Scientific Study

1. What is scientific learning?

2. Name the fundamental and derived unit.

3. What is the dimension of a physical quantity? Give an example.

4. What is a derived unit? Give two examples.

5. Write the basic unit involved in the following derived units; Joule, Pascal, hertz, Newton

6. Raju wants to investigate which color of an object has the highest capacity to absorb heat. He took four tin cans and painted them with black, white, green, and red colors respectively. He poured an equal amount of water into each can, closed the openings, and placed them in sunlight for an hour. After that, he measured the temperature of the water in each can using a thermometer. Answer the following questions based on this experiment.

   i. Write the independent and dependent variables.
   ii. Which variables should be controlled by Raju? Explain.
   iii. What is the hypothesis of this experiment?
   iv. How will Raju ensure that the temperature measurements are accurate?
   v. How might Raju extend this experiment to test other factors that affect the absorption of heat by an object?

7. Why is the unit of work a derived unit?

8. Analyse the following equations unit-wise to prove whether it is valid or not.

i. $S = ut + \frac{1}{2}at^2$

ii. $v^2 - u^2 = 2a.s$

9. Why are independent and dependent variables important in scientific study?

10. Clarify different types of variables giving an example of an experiment.