**Review APES chapter 16**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

 1. Iceland intends to use and sell what fuel source?

|  |  |
| --- | --- |
| a. | petroleum |
| b. | oxygen |
| c. | hydropower |
| d. | windpower |
| e. | hydrogen |

 2. Which is our *best* immediate energy option?

|  |  |
| --- | --- |
| a. | Find and burn more forms of oil, natural gas, and coal. |
| b. | Cut out unnecessary energy waste by improving energy efficiency. |
| c. | Build more and better conventional nuclear power plants. |
| d. | Increase efforts to develop breeder nuclear fission and nuclear fusion. |
| e. | Discover a new form of energy. |

 3. Which of the following is the most energy efficient?

|  |  |
| --- | --- |
| a. | nuclear power plant |
| b. | coal-burning power plant |
| c. | internal combustion engine |
| d. | passive solar heating |
| e. | incandescent light bulbs |

 4. What percentage of the commercial energy used in the United States is wasted?

|  |  |
| --- | --- |
| a. | 54% |
| b. | 64% |
| c. | 74% |
| d. | 84% |
| e. | 94% |

 5. What percentage of the commercial energy used in the United States is wasted unnecessarily?

|  |  |
| --- | --- |
| a. | 11% |
| b. | 23% |
| c. | 33% |
| d. | 43% |
| e. | 51% |

 6. According to Amory Lovins, the easiest, fastest, and cheapest way to get more energy with the least environmental impact is to

|  |  |
| --- | --- |
| a. | Improve photovoltaics. |
| b. | Develop wind power. |
| c. | Initiate the second wave of nuclear power plants in the United States. |
| d. | Eliminate energy waste. |
| e. | Switch to natural gas transportation. |

 7. Energy consumption can be reduced by all of the following *except*

|  |  |
| --- | --- |
| a. | using mass transit instead of individual automobiles |
| b. | turning the thermostat up in wintertime |
| c. | turning off unused lights |
| d. | purchasing only needed products |
| e. | reducing packaging |

 8. When purchasing appliances, consumers can make more economically and environmentally conscious decisions by considering

|  |  |
| --- | --- |
| a. | initial cost |
| b. | operating cost |
| c. | external cost |
| d. | life-cycle cost |
| e. | consumer cost |

 9. We can conserve energy by

|  |  |
| --- | --- |
| a. | increasing the efficiency of our equipment |
| b. | recycling the energy we use |
| c. | using nonrenewable resources |
| d. | using high-quality energy whenever possible |
| e. | all of these |

 10. The *least* efficient method of space heating is

|  |  |
| --- | --- |
| a. | passive solar heat |
| b. | electricity produced by nuclear power plants |
| c. | natural gas furnaces |
| d. | oil furnaces |
| e. | none of these |

 11. The most expensive way to provide space heat is by using

|  |  |
| --- | --- |
| a. | propane |
| b. | electricity |
| c. | kerosene |
| d. | oil |
| e. | wood |

 12. Energy efficiency could be improved by all of the following, *except*

|  |  |
| --- | --- |
| a. | buying cars with good fuel mileage |
| b. | buying energy-efficient appliances |
| c. | keeping car engines tuned |
| d. | removing insulation from attics |
| e. | buying fluorescent light bulbs |

 13. If the United States wanted to make the most difference in tightening up energy efficiency of widespread energy-using devices, which one of the following is likely to attract the *least* attention?

|  |  |
| --- | --- |
| a. | internal combustion engines |
| b. | nuclear power plants |
| c. | refrigerators |
| d. | incandescent light bulbs |
| e. | heating and air conditioning systems |

 14. Improving energy efficiency is *least* likely to

|  |  |
| --- | --- |
| a. | reduce environmental damage |
| b. | lessen the need for military intervention in the Middle East |
| c. | decrease competitiveness in the international marketplace |
| d. | give us more time to phase in renewable energy resources |
| e. | save money and provide jobs |

 15. Improving energy efficiency does all of the following, *except*

|  |  |
| --- | --- |
| a. | make nonrenewable fossil fuel supplies last longer |
| b. | provide a longer time for phasing in renewable energy sources |
| c. | improve national security by reducing dependence on oil imports |
| d. | eliminate excess jobs |
| e. | reduce environmental damage |

