Question 1

An astronaut is very distant from any objects including spacecraft, planets and stars. The astronaut throws a ball horizontally.

Which of the following is true after the ball has left the hand of the astronaut?

1. The ball eventually slows to a stop regardless of the speed with which it was thrown.
2. The ball continues to move in the same direction and with the same speed regardless of how it was thrown.
3. The ball will speed up.
4. The ball will speed up if it is thrown fast enough, but slow down if it is thrown too slowly.

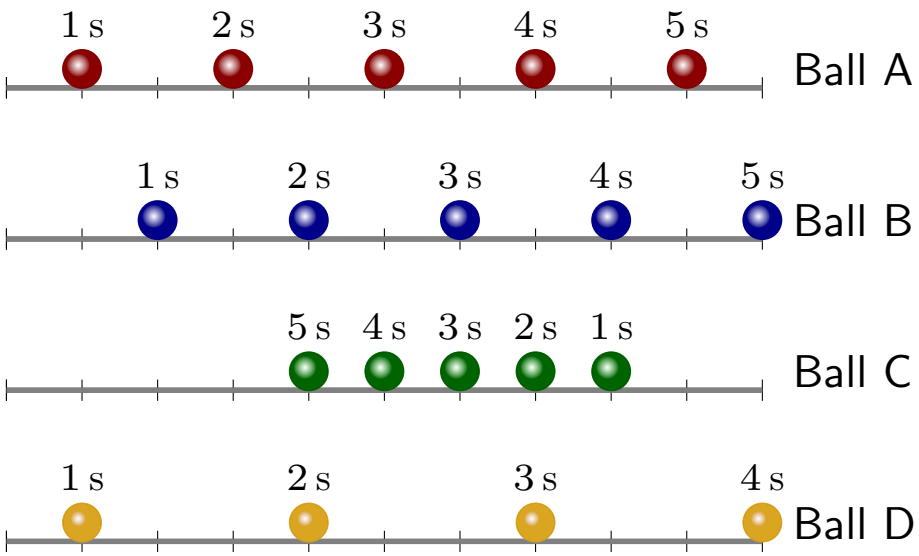
Question 2

An object can slide along a rough horizontal surface, such as in the PhET animation "Forces and Motion". Keeping it moving at a constant speed appears to require a force exerted by a person. Which if the following is true?

1. The Law of Inertia is incorrect since it does not naturally move with a constant speed.
2. The Law of Inertia is correct but it will never work in situations like this.
3. The Law of Inertia is correct man since there is still no overall external influence on the object.

Question 3

Various balls move along a straight horizontal path as illustrated. Photographs of the balls at intervals spaced $1\,\mathrm{s}$ apart are provided.

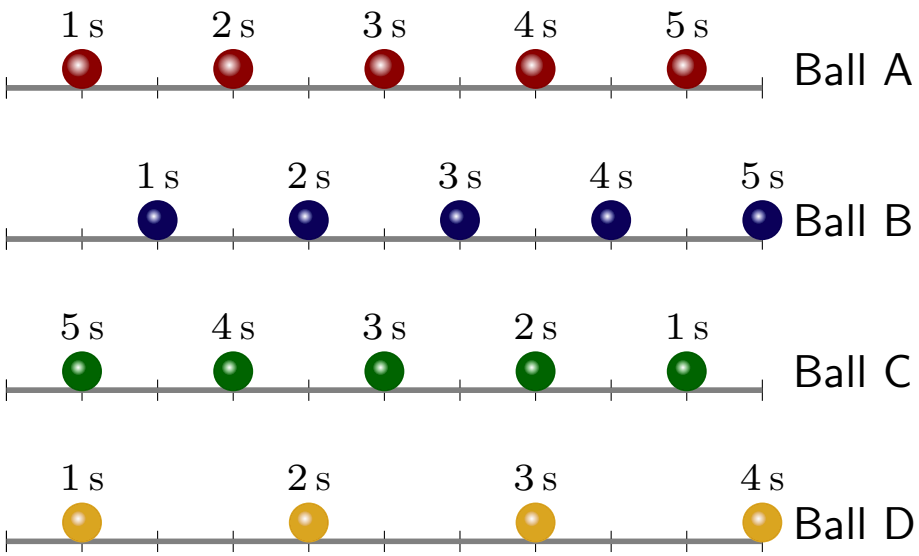


Which of the following is the correct rank of the speeds of the balls?

1. A and D same, B larger, C largest.
2. A and B same, C larger, D largest.
3. C smallest, A larger, B and D same and largest.
4. C smallest, A, B larger and D largest.

Question 4

Various balls move along a straight horizontal path as illustrated. Photographs of the balls at intervals spaced $1\,\mathrm{s}$ apart are provided.



Which of the following is true during the illustrated period?

1. All have the same velocity.
2. None have the same velocity.
3. A, B, C have same velocity.
4. A and B have same velocity.
5. A and C have same velocity.