



PHYSICS OF CLASS XI

CHAPTER – 1 PHYSICAL WORLD

Q.1. Who gave general theory of relativity?

Ans. Albert Einstein gave the general theory of relativity.

Q.2. Is gravitational force is universal?

Ans. Yes, gravitational force is universal.

Q.3. How a strong nuclear force is stronger comparing to electromagnetic force?

Ans. A strong nuclear force is 100 times stronger than the electromagnetic force in strength.

Q.4. Is strong nuclear force charge dependent?

Ans. Strong nuclear force is not charge dependent.

Q.5. What is the range of weak nuclear force?

Ans. The range of weak nuclear force is of order of 10^{-16} m.

Q.6. Give an example of achievement in unification.

Ans. Unified celestial and terrestrial mechanics showed that the same laws of motion and the law of gravitational apply to both the domains.

Q.7. Give an example of conservation law of energy.

Ans. A freely falling body under gravity is an example of conservation law of energy.

Q.8. It is more important to have beauty in the equations of physics than to have them agree with experiments". The great British physicist PAM Dirac held

this view. Criticize this statement. Look out for some equations and results in this book which strike you as beautiful.

Ans. The statement of great British physicist PAM Dirac is partially true.

e.g., $F = m a$, $E = mc^2$ are some of the simple and beautiful equations of physics which have universal application.

However, this is not the case always. The equations involved in general theory of relativity and some of the latest work of higher physics are neither simple nor beautiful. They are rather difficult to understand.

Q.9. Why do we express laws of physics in mathematical form?

Ans. The laws of physics are generally expressed as mathematical equations which are then used to make predictions about other phenomena. When a physics law is expressed in mathematical form, it is preferable to the qualitative statement. Moreover, mathematical form permits us to verify the various experimentally.

Q.10. Though India now has a large base in science and technology which is just expanding, It is still a long way for realizing its potential for becoming a world leader in science. Name some important factors, which in your view hindered the advancement of science in India.

Ans. Few important factors which have hindered the advancement of science in India are given below

- (i) Poverty, due to which there is lack of resources and infrastructure.
- (ii) Poor management of science education.

- (iii) Lack of scientific planning.
- (iv) No coordination between researchers and industrialists.

Q.11. No Physicist has ever 'seen' an 'electron'. Yet all Physicists believe in the existence of electrons. An intelligent but superstitious man advances this analogy to argue that 'ghosts' exists even though no one has seen one. How will you refute his argument ?

Ans. It is true that no Physicist has ever seen an electron but several phenomena taking place in our daily life give us evidence of the existence of the electron such as frictional electricity.

On the other hand, no one has ever seen ghosts but there is no phenomena which can be explained on the basis of the existence of ghosts. Therefore, there is no comparison between two cases.

Q.12. The industrial revolution in England and Western Europe more than centuries ago was triggered by some key scientific and technological advances. What were these advances?

Ans. The industrial revolution in England and Western Europe more than two centuries ago was triggered by some key scientific and technological advances. Few of which are given below

- (i) Discovery of electricity
- (ii) Invention of powerloom, safety lamp, cotton gin, steam engine, etc.



Q.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.

Ans. Some of the key areas which will transform radically the present society are given below

- (i) Discovery of laser will bring a revolution in the field of communication as a laser beam can transmit thousands of signals simultaneously. It can be used in bloodless surgery in curing eye tumours etc.
- (ii) Development of superconducting materials at room temperature will bring a revolution in the field of supercomputers, electromagnets, transmission of electric power etc.
- (iii) Development of biotechnology
- (iv) Development of satellites.

Q.14. Write in about 1000 words a fiction piece based on your speculation on the science and technology of the twenty second century.

Ans. Imagin you alongwith your friends are in a spaceship which is moving towards Mars. The body of the spaceship is made of a specially designed matter which becomes more harder as its temperature increases. Spaceship is using nuclear fuel and there are three nuclear power plants in spaceship. Two of them work alternatively and third is for emergency. The speed of the



spaceship is very high and all of you are very happy. The energy produced in power plants are converted into electric energy which runs the motors of the spaceship.

You alongwith your friends reach safely on Mars, collects data, takes photographs and then returns of the Earth. In return journey, the spaceship collides with an object in the space due to which two power plants stop to work. Now, only one power plant is working and due to overheating its efficiency is decreasing continuously. You and your friends try to reduce the temperature of the power plant by flowing air in the plant and try to repair the fuse of the other power plants. Finally, fuse of one other plant crosses the danger limit of an excess of temperature. Finally, you and your friends return safely on Earth.

Q.15. Attempt to formulate your moral views on the practice of science.

Imagine yourself stumbling upon a discovery, which has a great academic interest but in certain to have nothing but dangerous consequences for the human society. How, if at all, will you resolve your dilemma?

Ans. Science is a search of truth. Each discovery either it is good or bad for our society should be made public. The reason is that a discovery which appears bad or dangerous today for our society may be useful for us later on.

We should aware the public about misuse of discoveries and technologies. For example, nuclear fission led to generate electric power which is backbone of



the development of any country but it can be used in developing atom bomb also.

Q.16. India has had a long and unbroken tradition of great scholarship in mathematics, astronomy, linguistic, logic and ethics. Yet, in parallel with this, several superstitious and obscurantistic attitudes and practices flourished in our society and unfortunately continue even today among many educated people too. How will you use your knowledge of science to develop strategies to counter these attitudes?

Ans. Illogical practices, superstitious attitudes which are still flourishing in our society can be removed only by educating the society.

Mass media like radio, TV, newspaper, magazines etc can play a vital role in it. Programme should be framed to target these illogical practices.

Q.16. Through the law gives women equal status in India, many people hold unscientific views on a woman's innate nature, capacity and intelligence and in practice give them a secondary status and role.

Demolish this view using scientific arguments and by quoting examples of great women in science and other spheres and persuade yourself and others that given equal opportunity, women are on par with men.

Ans. There is no difference in the capacity of the woman in taking good and quick decisions, in doing hard work and intelligence.

The development of human brain depends on the nutrition contents of prenatal and postnatal diet and it does not depend on the gender. Anything



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which can be achieved by a man can also be achieved by a woman. In every field of life, woman has proved herself. Madam Curie, a Physicist, won Nobel prize.

Mother Teresa was a great saint, Kalpana Chawala an astrologer, Mrs. Indira Gandhi, Margret Thacher, Lata Mangeskar etc., are well known personalities in different fields. Therefore, the women should be given equal opportunity on par with men.

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