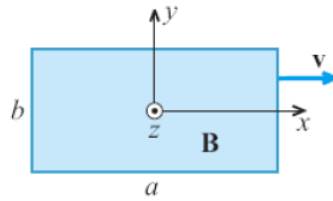


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*Moving loop in a magnetic field.* A rectangular loop moves with a constant velocity  $v$  ( $\mathbf{v} = v\mathbf{a}_x$ ) in a magnetic field of flux density vector  $\mathbf{B}$ . The ambient medium is air. Referring to Fig. Q6.7, and with  $B_0$ ,  $\omega$ , and  $a$  being positive constants, there is a nonzero emf induced in the loop ( $e_{\text{ind}} \neq 0$ ) if

- (A)  $\mathbf{B} = B_0 \cos \omega t \mathbf{a}_x$ .
- (B)  $\mathbf{B} = B_0 \cos \omega t \mathbf{a}_z$ .
- (C)  $\mathbf{B} = B_0 \mathbf{a}_z$ .
- (D)  $\mathbf{B} = B_0 x \mathbf{a}_z / a$ .
- (E)  $\mathbf{B} = B_0 y \mathbf{a}_z / a$ .
- (F) More than one of the above cases.



**Figure Q6.7** Loop moving with a velocity  $\mathbf{v}$  in a magnetic field; for Question 6.19.

*Solution:* (F)

*Answer:* (F)