Scientific Mothod

A. Choose the correct answer:

1. What is the first step in the scientific method?

- a) Conducting an experiment
- b) Making an observation
- c) Forming a conclusion
- d) Publishing results

2. Which of the following is an example of forming a hypothesis?

- a) Reading a book about science
- b) Guessing the outcome of an experiment without reasoning
- c) Predicting that plants grow faster in sunlight based on previous knowledge
- d) Watching a documentary on space

3. Why is it important to conduct experiments in the scientific method?

- a) To prove that all scientific theories are wrong
- b) To test hypotheses and collect data
- c) To make random guesses
- d) To memorize scientific facts

B. Fill in the Blanks:

- 1. The scientific method begins with making a ______ about the natural world.
- 2. A ______ is a testable explanation or prediction based on prior knowledge.
- 3. In an experiment, the variable that is deliberately changed is called the ______ variable.

C. Case Study:

A student named Rahul wanted to find out if the amount of sunlight affects the growth of tomato plants. He followed the scientific method to conduct his experiment.

- 1. **Observation:** Rahul noticed that plants in his garden grew at different rates, even though they were watered the same way.
- 2. **Hypothesis:** He predicted that plants receiving more sunlight would grow taller than those receiving less sunlight.
- 3. Experiment: Rahul planted three identical tomato plants in separate pots:

- Plant A was placed in direct sunlight for 8 hours a day.
- Plant B was placed in partial sunlight for 4 hours a day.
- Plant C was kept indoors with only artificial light.
- 1. Data Collection: After three weeks, Rahul measured the height of the plants:
 - Plant A grew 30 cm tall.
 - Plant B grew 18 cm tall.
 - Plant C grew 10 cm tall.
- 2. **Conclusion:** Rahul concluded that plants exposed to more sunlight grew taller than those with limited or no sunlight.

Questions & Answers:

- 1. What was Rahul's hypothesis in the experiment?
- 2. Why did Rahul keep all three plants the same except for the amount of sunlight they received?
- 3. What was the independent variable in Rahul's experiment?
- 4. Based on Rahul's conclusion, how does sunlight impact plant growth?

D. Short Answer Questions:

- 1. What are the key steps of the scientific method?
- 2. Why is forming a hypothesis important in scientific research?
- 3. How does an experiment help in proving or disproving a hypothesis?

E. Long Answer Questions:

- 1. Explain the scientific method in detail and describe its importance in everyday problem-solving.
- 2. Why is it necessary to control variables in an experiment? Give an example to support your answer.
- 3. How does repeating experiments improve the reliability of scientific findings?