Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following statements is true regarding genetically modified (GM) crops? 1) _____
A) The United States leads the world in land area dedicated to GM crops.
B) GM crops are widely favored by environmentalists.
C) Latin America leads the world in land area dedicated to GM crops.
D) Europe leads the world in land area dedicated to GM crops.

Answer: A
Explanation: A)
B)
C)
D)

2) Although industrial agriculture has greatly reduced world hunger and malnutrition, it has _____. 2) _____
A) not significantly increased the productivity of modern agriculture
B) contributed significantly to the destruction of the ozone layer
C) doubled the amount of land used to raise crops
D) required high levels of fertilizer and pesticide use

Answer: D
Explanation: A)
B)
C)
D)

3) Pesticide use has tripled in the past 40 years, yet pests still cause extensive damage to crops. Why has this increased use of pesticides not been more effective? 3) _____
A) The pesticides available are no longer suited for the most common types of pests.
B) The pesticides in use today are much less powerful due to government regulations.
C) The widespread use of pesticides has resulted in the evolution of pesticide-resistant pests.
D) Increases in ultraviolet radiation and global warming break down pesticides faster.

Answer: C
Explanation: A)
B)
C)
D)

4) Irrigation can result in the salinization of soils because _____. 4) _____
A) shortages of fresh water require the use of salt water for irrigation
B) many of the plants grown in these regions excrete salts into the soil
C) the irrigation water washes away soil leaving behind concentrated salts
D) salts are deposited on the soil surface as water evaporates

Answer: D
Explanation: A)
B)
C)
D)

5) If the total global production of grains cannot be significantly increased in the next 50 years, and the human population continues to increase, one strategy to feed people would be to _____. 5) _____

A) increase our use of fossil fuels in agriculture
B) greatly reduce the amount of meat in our diets
C) increasingly rely on fungi for nutritional needs
D) engineer plants that can grow without sunlight

Answer: B
Explanation: A)
B)
C)
D)

6) Roundup Ready corn is a transgenic crop that is resistant to the herbicide Roundup (glyphosate). What is the main reason that farmers would want to plant Roundup Ready corn? 6) _____

A) Roundup Ready corn produces its own herbicide, which would kill nearby weeds without the farmers having herbicides on their fields.
B) Many farmers have problems with airborne Roundup drifting in from nearby farms, and Roundup Ready corn would be protected from such airborne herbicide.
C) Farmers can use Roundup on the weeds in their cornfields without killing their corn.
D) Water supplies are often contaminated with Roundup, which typically kills corn. Such contaminated water can be used only on Roundup Ready crops.

Answer: C
Explanation: A)
B)
C)
D)

7) Herbicides would be most useful in combating _____. 7) _____

A) mosquitoes that spread malaria in tropical rain forests
B) fungi that attack plant roots
C) weeds that infest our agricultural fields
D) bacteria, such as *Salmonella*, which sometimes contaminate meat

Answer: C
Explanation: A)
B)
C)
D)

8) Which of the following is a major contributor to the decline in pollinator populations? 8) _____

A) Collisions with vehicles
B) Use of domesticated bees for pollinating fruit crops
C) Use of insecticides in agricultural areas
D) Use of genetically modified crops

Answer: C
Explanation: A)
B)
C)
D)

9) Which of the following statements regarding farm size and U.S. agricultural sales is true? 9) _____

A) Most farms in the United States are large farms, and agricultural sales are dominated by large farms.
B) Most farms in the United States are midsized and small farms, and agricultural sales are dominated by midsized and small farms.
C) Although the majority of farms in the United States are classified as large farms, agricultural sales are dominated by midsized and small farms.
D) Although the majority of farms in the United States are classified as midsized and small farms, agricultural sales are dominated by large farms.

Answer: D
Explanation: A)
B)
C)
D)

10) In 2008, the average daily caloric intake in the United States was _____ calories, and the daily caloric intake in developing countries was _____ calories. 10) _____

A) 3800; 2100 B) 3800; 2800 C) 2500; 2100 D) 2800; 2100

Answer: A
Explanation: A)
B)
C)
D)

11) Which of the following statements most accurately describes the benefits of Bt corn? 11) _____

A) Although Bt corn has its benefits, the use of Bt corn runs the risk of pests becoming immune to its toxins.
B) Bt corn is resistant to the pesticide Bt, so farmers growing Bt corn can use Bt on the weeds in their cornfields without it harming their crop.
C) Because it contains a certain gene removed from a soil bacterium, Bt corn is immune to the European corn borer.
D) Bt corn produces increased yields because it is resistant to infection from the Bt virus that lives in agricultural soils.

