

Student: _____

1. The process by which large nuclei are split into smaller ones is called nuclear
 - A. Fission.
 - B. Fusion.
 - C. Breeding.
 - D. Cracking.
2. In current U.S. commercial nuclear reactors,
 - A. Energy is generated by fusion.
 - B. A controlled chain reaction is sustained.
 - C. The most abundant natural isotope of uranium is used.
 - D. All of the choices are correct.
3. About 95% of the uranium reserves around the world are found in
 - A. metamorphic and metasedimentary rocks.
 - B. igneous and metasedimentary rocks.
 - C. sedimentary and metamorphic rocks.
 - D. sedimentary and metasedimentary rocks.
4. The production of new fuel is maximized by
 - A. Initial reactor.
 - B. Fission reactor.
 - C. Fusion reactor.
 - D. Breeder reactor.
5. Currently, the nominal lifetime (time that plants may operate, before they must be dismantled) allowed for fission-type nuclear reactors in the United States is
 - A. About four years.
 - B. About forty years.
 - C. About one hundred years.
 - D. Nuclear reactors need not be retired, because new technology developments have demonstrated that they can be fixed.
6. Uranium is often concentrated naturally in granites and
 - A. Kimberlites.
 - B. Basalts.
 - C. Carbonates.
 - D. Bauxites.
7. A breeder reactor
 - A. Reprocesses spent fuel rods to extract plutonium.
 - B. Would be pollution-free, but the technology does not yet exist.
 - C. Converts more-common isotopes, such as uranium-238, to fissionable fuel during normal operation.
 - D. All of the choices are correct.
8. Plutonium is
 - A. Chemically toxic to humans.
 - B. Radioactive.
 - C. Fissionable.
 - D. All of the choices are correct.

9. Nuclear fusion reactors would
 - A. Be very inexpensive to build, once the technology is perfected.
 - B. Involve far fewer radiation hazards than fission reactors.
 - C. Require extremely rare elements as fuel, which is why none are currently in use.
 - D. Produce more nuclear fuel for future use as they operate.

10. In the United States, towards the end of the year 2008, there were this many nuclear power plants operating
 - A. About 1000.
 - B. A little over 100.
 - C. Fewer than 10.
 - D. None.

11. During mid-2009, nuclear fission power plants in the entire world numbered a little less than
 - A. 44.
 - B. 5,000.
 - C. 440.
 - D. 40,000.

12. "Cold fusion"
 - A. Is a very cheap and efficient way to carry out fusion reactions.
 - B. Involves using a rare isotope of uranium.
 - C. Has not been clearly demonstrated in the laboratory.
 - D. Can be used to produce fuel for future nuclear reactors.

13. The sun generates its tremendous energy output by
 - A. Nuclear fusion.
 - B. Nuclear fission.
 - C. Combustion.
 - D. Geothermal energy.

14. Generation of electricity using photovoltaic cells
 - A. Is not technologically possible at present.
 - B. Causes some pollution because toxic chemicals are released as the electricity is produced.
 - C. Is most practical for large industrial consumers.
 - D. Would involve commitment of considerable land and material for large-scale use.

15. Traditional geothermal power generation
 - A. Involves using hot magma to run generating equipment.
 - B. Relies on the heat released at the surface by the cooling earth.
 - C. Uses water or steam heated by hot rocks near the surface.
 - D. Requires geysers and hot springs.

16. With increasing depth in the earth the temperature increases as well. This is called as the
 - A. Thermal gradient.
 - B. Pressure gradient.
 - C. Binary gradient.
 - D. Geothermal gradient.

17. Given that a region has an average annual air temperature of 13°C , what would the subsurface temperature be at a depth of 2 km? Assume the geothermal gradient is the same as the world average geothermal gradient, which is approximately 30°C per kilometer.
 - A. 60°C
 - B. 73°C
 - C. 80°C
 - D. 93°C

