

Physics - ICS Part 2 Physics Chapter 21 Short Questions Preparation

Q1. How alpha and beta may ionize an atom without directly hitting the electrons?

Ans 1: As alpha and beta are electrically charged particles, so they can cause ionization without hitting an atom either by repelling the electron of target particle.

Q2. How energy released when 1 amu converted into energy?

Ans 1: $1 \text{ amu} = 1.66 \times 10^{-27} \text{ kg}$

the energy of 1 amu is $1 \text{ amu} = 1.494 \times 10^{-10} \text{ J}$

$1 \text{ amu} = 931 \text{ MeV}$

Q3. 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.

Q4. What is half life?

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

Q5. If you swallowed a alpha source and beta source, which would be more dangerous to you? Explain

Ans 1: As alpha particles have greater energy and ionizing power than beta particles, so alpha particles are more dangerous than beta particles.

Critical volume: The volume of critical mass is called critical volume.

Q6. 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.

Q7. Why are heavy nuclei unstable?

Ans 1: Heavy nuclei are unstable because their binding energy per nucleon is less than lighter nuclei. So less energy is required to break heavy nuclei and they become unstable.

Q8. 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.

Q9. What is radioactivity decay? Give an example.

Ans 1: The emission of radiations from elements having atomic number Z greater than 82 is called radioactivity or radioactive decay.
The emission of an α -particle from radium-226, results in the formation of radon gas.

Q10. Discuss the advantages of fission power from point of view of safety, pollution and resources.

Ans 1: Advantages of nuclear power are given below

1. Nuclear fission energy releases 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.