 16. Cogeneration

|  |  |
| --- | --- |
| a. | involves instruments like heat pumps that can generate heating and cooling |
| b. | combines passive solar and active solar technologies |
| c. | involves both electricity and natural gas |
| d. | uses waste heat to produce electricity |
| e. | uses heat from the earth to produce electricity |

 17. Forty-five percent of new passenger-car sales in Europe is made up of

|  |  |
| --- | --- |
| a. | energy-efficient diesel cars |
| b. | hybrid cars |
| c. | plug-in hybrid cars |
| d. | hydrogen fuel cell cars |
| e. | conventional gasoline cars |

 18. Industry can reduce its energy consumption by

|  |  |
| --- | --- |
| a. | switching to incandescent lighting |
| b. | quickly venting waste heat to the environment |
| c. | increasing recycling and reuse of materials |
| d. | using more standard electric motors |
| e. | using more fossil fuels |

 19. Utilities make money by selling electricity. To make more money, they have often encouraged customers to use even more electricity. This lack of incentive to improve energy efficiency creates a

|  |  |
| --- | --- |
| a. | harmful negative feedback loop |
| b. | harmful positive feedback loop |
| c. | helpful negative feedback loop |
| d. | helpful positive feedback loop |
| e. | synergistic effect |

 20. Energy efficiency can be encouraged by all of the following, *except*

|  |  |
| --- | --- |
| a. | demand-side management |
| b. | regulations making it possible for utilities to profit from reducing the amount of electricity they sell |
| c. | giving utilities a share of the money they save by improvements in energy efficiency |
| d. | supply-side management |
| e. | none of these |

 21. At this time, the most important way to save energy and money in transportation is to

|  |  |
| --- | --- |
| a. | switch to hydrogen-powered cars |
| b. | switch to electric engines |
| c. | increase the fuel efficiency of motor vehicles |
| d. | ban cars in cities |
| e. | require mandatory mass transportation |

 22. Requiring higher average fuel-efficiency standards would do all of the following, *except*

|  |  |
| --- | --- |
| a. | save huge amounts of energy |
| b. | reduce air pollution |
| c. | cost jobs |
| d. | reduce emissions of heat-trapping carbon dioxide |
| e. | reduce water pollution |

 23. The weakness of electric cars is their

|  |  |
| --- | --- |
| a. | noise level |
| b. | maintenance cost |
| c. | energy-storage system |
| d. | slow acceleration |
| e. | price |

 24. Ecocars

|  |  |
| --- | --- |
| a. | are made from composite materials that won't rust and can be recycled |
| b. | have a greater range than electric cars |
| c. | could operate emission-free in urban areas |
| d. | are made from composite materials that won't rust and can be recycled *and* could operate emission-free in urban areas |
| e. | all of these |

 25. Demand for ecocars would be increased by all of the following strategies, *except*

|  |  |
| --- | --- |
| a. | a rebate system that gives people money for buying fuel-efficient cars and charges people more for buying gas-guzzling vehicles |
| b. | establishing higher average fuel-efficiency standards for all new cars |
| c. | including social and environmental costs in the price of gasoline |
| d. | maintaining the status quo |
| e. | establishing higher average fuel-efficiency standards for all new cars and including social and environmental costs in the price of gasoline |

 26. Heating, cooling, and lighting buildings consumes about \_\_\_\_ of the energy used in modern societies.

|  |  |
| --- | --- |
| a. | one-fifth |
| b. | one-fourth |
| c. | one-third |
| d. | one-half |
| e. | two-thirds |

 27. The energy efficiency of buildings can be improved by all of the following strategies, *except*

|  |  |
| --- | --- |
| a. | use of energy-efficient appliances |
| b. | use of energy-efficient compact fluorescent light bulbs |
| c. | plugging leaks |
| d. | building big windows into the northern side of new housing |
| e. | energy-efficient lighting |

 28. The cheapest and *most* energy-efficient way to heat a house is super-insulation coupled with

|  |  |
| --- | --- |
| a. | active solar heating and a natural gas furnace |
| b. | active solar heating and electric resistance heating produced by a nuclear power plant |
| c. | passive solar heating and a high-efficiency natural gas furnace |
| d. | passive solar and electric resistance heating produced by a nuclear power plant |
| e. | a heat pump |