Answer: C
Explanation: A)
B)
C)
D)

12) What commonly used pesticide caused declines in bird populations in the 1950s and 1960s by weakening the shells of bird eggs? 12) _____

A) DDT B) 2,4-D C) Roundup D) Malathion

Answer: A
Explanation: A)
B)
C)
D)

13) Monoculture _____. 13) _____

A) is a new development in agriculture that is more sustainable than industrial agriculture
B) is a development of industrial agriculture
C) accounts for less than 1% of U.S. croplands
D) requires no chemical fertilizers or pesticides

Answer: B
Explanation: A)
B)
C)
D)

14) Which of the following statements about monoculture farming is true? 14) _____

A) Because of the risk of environmental degradation, monoculture farming is illegal in the United States.
B) Monoculture farming is an agricultural practice that increases a crop's susceptibility to insect pests.
C) Monoculture farming prohibits the use of crops that have been genetically modified.
D) Monoculture farming prohibits the use of synthetic fertilizers and pesticides.

Answer: B
Explanation: A)
B)
C)
D)

15) Which of the following methods would be most effective in preventing the evolution of pesticide resistance? 15) _____

A) Using more pesticide whenever resistance appears in the pest population
B) Applying pesticides to the soil before planting and after harvesting a crop
C) Using pesticides only during major outbreaks of pests
D) Using crop rotation and biological controls instead of pesticides

Answer: D
Explanation: A)
B)
C)
D)

16) Organic agriculture _____. 16) _____

A) has increased in the United States in recent years
B) has no national standards in the United States
C) and organically grown produce have not been supported by the European Union
D) began in the 1960s

Answer: A
Explanation: A)
B)
C)
D)

17) All of the following are USDA requirements for certified organic crops, dairy, and meat *except* that _____. 17) _____

A) animal manure may be used to fertilize crops
B) all animals raised for slaughter must be fed organic food or graze on land that is managed with organic practices
C) genetically engineered seeds may not be used to produce organic crops
D) vaccines may not be used on animals raised for slaughter

Answer: D
Explanation: A)
B)
C)
D)

18) Transgenic plants are different from conventional hybrid plants produced hundreds of years ago in that transgenic plants may _____. 18) _____

A) not be used as sources of human food
B) have new traits not found in their ancestral species
C) contain genetic material from genetically dissimilar parents
D) contain genes from animals or bacteria

Answer: D
Explanation: A)
B)
C)
D)

19) Roundup Ready corn is a transgenic crop that is resistant to the herbicide Roundup (glyphosate). Which one of the following would be the greatest concern regarding Roundup Ready corn? 19) _____

A) Transfer of Roundup resistance to other crops, such as soybeans
B) Eventual loss of this trait from Roundup Ready corn due to hybridization
C) Lower yields produced by Roundup Ready corn
D) Evolution of herbicide resistance in weeds that commonly infect cornfields

Answer: D
Explanation: A)
B)
C)
D)

20) Which of the following statements about our global food supply is true? 20) _____

