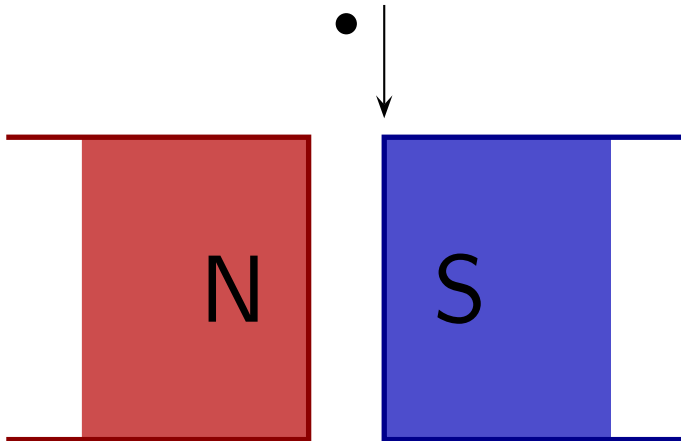


Question 1

An alpha particle (two protons and two neutrons) is fired into the gap between two closely spaced magnets as illustrated.

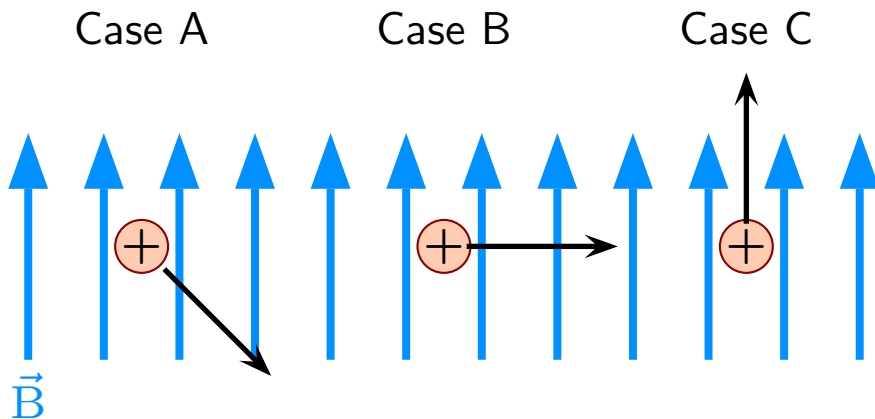


Which of the following best represents the direction of the force exerted by the magnets on the alpha particle while it is between them?

1. ←
2. →
3. Into the board
4. Out of the board

Question 2

Identical positively charged particles move through identical magnetic fields with identical speeds, in directions indicated by black vectors, as illustrated.

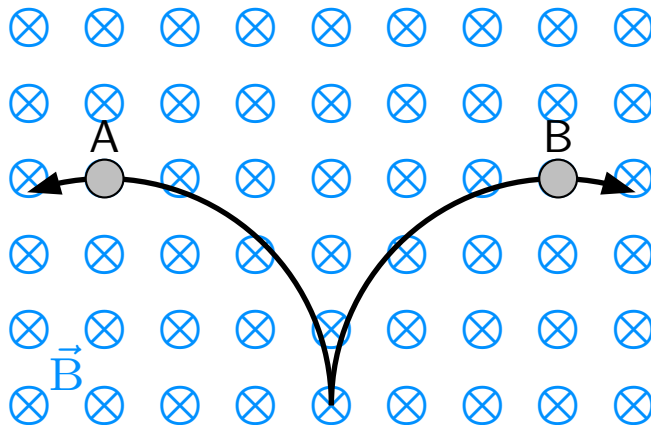


Which of the following ranks the magnitudes of magnetic forces?

1. $B > A = C$
2. $C > B > A$
3. $B > A > C$
4. $C > A > B$
5. $A > C > B$

Question 3

Two charged particles each move with constant speed in a region containing a uniform and constant magnetic field. Their trajectories when viewed from above are as illustrated.

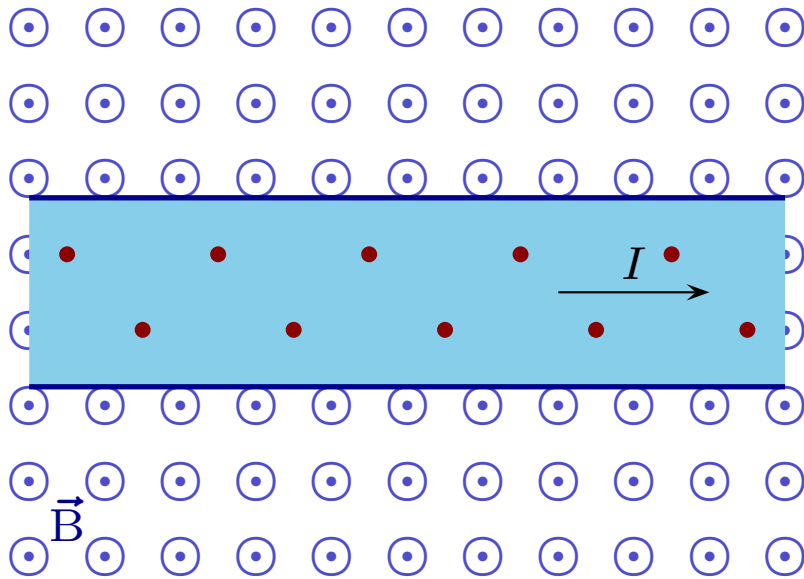


Which is true regarding the charges of the particles?

1. Both are positive.
2. Both are negative.
3. They are opposite but one cannot say which is positive.
4. A is positive, B is negative.
5. B is positive, A is negative.

Question 4

A wire carries a current pointing to the right. The wire is placed into a magnetic field, \vec{B} , pointing out of the screen.



Which of the following is true?

1. Moving charges positive \Rightarrow upper edge positive. Same for negative moving charges.
2. Moving charges positive \Rightarrow upper edge positive. Opposite for negative moving charges.
3. Moving charges positive \Rightarrow upper edge negative. Same for negative moving charges.
4. Moving charges positive \Rightarrow upper edge negative. Opposite for negative moving charges.
5. Both edges neutral regardless of the sign of the moving charges.