

QB365

Important Questions - Physical World

11th Standard CBSE

Physics

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) Why do we call Physics an exact Science? 1
- 2) Give two approaches to study Physics. 1
- 3) Name two major groups of Physics. 1
- 4) Which group of Physics has recently come into existence? 1
- 5) Quantitative measurement plays major role in Physics, why? 1
- 6) Name the scientific principle behind the technology, 'nuclear reactor'. 1
- 7) Give one major discovery resulted due to basic laws of electricity and magnetism. 1
- 8) Can gravitational force exist without any physical contact between acting bodies? 1
- 9) In macroscopic level of Physics, gravitational force is dominant as compared to electromagnetic force, why? 1
- 10) How much stronger nuclear force is compared to electromagnetic force? 1

Section-B

- 11) Is strong nuclear force, charge dependent? 2
- 12) Some of the most profound statements on the nature of science have come from Albert Einstein, one of the greatest scientists of all time. What do you think did Einstein mean when he said, "The most incomprehensible thing about the world is that it is comprehensible"? 2
- 13) 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. 2
- 14) Politics is the art of possible. Similarly, Science is the art of the soluble. Explain this beautiful aphorism on the nature and practice of science. 2
- 15) "It is more important to have beauty in the equation 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 result in this book which strike you as beautiful. 2
- 16) Though India now has a large base in science and technology which is fast 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 have hindered the advancement of science in India. 2
- 17) No physicist has ever 'seen' an 'electron'. Yet all Physicists believe in the existence of electron. An intelligent but superstitious man advances this analogy to argue that 'ghosts' exist even though no one has seen one. How will you refute his argument? 2
- 18) The industrial revolution in England and Western Europe more than two centuries ago was triggered by some key scientific and technological advances. What were these advances? 2

- 19) 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. 2
- 20) Write in about 1000 words, a fiction piece based on your speculation on the science and technology of the twenty second century. 2

Section-C

- 21) Attempt to formulate your moral views on the practice of Science. Imagine yourself stumbling upon a discovery, which has a 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? 5
- 22) India has had a long and unbroken tradition of great scholarship in Mathematics, astronomy, linguistics, 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? 5
- 23) Though 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. 5
- 24) Science, like any knowledge, can be put to good or bad use, depending on the user. Given below are some of the application of science. Formulate your views on whether the particular application is good, bad or something that cannot be so clearly categorized. 5
- (i) Mass vaccination against small pox to curb and finally eradicate this disease from the population.
 - (ii) Television for eradication of illiteracy and for mass communication for news and ideas.
 - (iii) Prenatal sex determination.
 - (iv) Computers for increase in work efficiency.
 - (v) Putting artificial satellites around the earth.
 - (vi) Development of nuclear weapons.
 - (vii) Development of new and powerful techniques of chemical and biological warfare.
 - (viii) Purification of water for drinking.
 - (ix) Plastic surgery.
 - (x) Cloning.

Section-A

- 1) Most of measurement in physics are made with high precise and accuracy, so it is called exact Science. 1
- 2) Two approaches to study Physics are unification and reduction. 1
- 3) The two major groups of physics are microscopic group and macroscopic group. 1
- 4) An intermediate group of Physics namely mesoscopic Physics has recently came into existance. 1

- 5) 1
Quantitative measurement plays major role in Physics, because all the laws of nature are better expressed in the form of mathematical equation.
- 6) Controlled nuclear fission is the scientific principle behind the technology of steam engine. 1
- 7) Wireless communication technology was a major discovery due to laws of electricity and magnetism. 1
- 8) Yes, gravitational force exist without any physical contact between acting bodies. 1
- 9) 1
Because, matter as a whole is electrically neutral due to presence of both negative and positive charge in equal quantity.
- 10) A strong nuclear force is 100 times stronger than the electromagnetic force in strength. 1

