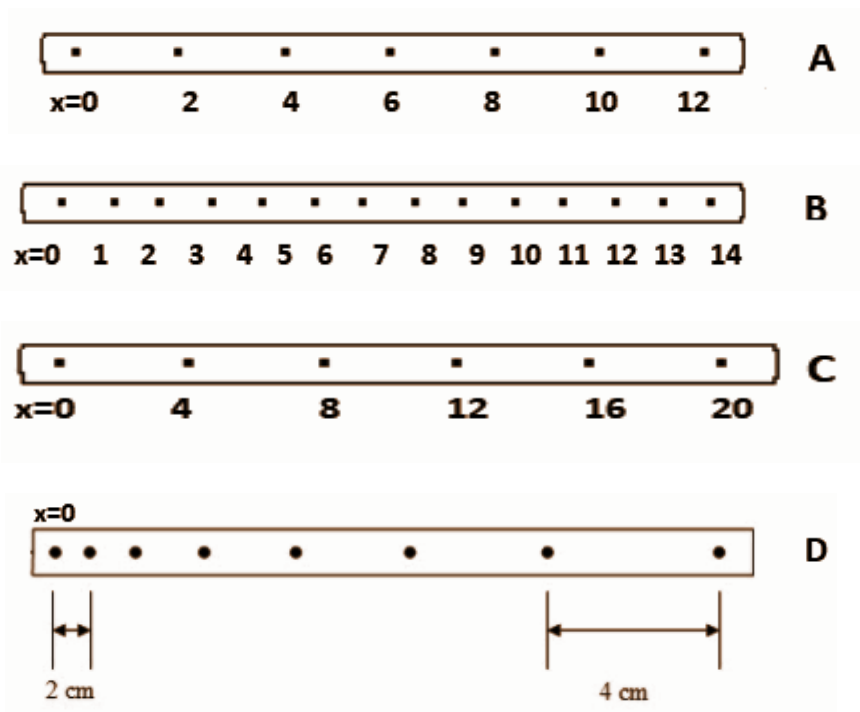


CCT Weekly Practice Science

Motion

Imagine a car with a leaky engine that drips oil at a regular rate of 50 drops per second. As the car travels through town, it would leave a trace of oil on the street that would reveal information about the motion of the car. The trace of the oil in four different situations are shown. (The positions are given in *centimeters*.)



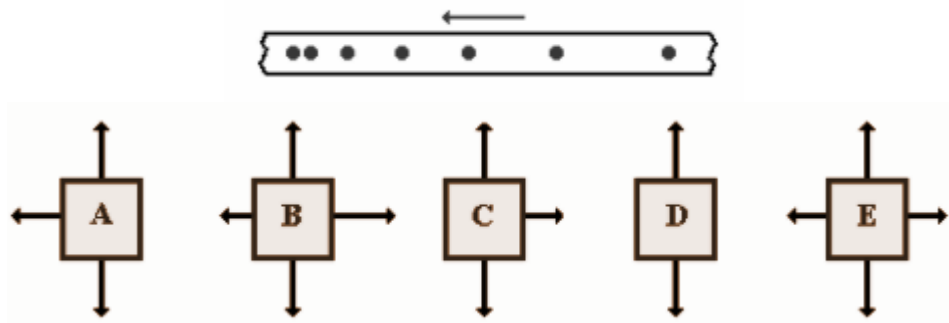
1. Identify the type of motion by the car in situations A, B, C and D.

2. What is the ratio of speed of the car in situations A, B and C?

- (a) 1:2:4
- (b) 2:1:4
- (c) 4:2:1
- (d) 2:4:1

3. What is the acceleration of the car in situation D?

4. In case D, if the oil drop diagram shows the motion of a left-ward-moving object, Which force diagram(s) is/are consistent with the oil drop diagram? (The arrows represent forces; arrow length represents the size of the force.)



- (a) A only
(b) B only
(c) B and C
(d) D and E
5. **Statement 1:** A positive acceleration of a body can be associated with ‘slowing down’ of the body.
Statement 2: Acceleration acts along the direction of velocity of the body.
Choose the correct option:
(a) Both Statement 1 and Statement 2 are true.
(b) Both Statement 1 and Statement 2 are true and Statement 2 is the correct explanation of Statement 1.
(c) Statement 1 is true but Statement 2 is false.
(d) Statement 1 is false but Statement 1 is true.
(e) Both Statement 1 and Statement 2 are false.
6. Draw the oil drop diagram of a car moving to the right and slowing down and a car moving to the left and speeding up. What is the difference between the two?

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CCT Weekly Practice Science

Answers:- Motion

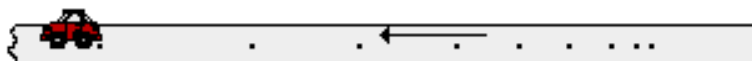
1. A, B, C -Uniform Motion
D- Non- Uniform Motion / Uniform Accelerated Motion
2. b) 2:1:4
3. Time between each drop= $1/50 = 0.02$ s
 $u = 0.02/0.02 = 1\text{m/s}$
 $v = 0.04/0.02 = 2\text{m/s}$
 $t = 6 \times 0.02 = 0.12\text{s}$
 $a = (v-u)/t = 8.33 \text{ ms}^{-2}$
4. c) B and C
5. c) Statement 1 is true but Statement 2 is false.
6. **There is no difference!**

The two diagrams would be indistinguishable from each other as indicated by the following two diagrams.

- a) Moving right and slowing down



- b) Moving left and speeding up



These are the two ways to accelerate leftward; and regardless of how it happens, the oil drop trace would be identical.

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