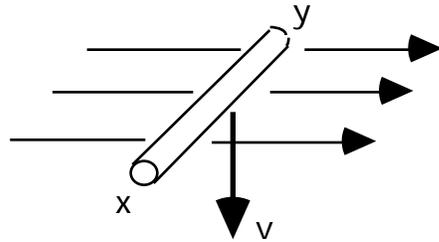


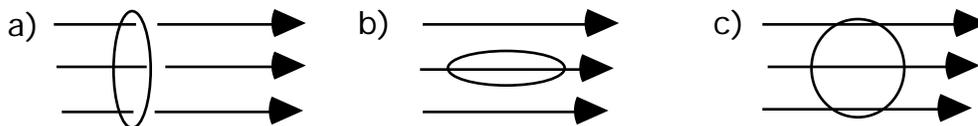
Phys12 Magnetic Flux and Faraday's Law Quiz - 30

1) A 3.0 cm conducting rod moves as shown with a speed of 60. cm/s in a 1.2 T [right] magnetic field.



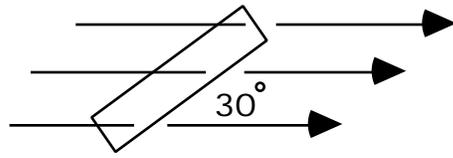
- a) Find the electromotive force (emf).
- b) At which end is there a surplus of electrons? (x or y)
- c) If the velocity is parallel to the field, and in the same direction as the field, find the magnitude of the emf between x and y.

2) For each of the orientations shown, find the flux through the circular loop if its area is 0.010 m^2 and the magnetic field is 0.50 T .



3) If the loop in question 2)a) above, changes its orientation to that shown in 2)b) in 0.040 s , find the electromotive force (emf).

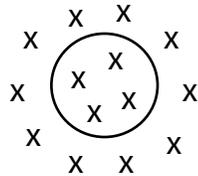
4) Find the maximum flux through the square loop below. The magnetic field is 0.85 T [right] and the area is 0.0050 m^2 . It is oriented so that the plane of the loop is at an angle of $30.^\circ$ to the magnetic field direction.



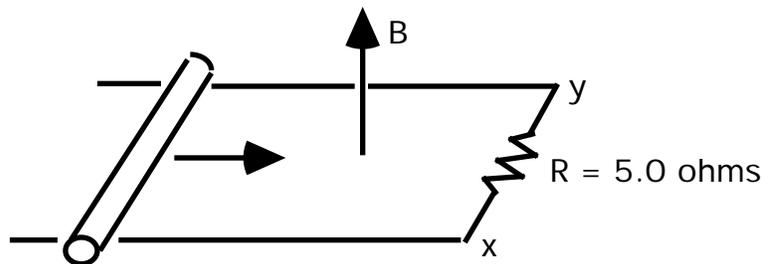
5) A 2.5 cm diameter circular loop is removed from a 1.2 T field in 50. ms. Find the maximum electromotive force.

6) A 1.3 cm diameter coil with 25 turns is rotated 90. degrees in a 0.45 T magnetic field in a time of 0.010s. Find the maximum emf.

7) The B field in the 1.0 cm² loop below changes from 1.0 T into the page to 0.50 T into the page in 0.080 s. Find the emf. Give the direction of the induced current.



8) A conducting rod moves on the U-shaped conductor as shown below. The speed is 55 cm/s. The rod is 25 cm long. The magnetic field is 0.90 T [up].



- Find the voltage across the resistor R.
- Find the magnitude of the current through the resistor R.
- Give the direction of the conventional current in the above circuit. (x to y or y to x)

Answers : 1)a) 0.022 V, b) y, c) 0.0 V, 2)a) 0.0050 Wb, b) 0.0 Wb, c) 0.0 Wb, 3) 0.13 V, 4) 2.1×10^{-3} Wb, 5) 0.012 V, 6) 0.15 V, 7) 6.3×10^{-4} V, clockwise, 8)a) 0.12 V, b) 0.025 A, c) x to y.