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 particle,so they can cause ionization without hitting an atom either by,repellings the electron of target particle.

Q2. What are isotopes?What do they have common and what are their difference.

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. 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.

Q4. Discuss the advantage and disadvantage of nuclear power compare to the use of fossil fuel generated power.

Ans 1: Advantage and disadvantage of nuclear power are given below compared to the use of fossil generated power.
Advantage:

1. Much more energy is produced.
2. Produces no environmental pollution.
3. Electricity produced in this way is far cheaper than fossil fuel generated power.

Disadvantage :

1. Uranium mining is more dangerous than coal mining.
2. Nuclear waster is very injurous and harmful to living things.
3. Nuclear waste can not be transported through area of population whereas fossil fuel can be.

Q5. What information if revealed by the length and shape of track of an incident particle in Wilson Cloud Chamber?

Ans 1: In a wilson cloud chamber

1. Alpha particle have larger mass and greater ionizing power so its path is straight.
2. Beta particle have less mass and less ionizing power,so its path is thinner shorter and discontinuous.
3. Gamma particle have no mass and high penetrating power,so its leaves no definite track along its path,

---

Q6. How energy released when 1 amu converted into energy?

Ans 1: 1 amu= 1.66 x10^{-27}kg

the energy of 1 amu is 1 amu =1.494 x10^{-10}J
1 amu= 931 MeV

Q7. What is radioactive tracer?Give its one application each in industry and medicine.

Ans 1: Radioactive tracer is a radioactive isotope which acts as an indicator or tracer that makes it possible to follow the course of a chemical or biological process.They are used in

1. Medicine to detect malignant tumors
2. Agriculture to study the uptake of a fertilizer by a plant.

Q8. What is the function of control rods in nuclear reactor?

Ans 1: Controls rods made of Cadmium or Boron are used for the control of number of neutrons,so that of all the neutrons produced in fission ,only one neutrons produces further fission reaction.
In case of emergency or for repair purpose control rods are used to stop the chain reaction and shut down the reactor.

Q9. Define mass defect and binding energy.

Ans 1: Mass defect: The mass of the nucleus is always less than the total mass of the protons and neutrons that make up the nucleus,The difference of the two masses is called mass defect.
Binding energy:The missing mass is converted into energy at the formation of the nucleus and is called binding energy.

Q10. If nucleus has a life of one year,does this mean that it will be completely decayed after two years?

Ans 1: No it will not decay completely after two years.
Numbers of atom at initial stage =N_o
number of atoms decayed after first year =1/2N_o
