

Past-paper walk-through

2.1.2 Velocity–time and acceleration–time graphs

A-Level Physics

Questions in this set

- 9702/12 M22 Q5 ■ 1 mark p.4
How can the acceleration of an object be determined? A from the area...
- 9702/13 N21 Q6 ■ 1 mark p.6
The graph shows the variation with time of the acceleration of a car....
- 9702/13 J21 Q6 ■ 1 mark p.9
The diagram shows a velocity–time graph for a car. 12 10 8 6 4 2 0 0 1...
- 9702/12 J24 Q6 ■ 1 mark p.12
A car travels along a straight horizontal road. The graph shows the...
- 9702/11 J22 Q5 ■ 1 mark p.15
The curved line PQR is the velocity–time graph for a car starting from...
- 9702/1 22 Q6 ■ 1 mark p.18
A radio-controlled toy car travels along a straight line for a time of...

Questions in this set

- 9702/11 N22 Q5 ■ 1 mark p.21
A particle accelerates from rest. The graph shows the variation of the...
- 9702/12 M23 Q6 ■ 1 mark p.24
The graph shows the variation with time t of the displacement s of an...
- 9702/12 N24 Q4 ■ 1 mark p.28
The graph shows how the acceleration of an object moving in a straight...

Question 5

9702/12 M22 ■ Q5 ■ 1 mark

- 5** How can the acceleration of an object be determined?
- A** from the area under a displacement–time graph
 - B** from the area under a velocity–time graph
 - C** from the gradient of a displacement–time graph
 - D** from the gradient of a velocity–time graph

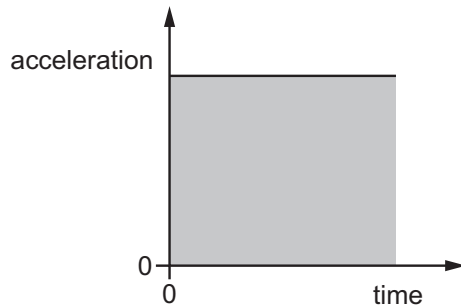
Solution 5

Answer: **D**

Question 6

9702/13 N21 ■ Q6 ■ 1 mark

- 6** The graph shows the variation with time of the acceleration of a car.



Question 6

9702/13 N21 ■ Q6 ■ 1 mark

What **must** the shaded area under the graph represent?

- A** the average velocity of the car
- B** the change in velocity of the car
- C** the final velocity of the car
- D** the initial velocity of the car

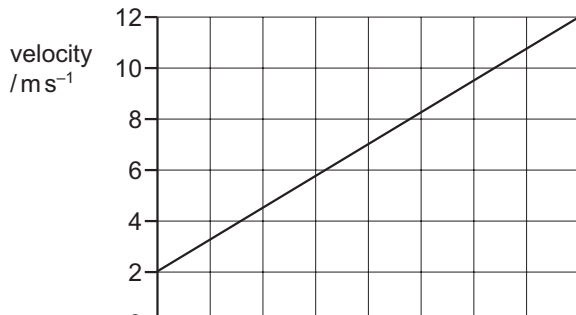
Solution 6

Answer: **B**

Question 6

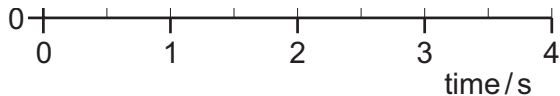
9702/13 J21 ■ Q6 ■ 1 mark

- 6** The diagram shows a velocity–time graph for a car.



Question 6

9702/13 J21 ■ Q6 ■ 1 mark



What is the distance travelled during the first 4.0 s?

A 2.5 m

B 3.0 m

C 20 m

D 28 m

Solution 6

Answer: **D**

Question 6

9702/12 J24 ■ Q6 ■ 1 mark

A car travels along a straight horizontal road. The graph shows the variation of the velocity v of the car with time t for 6.0 s of its journey.

The brakes of the car are applied from $t = 1.0$ s to $t = 4.0$ s.