 29. The *most* effective water heater

|  |  |
| --- | --- |
| a. | is an electric water tank |
| b. | is a gas water heater |
| c. | is an oil water heater |
| d. | is a tankless instant water heater fired by natural gas |
| e. | is a propane water heater |

 30. All of the following statements regarding the use of solar cookers are true, *except* they

|  |  |
| --- | --- |
| a. | can reduce deforestation |
| b. | are expensive to purchase |
| c. | can save time and labor |
| d. | reduce indoor air pollution |
| e. | can be built locally |

 31. In 2004, which of the following sources represented the highest total cost of producing electricity (in U.S. cents per kilowatt hour)?

|  |  |
| --- | --- |
| a. | solar cells |
| b. | coal |
| c. | wind |
| d. | nuclear |
| e. | biomass |

 32. Renewable energy resources include all of the following, *except*

|  |  |
| --- | --- |
| a. | the sun |
| b. | the wind |
| c. | biomass |
| d. | natural gas |
| e. | water |

 33. Developing renewable energy resources could account for \_\_\_\_ of world energy production by 2050 or sooner.

|  |  |
| --- | --- |
| a. | 20% |
| b. | 30% |
| c. | 40% |
| d. | 50% |
| e. | 60% |

 34. Development of renewable energy resources would

|  |  |
| --- | --- |
| a. | cost money |
| b. | eliminate the need for oil imports |
| c. | produce more pollution per unit of energy |
| d. | decrease military, economic, and environmental security |
| e. | cost jobs |

 35. Windows designed to capture solar energy in the United States face

|  |  |
| --- | --- |
| a. | north |
| b. | east |
| c. | south |
| d. | west |
| e. | northeast |

 36. Thermal mass could be provided in the form of walls and floors of all of the following, *except*

|  |  |
| --- | --- |
| a. | brick |
| b. | paper |
| c. | concrete |
| d. | adobe |
| e. | none of these |

 37. All of the following are features of passive solar design, *except*

|  |  |
| --- | --- |
| a. | adobe walls used for heat storage |
| b. | coniferous trees blocking the sun all year |
| c. | windows on the south side of the house |
| d. | summer cooling vents in the roof |
| e. | flagstone floor used for heat storage |

 38. Which country gets 92% of its energy from renewable sources?

|  |  |
| --- | --- |
| a. | Denmark |
| b. | Brazil |
| c. | Iceland |
| d. | Costa Rica |
| e. | China |

 39. Advantages of solar space heating include all of the following, *except*

|  |  |
| --- | --- |
| a. | a free energy source |
| b. | low to moderate net useful energy |
| c. | well-developed active and passive technologies |
| d. | no carbon dioxide additions to the atmosphere |
| e. | well-developed active and passive technologies and no carbon dioxide additions to the atmosphere |

 40. All of the following can be used for cooling a house in warm weather, *except*

|  |  |
| --- | --- |
| a. | windows |
| b. | earth tubes and tanks buried 20 feet underground |
| c. | deciduous trees to block the summer sun |
| d. | foil sheets under the floor |
| e. | fans |

 41. Solar thermal systems can

|  |  |
| --- | --- |
| a. | track the sun |
| b. | focus sunlight on a central heat-collection point |
| c. | produce temperatures high enough for making high-pressure steam to run turbines |
| d. | all of these |
| e. | none of these |

 42. The solar technology that most strongly focuses the sun's rays is the

|  |  |
| --- | --- |
| a. | active solar heating system |
| b. | solar power tower |
| c. | non-imaging optical solar concentrator |
| d. | solar cooker |
| e. | solar wind tunnel |

 43. A type of distributed receiver system that has captured a fraction of the commercial market is the

|  |  |
| --- | --- |
| a. | active solar heating system |
| b. | solar power tower |
| c. | solar cooker |
| d. | solar thermal plant |
| e. | solar wind tunnel |

 44. Solar power plants

|  |  |
| --- | --- |
| a. | pollute air and water |
| b. | take three to five years to construct |
| c. | with natural gas backup produce electricity at twice the price of nuclear plants |
| d. | can be built as large or small as needed |
| e. | are almost as cost effective as nuclear power plants |

