**CBSE test Paper 04**

**Chapter 1 Physical World**

1. “It is more important to have beauty in the equations of physics than to have them agree with experiments.” The great British physicist P. A. M. Dirac held this view. Which of the following goes against this view?

    a. Beauty appeal emotionally
    b. “Beauty lies in the eyes of the beholder” whereas science aims for objectivity
    c. A thing of Beauty is a joy forever
    d. A beauty appeals to the majority

2. Visible goods are recorded in this part of balance of payments account:

    a. Official account
    b. Current account
    c. Govt. account
    d. Capital account

3. The fundamental force with the shortest range is

    a. Weak Nuclear Force
    b. Electromagnetic Force
    c. Strong Nuclear Force
    d. Gravitational Force

4. Just as a new experiment may suggest an alternative theoretical model, a theoretical advance may suggest what to look for in some for in some experiments. Which of the following experiments can be considered to support this claim?

    a. scattering of alpha particle or the gold foil experiment
    b. Davisson and Germer Experiment
    c. Michelson Morley experiment
    d. experimental discovery of positron

5. The sun releases energy coming from

a. electromagnetic waves
b. gravitational forces
c. weak electrical forces
d. strong nuclear forces

6. Can gravitational force exist without any physical contact between acting bodies?
7. How much stronger nuclear force is compared to electromagnetic force?
8. In a macroscopic level of Physics, gravitational force is dominant as compared to the electromagnetic force, why?
9. Name the scientist and the country of his origin whose field of work was 'cosmic rays'.
10. Name three important discoveries of physics, which have contributed a lot in development of biological sciences.
11. Why do we call physics an exact science?
12. What do you understand by the term scientific method?
13. It is often said that the world is witnessing now a second industrial revolution, which will transform the society as radically as did the first. List some key contemporary areas of science and technology, which are responsible for this revolution.
14. Write in about 100 words a fiction piece based on your speculation on the science and technology of the twenty-second century.
15. “Every great physical theory starts as a heresy and ends as a dogma”. Give some examples from the history of science of the validity of this incisive remark.

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**Answer**

1. b. "Beauty lies in the eyes of the beholder" whereas science aims for objectivity
   **Explanation:** Beauty is something that someone need to feel. If you think good then your views about anything ll be good. So the beauty of something depend on which type of eyes/views/thought he/she had. But science is understanding the nature.

2. b. Current account
   **Explanation:** Current account

3. a. Weak Nuclear Force
   **Explanation:** There are four fundamental forces in nature which are Gravitational force, Strong force, Weak force and Electromagnetic force.
   **Gravitational Force:** This force is the weakest but has an infinite range.
   **Strong Nuclear force:** This force holds the nucleus of an atom together. It is the strongest of the forces. It acts over a range of about $10^{-15m}$.
   **Weak Nuclear Force:** This force is weak compared to the strong force as the name implies and has the shortest
   range of $10^{-18m}$
   **Electromagnetic Force**: This is the second strongest force after the strong force and it acts on electrically charged particles. It has strength of 1/137 relative to the strong force but has an infinite range.

4. d. experimental discovery of positron
   **Explanation:** Yes, urgently Without an extended evolutionary framework, the theory neglects key processes, say Kevin Laland and colleagues. Charles Darwin conceived of evolution by natural selection without knowing that genes exist. Now mainstream evolutionary theory has come to focus almost exclusively on genetic inheritance and processes that change gene frequencies.
   Carl David Anderson discovered the positron on August 2, 1932, for which he

won the Nobel Prize for Physics in 1936. ... The positron was the first evidence of antimatter and was discovered when Anderson allowed cosmic rays to pass through a cloud chamber and a lead plate.

5. d. strong nuclear forces
   **Explanation:** In addition to intense heat, there is an incredible amount of pressure at the Sun's core. In fact, the vast amounts of hydrogen atoms in the Sun's core are compressed and heated so much that they fuse together.
   This reaction, known as nuclear fusion, converts hydrogen atoms into helium.
   The by-product of nuclear fusion in the Sun's core is a massive volume of energy that gets released and radiates outward toward the surface of the Sun and then into the solar system beyond it.

6. Yes, a gravitational force exists without any physical contact between acting bodies because, gravity is a fundamental force of the nature which works between any two bodies in the universe without physical contact.

7. The strong nuclear force is 100 times ($10^2$ times) stronger than electromagnetic force.

8. Gravitational forces are dominant as compared to the electromagnetic force because atoms of matter are electrically neutral because their nuclei contain the same number of protons as there are electrons surrounding the nuclei.

9. Hess, Austria

10. The most important discoveries of physics, which have contributed in development of biology are:

    i. Ultrasonic waves.
    ii. X-rays and neutron diffraction technique.
    iii. Electron microscope
    iv. Radio isotopes

11. The physics is called an exact science because it is based on measurement of fundamental quantities.

12. The systematic observations, reasoning, mathematical modeling and theoretical

prediction form the scientific method.

13. Some key contemporary areas of science and technology, which are chiefly responsible for
a new industrial revolution taking place now and likely to take place in near future are:

    i. Design of super-fast computers.
    ii. Biotechnology.
    iii. Developments in the field of space sciences.
    iv. Development of super-conducting materials at room temperature.
    v. Advancements in the field of electronics, information technology and nanotechnology.

14. i. The development on the front of genetic engineering and biotechnology will include:
        a. Production of man, animals and plants with specific characteristics.
        b. High yielding variety of plants and specific crops would be sown.
    ii. Multiple use of laser in various fields or even more developed device which will transform the world. Man would treat himself as the king of universe.
    iii. Man may travel in space with unthinkable speeds and transportation would be totally revolutionized.
    iv. Man would travel deeper into the space and may settle on other planets, befriend strange creatures from other worlds or may wage a war with them.
    v. In the field of communication, 22 $^{nd}$ century has many surprises in store. Two persons sitting on the globe or on moon would talk on phone face to face.
    vi. Man may partially conquer diseases and slow down ageing.

15. The statement above is true. The validity of this incisive remark can be validated from the example of the moment of inertia. It states that the moment of inertia of a body depends on its energy. But according to Einstein's mass-energy relation ($E = MC^2$), energy depends on the speed of the body. Another example is that geocentric theory of copernicus started as heresy but it ended as a dogma when his theory was explained by Tycho Brahe and Johannes Kepler later on.