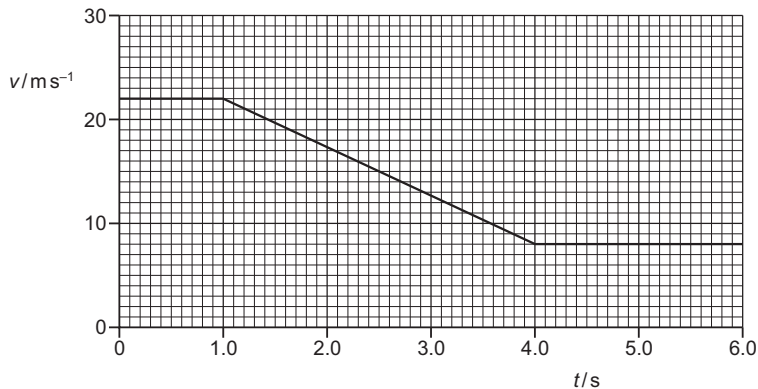
How far does the car travel while the brakes are applied?

[1]

A 21 m**B** 45 m**C** 67 m**D** 83 m

Question 6

The graph shows the variation of the velocity ... of the car with time ... for ... of its journey.



Solution 6

A 21 m

B 45 m



C 67 m

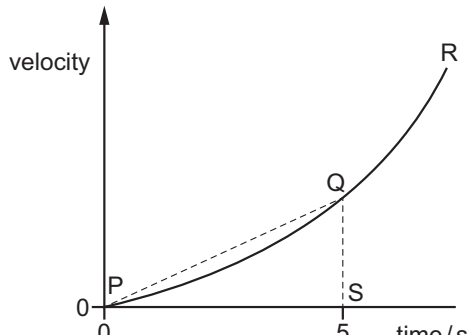
D 83 m

Answer: **B**

Question 5

9702/11 J22 ■ Q5 ■ 1 mark

- 5** The curved line PQR is the velocity–time graph for a car starting from rest.



Question 5

9702/11 J22 ■ Q5 ■ 1 mark

A velocity-time graph for a car. The vertical axis is labeled 'velocity / ms⁻¹' and the horizontal axis is labeled 'time / s'. The graph shows a curve starting at point P on the vertical axis, passing through point Q, and ending at point S on the horizontal axis. The area under the curve PQS is shaded. The curve PQS is concave down, starting at P, passing through Q, and ending at S. The area under the curve PQS is shaded.

What is the average acceleration of the car over the first 5 s?

- A** the area below the curve PQ
- B** the area of the triangle PQS
- C** the gradient of the straight line PQ
- D** the gradient of the tangent at Q

Solution 5

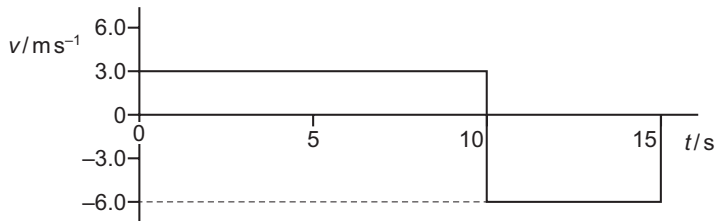
Answer: **C**

Question 6

9702/1 22 ■ Q6 ■ 1 mark

- 6 A radio-controlled toy car travels along a straight line for a time of 15 s.

The variation with time t of the velocity v of the car is shown.



What is the average velocity of the toy car for the journey shown by the graph?

Question 6

9702/1 22 ■ Q6 ■ 1 mark

A -1.5ms^{-1}

B 0.0ms^{-1}

C 4.0ms^{-1}

D 4.5ms^{-1}

Solution 6

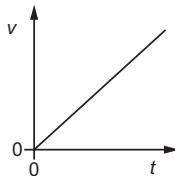
Answer: **B**

Question 5

9702/11 N22 ■ Q5 ■ 1 mark

- 5 A particle accelerates from rest.

