

Physics

Test Topic 6

1. What are the types of motion and define each.
2. Define the following.
 - a. Distance
 - b. Displacement
 - c. Speed
 - d. Velocity
 - e. Acceleration
 - f. Deceleration
 - g. Uniform acceleration
 - h. Uniform deceleration
 - i. motion
3. Rusangwanwa cycles to school 2.5 km away in 5 minutes. What is his average speed in:
 - a. Meters per second
 - b. kilometres per hour.
4. Nesa and Nshimiye decided to walk to a picnic site 12 km away. They walked the first 6 km at an average speed of 6 km/h and the rest at 5 km/h.
 - a. How long did the journey take?
 - b. What was their average speed for the journey?
5. The initial velocity of a motor cyclist riding on a straight road is 10 m/s. If the velocity was increasing by 5 m/s every second, find the:
 - a. velocity after
 - i. 1 s
 - ii. 2 s
 - iii. 5 s.
 - b. average velocity in 5 s.
6. A racing car accelerates on a straight section of a road from rest to a velocity of 50 m/s in 10 s. Find:
 - a. the acceleration of the car
 - b. the distance travelled by the car in 10 s.
7. A motorcyclist accelerates from 10 m/s to 30 m/s in 20 s. Calculate:
 - a. the acceleration of the motorcyclist.
 - b. the displacement of the motorcyclist.
8. An object travelling at 10 m/s decelerates at 2.0 m/s^2 . How long does the object take before coming to rest? Calculate the distance travelled by the object before it comes to rest.

9. A cyclist starts from rest and accelerates at 1.0 m/s^2 for 30 s. The cyclist then travels at a constant speed for 1 minute and then decelerates uniformly and comes to a stop in the next 30 s.
- Find the maximum speed attained in
 - metres per second
 - kilometres per hour.
 - Calculate the total distance covered in metres.
10. A bus decelerates from 18 m/s to rest in 10 seconds. Calculate:
- the deceleration of the bus
 - the displacement of the bus.
11. A stone is let to fall vertically down from a window on the 10th floor of a building 40 m above the ground. Find the time taken by the stone to reach the ground.
12. An object is thrown vertically upwards with an initial velocity of 50 m/s . Find
- the maximum height reached by the object.
 - the time taken to reach this height. (Neglect the effect of air resistance.)
13. A mass is dropped from a height of 50 m above the moon's surface. How long does the mass take to fall to the moon's surface if the moon's acceleration due to gravity is 1.7 m/s^2 ? Calculate the difference in time for the same mass when dropped 50 m above the earth's surface (Neglect air resistance.)
14. Define the following
- Impulse
 - Linear momentum
15. State Newton's first law of motion.
16. Define inertia.
17. Mention four factors affecting inertia of a body.
18. State Newton's second law of motion.
19. State Newton's third law of motion.
20. What is the relationship between impulse and the change in momentum?
21. A 0.06 kg tennis ball drops freely from the left hand of a player. When in the air, it hits a racquet and leaves with a horizontal speed of 58 m/s .
- Calculate the impulse produced on the ball.
 - If the time of contact with the racquet is 0.025 seconds, calculate the average force exerted on the ball.
22. A bullet of mass 7 g travels with a velocity of 150 m/s . It hits a target and penetrates into it. It is brought to rest in 0.04 s . Find the:
- distance the bullet travels in the target.
 - average retarding force exerted on the bullet.

23. A ball of mass 45 g travelling horizontally at 30 m/s strikes a wall at right angles and rebounds with a speed of 20 m/s. Find the impulse exerted on the ball.