

Physics - 12th Class Physics Chapter 10 Short Questions Preparation

Q1. Briefly describe the term radiography.

Ans 1: The radiography is a technique used in medicine such as internal imaging of the brain to determine the size and location of the tumor precisely.

Q2. What are isotopes? What do you have in common?

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.

Q3. Which radiation does would deposit more energy to the body(a)10 m Gy to the hand (b)1m Gy dose to entire body.

Ans 1: Since

absorbed dose=D=energy/mass

energy=D * Mass

since the mass of whole body is much greater than mass of the hand, therefore 1 Gy dose given to the entire body deposit more energy.

Q4. 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.

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

Q5. Wh Geiger counter is not suitable for fast counting?

Ans 1: Geiger counter is not suitable for fast counting because of its longer dead time. The positive ions take several time as long to reach the outer cathode, because positive ions are very massive than the electrons. During this time further incoming particle can not be counted, This time is called as the dead time of counter which delays fast counting system.

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

Ans 1: The principle of operation of solid state detector is based upon the production of electron-hole pair to cause a pulse of current.

Q7. Define Half line and discuss its dependence.

Ans 1: The half line $T_{1/2}$ of a radioactive elements is that period in which half of the atom decay.

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.

Q8. Differentiate between controlled and uncontrolled reaction.

Ans 1: To maintain a sustained controlled nuclear reaction, for every 2 or 3 neutrons released , only one must be allowed to strike another uranium nucleus.it is called controlled chain reaction.

Ans 2: If more than one neutron produces further fission then it will grow uncontrolled and called uncontrolled chain reaction.

Q9. Discuss the advantages of fission power from point of view of safety, pollution and resources.

Ans 1: Advantage of nuclear power are given below

- 1. Nuclear fission energy, release a highly reduced amount of the gases into the air, resulting in a slower rate of global warming and pollution.
- 2. The energy is quick to create; meaning that they are able to make a large amount of some form of emergency required it.
- 3. Much more energy is produced.

Q10. Define half-line of radioactive element. How is it related with decay constant?

Ans 1: Half-line: $T_{1/2}$ is the period in which half of the atom of a radioactive element decay.

It is related with a decay constant by formula.

 $T_{1/2} = 0.693/\Lambda$