

Physics - 12th Class Physics Chapter 10 Short Questions Preparation

Q1. What are isotopes? What do they have in common and what are their differences?

Ans 1: Isotopes are such nuclei of an element that have the same charge number Z but have different mass number A . It means, in the nucleus the number of protons is the same but the number of neutrons is different.

Q2. Differentiate between parent and daughter element.

Ans 1: The change of an element into a new element due to emission of radiation is called radioactive decay. The original atom is called parent element and the element formed due to this decay is called daughter element.

Q3. Write names of hydrogen isotopes.

Ans 1: Three isotopes of hydrogen are:

1. Protium
2. Deuterium
3. Tritium

Q4. Define nuclear fission.

Ans 1: Such a reaction in which a heavy nucleus like that of uranium splits up into two nuclei of roughly equal size along with the emission of energy is called fission reaction.

Q5. Define Half life and discuss its dependence.

Ans 1: The half life $T_{1/2}$ of a radioactive element is that period in which half of the atom decays.

Dependence: The number of decaying atoms is proportional to the number of atoms present in the beginning of the period and is proportional to time interval.

Q6. Describe the principle of operation of solid state detector?

Ans 1: A solid state detector is a specially designed p-n junction operating under a reversed bias in which electron-hole pairs are produced by the incident radiation to cause a current pulse to flow through the external circuit.

Q7. How can radioactivity help in the treatment of cancer?

Ans 1: It helps in treatment of cancer:

1. Cobalt-60 is used in radiotherapy.

2. For skin cancer, phosphorus-32 or strontium-90 is used.
3. Radioactive iodine-131 is used to cure cancer of thyroid gland.

Q8. What are the relation between decay constant λ and the half-life of a radioactive element?

Ans 1: The relation between decay constant λ and the half life ($T_{1/2}$) is $\lambda T_{1/2} = 0.693$

Q9. What do you understand by "background radiation"? State two source of this radiation?

Ans 1: When no radioactive source is placed near the radiation detector, it records radiation, These radiations are called background radiations..

Its source are

1. Cosmic rays
2. presence of radioactive substance Earth crust and atmosphere.

Q10. Define Hadrons and Leptons.

Ans 1: Hadrons: These are not elementary particle, They are composed of other elementary particle called quarks. The example of hadrons are protons, neutrons, mesons etc, They experience strong nuclear force.

Leptons: They are elementary particles. They do not experience strong nuclear force, The example of leptons are electrons, muons and neutrinos etc.
