# Physics - 12th Class Physics Chapter 10 Short Questions Preparation

Q1. 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.

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Q2. 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.

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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.

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Q4. 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.

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Q5. What is radioactivity decay?Give an example.

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

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Q6. 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/Λ

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Q7. 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.

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Q8. 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.

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Q9. 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.

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Q10. 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.

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