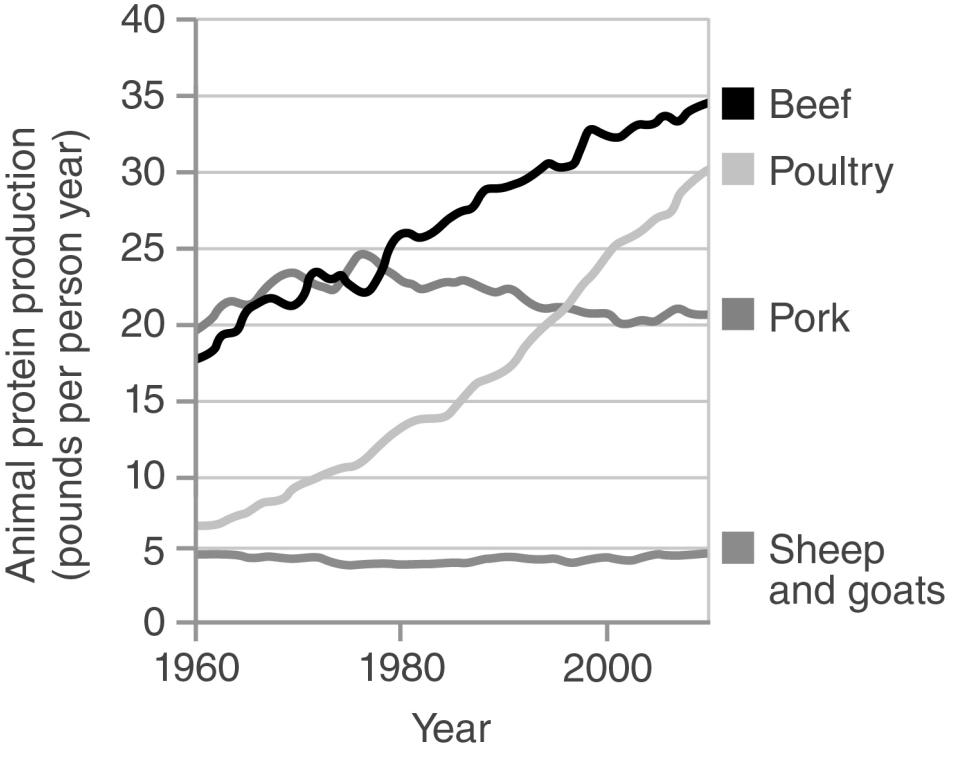
A) New developments in organic farming and genetically modified crops are expected to relieve our current deficit in global food supply.
B) We currently have a deficit in our global food supply, and the deficit is expected to worsen over the next 40 years.
C) The surplus in our global food supply is expected to provide us with a "cushion" as our global population increases to 9 billion people by the middle of the 21st century.
D) To avoid a deficit in our global food supply, food production will have to increase faster over the next 40 years than it has over the past 40 years.

Answer: D
Explanation: A)
B)
C)
D)

21) In the long term, sustainable agriculture will require _____. 21) _____

A) using less fertilizer and decreasing the production and use of fuels made from crops
B) using more fertilizer and increasing the production and use of fuels made from crops
C) increasing meat consumption in developing countries
D) expanding the type of industrial agriculture presently used in developed nations to Africa and Southeast Asia

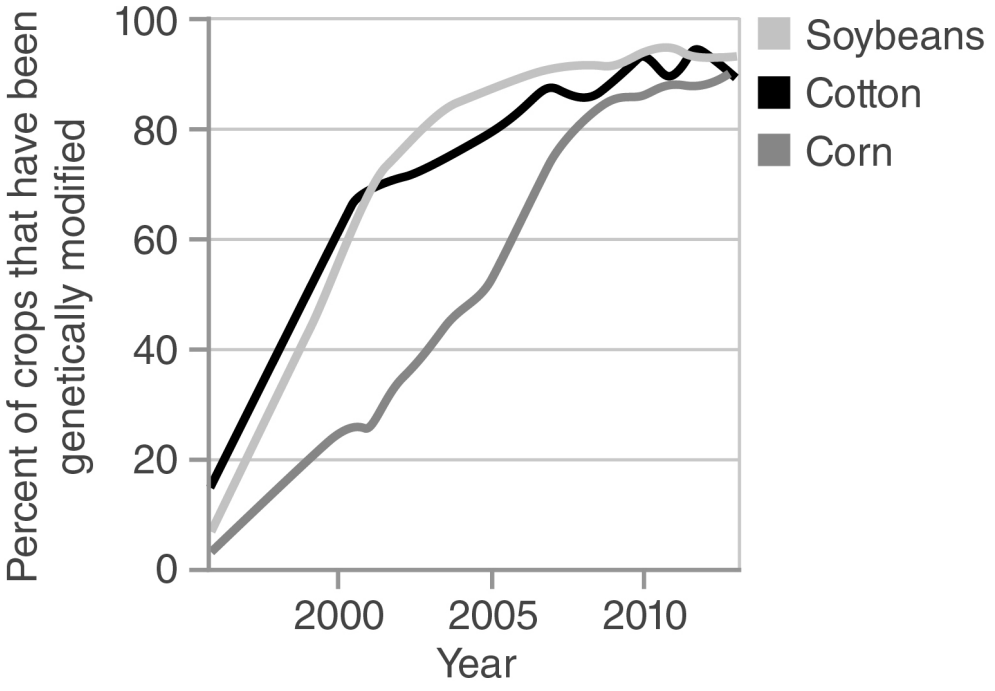
Answer: A
Explanation: A)
B)
C)
D)



22) Which of the following can be inferred from this figure depicting global production of animal protein? 22) _____

A) Although the production of pork and poultry has increased, global dietary intake of animal proteins has remained stable over the past 50 years.
B) More pork protein is produced than all other animal proteins combined.
C) If trends continue, poultry may soon become more popular than beef as a source of animal protein.
D) The amount of poultry and pork consumed is increasing because of an increase in global population.

