

Worksheet for Grade 11: Unit-1

Uniformly accelerated motion in 1D, Relative velocity in 2D, and uniform circular motion

I. Choose the correct Answer

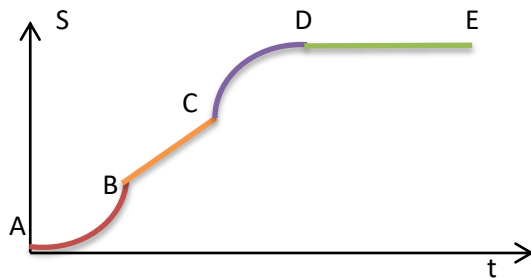
- In uniformly accelerated motion:
 - Velocity increases at a non-uniform rate
 - Velocity is constant
 - Acceleration is constant
 - Displacement increases uniformly
- In motion which quantity never be negative?
 - Displacement
 - Acceleration
 - Velocity
 - Time
- Whenever a car moves at 12m/s:
 - Its velocity increases by 12m/s in each second
 - its displacement remains constant
 - its acceleration is zero
 - its acceleration is 12m/s²
- Graph of uniformly accelerated motion is:
 - Straight line in s-t graph
 - Parabola in s-t graph
 - Inclined line in a-t graph
 - Horizontal line in v-t graph
- Slope of velocity-time graph represents:
 - Displacement
 - Average speed
 - Acceleration
 - Change in velocity
- If the motion decelerates uniformly, which quantity becomes negative?
 - Acceleration
 - Velocity
 - Displacement
 - Speed
- An object under free fall motion moves a distance proportional to:
 - time
 - time square
 - Speed
 - acceleration
- Which cannot describe an object thrown vertically upward under ignorance of air resistance?
 - It takes equal time for upward & downward trip
 - It moves with constant acceleration
 - It possess positive acceleration for down ward trip
 - Its total distance is double of the distance moved during upward trip.
- If velocity of a given motion is expressed by $v = t^2 + 3t$, which describes the motion?
 - It moves with constant acceleration
 - It moves equal distance in equal time interval
 - It velocity increases uniformly
 - Its acceleration increases uniformly
- If velocity of a motion is $V = t^3 + 2t^2 + t - 2$, acceleration at $t = 2s$ is:
 - 21m/s²
 - 8m/s²
 - 18m/s²
 - 20m/s²
- Cheetah is at 20m from Gazelle just before both of them start to run from rest. The Cheetah was run at an acceleration of 10m/s². If the Gazelle was run 2km before caught by Cheetah, for how many seconds did the Cheetah run?
 - 44.6s
 - 31.8s
 - 25.4s
 - 36.2s
- Two cars are at 1km from each other. If they move at 20m/s and 30m/s toward each other on straight path, how long it takes them to pass each other?
 - 80s
 - 40s
 - 10s
 - 20s
- A motorist moving at speed v observed a traffic sign and applies to the brake to slow down its speed uniformly. It takes 20 seconds and covers 100m before coming to rest. What is the initial speed (v) of the motorist?
 - 10m/s
 - 5m/s
 - 20m/s
 - 40m/s
- An air plane is moving East at 400m/s and the wind that region is blowing South at 300m/s, the magnitude of the velocity of the air plane relative to the ground is:
 - 500m/s
 - 100m/s
 - 700m/s
 - 400m/s
- A car started from rest and accelerated uniformly at 2m/s² for 100s before the driver applied a brake to stop the car. The car decelerated uniformly for 1min before coming to rest. The average speed of the car is:
 - 50m/s
 - 100m/s
 - 20m/s
 - 10m/s
- In the bellow V-t graph, what is the average speed during the entire motion?
 - 4.5m/s
 - 7.4m/s
 - 11.6m/s
 - 3.9m/s
- In question number 16, acceleration of the motion is:
 - 1m/s²
 - 2m/s²
 - 4m/s²
 - 3m/s²
- Which is not true about motion?
 - When velocity is constant acceleration is zero
 - When speed is constant an object moves equal distance in equal time interval
 - When the object moves at non-zero constant acceleration, velocity of an object increases uniformly

D. When speed increases uniformly, distance also increases uniformly.

19. Which do not describe graphs of motion correctly?

- A. In V-t, distance is equal to area under the graph
- B. In a-t, average velocity is equal to area under the graph
- C. In V-t, acceleration is equal to slope of the graph
- D. In S-t, average speed is equal to slope of the graph

20. In a below S-t graph the motion along AB, BC, CD, and DE represents:



- A. **Um, uam, udm** and **at rest**
- B. **Uam, um, at rest** and **udm**
- C. **Udm, uam, um** and **at rest**
- D. **Uam, at rest, uam** and **um**

21. If an object is released from a very high position in air resistance, which of the following is not true?

- A. As object moves downward, drag force of air increases
- B. At a point where drag force of air and weight of the object balances each other, velocity reaches its maximum value.
- C. Once the object attains its maximum velocity, there is no increase in drag force.
- D. Once the object attains its terminal velocity, the object accelerates by gravitational acceleration.

22. A man fired a bullet from a position of his head with a velocity of 300m/s vertically upward. If the bullet come back and hit the ground after 60.008s, what do you say about the height of the man? (ignore air resistance, use $g = 10\text{m/s}^2$)

- A. 1.5m B. 2.0m C. 2.4m D. 1.8m

23. Which is not constant in uniform circular motion?

- A. Acceleration C. Tangential velocity
- B. Angular velocity D. Centripetal force

24. Which is not under uniform circular motion?

- A. Revolution of electrons around the nucleus
- B. Rotation of tire when the car accelerates
- C. Motion of geostationary satellites

D. Motion of car around a fixed point on horizontal level.

25. What tension can support motion of a 2kg mass when tied to a 10cm string and moving along horizontal circle at a constant speed of 20m/s?

- A. 4000N B. 2000N C. 1000N D. 8000N

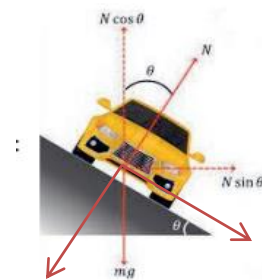
26. A 24,000kg car is moving around a circular road of radius 50m at 10m/s. The coefficient of friction between the ground and the tire is:

- A. 0.1 B. 0.3 C. 0.2 D. 0.4

27. In question number 21, how many revolutions can be covered by the car within 1minute?

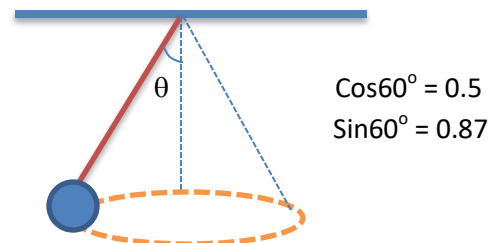
- A. 8rev B. 4rev C. 6rev D. 12rev

28. Whenever a car can move in a banking angle, θ without frictional force?



- A. When $mg\sin\theta >$ centripetal force
- B. When $N\sin\theta >$ centripetal force
- C. When $N\cos\theta >$ centripetal force
- D. When $N >$ centripetal force

29. In a conical pendulum a 1kg mass is tied to a 50cm string and rotate at an angle of 60° from vertical.



The tension in the string and the radius of rotation is:

- A. 20N & 40cm C. 10N & 50cm
- B. 40N & 30cm D. 5N & 20cm