



PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

MOTION

Solved Examples

1. An object travels 16 m in 4s and then another 16 min 2 s. What is the average speed

of the object?



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2. A sound is heard 5 s later than the lightning is seen in the sky on a rainy day. Find the distance of location of lightning? Given the speed of sound 346 m s^{-1}



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3. The brakes applied to a car produce an acceleration of 6ms^{-2} in the opposite direction to the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance traveled during this time.



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4. A 900 kg car moving at 10ms^{-1} takes a turn around a circle with a radius of 25 m.

Determine the acceleration and the net force acting upon the car.



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Exercise Choose The Correct Answer

1. The area under velocity - time graph represents the _____

A. velocity of the moving object

B. displacement covered by the moving object

C. speed of the moving object

D. acceleration of the moving object

Answer: D



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2. Which one of the following is most likely not a case of uniform circular motion?

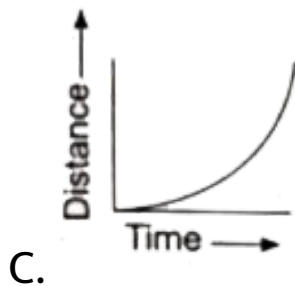
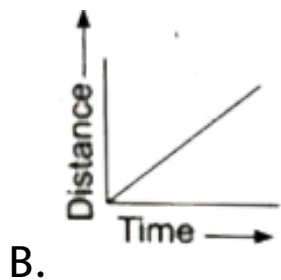
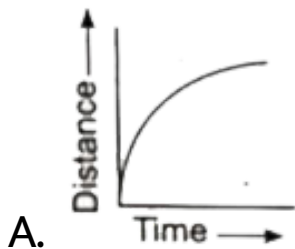
- A. Motion of the Earth around the Sun
- B. Motion of a toy train on a circular track
- C. Motion of a racing car on a circular track
- D. Motion of hour's hand on the dial of the
clock

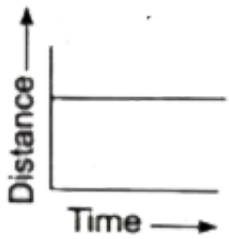
Answer: A



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3. Which of the following graph represents uniform motion of a moving particle?





D.

Answer: B



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4. Centrifugal force is a

A. a real force

B. the force reaction of centripetal force

C. virtual force

D. directed towards the centre of the
circular path

Answer: C



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Exercise Fill In The Blanks

1. Speed is a ____ quantity whereas velocity is a
____ quantity.



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2. Slope of displacement-time graph at any instant gives :



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3. The negative acceleration is also called as

----- .



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4. The area under velocity - time graph represents the _____



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Exercise True Or False

1. The motion of a city bus in a heavy traffic road is an example for uniform motion.



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2. Acceleration can get negative value also



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3. Distance covered by a particle never becomes zero but displacement becomes zero.



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4. The velocity - time graph of a particle falling freely under gravity would be straight line

parallel to the x-axis.



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5. If the displacement of an object is proportional to square of time, then the object moves with:

- A. Uniform velocity
- B. Uniform acceleration
- C. increasing acceleration
- D. decreasing acceleration

Answer: b



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Exercise Assertion And Reason

1. Assertion: The accelerated motion of an object may be due to change in magnitude of velocity or direction or both of them.

Reason: Acceleration can be produced only by change in magnitude of the velocity. It does not depend the direction.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If assertion is false but reason is true.

Answer: C



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2. Assertion: The Speedometer of a car or a motor-cycle measures its average speed.

Reason: Average velocity is equal to total displacement divided by total time taken.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of

assertion

C. If assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D



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3. Assertion: Displacement of a body may be zero when distance travelled by it is not zero.

Reason: The displacement is the shortest distance between initial and final position.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion
- C. If assertion is true but reason is false
- D. If assertion is false but reason is true.

Answer: A



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Exercise Match The Following

1. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 m/s. It implies that the boy is:

- A. at rest
- B. Moving with no acceleration
- C. in acceleration motion
- D. moving with uniform velocity

Answer: c



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Exercise Answer Briefly

1. Define velocity and speed.



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2. Distinguish between Distance and Displacement.



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3. What do you mean by uniform motion?



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4. Distinguish between speed and velocity.

(AS_1)



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5. What do you understand about negative acceleration?



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6. Is the uniform circular motion accelerated?

Give reasons for your answer.



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7. Uniform circular motion.



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Exercise Answer In Detail

1. Which of the following can sometimes be 'zero' for a moving body? i. Average velocity ii. Distance travelled iii. Average speed iv. Displacement

A. Only (i)

B. (i) and (ii)

C. (i) and (iv)

D. Only (iv)

Answer: c



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2. Which of the following statement is correct regarding velocity and speed of a moving body?

- A. Velocity of a moving body is always higher than its speed
- B. Speed of a moving body is always higher than its velocity
- C. Speed of a moving body is its velocity in a given direction
- D. Velocity of a moving body is its speed in a given direction

Answer: d



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Exercise Problems

1. A ball is gently dropped from a height of 20m. If its velocity increases uniformly at the rate of 10ms^{-2} . With what velocity will it strike the ground? After what time will it strike the ground?



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2. An athlete completes one round of a circular track of diameter 200 in 40 s. What will be the distance covered and the displacement at the end of 2 m and 20 s?



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3. A racing car has a uniform acceleration of $4ms^{-2}$. What distance it covers in 10 s after the start ?



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Question Paper I Choose The Best Answer

1. The area under velocity - time graph represents the _____

A. velocity of the moving object

B. Displacement covered by the moving object

C. Speed of the moving object

D. None

Answer: B



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2. The SI unit of acceleration is _____.