Answer: C
Explanation: A)
B)
C)
D)



23) Which of the following can be inferred from the information in the figure? 23) _____

A) After rapid increases in the use of GMOs from 1995 to 2010, the percent of U.S. crops that are genetically modified has leveled off since 2010.
B) More bushels of genetically modified corn were produced in 2010 than soybeans.
C) Corn, cotton, and soybeans are the only genetically modified crops grown in the United States.
D) The use of genetically modified crops began in 1985.

Answer: A
Explanation: A)
B)
C)
D)

24) Which of the following is an integrated pest management (IPM) strategy that would be used to prevent a pest outbreak? 24) _____

A) Planting several crops in the same area
B) Targeted use of chemical pesticides
C) Monoculture farming
D) Mechanical pest control

Answer: A
Explanation: A)
B)
C)
D)

25) Today, famine is a regular event in the Sahel region of _____. 25) _____

A) Southeast Asia
B) Africa
C) Australia
D) Central America

Answer: B
Explanation: A)
B)
C)
D)

26) Published in 1962, the book *Silent Spring* helped to establish _____. 26) _____

A) the modern civil rights movement
B) the Food and Drug Administration
C) the National Wildlife Federation
D) the modern environmental movement

Answer: D
Explanation: A)
B)
C)
D)

27) Many people in the developing world primarily rely upon a diet of rice. Such a diet, even with plenty of rice available to meet daily caloric requirements, runs a high risk of _____. 27) _____

A) insufficient intake of energy
B) obesity
C) protein deficiency and disease
D) overnourishment

Answer: C
Explanation: A)
B)
C)
D)

28) Which one of the following is a major cause of global topsoil loss? 28) _____

A) Rising ocean levels
B) Construction of new buildings and roads
C) Erosion via water and wind
D) Creation of new mines

Answer: C
Explanation: A)
B)
C)
D)

29) Armed conflicts are most likely to contribute to famine _____. 29) _____

A) in coastal regions that make great use of seafood
B) in countries that are primarily exporters of grain
C) where rice is the main source of food
D) where food production and distribution are already problematic

Answer: D
Explanation: A)
B)
C)
D)

30) Which one of the following requires the most grain to produce one pound of animal product? 30) _____

A) Milk B) Eggs C) Beef D) Pork

Answer: C

Explanation: A)
B)
C)
D)

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

31) Explain the role of pollinators in agriculture, and describe two reasons for the global declines in pollinator populations.

Answer: For many crops, such as apples, peppers, tomatoes, and melons, pollinators are needed to transfer pollen grains from one plant to another. Without this crucial step, these crops would not be able to develop fruit. Plants are pollinated by a wide variety of insects, such as bees and butterflies, and sometimes by birds and bats. Pollinators are threatened by habitat loss as their native ecosystems have been replaced with monoculture fields. Their populations have also declined because of the widespread use of insecticides on agricultural fields. The use of insecticides on crops requiring pollinators can in fact decrease crop yield.

32) Describe the main goals of precision agriculture.

Answer: The main goals of precision agriculture are to reduce the use of water and fertilizers in agriculture. In many areas, groundwater supplies are dwindling because of agricultural use. One solution for the overuse of groundwater is to reduce agricultural activity in areas that have insufficient rainfall or surface water supplies to sustain agricultural crops. Similarly, farmers can plant crops that require less water, and they can use drip irrigation systems that deliver water directly to the roots of their plants. Nitrogen fertilizers are energy intensive, and phosphorus fertilizer supplies are expected to dwindle in the 21st century, so farmers would want to apply fertilizers only in those areas of their fields where fertilizer is needed.

33) Explain why there are so many malnourished people on the planet.