The graph shows the variation of the velocity v of the particle with time t .



Which graph shows the variation of the velocity v with the acceleration a of the particle?

.. ↑

A

.. ↑

B

.. ↑

C

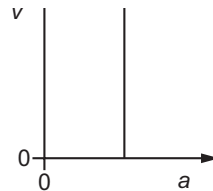
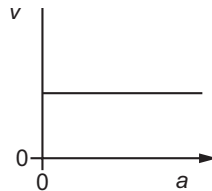
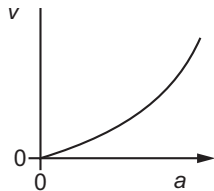
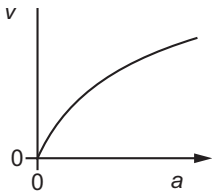
.. ↑

D

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Question 5

9702/11 N22 ■ Q5 ■ 1 mark



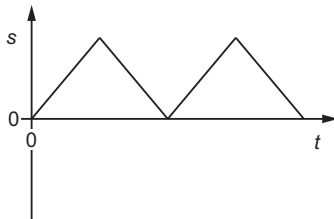
Solution 5

Answer: **D**

Question 6

9702/12 M23 ■ Q6 ■ 1 mark

- 6 The graph shows the variation with time t of the displacement s of an object.



Which graph represents the variation with time t of the acceleration a of the object?



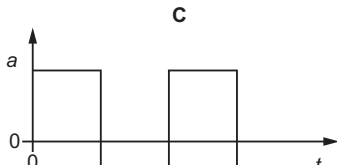
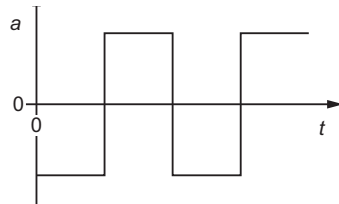
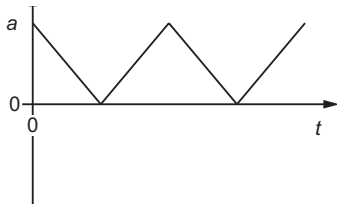
A



B

Question 6

9702/12 M23 ■ Q6 ■ 1 mark



Question 6

9702/12 M23 ■ Q6 ■ 1 mark



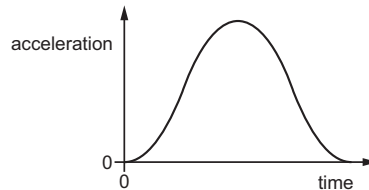
Solution 6

Answer: **D**

Question 4

9702/12 N24 ■ Q4 ■ 1 mark

- 4 The graph shows how the acceleration of an object moving in a straight line varies with time.



The object starts from rest.

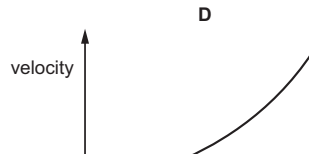
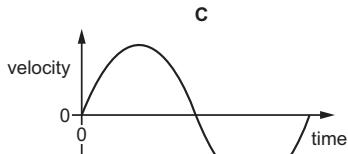
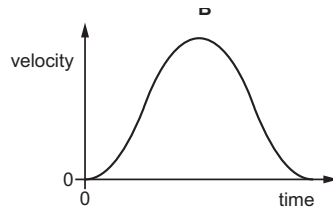
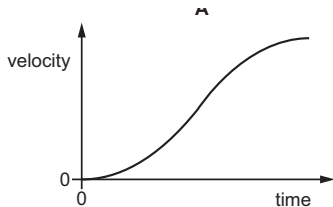
Which graph shows the variation with time of the velocity of the object over the same time interval?

A

B

Question 4

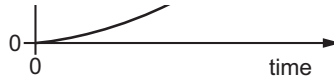
9702/12 N24 ■ Q4 ■ 1 mark



Question 4

9702/12 N24 ■ Q4 ■ 1 mark

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Solution 4

Answer: **A**