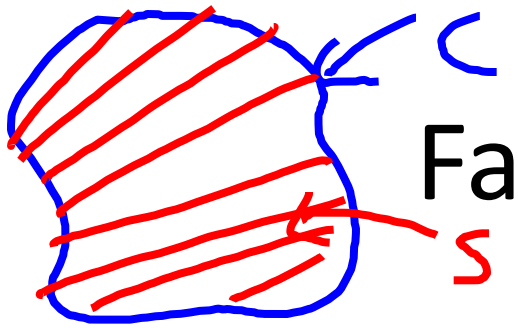
Before Lab Next Week

- Read through the entirety of Lab 6 - RLC Circuits in the manual.
- Pay special attention to all of Section 6.1.
- Do Exercises 1 and 2 and bring these with you to lab.

According to Faraday's law, a necessary and sufficient condition for an electromotive force to be induced in a closed circuit loop is the presence in the loop of

1) a magnetic field.
2) magnetic materials.
3) an electric current.
4) a time-varying magnetic flux.
5) a time-varying magnetic field.



Faraday's Law

- When the magnetic flux through some loop (C) changes, it induces an emf around the loop proportional to the rate at which the flux through the loop changes.
- If loop has *N* turns, the emf is *N* times larger.
- Lenz' Law: the sign of the emf is such that an induced current opposes the change in flux.

$$\mathcal{E} = -N\frac{d\Phi_B}{dt} = -N\frac{d}{dt}\int \vec{\mathbf{B}}\bullet\hat{\mathbf{n}}dA$$

For which of the diagram(s) will current flow through the light bulb? (In 3 and 4 assume the magnets move in the plane of the loop.)