Answer: The majority of malnourished people are undernourished, meaning that there is some kind of nutrient deficiency in their diet. In some cases, people are simply not taking in enough calories. In other cases, they lack specific dietary nutrients such as iron, vitamin A, and zinc. In some places, the available food lacks some dietary requirements. For example, rice is widely available in many countries, but it lacks amino acids found in beans and meats, so someone with a diet consisting largely of rice will lack those amino acids. While the majority (almost 2 billion) of malnourished people on the planet are undernourished, some (1.5 billion) malnourished people are taking in excessive calories in their diet. These people tend to live in richer countries that have better developed agricultural regions. Ultimately, we are currently producing enough food for everyone. The problem is that we do not have the infrastructure in place to distribute the food to where it is needed. Natural disasters such as droughts and floods, plus human conflicts, exacerbate the problems with food distribution.

1) A
2) D
3) C
4) D
5) B
6) C
7) C
8) C
9) D
10) A
11) C
12) A
13) B
14) B
15) D
16) A
17) D
18) D
19) D
20) D
21) A
22) C
23) A
24) A
25) B
26) D
27) C
28) C
29) D
30) C
31) For many crops, such as apples, peppers, tomatoes, and melons, pollinators are needed to transfer pollen grains from one plant to another. Without this crucial step, these crops would not be able to develop fruit. Plants are pollinated by a wide variety of insects, such as bees and butterflies, and sometimes by birds and bats. Pollinators are threatened by habitat loss as their native ecosystems have been replaced with monoculture fields. Their populations have also declined because of the widespread use of insecticides on agricultural fields. The use of insecticides on crops requiring pollinators can in fact decrease crop yield.
32) The main goals of precision agriculture are to reduce the use of water and fertilizers in agriculture. In many areas, groundwater supplies are dwindling because of agricultural use. One solution for the overuse of groundwater is to reduce agricultural activity in areas that have insufficient rainfall or surface water supplies to sustain agricultural crops. Similarly, farmers can plant crops that require less water, and they can use drip irrigation systems that deliver water directly to the roots of their plants. Nitrogen fertilizers are energy intensive, and phosphorus fertilizer supplies are expected to dwindle in the 21st century, so farmers would want to apply fertilizers only in those areas of their fields where fertilizer is needed.

33) The majority of malnourished people are undernourished, meaning that there is some kind of nutrient deficiency in their diet. In some cases, people are simply not taking in enough calories. In other cases, they lack specific dietary nutrients such as iron, vitamin A, and zinc. In some places, the available food lacks some dietary requirements. For example, rice is widely available in many countries, but it lacks amino acids found in beans and meats, so someone with a diet consisting largely of rice will lack those amino acids. While the majority (almost 2 billion) of malnourished people on the planet are undernourished, some (1.5 billion) malnourished people are taking in excessive calories in their diet. These people tend to live in richer countries that have better developed agricultural regions. Ultimately, we are currently producing enough food for everyone. The problem is that we do not have the infrastructure in place to distribute the food to where it is needed. Natural disasters such as droughts and floods, plus human conflicts, exacerbate the problems with food distribution.

Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following health problems is most closely associated with the thinning of Earth's ozone layer? 1) _____
A) Skin irritations B) Skin cancer C) Heart disease D) Blindness

Answer: B
Explanation: A)
B)
C)
D)

2) The Montreal Protocol _____. 2) _____
A) resulted in significant reduction in the production of CFCs by signatory nations
B) addressed transnational movement of acid-forming pollutants
C) developed the framework for reduction of carbon dioxide in the United States and Canada
D) is an example of a failed attempt to reduce international air pollution

Answer: A
Explanation: A)
B)
C)
D)

3) The ozone layer is in what layer of the atmosphere? 3) _____
A) Mesosphere B) Thermosphere C) Troposphere D) Stratosphere

Answer: D
Explanation: A)
B)
C)
D)

4) The Coriolis effect _____. 4) _____
A) results in seasonal temperature fluctuations across the globe
B) results in the formation of stratospheric ozone
C) is caused by the gravitational pull of the sun and the Moon
D) is caused by Earth's rotational forces

Answer: D
Explanation: A)
B)
C)
D)

5) Which of the following is a secondary pollutant in the troposphere but a beneficial component of the stratosphere? 5) _____

A) Carbon monoxide
B) Ozone
C) Nitrogen oxides
D) Carbon dioxide

Answer: B
Explanation: A)
B)
C)
D)

6) Within a Hadley cell, _____. 6) _____

A) warm air rises and cool air falls
B) cool water rises and warm water falls
C) warm water rises and cool water falls
D) cool air rises and warm air falls

Answer: A
Explanation: A)
B)
C)
D)