 45. Cells that convert solar energy directly into electricity are called

|  |  |
| --- | --- |
| a. | electrosolar chips |
| b. | photovoltaic cells |
| c. | helioelectric units |
| d. | photoelectric cells |
| e. | solarelectric cells |

 46. The chief ingredient of most solar cells is

|  |  |
| --- | --- |
| a. | silicon |
| b. | sodium |
| c. | chromium |
| d. | arsenic |
| e. | calcium |

 47. All of the following are characteristic of solar cells, *except*

|  |  |
| --- | --- |
| a. | durability up to 30 years |
| b. | quick installation |
| c. | easy expansion of the system as needed |
| d. | primarily metal composition |
| e. | no carbon dioxide emissions |

 48. All of the following are likely to be big markets for solar cell technology, *except*

|  |  |
| --- | --- |
| a. | Mexico |
| b. | India |
| c. | Poland |
| d. | Brazil |
| e. | Korea |

 49. Most of the world's untapped potential for hydropower is in all of the following regions, *except*

|  |  |
| --- | --- |
| a. | India |
| b. | China |
| c. | South America |
| d. | the United States |
| e. | Central Africa |

 50. In 1890, the first country to use wind turbines to produce commercial electricity was

|  |  |
| --- | --- |
| a. | Denmark |
| b. | Germany |
| c. | Spain |
| d. | Holland |
| e. | France |

 51. Hydroelectric power may be

|  |  |
| --- | --- |
| a. | large scale |
| b. | small scale |
| c. | pumped storage |
| d. | large scale and small scale |
| e. | all of these |

 52. Which of the following countries produces the greatest proportion of its electricity by hydroelectric plants?

|  |  |
| --- | --- |
| a. | Austria |
| b. | Switzerland |
| c. | Norway |
| d. | Italy |
| e. | Russia |

 53. Hydroelectric plants

|  |  |
| --- | --- |
| a. | need to be shut down frequently for maintenance checks |
| b. | offer low net useful energy yield |
| c. | have relatively high operating and maintenance costs |
| d. | help control flooding and supply a regulated flow of irrigation water to areas below the dam |
| e. | all of these |

 54. Which of the following is a disadvantage of hydroelectric plants?

|  |  |
| --- | --- |
| a. | high pollution |
| b. | high construction costs |
| c. | high operation and maintenance costs |
| d. | low functional life span |
| e. | all of these |

 55. Huge dams have all of the following impacts, *except*

|  |  |
| --- | --- |
| a. | destruction of wildlife habitat |
| b. | lessening of natural fertilization of agricultural land below the dam |
| c. | lessening of fish harvests above the dam |
| d. | flooding of vast areas |
| e. | increasing fish harvests above the dam |

 56. The world's fastest growing energy resource is

|  |  |
| --- | --- |
| a. | hydroelectric dams |
| b. | wind power |
| c. | nuclear power |
| d. | coal-fired power plants |
| e. | tidal energy |

 57. Wind power

|  |  |
| --- | --- |
| a. | is an unlimited source of energy at favorable sites |
| b. | requires long construction time |
| c. | has a low net useful energy yield |
| d. | emits moderate air pollution |
| e. | produces CO2 emissions |

 58. Wind farms

|  |  |
| --- | --- |
| a. | are very quiet |
| b. | may interfere with flight patterns of migratory birds |
| c. | do not require backup energy production systems |
| d. | are considered visually pleasing |
| e. | all of these |

 59. Biomass fuels are

|  |  |
| --- | --- |
| a. | solid |
| b. | liquid |
| c. | gaseous |
| d. | solid *and* liquid |
| e. | all of these |

 60. Potentially renewable biomass is currently being exploited in unsustainable ways because of

|  |  |
| --- | --- |
| a. | inefficient burning of wood in open fires |
| b. | use of inefficient stoves |
| c. | soil erosion |
| d. | all of these |
| e. | none of these |

 61. Burning of biomass

|  |  |
| --- | --- |
| a. | releases more carbon dioxide per ton burned than does coal |
| b. | releases more air pollution per unit of energy produced than does uncontrolled burning of coal |
| c. | requires little land |
| d. | can cause soil erosion, water pollution, and loss of wildlife habitat |
| e. | does not cause water pollution |

