Short Answer Type Questions-II

Q.1. Define Biophysics.

Ans. It is defined as the understanding of biological processes based upon the principles of physics.

For example:

(i) Spectroscopic techniques are used to study the constitution of biological molecules and disorder in them.

(ii) Laws of thermodynamics are used to explain various biological activities of predators and also the activities of molecules.

Q.2. What is understood by unification and reduction in physics?

Ans. Unifications: It is a trial to correlate and unite various universal laws and basic phenomena of nature to explain an activity.

For example – Maxwell unified electric, magnetic and optical phenomenon when he explained that light is an electromagnetic wave.

Reduction: It is the effort to solve a complex problem by breaking it into simpler parts. It is considered as the heart of physics.

For example - temperature of a system is reduced to average kinetic energy.

Q.3. Who invented : (i) Computer, (ii) Transistor, (iii) Electric bulb and Telegraphy, (iv) Radar, (v) Wireless telegraphy (vi) Telephone?

Ans. (i) Charles Babbage, (ii) J. Bardeen, (iii) A. Edison, (iv) Apleton, (v) Marconi, (vi) Graham Bell.

Q.4. Name the theories given by the following : (i) Neil Bohr, (ii) Lawrence, (iii) Henry Bacquerel, (iv) Galileo, (v) Bragg, (vi) Aldus Salam.

Ans. (i) Theory of atomic structure, (ii) Cyclotron, (iii) Natural radioactivity, (iv) Principle of inertia, (v) Crystal structure by X-rays, (vi) Unified field theory.

Q.5. Given the nationality of the following scientists: (i) Vander Waals, (ii) Curie, (iii) Yukawa, (iv) Galileo, (v) Michelson, (vi) Heisenberg.

Ans. (i) Dutch, (ii) France, (iii) Japan, (iv) Italy, (v) U.S.A., (vi) Germany.

Q.6. Name some famous Indian physicists and mention their discoveries.

Ans. (i) S.N. Bose – Quantum statistics.

(ii) C.V. Raman – Scattering of light molecules.

(iii) H. J. Bhabha – Cosmic radiation.

(iv) S. Chandra Shekhar – Evolution of stars.

(v) M.N. Saha – Thermal ionication.

Q.7. What is the relation between physics and technology?

Ans. Broadly speaking, physics and technology both constitute science. Physics is the heart and technology is the body of science. The application of the principles of physics for practical purposes becomes technology, e.g.,

(i) Aeroplanes fly on the basis of Bernoulli's theorem.

(ii) Rocket propulsion is based on Newton's second and third laws of motion.

(iii) Generation of power from nuclear reactor is based on the phenomena of controlled nuclear fission.

(iv) Lasers are based on the population inversion of electrons and so on.

Thus, we can say that technology is applied physics.

Q.8. What is the relation between physics and society?

Ans. Most of the development made in physics have a direct impact on society, e.g.,

(i) Exploration of new sources of energy is of great importance to the society.

(ii) Rapid means of transport are no less important for the society.

(iii) The society has been enriched due to the advance in electronic lasers and computers.

(iv)Development of T.V., radio, satellites, telephone, telegraph have revolutionized the means of communications which have a direct impact on society and so on

Q.9. Name a few aspects of your daily life in which you rely on simplicity of nature.

Ans. Law of physics represent the nature in simplest form. We face nature in many ways in our daily life. For example – We work, walk, write, talk and stand on our feet and so on.

The natural way of taking bat, chewing food etc. can be easily understood in forms of simple laws of science.

Even though the action like swimming, running and playing may be complex but the underlying law of nature are quite simple such as Newton's law, friction etc.

Q.10. In science, sometimes we observe certain phenomenon experimentally but are unable to find a logical equation or theory for that. Sometimes it also happen that we have a scientific theory supported by mathematical formulation yet are unable to test it supported by mathematical formulation site one such example.

Ans. Einstein worked to establish a relation between the energy and mass of body. He was of the view that these are the two sides of the same coin or two facts of the simple physical quantity. He succeeded when the gave his mas energy equation $E = mc^2$. But its experimental verification came 40 year later in 1945 when atomic bomb was exploded over japan.

Q.11. How science helped in solving the food problem in several countries?

Ans. Science has helped in solving food problems in the following ways:

(i) It has introduced new agriculture implement.

(ii) Science has improved the quality of seeds by genetic engineering.

(iii) High yielding hybrid variety of grains have been developed. Some easily reaping varieties have also been developed and grown.

(iv) Use of pesticides and insecticides have saved crop from being destroyed by the insects and pests.

(v) Some new type of crops are also developed and are being developed to meet the requirement of the society.

Q.12. What is scientific temperament and scientific way of doing the things?

Ans. A mind set moulded in a particular set of thinking and is known as scientific temperature. It is not only based on logic and facts but also on reliable observations.

The ultimate test of truth in science is the experimental verification. A scientific way of doing things involve the following steps:

(i) Identifying the problem or aim.

(ii) Collecting all relevant information or data related to the problem.

(iii) Hypothesizing or proposing a possible theory.

Q.13. List various laws of conservation of quantities.

Ans. Some important laws of conservation are given below:

(i) Conservation of energy

- (ii) Conservations of mass
- (iii) Conservation of momentum
- (iv) Conservation of angular momentum
- (v) Conservation of charge