CHAPTER ONE

INTRODUCTION TO PHYSICS

Science in our lives

Scientists are people trained in science and who practice the knowledge of science. We require people in industries to work as engineers, technicians, researchers, in hospitals as doctors, nurses and technologists. Science gives us powerful ideas, instruments and methods which affect us in our daily lives.

Scientific methods

1. A ***laboratory*** is a building specifically designed for scientific work and may contain many pieces of apparatus and materials for use.
2. A ***hypothesis*** is a scientific fact or statement that has not been proven or experimented.
3. A ***law or principle*** is a scientific fact or statement that has been proven and experimented to be true for all conditions.
4. A ***theorem*** is a fact or statement that is true and proven but applicable under specific conditions.

What is physics?

Physics is a Greek word meaning ***nature*** hence it deals with ***natural phenomena***. ***Physics is therefore a science whose objective is the study of components of matter and their mutual interactions. Physics is also defined as the study of matter and its relation to energy.***A physicist is able to explain bulk properties of matter as well as other phenomena observed.

Branches of physics

1. ***Mechanics*** – the study of motion of bodies under the influence of force.
2. ***Electricity*** – this deals with the movement of charge from one point to another through a conductor.
3. ***Magnetism*** – the study of magnets and magnetic fields and their extensive applications.
4. ***Thermodynamics / heat*** – this is the study of the transformation of heat from one form to another.
5. ***Optics*** –the study of light as it travels from one media to another
6. ***Waves*** – the study of disturbances which travel through mediums or a vacuum.
7. ***Particle physics***
8. ***Nuclear physics***
9. ***Plasma physics***

Relation of physics to other subjects

Since physics enables us to understand basic components of matter and their mutual interactions it forms the base of natural science. Biology and chemistry borrow from physics in explaining processes occurring in living things and organisms. Physics also provides techniques which are applied almost every area of pure and applied science i.e. meteorology, astronomy etc.

Career opportunities in physics

1. **Engineering** – *civil*
    - *Electrical*
    - *Mechanical*
    - *Agricultural*
    - *Environmental*
    - *Chemical*
    - *Computer*
2. **Meteorology**
3. **Surveying**
4. **Geology**
5. **Astronomy**

   ***NOTE**: - all science based careers i.e. doctors, nurses, technologists, engineers, pharmacists etc. need physics as a true foundation.*

Basic laboratory safety rules

1. Proper dressing must be observed, no loose clothing, hair and closed shoes must be worn.
2. Identify the location of electricity switches, fire-fighting equipment, first aid kit, gas and water supply systems.
3. Keep all windows open whenever working in the laboratory.
4. Follow all instructions carefully and never attempt anything in doubt.
5. No eating or drinking allowed in the laboratory.
6. Ensure that all electrical switches, gas and water taps are turned off when not in use.
7. Keep floors and working surfaces dry. Any spillage must be wiped off immediately.
8. All apparatus must be cleaned and returned in the correct location of storage after use.
9. Hands must be washed before leaving the laboratory.
10. Any accidents must be reported to the teacher immediately.