

# Nuclear Physics Job Interview Questions And Answers



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## Nuclear Physics Interview Questions And Answers Guide.

### Question - 1:

What is nucleus?

#### Ans:

It is the part of an atom where whole mass of the atom is assumed to be concentrated. Or it is the central part of an atom which contains protons and neutrons.

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### Question - 2:

How is energy transformed in windmills?

#### Ans:

Essentially what happens is that as the energy from the wind rotates the vanes of the mill, coils of wire rotate inside a permanent magnet (generator) and produce electric voltage/current. This current is then sent onto the grid and used by us as electricity, another form of energy. This is a very simple explanation and there is a lot more in the design of the system.

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### Question - 3:

Name the woman scientist who has played the pivotal role in the development of missile technology of India and is nicknamed "Missile Woman"?

#### Ans:

Tessy Thomas

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### Question - 4:

In radioactive dating we use half-life to determine the age of a sample but not average life. Why?

#### Ans:

It is a quantitative measure in which we compare the quantity of a radioactive substance in the sample to that in the atmosphere/fresh substance.

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### Question - 5:

What is meant by the rest mass energy of an electron?

#### Ans:

According to Einstein's Theory of Relativity, the mass of a body (say a particle) depends on the energy and on the momentum (say the velocity) with which the particle moves. So, we have a problem: is there a mass value that every observer can relate to? Yes: is the rest mass, that is the mass you could measure in a frame of reference co-moving with the particle (in which the particle is still), that is the center-of-mass frame and that coincides with the minimum value measurable for every observer.

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**Question - 6:**

What is fusion?

**Ans:**

It is a nuclear reaction in which two nuclei combine to form a larger (with nearly combined mass) nuclei. It releases lot of energy. Sun and stars release energy in this fashion

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**Question - 7:**

What is the difference between cathode ray and beta ray?

**Ans:**

actually normal on the wave front called RAY, in the beta radiation there is wave packet and hence no wave front. in cathode ray there is electromagnetic radiation and we can use word ray but in the case of beta particle we use word beta radiation instead of betaray

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**Question - 8:**

Can an electron be obtained (or come out) from the nucleus?

**Ans:**

Yes, electron having an energy higher than the ordinary atomic electron may come out of the nucleus due to beta decay process. A negative beta is identical to an electron in all respect except with difference in kinetic energy.

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**Question - 9:**

Explain history of nuclear reaction?

**Ans:**

bigger nucleus broken to form two lighter nucleus and two or three neutrons is called nuclear fission used for making atom bomb  
two lighter nucleus joined to form bigger nucleus is called nuclear fusion used for making hydrogen bomb

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**Question - 10:**

What is Fission and Fusion?

**Ans:**

Fission: The breaking down of a Nucleus (not atom) into smaller nuclei. It is usually induced by a neutron.

For example, a Helium nucleus (called alpha particle) is divided into two  $4\text{He}(+2) \rightarrow 2\text{H}(+1) + 2\text{H}(+1)$

A lot of energy is released in the process.

Fusion: This happens when two nuclei combine to form a larger nucleus. Huge amount of energy is needed to start this. Because it's not easy to bring two positively charged nuclei closer.

When they combine, a huge amount of energy is released.

This usually happens in the stars.

The energy required to start the fusion comes from the gravitational force between the particles.

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**Question - 11:**

The velocity of a body was noted to be constant during five minutes of its motion. What was acceleration during this interval?

**Ans:**

since velocity of body remains constant during given time period, so diff. of velocity (constant) with respect to time will be ZERO.

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**Question - 12:**

Name any two elementary particles which have almost infinite life time?

**Ans:**



Electron and proton have almost infinite life time.

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**Question - 13:**

Cadmium rods are provided in a nuclear reactor. Why?

**Ans:**

cadmium rods are provided in nuclear reactors because when we start nuclear reactor then more energy is required for start the reactor, we can not start nuclear reactor with less energy, the rod is used specially for stopping contact of neutron particles with the system

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**Question - 14:**

What is the essential difference between an electron and a beta ray?

**Ans:**

The electron of nuclear origin is called a beta-particle. There is otherwise no difference between an electron and a beta-particle.

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**Question - 15:**

What holds nucleons together in a nucleus?

**Ans:**

Nuclear force. It is the nuclear force which binds the nucleons together and is responsible for the stability of nucleus.

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**Question - 16:**

Tell me Is it possible that a nucleus has negative mass defect?

**Ans:**

If the nucleus has had a mass defect it is likely that the strong force and the weak force have sustained a major reduction in equilibrium. This can cause the positive and negative charges to reverse and change energy levels. Such a phenomenon has been described by Einstein in his paper on the speed of light and time reduction. You can check this with the use of an electron microscope to determine if the color spectrum had changed drastically. If so, then you may have a problem.

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**Question - 17:**

Why is heavy water used as a moderator?

**Ans:**

Heavy water is water highly enriched in the hydrogen isotope deuterium. We can compare the neutron interactions with billiard ball collision, where a neutron collides with a nucleus of other atoms & loses energy. If the colliding nucleus size is small like a hydrogen nucleus, it will lose maximum energy. If the nucleus is heavy, the neutron hits the nucleus, just changes its direction but not that much change in the energy of the neutron. So we use heavy water as a moderator to slow down neutrons.

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**Question - 18:**

How are asteroids formed?

**Ans:**

Due to impact of planets, rocks are ejected into space and become asteroids. In some cases, the gaseous material and vapour produced in the supernova are coagulated in space and form asteroids.

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**Question - 19:**

What is  $E = mc^2$ ?



**Ans:**

this is mass-energy lesion

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