18. Which of the following energy sources is particularly associated with plate boundaries?
 - A. Tidal power
 - B. Geothermal power
 - C. Hydropower
 - D. Nuclear fusion power
19. Power generation using the Ocean Thermal Energy Conversion method
 - A. Uses the temperature difference between shallow and deep ocean water to run turbines that generate electricity.
 - B. Uses the temperature difference between daytime and nighttime in tropical oceans to generate electricity.
 - C. Uses the energy of tsunami generated in polar regions and moving toward tropical regions to generate electricity.
 - D. Converts the heat from black smokers on the sea floor into useable energy.
20. Hydropower plants
 - A. Are no longer used in the United States because they are inefficient.
 - B. Consume large amounts of water.
 - C. Pollute water, which is why they are undesirable.
 - D. Are used exclusively for generating electricity.
21. Energy from tides cannot be harnessed because it is too
 - A. Concentrated.
 - B. Dispersed.
 - C. Excessive.
 - D. All the choices are correct.
22. Limitations of wind and solar energy include all of the following except
 - A. Both are low pollution forms of energy production.
 - B. Both entail a storage problem.
 - C. Both vary in intensity regionally.
 - D. Both are very dispersed energy sources.
23. The Chernobyl reactor accident caused all of the following except
 - A. Psychological distress in local residents.
 - B. Core meltdown.
 - C. Extensive nuclear fusion reactions inside the reactor.
 - D. Release of airborne radioactive material over northern Europe.
24. Which of the following energy sources is not renewable?
 - A. Solar energy
 - B. Wind energy
 - C. Nuclear fission power
 - D. Hydropower
25. Which of the following renewable energy sources provides the greatest share of energy consumed in the U.S.?
 - A. Solar energy
 - B. Geothermal power
 - C. Wind energy
 - D. Conventional hydropower
26. It is somewhat more difficult to project future energy needs than to project demand for minerals.
True False
27. Radioactive materials can be made nonradioactive by heating and treating by chemical reaction.
True False

28. If the nuclear-power option were pursued vigorously with current commercial reactor technology, all U.S. electricity needs could be supplied by nuclear power by the year 2010.
True False
29. Tailings left over after uranium ore processing can themselves present a radiation hazard.
True False
30. One advantage of current commercial nuclear reactors is that, although they are expensive to build, they can be used indefinitely, as long as sufficient fuel is available.
True False
31. The principal objection to nuclear fission power is that projected risks of deaths associated with normal operation of fission-powered plants are far higher than for any of the fossil fuels.
True False
32. Nuclear power accounts for a higher proportion of electricity generation in the United States than anywhere else in the world.
True False
33. A Chernobyl-style reactor accident is unlikely with commercial U.S. reactors, because of differences in reactor design and containment structures.
True False
34. Worldwide, nations are dismantling their nuclear-fission plants because of the high levels of pollution they produce and concerns about resultant climate change.
True False
35. Passive solar technology features are usually more economical to design and build initially into new structures than incorporating them into homes that already exist.
True False
36. Passive-solar heating systems are so named because they do not involve mechanical devices.
True False
37. In the case of traditional geothermal power generating plants, individual geothermal fields can typically be used for only a few decades before the rocks become too chilled for efficient power generation.
True False
38. Binary geothermal power generators can utilize lower temperature water in comparison to traditional (flash) geothermal technology.
True False
39. Use of reservoirs for hydropower generation may, in some measure, conflict with use of the same reservoirs for flood control.
True False
40. Exploiting hydroelectric power by constructing dams on rivers and streams is environmentally sound.
True False
41. A limitation on the use of hydropower is that it is subject to reduction or interruption during periods of unusually prolonged drought.
True False
42. Tidal power generation would be possible along most coastlines but is not being practiced now mainly because of scenic considerations.
True False
43. In the U.S., more water flows through hydropower-generation facilities than the total surface-water runoff of the nation.
True False

44. A "wind farm" with generating capacity comparable to that of a conventional electric power plant would cover a large area, but the land could be used simultaneously for other purposes, such as agricultural activities.
True False
45. Methane can be produced by decay of garbage in landfills and manure from feedlots.
True False
46. Ethanol, once widely used in gasoline (to make "gasohol"), is no longer used in gasoline, because there is no longer a worldwide shortage of petroleum fuels.
True False
47. Recent changes in energy policy will mandate conversion of "fleet vehicles" to use solar electricity rather than fossil fuels.
True False
48. Because developing countries use little energy per capita, global energy demands can be expected to remain close to current levels for several decades at least.
True False
49. Rapid development of hydropower in nations such as China raises safety concerns about the dams.
True False
50. Dams have a shelf life.
True False

15 Key

1. The process by which large nuclei are split into smaller ones is called nuclear
A. Fission.
B. Fusion.
C. Breeding.
D. Cracking.

Montgomery - Chapter 15 #1

2. In current U.S. commercial nuclear reactors,
A. Energy is generated by fusion.
B. A controlled chain reaction is sustained.
C. The most abundant natural isotope of uranium is used.
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Montgomery - Chapter 15 #2

3. About 95% of the uranium reserves around the world are found in
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Montgomery - Chapter 15 #3

4. The production of new fuel is maximized by
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Montgomery - Chapter 15 #4

5. Currently, the nominal lifetime (time that plants may operate, before they must be dismantled) allowed for fission-type nuclear reactors in the United States is
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Montgomery - Chapter 15 #5

6. Uranium is often concentrated naturally in granites and
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Montgomery - Chapter 15 #6

