

**KENDRIYA VIDYALAYA SANGATHAN****ZIET, BHUBANESWAR****STUDY MATERIAL FOR CLASS XI SUBJECT : PHYSICS****CHAPTER -I****PHYSICAL WORLD****MAIN POINTS**

- Physics deals with the study of the basic laws of nature and their manifestation in different phenomena. The basic laws of physics are universal and apply in widely different contexts and conditions.
- The scope of physics is wide, covering a tremendous range of magnitude of physical quantities.
- Physics and technology are related to each other. Sometimes technology gives rise to new physics at other times physics generates new technology. Both have direct impact on society.
- There are four fundamental forces in nature that govern the diverse phenomena of the macroscopic and the microscopic world. These are the 'gravitational force', the electromagnetic force', 'the strong nuclear force', and the weak nuclear force'
- The physical quantities that remain unchanged in a process are called conserved quantities. Some of the general conservation laws in nature include the law of conservation of mass, energy, linear momentum, angular momentum, charge, parity, etc.
- Conservation laws have a deep connection with symmetries of nature. symmetries of space and time, and other types of symmetries play a central role in modern theories of fundamental forces in nature.
- Gravitational force is the force of mutual attraction between any two objects by virtue of their masses. It is always attractive
- Electromagnetic Force is the force between charged particles. It acts over large distances and does not need any intervening medium. Enormously strong compared to gravity. It can be attractive or repulsive.
- Strong nuclear force is the force that binds the nucleons together. It is the strongest of all the fundamental forces. It is charge independent. And very short range.
- Weak nuclear force appears only in certain nuclear processes such as  $\beta$ -decay. Weak nuclear force is not as weak as the gravitational force.
- In a chemical reaction if the total binding energy of the reacting molecules is less than that of the product molecules the difference appears as heat and the reaction is exothermic
- In a chemical reaction if the total binding energy of the reacting molecules is more than that of the product molecules the difference amount of energy is absorbed and the reaction is endothermic.
- In a nuclear process mass gets converted into energy. This is the energy which gets released in a nuclear power generation and nuclear explosions.