

Nuclear Energy Basics

Nuclear Energy · Answer Key · 20 Questions

1. Which subatomic particle is released during the fission of a Uranium-235 nucleus to trigger further fission events?

- A) Proton
- B) Neutron**
- C) Electron
- D) Positron

2. What is the primary fuel source used in most conventional nuclear power reactors?

- A) Coal
- B) Natural gas
- C) Uranium**
- D) Hydrogen

3. In a nuclear power plant, what is the main purpose of the control rods?

- A) To absorb neutrons and regulate the fission rate**
- B) To convert heat directly into electricity
- C) To cool the reactor core
- D) To store spent nuclear fuel

4. Which process involves the splitting of a heavy atomic nucleus into smaller nuclei?

- A) Nuclear fusion
- B) Nuclear fission**
- C) Radioactive decay
- D) Chemical combustion

5. What is the role of the moderator in a nuclear reactor?

- A) To increase the speed of neutrons
- B) To slow down neutrons to increase fission probability**
- C) To accelerate the flow of coolant
- D) To prevent the release of radiation

6. Which Australian state currently has legislation that prohibits the construction of nuclear power plants?

- A) Queensland
- B) New South Wales
- C) Victoria
- D) All of the above**

7. What form of energy is primarily used to drive the steam turbines in a nuclear power plant?

A) Thermal energy

B) Kinetic energy of alpha particles

C) Chemical potential energy

D) Magnetic energy

8. Which isotope of Uranium is the most commonly used fuel in nuclear reactors?

A) Uranium-238

B) Uranium-235

C) Uranium-234

D) Uranium-233

9. What is the name of the process that powers the Sun, involving the combination of light nuclei?

A) Nuclear fission

B) Nuclear fusion

C) Alpha decay

D) Beta decay

10. What does the acronym 'PWR' stand for in the context of nuclear reactor designs?

A) Power Water Reactor

B) Pressurized Water Reactor

C) Primary Waste Reactor

D) Proton Well Reactor

11. Which material is commonly used as a neutron moderator in nuclear reactors?

A) Lead

B) Graphite

C) Gold

D) Iron

12. Approximately what percentage of global electricity is generated by nuclear power?

A) 5%

B) 10%

C) 25%

D) 50%

13. What is the main byproduct of a nuclear power plant that requires long-term geological disposal?

- A) Carbon dioxide
- B) Spent nuclear fuel**
- C) Sulfur dioxide
- D) Methane

14. Which of these is a non-renewable energy source?

- A) Wind
- B) Solar
- C) Nuclear**
- D) Hydro

15. Where is the heat generated within a nuclear power plant?

- A) The turbine
- B) The cooling tower
- C) The reactor core**
- D) The transformer

16. What type of reaction maintains a steady supply of energy in a nuclear reactor?

- A) Chain reaction**
- B) Exothermic chemical reaction
- C) Combustion reaction
- D) Endothermic reaction

17. What is the function of the containment building in a nuclear power plant?

- A) To generate electricity
- B) To house the steam turbines
- C) To prevent the release of radioactive materials**
- D) To mine uranium ore

18. Which country is currently the world's largest producer of nuclear power by total volume?

- A) United States**
- B) France
- C) Japan
- D) China

19. Nuclear power plants are often located near large bodies of water primarily to:

- A) Provide a source of hydroelectricity
- B) Provide water for cooling the steam**
- C) Dissolve nuclear waste
- D) Extract minerals for fuel

20. What is the primary energy transformation that occurs in a nuclear reactor?

- A) Nuclear potential energy to thermal energy**
- B) Chemical energy to electrical energy
- C) Kinetic energy to nuclear energy
- D) Electrical energy to thermal energy