7) Atmospheric nitrogen is converted to nitrogen oxides _____. 7) _____

A) when fertilizers containing nitrogen are applied to farm fields
B) when fuels are burned at high combustion temperatures
C) in a photochemical reaction with ozone
D) by using catalytic converters on automobiles

Answer: B
Explanation: A)
B)
C)
D)

8) Catalytic converters are used to control emissions of _____. 8) _____

A) carbon monoxide and nitrogen oxides
B) carbon monoxide and sulfur dioxide
C) carbon dioxide and nitrogen gas
D) carbon dioxide and nitrogen oxides

Answer: A
Explanation: A)
B)
C)
D)

9) Which one of the following would contribute most to acid precipitation falling in the northeastern United States? 9) _____

A) Ozone forming during morning rush hour in Buffalo, New York
B) Coal-fired power plants in northeastern Canada
C) Nuclear power plants in the region
D) Coal-fired power plants in the Midwest

Answer: D
Explanation: A)
B)
C)
D)

10) During the 1990s, damaging acid precipitation in the United States occurred predominantly _____. 10) _____

A) in western states such as Nevada and California
B) in the Northeast
C) in southern states such as Texas and Louisiana
D) in the Midwest

Answer: B
Explanation: A)
B)
C)
D)

11) What two pollutants are the primary causes of acid precipitation? 11) _____

A) Ozone and lead B) SO_2 and NO_X C) NO_X and N_2O D) Ozone and SO_2

Answer: B
Explanation: A)
B)
C)
D)

12) Tropospheric ozone forms from reactions involving _____. 12) _____

A) volatile organic compounds (VOCs) and nitrogen oxides
B) stratospheric ozone and jet stream winds
C) tropospheric CFCs and stratospheric ozone
D) atmospheric nitrogen and atmospheric oxygen

Answer: A
Explanation: A)
B)
C)
D)

13) Coal mines and coal processing facilities are required to minimize the amount of coal dust emitted during mining, processing, and transporting the coal. The regulations controlling coal dust emissions would mainly prevent _____. 13) _____

A) lung damage to those working at the plant and living nearby
B) wasting coal that can be reclaimed and burned to produce electricity
C) coal "fog" that can cause traffic fatalities
D) acid precipitation in the region

Answer: A
Explanation: A)
B)
C)
D)

14) Which of the following symptoms most closely matches the known physiological effects of carbon monoxide? 14) _____

A) Inflammation of the eyes, nasal passages, and skin
B) Lung irritation and bronchitis
C) Feeling tired
D) Skin cancer

Answer: C
Explanation: A)
B)
C)
D)

15) Winds carry air from _____. 15) _____

A) areas of low pressure toward areas of high pressure
B) areas of high temperature toward areas of low temperature
C) areas of low temperature toward areas of high temperature
D) areas of high pressure toward areas of low pressure

Answer: D
Explanation: A)
B)
C)
D)

16) Inhaling PM 2.5 is most likely to cause _____. 16) _____

A) damage to alveoli in the lungs B) hallucinations
C) brain damage D) depletion of the ozone layer

Answer: A
Explanation: A)
B)
C)
D)

17) The air you breathe is 78% _____. 17) _____

A) oxygen B) nitrogen C) hydrogen D) carbon dioxide

Answer: B
Explanation: A)
B)
C)
D)

18) The Coriolis effect contributes to _____. 18) _____

A) the destruction of the ozone layer B) global wind patterns
C) increased acidic deposition D) global warming

Answer: B
Explanation: A)
B)
C)
D)

19) Near the equator, the atmospheric circulation patterns are called _____. 19) _____

A) high-pressure cells
B) Ferrel cells
C) Hadley cells
D) Coriolis cells

Answer: C
Explanation: A)
B)
C)
D)

20) Temperature increases with altitude through most of the stratosphere because _____. 20) _____

A) sunlight is more intense in the stratosphere
B) of the interaction between ozone and the sun's UV radiation
C) jet stream winds produce frictional heat
D) greenhouse gases in the stratosphere warm the air

Answer: B
Explanation: A)
B)
C)
D)

21) In the United States, air quality has _____ in the past 40 years. In China, air quality has _____ over the same time period. 21) _____

A) improved; gotten worse
B) gotten worse; improved
C) gotten worse; also gotten worse
D) improved; improved even more

Answer: A
Explanation: A)
B)
C)
D)