Section-B

- 11) Strong nuclear force is not charge dependent. 2
- 12) 2
The physical world, when seen by a layman, presents us with such a wide diversity of things. It seems incomprehensible, i.e. as if it cannot be understood.
On study and analysis, the scientists find that the physical phenomena from atomic to astronomical ranges can be understood in terms of only a few basic concepts, i.e. the physical world becomes comprehensible. This is what is meant by Einstein's statement made above.
- 13) 2
The statement is true, e.g. in ancient times, **Ptolemy** postulated that earth is stationary and all the heavenly bodies like sun, stars, planets etc., revolve around earth. Later, an Italian scientist, Galileo postulated that sun is stationary and earth along with other planets is revolving around the sun. Galileo was punished by the authorities for spreading wrong concepts. However, later on. Newton and Kepler supported Galileo's theory and now it is no more than a dogma.
- 14) 2
It is well known that to win over votes, politicians would make anything and everything possible even when they are least sure of the same. That is why, we say that politics is the art of possible.
The statement that science is the art of the soluble implies that a wide variety of physical phenomena are understood in terms of only a few basic concepts, i.e. there appears to be unity in diversity as if widely different phenomena are soluble in a few theories and can be explained in terms of only a few fundamental laws.
- 15) 2
The statement of great British physicist PAM Dirac is partially true.
e.g. $F = ma$, $E = mc^2$ 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 simple nor beautiful. They are rather difficult to understand.

- 16) Few important factors which have hindered the advancement of science in India are given below 2
- (i) Poverty, due to which there is a lack of resources and infrastructure
 - (ii) Poor management of science education
 - (iii) Lack of scientific planning
 - (iv) No coordination between researchers and industrialists
- 17) 2
- 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.
- 18) 2
- The industrial revolution in England and Western Europe more than two centuries ago was triggered by some key scientific and technological advances.
- A few of which are given below
- (i) Discovery of electricity
 - (ii) Invention of powerloom, safety lamp, cotton gin, steam engine, etc.
- 19) 2
- 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.
- 20) 2
- Imagine you alongwith your friends are in a spaceship which is moving towards Mars. The body of the speceship is made of a specially designed matter which become more harder as its temperature increases. 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 to the Earth. In return journey is working and due to overheating. its efficiency is decreasing continuously.
- You and your friends try to reduce the temperature of the plant and try to repair the fuse of the other power plants. Finally, fuse of one other plant is repaired and start to work before the first plant crosses the danger limit of an excess of temperature. Finally, you and your friends return safely on Earth.

Section-C

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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 make public aware about misuse of discoveries and technologies. e.g., nuclear fission can be used in developing atom bomb also.

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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, magazine etc, can play a vital role in it. Programmes should be framed to target these illogical practices

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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 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 astronomer, Mrs. Indira Gandhi, Marget Thacher, Lata Mangeskar etc., are well known personalities in different fields. Therefore, the woman should be given equal opportunity at par with men.

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(i) Mass vaccination is good as, it is used to make the society free from the diseases like small pox.

(ii) Television for eradication of illiteracy and for mass communication of news and ideas is good as, it is a medium which is easily within the reach of common man and also they are very habitual to it.

(iii) Prenatal sex determination is bad because people are misusing it. Some of the people after determination of sex of child, think to abort. They do it especially with girl child.

(iv) Computer for increase in work efficiency is good as using the computer, a man can do much more work with greater efficiency and accuracy.

(v) Putting artificial satellite into orbits around the Earth is good for development as these satellites serve many purpose like remote sensing, weather forecasting.

(vi) Development of nuclear weapons is bad as they can be used in mass destruction.

(vii) Development of new and powerful tool of chemical and biological warfare are bad, as they can also be used for mass destruction.

(viii) Purification of water for drinking purpose is good as we can save ourself from the diseases which we can have due to drinking of the water.

(ix) Plastic surgery is good as with the help of it a man or women can remove the skin defects occurring due to accident or some other reasons. It has some bad effects too but they are not very considerable.

(x) Cloning is good as far as animals are concerned. With the help of it, we can develop some species of animals which can be used to serve some specific purpose. But it is not good for human beings.