Multiple choice questions - Projectiles and variable acceleration

Year: Year 13 · 10

Question 1 At the highest point of a projectile, the vertical velocity is

- ◯ **A.** 0
- ◯ **B.** u
- ◯ **C.** -9.8
- ◯ **D.** maximum

Question 2 The horizontal acceleration of a projectile (no air resistance) is

- ◯ **A.** 9.8
- ◯ **B.** 0
- ◯ **C.** -9.8
- ◯ **D.** u

Question 3 The range on level ground is greatest when $\theta =$

- ◯ **A.** 30°
- ◯ **B.** 60°
- ◯ **C.** 45°
- ◯ **D.** 90°

Question 4 Speed at the highest point is

- ◯ **A.** 0
- ◯ **B.** $u\sin\theta$
- ◯ **C.** u
- ◯ **D.** $u\cos\theta$

Question 5 If $v = 3t^2$, then $a =$

- ◯ **A.** $6t$
- ◯ **B.** t^3
- ◯ **C.** $3t$
- ◯ **D.** 6

Question 6 If $a = 2t$ and $v = 0$ at $t = 0$, then $v =$

- ◯ **A.** 2
- ◯ **B.** t^2
- ◯ **C.** $t^2 + 2$

- **D.** $2t^2$

Question 7 Two projection angles give the same range if they

- **A.** are equal
- **B.** add to 180°
- **C.** add to 90°
- **D.** differ by 45°

Question 8 To find total distance when velocity changes sign you

- **A.** integrate once
- **B.** differentiate
- **C.** use suvat
- **D.** split the integral where v = 0 and add absolute values

Question 9 Time of flight on level ground is

- **A.** $\dfrac{2u\sin\theta}{g}$
- **B.** $\dfrac{u\sin\theta}{g}$
- **C.** $\dfrac{2u\cos\theta}{g}$
- **D.** $\dfrac{u^2\sin 2\theta}{g}$

Question 10 A particle dropped from rest falls for 2 s. Its speed is

- **A.** 9.8 m/s
- **B.** 19.6 m/s
- **C.** 4.9 m/s
- **D.** 39.2 m/s

Answer grid - Projectiles and variable acceleration

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Question	Answer	Explanation
1	**A**	The particle momentarily stops rising.
2	**B**	No horizontal force.
3	**C**	$\sin 2\theta = 1$.
4	**D**	Horizontal component.
5	**A**	Differentiate.
6	**B**	Integrate.
7	**C**	$\sin 2\theta$ symmetric.
8	**D**	Distance is not displacement.
9	**A**	Up and down.
10	**B**	$v = gt$.