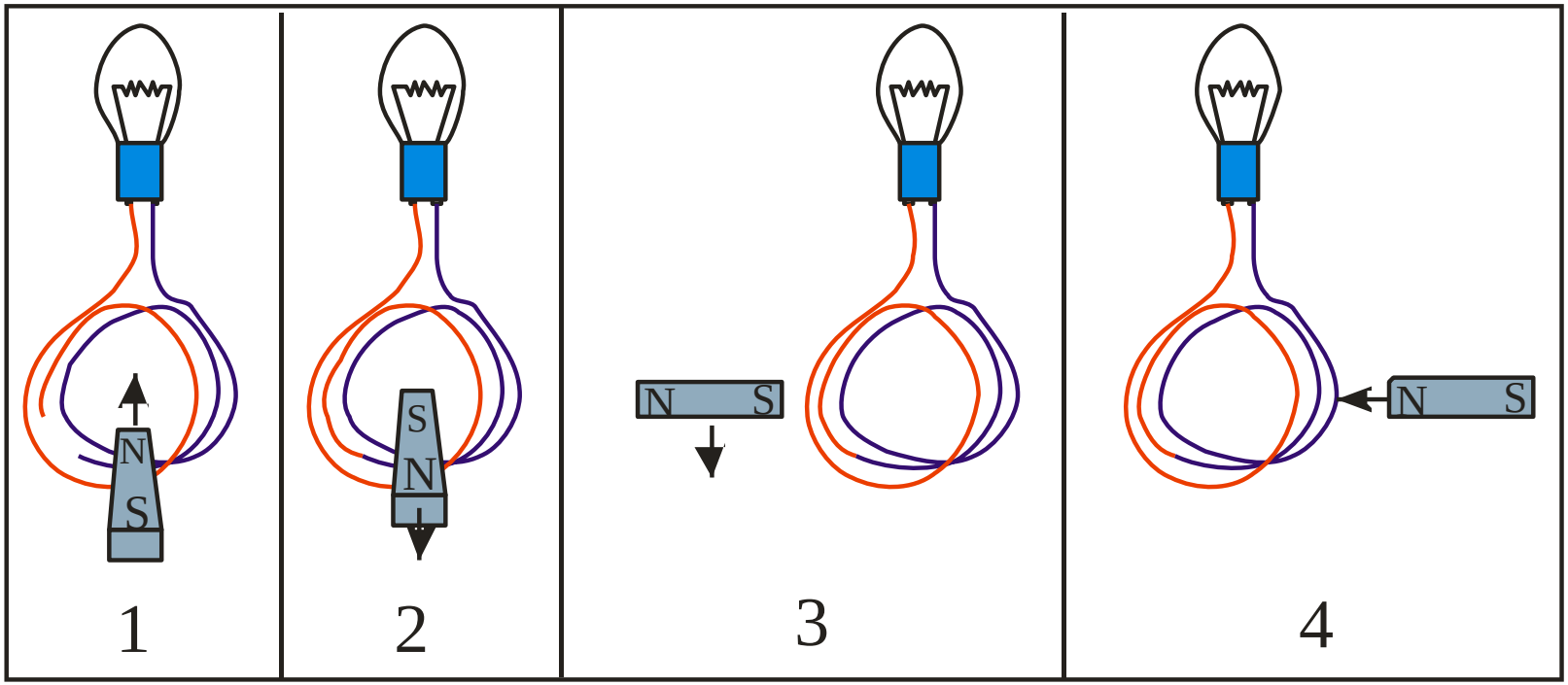
1) 1

2) 2

3) 3

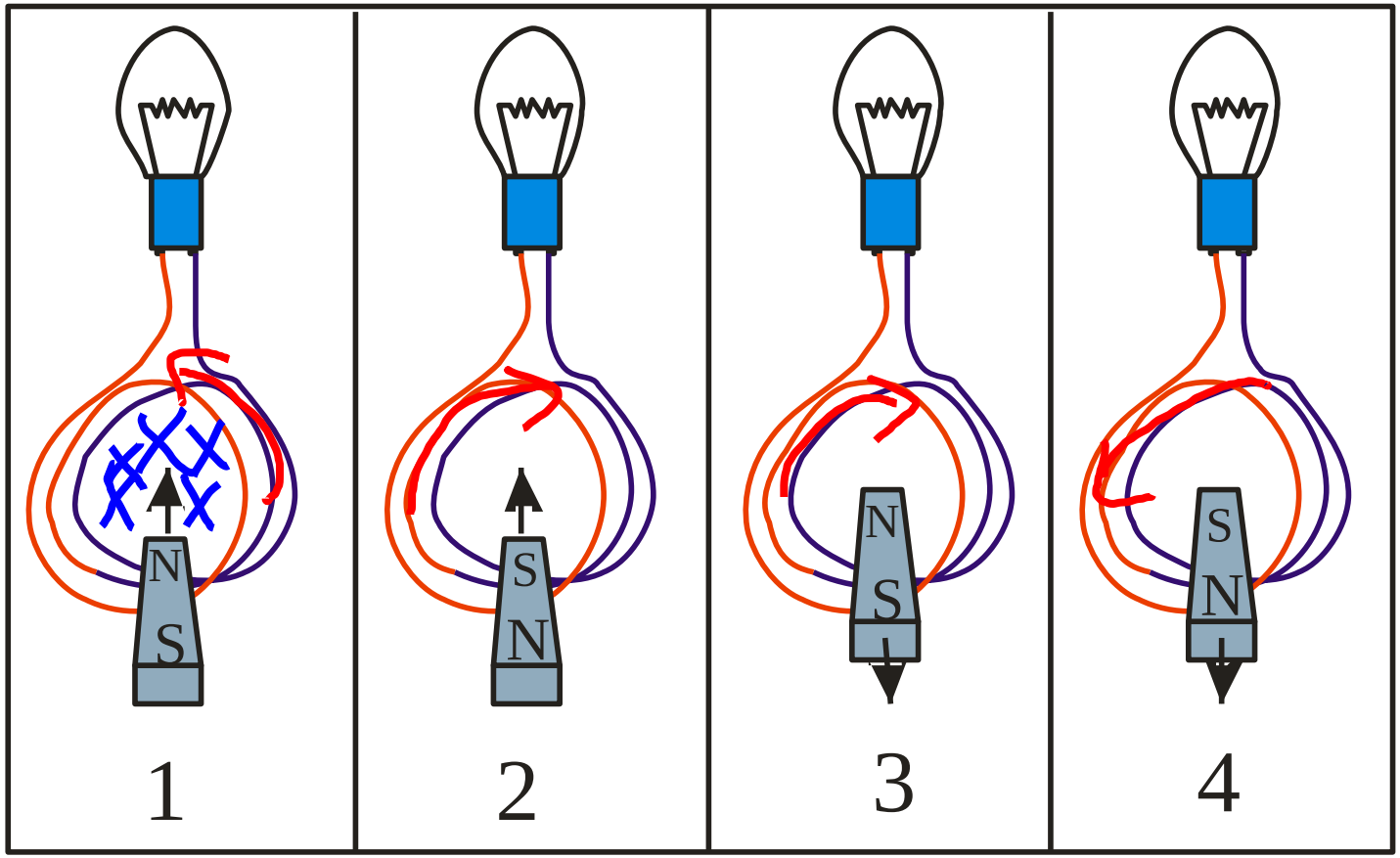
4) 4

5) 1 and 2

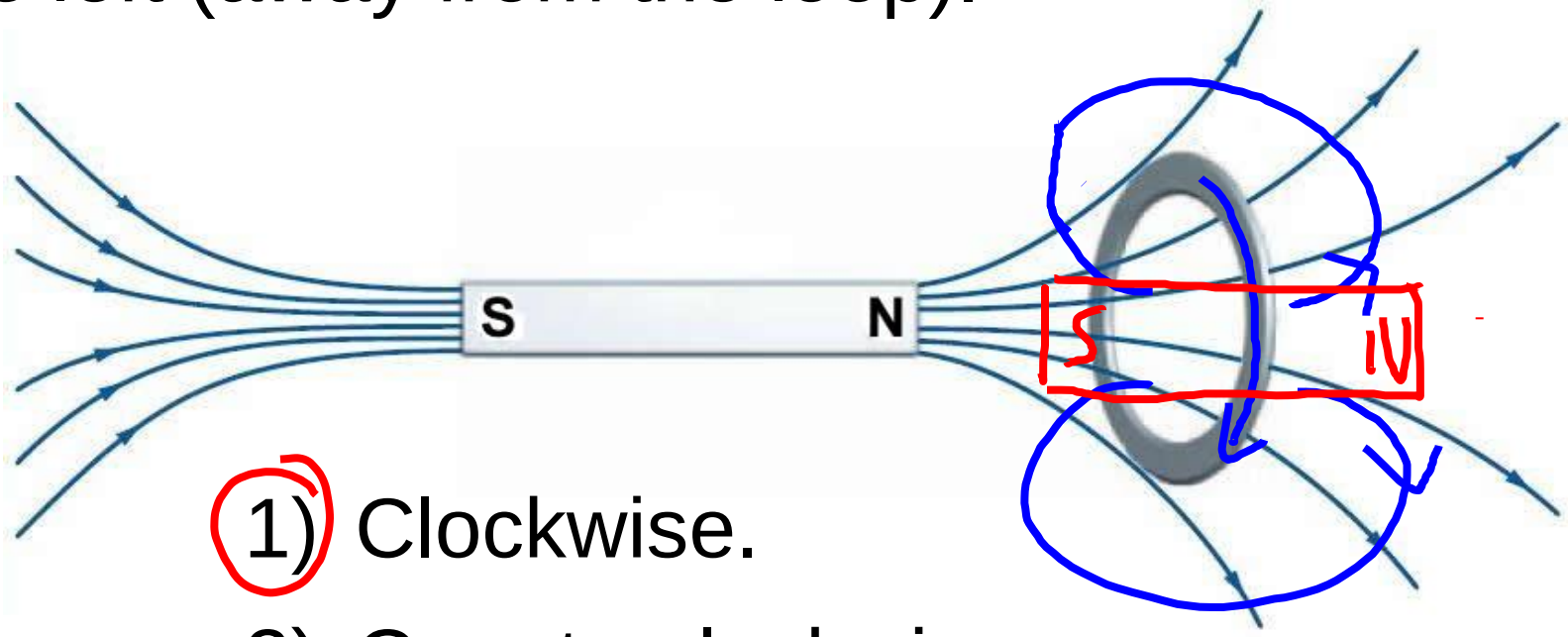


For which of the following diagrams will current flow in the clockwise direction?

1) 1 and 2
2) 3 and 4
3) 1 and 3
4) 2 and 4
5) 2 and 3



Find the direction of the induced current in the loop shown if the magnet is moving to the left (away from the loop).



1) Clockwise.
2) Counterclockwise.
3) No current is induced.

A conducting loop around a bar magnet begins to move away from the magnet. Which of the following statements is true?

1) The magnet and the loop repel one another.
2) The magnet and the loop attract one another.
3) The magnet and loop neither attract nor repel one another.