

Physics - ICS Part 2 Physics Chapter 21 Short Questions Preparation

Q1. 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.

Q2. 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.

Q3. Protons and neutron are formed by what types of quarks?

Ans 1: Protons is formed by two up and one down quarks. Neutron is formed by two down and one up quarks.

Q4. Write names of hydrogen isotopes.

Ans 1: Three isotopes of hydrogen are:

1. Protium
2. Deuterium
3. Tritium

Q5. Describe a brief account of interaction of various types of radiations with matter.

Ans 1:

1. An α particle has well defined range in a medium, before coming to rest which is called range of α -particle.
2. It loses its energy due to excitation and ionization of atoms and molecules in matter.

Ans 2: β -particle:

1. The ionizing ability of β particles is about 100 times less than that of an α particle.
2. The range of β particle is 100 times more than that of an α -particle.

Q6. What is the function of control rods in nuclear reactor?

Ans 1: Control 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 neutron 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.

Q7. What is self-quenching in Geiger Muller Counter?

Ans 1: A small amount of gas is added into the GM counter is called self quenching or internal quenching, In GM counter the phenomena of quenching is to save the counter from spurious or false counts.

Q8. Define decay constant.

Ans 1: Decay constant of any element is to the fraction of the decaying atoms per unit time.

Q9. 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 $1 \text{ amu} = 1.494 \times 10^{-10} \text{ J}$

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

Q10. 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-9 is used.
 3. Radioactive iodine-131 is used to cure cancer of thyroid gland.
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