 62. Gaseous and liquid biofuels include

|  |  |
| --- | --- |
| a. | biogas |
| b. | liquid methanol |
| c. | wood alcohol |
| d. | ethanol |
| e. | all of these |

 63. Biogas digesters are

|  |  |
| --- | --- |
| a. | very efficient, slow, and unpredictable |
| b. | very efficient, fast, and predictable |
| c. | very inefficient, slow, and unpredictable |
| d. | very inefficient, fast, and predictable |
| e. | very inefficient, fast, and unpredictable |

 64. Gasohol is gasoline mixed with

|  |  |
| --- | --- |
| a. | ethanol |
| b. | methane |
| c. | methanol |
| d. | butane |
| e. | propane |

 65. Which of the following substances is *not* considered to be a source of ethanol?

|  |  |
| --- | --- |
| a. | sorghum |
| b. | sugar beets |
| c. | potatoes |
| d. | corn |
| e. | rice |

 66. All of the following are advantages of using ethanol as a fuel, *except*

|  |  |
| --- | --- |
| a. | lower NO emissions |
| b. | potentially renewable |
| c. | lower CO emissions |
| d. | high octane |
| e. | some reduction in carbon dioxide emissions |

 67. A major disadvantage of using biomass for energy is

|  |  |
| --- | --- |
| a. | large land requirements |
| b. | higher nitrous oxide emissions than other sources of energy |
| c. | lack of versatility in its use and application |
| d. | that it is not renewable |
| e. | higher sulfur dioxide emissions than other sources of energy |

 68. Which of the following would *not* make a good choice for a biomass plantation?

|  |  |
| --- | --- |
| a. | cottonwood |
| b. | oak |
| c. | sycamore |
| d. | poplar |
| e. | pine |

 69. Some ecologists say that it makes the *least* sense to use crop residues as

|  |  |
| --- | --- |
| a. | fuel for energy |
| b. | food for animals |
| c. | a way to retard erosion |
| d. | a fertilizer |
| e. | building material |

 70. The country that is the world's largest producer of geothermal electricity is

|  |  |
| --- | --- |
| a. | Finland |
| b. | China |
| c. | Iceland |
| d. | the Philippines |
| e. | the United States |

 71. Geothermal energy is stored in the form of

|  |  |
| --- | --- |
| a. | dry steam |
| b. | wet steam |
| c. | hot water |
| d. | dry steam, wet steam, *and* hot water |
| e. | wet steam *and* hot water |

 72. Geothermal energy can be used for all of the following, *except*

|  |  |
| --- | --- |
| a. | heating space |
| b. | producing electricity |
| c. | transportation fuel |
| d. | producing high-temperature heat for industry |
| e. | heating space *and* producing high-temperature heat for industry |

 73. Magma is

|  |  |
| --- | --- |
| a. | a deep source of fossil fuel |
| b. | molten rock |
| c. | an air pollutant given off by geothermal energy |
| d. | cooled lava flow |
| e. | volcanic ash |

 74. Which of the following disadvantages of the development of geothermal power is *false*?

|  |  |
| --- | --- |
| a. | Use of geothermal energy is limited by scarcity of sites and economics. |
| b. | It sometimes causes land subsidence. |
| c. | It releases more carbon dioxide than fossil fuels. |
| d. | It sometimes causes ecosystem degradation. |
| e. | It has very high efficiency. |

 75. An advantage associated with the development and use of geothermal energy systems is that

|  |  |
| --- | --- |
| a. | Carbon dioxide is the only air pollutant produced. |
| b. | Geothermal power plants do not require cooling water. |
| c. | Geothermal energy sources are vast, reliable, and potentially renewable for areas near reservoir sites. |
| d. | There is no risk of harmful environmental impact. |
| e. | It requires high land use. |

 76. By 2050, which country plans to run its entire economy on renewable hydropower, geothermal energy, and wind and use these sources to produce hydrogen for running all of its motor vehicles and ships?

|  |  |
| --- | --- |
| a. | Norway |
| b. | Denmark |
| c. | Finland |
| d. | Iceland |
| e. | Spain |

