

Paper 1A practice

Name _____

Date _____

Score: _____ / 15

30 minutes · 15 marks · calculator and data booklet allowed

- Answer all the questions.
- For each question, choose the answer you think is best and circle the letter.
- Each question is worth 1 mark.
- Take $g = 9.8 \text{ m s}^{-2}$.

1. An object moves along a straight line and returns to its starting point.

- I. Its displacement is zero.
- II. Its average velocity is zero.
- III. Its average speed is zero.

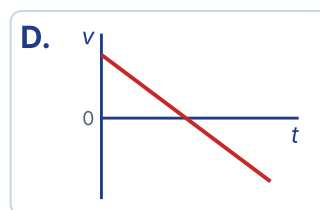
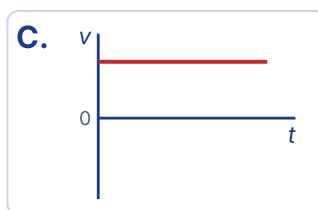
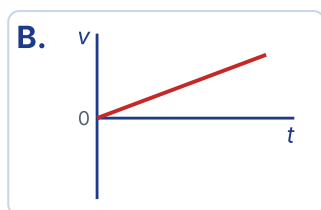
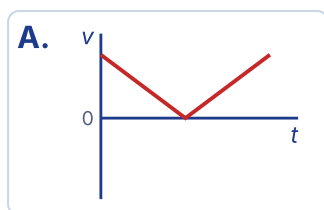
Which statements are correct?

- A. I only
- B. I and II only
- C. II and III only
- D. I, II and III

2. A car moves at constant velocity along a straight road. Its position changes from 120 m to 30 m in 15 s. What is its velocity?

- A. -8.0 m s^{-1}
- B. -6.0 m s^{-1}
- C. $+6.0 \text{ m s}^{-1}$
- D. $+10 \text{ m s}^{-1}$

3. A ball is thrown vertically upwards and caught at the same height. Air resistance is negligible. Upwards is positive. Which graph shows how the velocity v of the ball varies with time t ?



- A. Graph A
- B. Graph B
- C. Graph C
- D. Graph D

4. An object starts from rest and moves with constant acceleration. It travels a distance d in the first time interval t . What distance does it travel in the next time interval t ?

- A. d
- B. $3d$
- C. $4d$
- D. $8d$

5. A car travelling at speed v stops in a braking distance s . The car now travels at speed $3v$ and brakes with the same deceleration. What is the new braking distance?

- A. $\sqrt{3} s$
- B. $3s$
- C. $6s$
- D. $9s$

6. A ball is thrown vertically upwards at 15 m s^{-1} and caught at the same height. Air resistance is negligible. How long is the ball in the air?

- A. 0.65 s
- B. 1.5 s
- C. 2.3 s
- D. 3.1 s

7. A ball is thrown vertically upwards. Air resistance is negligible. What are the velocity and the acceleration of the ball at its highest point?

	Velocity	Acceleration
A	zero	g downwards
B	zero	zero
C	g downwards	zero
D	upwards	g downwards

8. A stone is dropped from rest from a height h and hits the ground with speed v . Air resistance is negligible. What is the speed of the stone after it has fallen a distance $\frac{1}{2}h$?

- A. $v/4$
- B. $v/2$
- C. $v/\sqrt{2}$
- D. $(\sqrt{3}/2)v$

9. A stone is thrown horizontally at 12 m s^{-1} from the top of a cliff 45 m high. Air resistance is negligible. How far from the foot of the cliff does it land?

- A. 12 m
- B. 26 m
- C. 36 m
- D. 45 m

10. A projectile is launched from level ground. Air resistance is negligible.

- I. The horizontal component of its velocity is constant.
- II. Its acceleration is zero at the highest point.
- III. The time to rise to the highest point equals the time to fall back to the ground.

Which statements are correct?

- A. I only
- B. I and II only
- C. I and III only
- D. II and III only

11. A ball is launched at speed u and angle θ above the horizontal. It reaches a maximum height H . The ball is now launched at speed $2u$ at the same angle. Air resistance is negligible. What is the new maximum height?

- A. $2H$
- B. $4H$
- C. $8H$
- D. $16H$

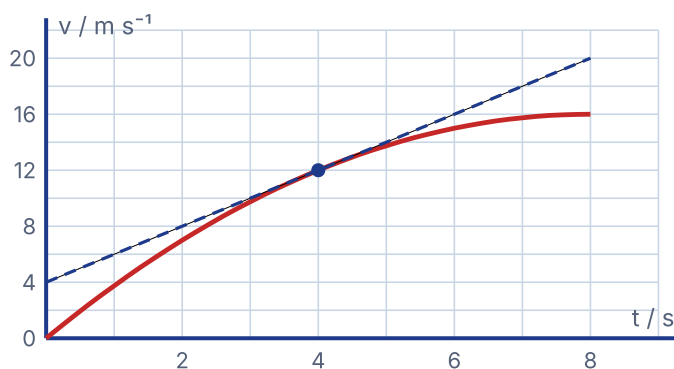
12. A stone is thrown from the top of a cliff 20 m high at 10 m s^{-1} , at 30° **below** the horizontal. Air resistance is negligible. How long does the stone take to reach the sea below?

- A. 1.2 s
- B. 1.6 s
- C. 2.0 s
- D. 2.6 s

13. A ball is launched with the same velocity, first with negligible air resistance and then with air resistance. How do the maximum height and the range with air resistance compare with those without air resistance?

	Maximum height	Range
A	smaller	larger
B	larger	smaller
C	the same	smaller
D	smaller	smaller

14. The graph shows how the velocity v of a car varies with time t . The dashed line is the tangent to the curve at $t = 4.0 \text{ s}$. What is the acceleration of the car at $t = 4.0 \text{ s}$?



- A. 1.0 m s^{-2}
- B. 2.0 m s^{-2}
- C. 3.0 m s^{-2}
- D. 5.0 m s^{-2}

15. A cart accelerates uniformly from rest to 8.0 m s^{-1} in 4.0 s . It then slows uniformly and stops 6.0 s later. What is its average speed for the whole motion?

- A.** 4.0 m s^{-1}
- B.** 5.0 m s^{-1}
- C.** 6.7 m s^{-1}
- D.** 8.0 m s^{-1}

End of paper

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HL Physics Notebook