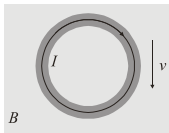# Induced EMF

1. A horizontal magnetic field points to the north. A metal rod is placed parallel to the ground and perpendicular to the magnetic field lines. When the rod is dropped, which of its ends is the negative pole of the induced emf?

2. A train travels at 120 km/h due north. Calculate the emf induced in the axles 1.43 m long.

3. The generator in a power station produces an emf with frequency 50 Hz and amplitude 15 kV. The coil has 12 turns and an area of 8 m². Calculate the magnitude of the magnetic field flowing through the coil.

4. A bar magnet is pushed through a coil. Discuss the direction of the current induced in the coil while the bar magnet enters and leaves (for both orientations of the bar magnet).

5. Two coils are oriented along their common axis. The first coil carries a current. Determine the direction of the current induced in the second coil (relative to the current in the first one) when the coils are moving together or apart, respectively.

6. A metal ring moves vertically through a magnetic field B, leading to an induced current (see figure). What can you tell about the magnetic field? Can you find more than one solution?