PHYSICAL WORLD

Important Points:

1. Science is exploring, experimenting and predicting from what we see around us.
2. The word Physics comes from a Greek word ***physis*** meaning nature.
3. **Gravitational Force:**

   a) The gravitational force is the mutual force of attraction between any two objects by virtue of their masses. It is a universal force.

   b) It plays an important role in the formation and evolution of stars, galaxies and galactic clusters.
4. **Electromagnetic Force:**

   a) For a fixed distance, electromagnetic force between protons is 10^{36} times the gravitational force between them.

   b) Electromagnetic force is the base for the structure of atoms and molecules.

   c) Gravity is always attractive, while electromagnetic force may be attractive or repulsive.
5. **Strong Nuclear Force:**

   a) The strong nuclear force binds protons and neutrons in a nucleus.

   b) This is strongest of all fundamental forces and about 100 times stronger than electromagnetic force.

   c) It is charge independent and acts equally between Proton - Proton, Neutron - Neutron, and

   Proton -Neutron.

   d) Its range is very small (10^{-15}m).

   e) It is responsible for the stability of nuclei.
6. **Weak Nuclear Force:**

   a) This force appears only in certain nuclear processes such as the $\beta-$decay.

b) These are weaker than the strong nuclear and electromagnetic forces, but stronger than gravitational forces.

c) Their range is very small (10^{-16} m).

7. The Raman Effect deals with scattering of light by molecules of a medium when they are excited to vibration energy levels.
8. According to Bose-Einstein statistics a gas of molecule below a certain temperature undergoes a phase transition to a state where a large fraction of atoms populate the same lowest energy state.

Very Short Answer Questions

1. What is physics?

A. Physics is the study of basic laws of nature and their manifestation in different natural phenomenon.

2. What is the discovery of C.V. Raman?

A: C.V. Raman discovered Raman Effect. It deals with scattering of light by molecules of a medium when they are excited to vibrational energy levels.

3. What are the fundamental forces in Nature?

A: 1) Gravitational Force 2) Electromagnetic Force

3) Strong Nuclear Force and 4) Weak Nuclear Force

4. Which of the following has Symmetry?

(a) Acceleration due to Gravity (b) Law of Gravitation

A: Law of Gravitation.

5. What is the contribution of S. Chandrasekhar to Physics?

A: Chandrasekhar limit. He worked on structure and evolution of stars.