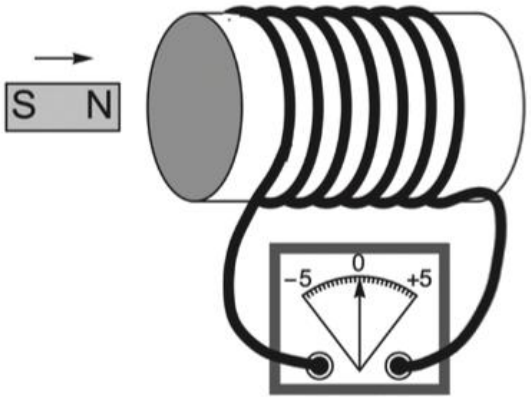
**Question 7** **(7 marks)**

The north pole of a bar magnet is moved at a constant speed of 0.370 m $s^{-1}$ towards a coil of wire. The coil has seven turns and a cross sectional area of 0.0240 $m^2$. The ends of the wire are connected to a galvanometer (which measures very small currents).




(a) State Lenz's law. (2 marks)

(b) With reference to Lenz's law, explain why the needle in the galvanometer moves to the left, i.e. the current in the galvanometer flows right to left. (3 marks)

(c) Explain why the emf induced in the coil is not constant, even though the speed of the magnet remains constant. (2 marks)