 77. Hydrogen gas can be used to

|  |  |
| --- | --- |
| a. | heat buildings |
| b. | fuel cars and trucks |
| c. | power factories |
| d. | fuel planes |
| e. | all of these |

 78. Which of the following statements is *false*?

|  |  |
| --- | --- |
| a. | When burned, hydrogen produces virtually no air pollutants. |
| b. | Some metals can store and release hydrogen. |
| c. | Fuel tanks of metal-hydrogen compounds would tend to explode in an accident. |
| d. | Experimental cars have been running on hydrogen for years. |
| e. | None of these statements is false. |

 79. Which of the following statements is *false*?

|  |  |
| --- | --- |
| a. | The costs of using solar energy to produce electricity are coming down. |
| b. | Hydrogen gas could be stored at high pressures and distributed by pipeline. |
| c. | Burning hydrogen releases low amounts of carbon dioxide. |
| d. | Hydrogen gas is easier to store than electricity. |
| e. | The costs of using solar energy to produce electricity are coming down and Burning hydrogen releases low amounts of carbon dioxide. |

 80. Large-scale funding of hydrogen research would generally be *least* opposed by

|  |  |
| --- | --- |
| a. | electric utilities |
| b. | sustainable developers |
| c. | fossil-fuel companies |
| d. | automobile manufacturers |
| e. | heating and air conditioning manufacturers |

 81. The Solar-Hydrogen Revolution could be encouraged by

|  |  |
| --- | --- |
| a. | convincing private investors to risk capital in investing in hydrogen |
| b. | convincing the government to put up some money for hydrogen development as it did for fossil fuels and nuclear energy in the past |
| c. | phasing in full-cost pricing of fossil fuels |
| d. | all of these |
| e. | none of these |

 82. Which of the following statements is *false*?

|  |  |
| --- | --- |
| a. | There is not enough financial capital to develop all energy alternatives. |
| b. | We should not depend on only one source of energy but should develop a mix of perpetual and renewable energy resources. |
| c. | Energy production should be centralized as much as possible to increase efficiency. |
| d. | Improving energy efficiency is the best option available to produce more energy. |
| e. | There is not enough financial capital to develop all energy alternatives and We should not depend on only one source of energy but should develop a mix of perpetual and renewable energy resources. |

 83. Which of the following approaches emphasizes today's prices for short-term economic gain and inhibits long-term development of new energy resources?

|  |  |
| --- | --- |
| a. | free-market competition |
| b. | energy prices kept artificially high |
| c. | energy prices kept artificially low |
| d. | government command and control |
| e. | intense regulation |

 84. Governments use \_\_\_\_ to manipulate the energy playing field.

|  |  |
| --- | --- |
| a. | tax breaks |
| b. | regulations |
| c. | subsidies |
| d. | all of these |
| e. | *only* regulations *and* subsidies |

 85. Keeping energy prices artificially low

|  |  |
| --- | --- |
| a. | encourages waste and rapid depletion of energy resources getting favorable treatment |
| b. | protects consumers from sharp price increases |
| c. | discourages the development of energy alternatives not getting favorable treatment |
| d. | does all of these |
| e. | *only* encourages waste and rapid depletion of energy resources getting favorable treatment *and* protects consumers from sharp price increases |

 86. Keeping energy prices artificially high does all of the following, *except*

|  |  |
| --- | --- |
| a. | encourage improvements in energy efficiency |
| b. | reduce dependence on imported energy |
| c. | dampen economic growth |
| d. | cause high unemployment |
| e. | none of these |

 87. A sustainable energy future is *least* likely to encourage

|  |  |
| --- | --- |
| a. | greatly increased use of perpetual and renewable resources |
| b. | phasing out of government subsidies for nonrenewable resources |
| c. | taxing of fossil fuels with energy assistance to the poor |
| d. | no government influence on personal decisions about purchases of energy-consuming goods |
| e. | tax credits for buying efficient cars |

 88. A sustainable energy future is *least* likely to encourage

|  |  |
| --- | --- |
| a. | requiring that all energy systems supported by government funds be based on cost-benefit analysis |
| b. | requiring that electrical production be on a least-cost basis |
| c. | full-cost pricing including social and environmental costs of energy sources |
| d. | permitting utilities to earn money by reducing electricity demand |
| e. | None of these |