22) Stratospheric ozone destruction involves a complex series of reactions. The first significant reaction involves _____. 22) _____

A) UV radiation from sunlight breaking apart O_3 molecules
B) ultraviolet (UV) radiation from sunlight causing Cl atoms to break free from CFCs
C) O_3 reacting with industrial sulfuric acid
D) O_3 reacting directly with CFCs

Answer: B
Explanation: A)
B)
C)
D)

23) Atmospheric pressure is the pressure exerted on an area from the weight of the atmosphere above it. Pressure is often measured in pounds per square inch (psi) and in units called millibars (mb). Normal air pressure at sea level is approximately 14.7 psi or 1,013 mb. At the top of Mount Everest, the air is only 33% as dense as it is at sea level, and the air pressure is approximately 333 mb. Denver, Colorado, at an elevation of 5,280 feet, has an average air pressure of 834 mb. The air in Denver is _____ as dense as it is at sea level. 23) _____

A) 121% B) 16% C) 82% D) 67%

Answer: C

Explanation: A)
B)
C)
D)

24) Jet streams are strong _____ that flow from _____. 24) _____

A) ocean currents; the equator toward higher latitudes
B) air currents; the equator toward higher latitudes
C) ocean currents; continent to continent
D) air currents; west to east

Answer: D

Explanation: A)
B)
C)
D)

25) The huge dust storms that took place in the southern plains of the United States in the 1930s _____. 25) _____

A) were the result of ozone depletion and acid precipitation killing off vegetation
B) were caused by abnormally warm waters in the central Pacific Ocean
C) were the result of a prolonged drought and poor farming techniques
D) were triggered by tornados and were worsened by global climate change

Answer: C

Explanation: A)
B)
C)
D)

26) The main pollutants that cause acid precipitation are _____. 26) _____

A) carbon monoxide and carbon dioxide B) lead and sulfur dioxide
C) sulfur dioxide and nitrogen oxides D) tropospheric ozone and carbon monoxide

Answer: C

Explanation: A)
B)
C)
D)

27) Lead pollution is a problem because lead _____. 27) _____

A) will cause the ozone hole to increase
B) causes central nervous system damage in humans
C) is a precious metal, and it is being lost to the atmosphere
D) forms an acid in the atmosphere, resulting in acid precipitation

Answer: B
Explanation: A)
B)
C)
D)

28) Which of the following is a secondary pollutant? 28) _____

A) Sulfuric acid
B) Carbon monoxide
C) Lead
D) Sulfur dioxide

Answer: A
Explanation: A)
B)
C)
D)

29) _____ are used to remove sulfur oxides from the emissions from coal-fired power plants. 29) _____

A) Scrubbers
B) Catalytic converters
C) Desulfinators
D) CFCs

Answer: A
Explanation: A)
B)
C)
D)

30) Atmospheric pressure is the pressure exerted on an area from the weight of the atmosphere above it. Pressure is often measured in pounds per square inch (psi) and in units called millibars (mb). Normal air pressure at sea level is approximately 14.7 psi or 1013 mb. At the top of Mount Everest, the air is only 33% as dense as it is at sea level, and the air pressure is approximately 333 mb. Denver, Colorado, at an elevation of 5,280 feet, has an average air pressure of 834 mb. What would Denver's air pressure be in psi? 30) _____

A) 17.9 psi
B) 12.1 psi
C) 8.34 psi
D) 14.7 psi

Answer: B
Explanation: A)
B)
C)
D)

31) The greatest loss of stratospheric ozone _____. 31) _____

A) occurred after the Montreal Protocol failed to be ratified
B) is expected to occur in the mid-21st century
C) occurs in urban areas where automobile use is most prevalent
D) has occurred over Antarctica

Answer: D
Explanation: A)
B)
C)
D)

32) Much progress in reducing atmospheric levels of lead pollution has resulted from _____. 32) _____

A) the elimination of leaded gasoline
B) the switch from lead to graphite in pencils
C) new types of lead scrubbers on smokestacks that removed lead from the power plant emissions
D) the development of new types of batteries that use lithium instead of lead

Answer: A
Explanation: A)
B)
C)
D)

33) Which of the following statements is most logical? 33) _____

A) "I like the weather in Iowa. I just don't like the climate."
B) "I just shoveled 12 inches of climate off my driveway."
C) "Climate happens all the time. Weather just happens when you're paying attention."
D) "We can pretty well predict climate ourselves. We need professionals to predict weather."