7. A breeder reactor
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Montgomery - Chapter 15 #7

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Montgomery - Chapter 15 #8

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Montgomery - Chapter 15 #9

10. In the United States, towards the end of the year 2008, there were this many nuclear power plants operating
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Montgomery - Chapter 15 #10

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Montgomery - Chapter 15 #11

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Montgomery - Chapter 15 #12

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Montgomery - Chapter 15 #13

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Montgomery - Chapter 15 #14

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Montgomery - Chapter 15 #15

16. With increasing depth in the earth the temperature increases as well. This is called as the
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Montgomery - Chapter 15 #16

17. Given that a region has an average annual air temperature of 13°C, what would the subsurface temperature be at a depth of 2 km? Assume the geothermal gradient is the same as the world average geothermal gradient, which is approximately 30°C per kilometer.
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Montgomery - Chapter 15 #17

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Montgomery - Chapter 15 #18

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Montgomery - Chapter 15 #19

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Montgomery - Chapter 15 #20

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Montgomery - Chapter 15 #21

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Montgomery - Chapter 15 #22

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Montgomery - Chapter 15 #23

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Montgomery - Chapter 15 #24

25. Which of the following renewable energy sources provides the greatest share of energy consumed in the U.S.?
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Montgomery - Chapter 15 #25

26. It is somewhat more difficult to project future energy needs than to project demand for minerals.
TRUE

Montgomery - Chapter 15 #26

27. Radioactive materials can be made nonradioactive by heating and treating by chemical reaction.
FALSE

Montgomery - Chapter 15 #27

28. If the nuclear-power option were pursued vigorously with current commercial reactor technology, all U.S. electricity needs could be supplied by nuclear power by the year 2010.
FALSE

Montgomery - Chapter 15 #28

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TRUE

Montgomery - Chapter 15 #29

30. One advantage of current commercial nuclear reactors is that, although they are expensive to build, they can be used indefinitely, as long as sufficient fuel is available.
FALSE

Montgomery - Chapter 15 #30

31. The principal objection to nuclear fission power is that projected risks of deaths associated with normal operation of fission-powered plants are far higher than for any of the fossil fuels.
FALSE

Montgomery - Chapter 15 #31

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FALSE

Montgomery - Chapter 15 #32

33. A Chernobyl-style reactor accident is unlikely with commercial U.S. reactors, because of differences in reactor design and containment structures.
TRUE

Montgomery - Chapter 15 #33

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FALSE

Montgomery - Chapter 15 #34

35. Passive solar technology features are usually more economical to design and build initially into new structures than incorporating them into homes that already exist.
TRUE

Montgomery - Chapter 15 #35

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TRUE

Montgomery - Chapter 15 #36

37. In the case of traditional geothermal power generating plants, individual geothermal fields can typically be used for only a few decades before the rocks become too chilled for efficient power generation.

TRUE

Montgomery - Chapter 15 #37

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TRUE

Montgomery - Chapter 15 #38

39. Use of reservoirs for hydropower generation may, in some measure, conflict with use of the same reservoirs for flood control.

TRUE

Montgomery - Chapter 15 #39

40. Exploiting hydroelectric power by constructing dams on rivers and streams is environmentally sound.

FALSE

Montgomery - Chapter 15 #40

41. A limitation on the use of hydropower is that it is subject to reduction or interruption during periods of unusually prolonged drought.

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Montgomery - Chapter 15 #41

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FALSE

Montgomery - Chapter 15 #42

43. In the U.S., more water flows through hydropower-generation facilities than the total surface-water runoff of the nation.

TRUE

Montgomery - Chapter 15 #43

44. A "wind farm" with generating capacity comparable to that of a conventional electric power plant would cover a large area, but the land could be used simultaneously for other purposes, such as agricultural activities.

TRUE

Montgomery - Chapter 15 #44

45. Methane can be produced by decay of garbage in landfills and manure from feedlots.

TRUE

Montgomery - Chapter 15 #45

46. Ethanol, once widely used in gasoline (to make "gasohol"), is no longer used in gasoline, because there is no longer a worldwide shortage of petroleum fuels.

FALSE

Montgomery - Chapter 15 #46

47. Recent changes in energy policy will mandate conversion of "fleet vehicles" to use solar electricity rather than fossil fuels.

FALSE

Montgomery - Chapter 15 #47

48. Because developing countries use little energy per capita, global energy demands can be expected to remain close to current levels for several decades at least.

FALSE

Montgomery - Chapter 15 #48

49. Rapid development of hydropower in nations such as China raises safety concerns about the dams.
TRUE

Montgomery - Chapter 15 #49

50. Dams have a shelf life.
TRUE

Montgomery - Chapter 15 #50

15 Summary

<u>Category</u>	<u># of Questions</u>
Montgomery - Chapter 15	50