 89. The estimated net useful energy of oil, natural gas, and coal is

|  |  |
| --- | --- |
| a. | high and increasing |
| b. | high and decreasing |
| c. | moderate and stable |
| d. | low and increasing |
| e. | moderate and increasing |

 90. The fossil fuel with the *least* environmental impact is

|  |  |
| --- | --- |
| a. | oil |
| b. | natural gas |
| c. | coal |
| d. | oil shale |
| e. | kerosene |

 91. The *least* expensive perpetual resource is

|  |  |
| --- | --- |
| a. | improving energy efficiency |
| b. | hydroelectricity |
| c. | tidal energy |
| d. | photovoltaics |
| e. | wind energy |

 92. The renewable and perpetual resources with the *best* availability in the short term and the long term are

|  |  |
| --- | --- |
| a. | large- and small-scale dams |
| b. | low-temperature solar heating and improved energy efficiency |
| c. | photovoltaics and high-temperature solar heating |
| d. | wind energy |
| e. | geothermal energy |

 93. The energy resource that *most* improves the quality of the environment is

|  |  |
| --- | --- |
| a. | improved energy efficiency |
| b. | wind energy |
| c. | biomass |
| d. | hydrogen gas |
| e. | geothermal energy |

 94. Which of the following is *least* likely to characterize a sustainable energy future?

|  |  |
| --- | --- |
| a. | fiber-optic cables and microprocessors |
| b. | larger, regional power plants |
| c. | energy management systems |
| d. | improved energy efficiency |
| e. | ecocars |

 95. Which of the following statements does *not* reflect the thinking of Amory Lovins?

|  |  |
| --- | --- |
| a. | The answers you get depend on the questions you ask. |
| b. | The cheapest way to get more electricity is to convert to efficient lighting equipment. |
| c. | Energy efficiency and conservation are the cheapest ways to achieve low-temperature heating and cooling. |
| d. | The way to develop a sound energy policy is to define your energy sources and find the most efficient ways to increase each of them. |
| e. | None of these. |

 96. According to Amory Lovins, the *most* expensive way to get more electricity would be

|  |  |
| --- | --- |
| a. | industrial cogeneration |
| b. | eliminating pure waste of electricity |
| c. | building a new central power station |
| d. | making appliances cost-effectively efficient |
| e. | using alternative energy sources |

 97. Which of the following guidelines is *least* likely to be included in personal sustainable energy plans?

|  |  |
| --- | --- |
| a. | Get as much heat and cooling as possible from natural sources. |
| b. | Insulate existing houses heavily. |
| c. | Create cracks along flooring and ceilings to increase indoor air quality. |
| d. | Don't use electricity to heat space or water. |
| e. | None of these. |

**Review APES chapter 16**

**Answer Section**

**MULTIPLE CHOICE**

 1. ANS: E PTS: 1 DIF: Easy TOP: 16-0 Core Case Study

 2. ANS: B PTS: 1 DIF: Moderate

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 3. ANS: D PTS: 1 DIF: Easy

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 4. ANS: D PTS: 1 DIF: Easy

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 5. ANS: D PTS: 1 DIF: Easy

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 6. ANS: D PTS: 1 DIF: Difficult

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 7. ANS: B PTS: 1 DIF: Moderate

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 8. ANS: D PTS: 1 DIF: Moderate

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 9. ANS: A PTS: 1 DIF: Easy

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 10. ANS: B PTS: 1 DIF: Moderate

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 11. ANS: B PTS: 1 DIF: Easy

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 12. ANS: D PTS: 1 DIF: Difficult

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 13. ANS: C PTS: 1 DIF: Difficult

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 14. ANS: C PTS: 1 DIF: Difficult

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 15. ANS: D PTS: 1 DIF: Difficult

TOP: 16-1 Why Is Energy Efficiency an Important Energy Resource?

 16. ANS: D PTS: 1 DIF: Moderate TOP: 16-2 How Can We Cut Energy Waste?

 17. ANS: A PTS: 1 DIF: Moderate TOP: 16-2 How Can We Cut Energy Waste?

 18. ANS: C PTS: 1 DIF: Moderate TOP: 16-2 How Can We Cut Energy Waste?

 19. ANS: B PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 20. ANS: D PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 21. ANS: C PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 22. ANS: C PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 23. ANS: C PTS: 1 DIF: Easy TOP: 16-2 How Can We Cut Energy Waste?

