

CBSE Test Paper 05
Chapter 1 Physical World

1. Newtonian mechanics could not explain
 - a. flight of rockets
 - b. fall of bodies on earth
 - c. Some of the most basic features of atomic phenomena.
 - d. movement of planets
2. Classical Physics deals mainly with
 - a. transport phenomena
 - b. macroscopic phenomena
 - c. microscopic phenomena
 - d. surface phenomena
3. The major contribution of C.V. Raman was
 - a. Measurement of electronic charge
 - b. Inelastic scattering of light by molecules
 - c. model of hydrogen atom
 - d. Nuclear model of atom
4. Which of the following is a possible first step in applying the scientific method
 - a. Formulation of a question
 - b. Formulating a hypothesis
 - c. Conducting tests
 - d. Building a theory
5. Which of the following vectors are conserved for an isolated system?
 - a. The total linear momentum
 - b. The linear momentum of a particle
 - c. The force on a particle

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- d. The angular momentum of a particle
6. Which scientist received Nobel prize for his work on Molecular spectra?
7. What is unified field theory?
8. What is the range of weak nuclear force?
9. Are laws of nature same everywhere in the universe or different in different parts?
Give an example.
10. Is physics more of a philosophy or more of a mathematical science?
11. Name three important discoveries of physics, which have revolutionized modern chemistry.
12. Out of the four fundamental forces, which force is weakest and which is strongest?
13. Attempt to formulate your 'moral' views on the practice of science. Imagine yourself stumbling upon a discovery, which has great academic interest but is certain to have nothing but dangerous Consequences for the human society. How, if at all, will you resolve your dilemma?
14. Usha and Ritu are two sisters. Usha wants to explain some technologies to Ritu. Initially Ritu did not show any interest in knowing about the technologies. But Usha explained about the uses and application of some important discoveries.
- What values are displayed by Usha?
 - Name some technologies and related principles.
 - U.S.A.
 - U.K
 - India
 - Pakistan
15. What are the main steps involved in a scientific method to understand a natural phenomenon?

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Answer

1. c. Some of the most basic features of atomic phenomena.

Explanation: When science progressed into the realm of the microscopic, of dimensions the size of an atom, i.e. less than a nanometer, it was observed that newtonian mechanics and classical electrodynamics were in contradiction with experiments, could not explain them.

At the microscopic level, forces don't have a meaning, because nothing touches directly anything else. There are intermediate force carriers of what is perceived as "force" macroscopically.

2. b. macroscopic phenomena

Explanation: Classical physics is the study of motion, projectiles, pulleys, and the planets. It mainly deals with the movement of large objects (macroscopic) through space at a relatively low slow speeds.

Classical physics deals with the mechanics of an object's motion in response to a force. Because of this, classical physics is often referred to simply as mechanics or kinematics.

3. b. Inelastic scattering of light by molecules

Explanation: The Indian physicist C.V. Raman helped the growth of science in his country. He received the Nobel Prize for Physics in 1930 for the discovery that when light passes through a transparent material, some of the light changes in wavelength. This phenomenon is now called Raman scattering.

4. a. Formulation of a question

Explanation: The scientific method starts when you ask a question about something that you observe: How, What, When, Who, Which, Why, or Where? For a science fair project some teachers require that the question be something you can measure, preferably with a number. Add image of question 16686

5. a. The total linear momentum

Explanation: The rate of change of the total momentum of a system does not change, meaning this quantity is constant, and proving the principle of the conservation of linear momentum: When there is no net external force acting on a system of particles the total momentum of the system is conserved.

6. C.V. Raman (the great Indian Scientist) received Nobel Prize for his work on molecular spectra.
7. The theory with which scientists try to unify all forces is called unified field theory.
8. Weak nuclear force (also known as weak interaction) is of the order of 10^{-18} m.
9. Laws of nature are same everywhere in the whole universe. For example, the Newton's law of universal gravitation is true in whole universe i.e. on our Earth, on Moon, in our galaxy as well as also in other galaxies.
10. Physics is not a purely abstract science devoid of philosophy. Institution and philosophy have provided back bone to physics. Physicists are natural philosophers and Einstein is an example to quote.
11. Three important discoveries of physics, which have revolutionized modern chemistry, are:
 - (i) study of radioactivity
 - (ii) quantum theory
 - (iii) study of isotopes and determination of their masses by mass spectrographs.
12. Weakest force - Gravitational force Strongest force - Strong nuclear force.
13. A scientist aims at truth. A scientific discovery reveals a truth of nature. So, any discovery, good or bad for mankind, must be made public. A discovery which appears dangerous today may become useful to the mankind some time later. In order to prevent misuse of scientific technology, we must build up a strong public opinion. Scientists should in fact take up two roles - to discover truth and to prevent its misuse.
14. i. The values displayed by Usha are: dedicated, intelligence, helping nature and awareness.

ii. Technology: Principle

- A. Aeroplane: Bernoulli's theorem
- B. Rocket propulsion: Newton's second and third law of motion
- C. Nuclear reactor: Nuclear fission
- D. Optical fibers: Total internal reflection of light

15. For understanding a natural phenomenon, the following interconnected steps are involved in any scientific method:

- i. Systematic observations
- ii. Controlled experiments
- iii. Qualitative and quantitative reasoning
- iv. Mathematical modelling
- v. Prediction
- vi. Verification or falsification of theory