Answer: D
Explanation: A)
B)
C)
D)

34) As air descends in a circulation cell, the air _____, and a _____-pressure region occurs where the air reaches Earth's surface. 34) _____

A) cools; high B) cools; low C) warms; low D) warms; high

Answer: D
Explanation: A)
B)
C)
D)

35) Several members of a family die of carbon monoxide poisoning. Which of the following is the most likely source of the carbon monoxide? 35) _____

A) A faulty furnace
B) A nearby coal-fired power plant
C) A backyard bonfire
D) A faulty electric space heater

Answer: A
Explanation: A)
B)
C)
D)

36) Air at the equator is much warmer than air at the North and South Poles. Which of the following scenarios is most likely to decrease the difference in temperature between the equator and poles? 36) _____

A) Earth being completely covered with water
B) Earth spinning without a seasonal tilt to its axis
C) Earth being completely covered by land
D) Earth rotating in the opposite direction

Answer: A
Explanation: A)
B)
C)
D)

37) Which of the following is a primary pollutant? 37) _____

A) Lead B) Ozone C) Sulfuric acid D) Nitric acid

Answer: A
Explanation: A)
B)
C)
D)

38) Carbon monoxide _____. 38) _____

A) is consumed by plants for photosynthesis
B) is produced by plants during photosynthesis
C) is a major component of the atmosphere
D) causes ozone depletion
E) blocks oxygen transport in human blood

Answer: E
Explanation: A)
B)
C)
D)
E)

39) In the 1970s and 1980s, CFCs were widely used in _____. 39) _____

A) refrigerators and aerosol cans
B) snowmobiles and motorcycles
C) light bulbs and electronics
D) coal-fired power plants

Answer: A
Explanation: A)
B)
C)
D)

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

40) Explain how acid precipitation forms, and describe the impacts of acid precipitation on the environment.

Answer: Acid precipitation is a secondary pollutant formed in the atmosphere when sulfur and nitrogen oxides dissolve in water to produce sulfuric acid and nitric acid. Acid precipitation can affect both aquatic and terrestrial ecosystems, in addition to human-made structures. Acid precipitation can acidify streams and lakes, leading to the death of fish and other aquatic species. Trees are negatively impacted by acid precipitation when acidic rainwater causes harmful changes to soils. Acid precipitation is particularly damaging to stone structures, gradually dissolving away buildings, gravestones, and historic architecture.

41) Describe the distinction between a primary pollutant and a secondary pollutant. Give an example of a primary pollutant and an example of a secondary pollutant. Explain the source(s) and effect(s) of each of these pollutants, and describe recent U.S. trends in atmospheric concentrations of each.

Answer: A primary pollutant is a chemical contaminant that is directly released from its source, while a secondary pollutant is formed via reactions between primary pollutants and other gases in the atmosphere.
Lead is one example of a primary pollutant. Until its use was eliminated in 1996, lead was added to gasoline as a way to improve engine performance. Although its concentrations in the United States have been declining, lead is still released from fossil fuel combustion in power plants and from industrial processes such as lead smelters, solid waste incineration facilities, and lead-acid battery producers. Lead interferes with nervous system function and can cause brain damage.
Tropospheric ozone (O_3) is one example of a secondary pollutant. Tropospheric ozone forms from a series of reactions that involve VOCs and NO_x. Ozone irritates respiratory tissue and can cause breathing difficulty. Ozone can also cause damage to leaf tissue. Ozone concentrations have been declining in the United States, but not as rapidly as the decline in other pollutants.

42) Discuss the objective and success of the 1987 Montreal Protocol.

Answer: The objective of the Montreal Protocol was to reduce the use of CFCs, which were contributing to the depletion of the ozone layer, the loss of which would increase the global prevalence of skin cancer. The world community came together in 1987 to craft the Montreal Protocol, which has been ratified by most countries. As a result of the protocol, CFC production has been phased out and replaced by more ozone-friendly compounds. The Montreal Protocol is viewed as one of the most successful international environmental treaties ever signed.

1) B
2) A
3) D
4) D
5) B
6) A
7) B
8) A
9) D
10) B
11) B
12) A
13) A
14) C
15) D
16) A
17) B
18) B
19) C
20) B
21) A
22) B
23) C
24) D
25) C
26) C
27) B
28) A
29) A
30) B
31) D
32) A
33) D
34) D
35) A
36) A
37) A
38) E
39) A
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