 24. ANS: E PTS: 1 DIF: Moderate TOP: 16-2 How Can We Cut Energy Waste?

 25. ANS: D PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 26. ANS: C PTS: 1 DIF: Easy TOP: 16-2 How Can We Cut Energy Waste?

 27. ANS: D PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 28. ANS: C PTS: 1 DIF: Difficult TOP: 16-2 How Can We Cut Energy Waste?

 29. ANS: D PTS: 1 DIF: Moderate TOP: 16-2 How Can We Cut Energy Waste?

 30. ANS: B PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 31. ANS: A PTS: 1 DIF: Difficult

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 32. ANS: D PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 33. ANS: D PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 34. ANS: B PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 35. ANS: C PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 36. ANS: B PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 37. ANS: B PTS: 1 DIF: Difficult

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 38. ANS: D PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 39. ANS: B PTS: 1 DIF: Difficult

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 40. ANS: D PTS: 1 DIF: Difficult

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 41. ANS: D PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 42. ANS: B PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 43. ANS: D PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 44. ANS: D PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 45. ANS: B PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 46. ANS: A PTS: 1 DIF: Easy

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 47. ANS: D PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 48. ANS: C PTS: 1 DIF: Moderate

TOP: 16-3 What Are the Advantages and Disadvantages of Solar Energy?

 49. ANS: D PTS: 1 DIF: Moderate

TOP: 16-4 What Are the Advantages and Disadvantages of Producing Electricity from the Water Cycle?

 50. ANS: A PTS: 1 DIF: Moderate

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 51. ANS: E PTS: 1 DIF: Moderate

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 52. ANS: C PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 53. ANS: D PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 54. ANS: B PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 55. ANS: C PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 56. ANS: B PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 57. ANS: A PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 58. ANS: B PTS: 1 DIF: Easy

TOP: 16-5 What Are the Advantages and Disadvantages of Producing Electricity from Wind?

 59. ANS: E PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 60. ANS: D PTS: 1 DIF: Moderate

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 61. ANS: D PTS: 1 DIF: Moderate

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 62. ANS: E PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 63. ANS: A PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 64. ANS: A PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 65. ANS: C PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 66. ANS: A PTS: 1 DIF: Difficult

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 67. ANS: A PTS: 1 DIF: Moderate

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 68. ANS: B PTS: 1 DIF: Easy

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 69. ANS: A PTS: 1 DIF: Moderate

TOP: 16-6 What Are the Advantages and Disadvantages of Biomass as an Energy Source?

 70. ANS: E PTS: 1 DIF: Moderate

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 71. ANS: D PTS: 1 DIF: Easy

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 72. ANS: C PTS: 1 DIF: Moderate

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 73. ANS: B PTS: 1 DIF: Easy

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 74. ANS: C PTS: 1 DIF: Difficult

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 75. ANS: C PTS: 1 DIF: Difficult

TOP: 16-7 What Are the Advantages and Disadvantages of Geothermal Energy?

 76. ANS: D PTS: 1 DIF: Easy

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 77. ANS: E PTS: 1 DIF: Easy

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 78. ANS: C PTS: 1 DIF: Difficult

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 79. ANS: C PTS: 1 DIF: Difficult

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 80. ANS: B PTS: 1 DIF: Difficult

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 81. ANS: D PTS: 1 DIF: Moderate

TOP: 16-8 What Are the Advantages and Disadvantages of Hydrogen as an Energy Source?

 82. ANS: C PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 83. ANS: A PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 84. ANS: D PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 85. ANS: D PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 86. ANS: D PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 87. ANS: D PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 88. ANS: A PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 89. ANS: B PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 90. ANS: B PTS: 1 DIF: Easy

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 91. ANS: A PTS: 1 DIF: Easy

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 92. ANS: B PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 93. ANS: A PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 94. ANS: B PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 95. ANS: E PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 96. ANS: C PTS: 1 DIF: Moderate

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?

 97. ANS: C PTS: 1 DIF: Difficult

TOP: 16-9 How Can We Make a Transition to a More Sustainable Energy Future?