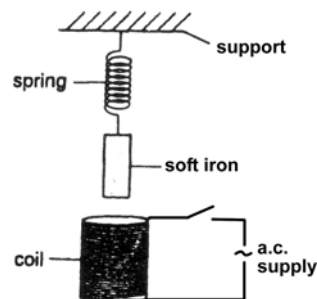


Electromagnetic Induction I – Homework Assignment

1. The diagram shows a soft iron bar attached to a spring above a coil of wire. The coil of wire is connected to an a.c. supply. When the switch is turned on, what happens?

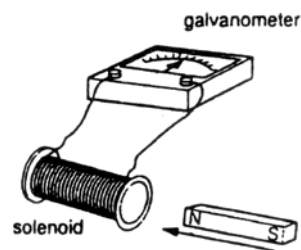
- a. The iron bar goes down and stays down.
- b. The iron bar oscillates up and down.
- c. The iron bar goes down and returns to its original position
- d. The iron bar goes up and remains up.



Please justify your answer.

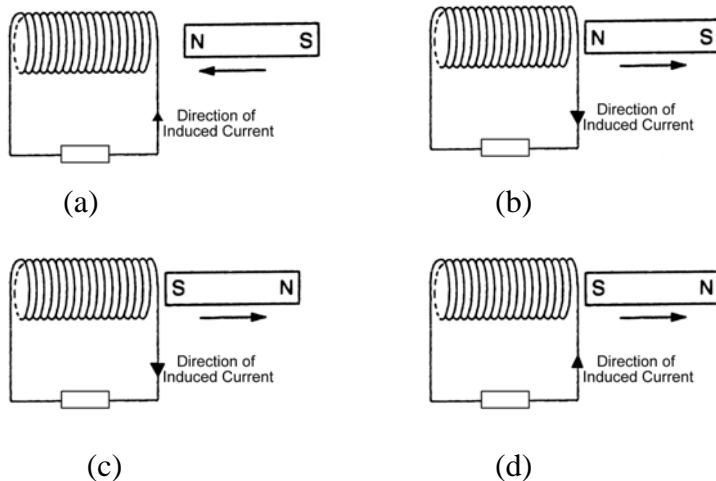
2. When a permanent bar magnet is moved into a solenoid as shown, a small deflection is recorded on the sensitive galvanometer. Which change would increase the size of the reading?

- a. Using the south pole instead of the north pole
- b. Use less turns of wire
- c. Pulling the magnet at the same speed at which it was inserted
- d. Inserting a resistor in series with the galvanometer
- e. Pushing the magnet in faster

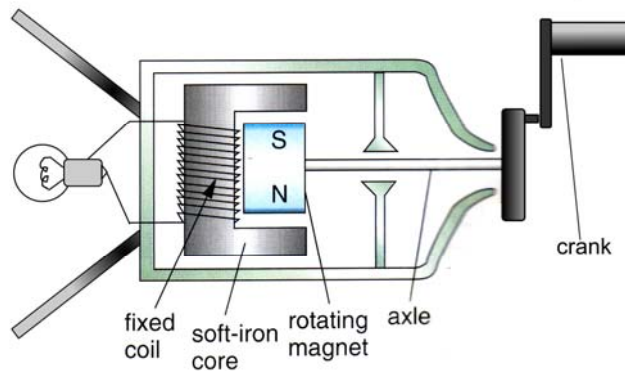


Please justify your answer. _____

3. Which diagram correctly gives the direction of the induced current when the magnet is moved as shown?



4. The diagram shows the cross-section of a simple hand-powered torchlight. When the crank is turned at a certain speed, the bulb would light up. Which change would not increase the brightness of the bulb?



- a. Turning the crank in the same direction but at a higher speed
- b. Using a fixed coil with more turns of wire
- c. Turning the crank in the opposite direction but at a higher speed
- d. Replacing the soft iron core with steel
- e. Using a stronger magnet

5. Besides gas and oil-powered plants such as the ones in Tuas and Senoko, name two examples of sources of energy that can provide Singapore with electrical energy through the use of an a.c. generator. For each example, state one advantage and disadvantage of using such a source.

6. Imagine that you are a consultant for Senoko power plant. Suggest two ways to the management on how they could increase the amount of electrical energy produced per day by the plant.