

Q. An alpha particle and a deuteron enter a region of magnetic field which is perpendicular to their velocity. If their kinetic energies are equal, then find the ratio of their radii.

- A 1 : 1
- B  $1 : \sqrt{2}$
- C  $\sqrt{2} : 1$
- D 4 : 2

Q. Tension in a spring is  $T_1$  when length is  $L_1$  and tension is  $T_2$  when its length is  $L_2$ . The natural length of the spring is

Answer D

A  $\frac{T_2 l_2 + T_1 l_1}{T_2 + T_1}$

B  $\frac{T_2 l_2 - T_1 l_1}{T_2 - T_1}$

C  $\frac{T_2 l_1 + T_1 l_2}{T_2 + T_1}$

D  $\frac{T_2 l_1 - T_1 l_2}{T_2 - T_1}$

Q. If  $\vec{A} \cdot \vec{B} = |\vec{A} \times \vec{B}|$ , find  $|\vec{A} - \vec{B}|$

Answer C

- A  $\sqrt{A^2 + B^2 + 2AB}$
- B  $\sqrt{A^2 + B^2 + \sqrt{2}AB}$
- C  $\sqrt{A^2 + B^2 - \sqrt{2}AB}$
- D  $\sqrt{A^2 + B^2}$

A butterfly is flying in North East direction with a velocity of  $\sqrt{2} \text{ m/s}$ . Wind is blowing from North to South with a velocity of  $1 \text{ m/s}$ . Find the displacement of the bird in three seconds.

Answer A

- A 15m,  $37^\circ$  North of East
- B 15m,  $37^\circ$  East to North
- C 15m,  $37^\circ$  North of West
- D None of these