A. ms^{-1}

B. ms^{-2}

C. ms

D. ms^2

Answer: B



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3. When a body starts from rest, the acceleration of the body after 2 second in ___ of its displacement .

A. Half

B. Twice

C. Four times

D. One fourth

Answer: A



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Question Paper I Short Answer

1. A bus travels, a distance of 20 km from Chennai central to airport in 45 minutes. What is the average speed?



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2. Why did the actual speed differ from average speed?



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3. . In which of the following cases of motions, the distance moved and the magnitude of the displacement are equal? i. If the car is moving on a straight road ii. If the car is moving in circular path iii. The pendulum is moving to and fro iv. The earth is moving around the sun

A. only 1

B. only 2

C. i and 3

D. 2 and 4

Answer: a



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4. The speed of a particle is constant, Will It have acceleration? Justify with an example.



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5. Distinguish between Distance and Displacement.



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Question Paper | Answer The Following Questions Briefly

1. In a free fall the velocity of a stone is increasing equally in equal intervals of time

under the effect of gravitational force of the earth. Then what can you say about the motion of this stone? Whether the stone is having:

- A. -uniform acceleration
- B. Non-uniform acceleration
- C. retardation
- D. constant speed

Answer: a



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Question Paper Ii Choose The Best Answer

1. In a 100 m race, the winner takes 10s to reach the finishing point. The average speed of the winner is _____ ms^{-1}

A. 5

B. 10

C. 20

D. 40

Answer: B



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2. Force involved in uniform circular motion is given by _____

A. $f = \frac{mv^2}{r}$

B. $f = mvr$

C. $f = \frac{mr^2}{v}$

D. $f = \frac{v^2}{r}$

Answer: A



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Question Paper Ii Choose Correct Statement

1. The numerical ratio of displacement to distance for a moving object is:

- A. Always less than 1
- B. Equal to 1 or less than 1
- C. Equal to 1 or more than 1

D. more than 1

Answer: b

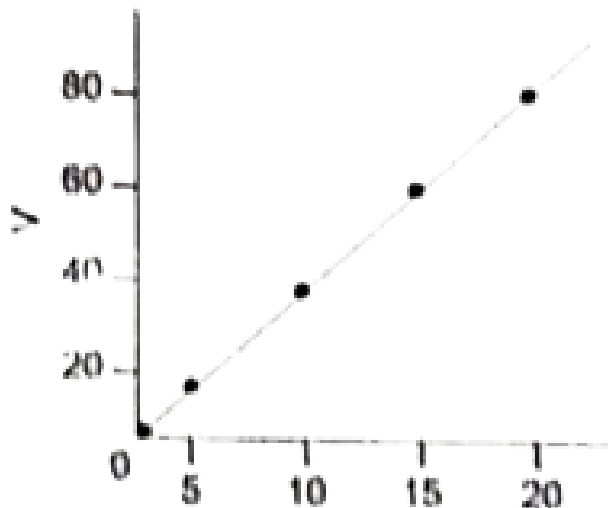


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Question Paper Ii Short Answer Questions

1. A motorcycle travelling at $20ms^{-1}$ has an acceleration of $4ms^{-2}$. What does it explains

about the velocity of the motorcycle?



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2. Complete the following sentences.

(a) The acceleration of the body that moves with a uniform velocity will be ____

(b) A train travels from A to station B with a

velocity of 100 km/h and returns from station B to station A with a velocity of 80 km/h. Its average velocity during the whole journey is _____ and its average speed is _____



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3. Distinguish between speed and velocity.

(AS₁)



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4. What is meant by negative acceleration?



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Question Paper li Answer The Following Question

1. A boy moves along the path ABCD. What is the total distance covered by the boy ? What is his net displacement ?



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1. When a body like earth is moving in a circular path the work done in that case is zero because:

A. Centripetal force acts in the direction of motion of the body

B. Centripetal force acts along the radius of circular path

C. Gravitational force acts along the radius
of circular path

D. centrifugal force acts perpendicular to
the radius of circular path

Answer: b



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2. A car is accelerated on a leveled road and attains a velocity 4 times of its initial velocity. In this process, the kinetic energy of the car

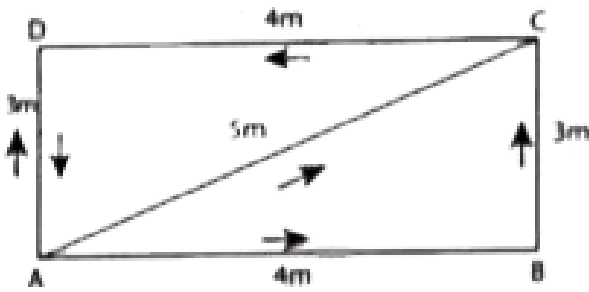
- A. Becomes twice to that of the initial
- B. Becomes four times to that of the initial
- C. Remains the same
- D. Becomes 16 times to that of the initial

Answer: D



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3. Observe the motion of a car as shown in the figure and answer the following questions :



Compare the distance covered by the car through the path ABC and AC. What do you observe? Which path gives the shortest distance to reach D from A? Is it the path ABCD or the path ACD or the path AD?



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4. energy possessed by a eagle flying in air is:

A. kinetic

B. potential

C. both kinetic and potential

D. can not say

Answer: c



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5. In the dams water is stored in the high reservoirs and then made to fall down. This falling water then rotates the turbines to

generate electricity. In this energy conversion process can you tell the initial and final energies respectively?

- A. kinetic and electrical
- B. potential and kinetic
- C. potential and electric
- D. kinetic and potential

Answer: a



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6. The type of energy possessed by a simple pendulum, when it is at the mean position is:

- A. kinetic energy
- B. potential energy
- C. kinetic + potential
- D. sound

Answer: a



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