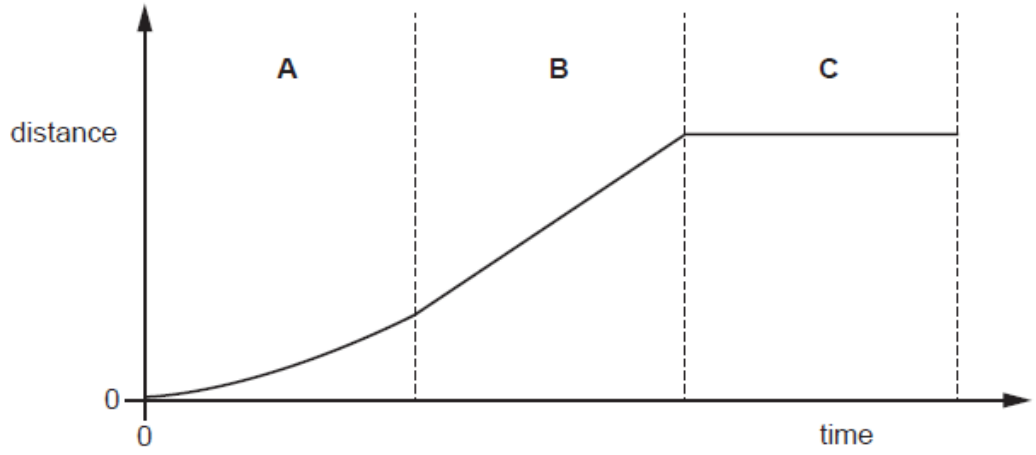

Fig. 1.1

Fig. 1.1 has been divided into three sections **A**, **B**, and **C**.

Complete the table by matching each section, **A**, **B**, or **C**, with the correct type of motion.

Tick (✓) **one** box in each row.

Type of motion	Section A	Section B	Section C
Stationary			
Constant speed			
Accelerating			

[3]

(b) The velocity against time graph of another van is shown in **Fig. 1.2**.

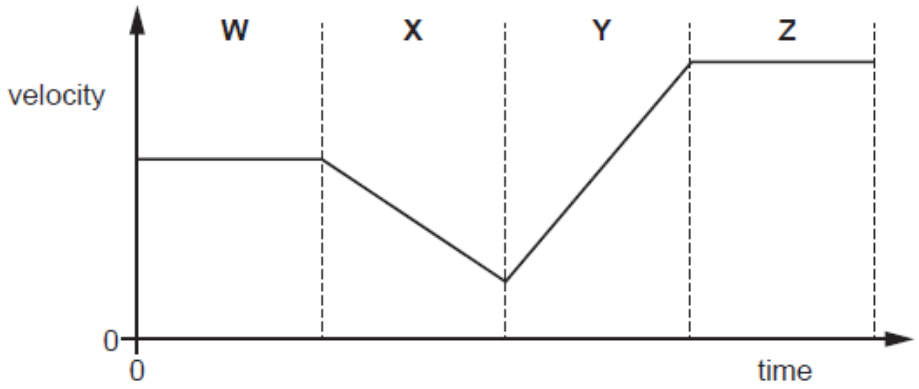

Fig. 1.2

Fig. 1.2 has been divided into four sections **W**, **X**, **Y**, and **Z**.

(i) Identify which section shows the van speeding up.

Explain your answer. **[2]**

(ii) Identify which section shows the van slowing down.

Explain your answer. **[2]**

(c) Data from the GPS tracker device can be used to calculate a van's average acceleration over the entire journey:

- initial speed = 8.5 m / s
- final speed = 36.5 m / s
- time for acceleration = 5.0 s

Use this information to calculate the average **acceleration** of the van.

Use the equation: acceleration = change in speed ÷ time taken

Give the **correct units** for your answer.

Acceleration = ... Units ..... **[3]**

(d) **(i)** Estimate the mass of the van, in kilograms (kg).

[1]

Mass = ... kg

(ii) Estimate the average force acting on the van.

Use your answers from **(c)** and **(d)(i)** to answer the question.

[3]

Force = ... N

Total Marks for Question Set 15: 14

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