1.	Which of the following terms refers to a set of methods to control pest organisms by using natural ecological interactions:
a)	biomagnification
b)	traditional ranching
c)	no-till agriculture
d)	contour plowing
e)	biological control
	Ans: e Difficulty: Easy Link to: 12.6

2.	The leading human cause(s) of desertification is/are:
a)	global warming
b)	conversion of rangelands to croplands in marginal areas
c)	poor forestry practices
d)	failure to use contour plowing
e)	all of these
	Ans: d Difficulty: Easy Link to: 12.10

3.	Which of the following is an agricultural practice in which the land is not plowed in most of the years:
a)	biomagnification
b)	traditional farming
c)	no-till agriculture
d)	contour plowing
e)	biological control
	Ans: c Difficulty: Easy Link to: 12.10

4.	Soil eroded from one location has to go somewhere else. A lot of it is washed down streams and rivers. Which of the following is not a form of environmental degradation associated with eroding soils?
a)	destruction of fisheries
b)	destruction of coastal coral reefs
c)	deposition in reservoirs
d)	chemical enrichment of waters downstream

e)	global warming
	Ans: e Difficulty: Easy Link to: 12.3, 12.4

5.	The purpose of adding a "terminator gene" to a genetically modified crop species is to prevent:
a)	attack by insect pests
b)	genetic crossover
c)	competition from weeds
d)	predation by grazing or browsing animals
e)	the crop from producing seeds for the following year
	Ans: e Difficulty: Easy Link to: 12.8

6.	Use of predators, parasites, and competitors for pest control defines which of the following?
a)	integrated waste management
b)	secondary pest outbreaks
c)	effective methods for controlling malaria
d)	game ranching
e)	biological pest control
	Ans: e Difficulty: Easy Link to: 12.6

7.	Overgrazing impacts the land in which of the following ways: I. It increases the diversity of plant species. II. Animals trample and compact the soil. III. It leads to increased soil erosion.
a)	I only
b)	II only
c)	III only
d)	I and III
e)	II and III

	Ans: e Difficulty: Medium Link to: 12.9

8.	Modern industrialized agriculture involves all of the following characteristics except:
a)	major use of fossil fuels
b)	increased CO_2 concentrations in the atmosphere
c)	increased decomposition of soil organic matter
d)	artificial use of fertilizer
e)	cultivation of subsistence crops
	Ans: e Difficulty: Medium Link to: 12.9

9.	Rice cultivation in the Sacramento Valley, California (Environmental Issue, Chapter 12) illustrates some of the effects of agriculture on the environment. To offset some of the negative impacts of rice cultivation, it has been suggested that the fields be flooded during the winter. The principal <u>positive</u> impact of this action would be to:
a)	create spawning grounds for salmon
b)	cleanse pesticides and herbicides from the land
c)	prevent off-road vehicle damage
d)	increase habitats for migratory waterfowl
e)	reduce groundwater recharge
	Ans: d Difficulty: Medium Link to: Critical Thinking Issue

10.	Integrated pest management involves:
a)	use of genetically engineered enemies
b)	cultivation of a lower diversity of crops
c)	application of highly specific chemicals
d)	use of intense land plowing to increase yields
e)	eradication of all pests
	Ans: c Difficulty: Easy Link to: 12.7

11.	Eating low on the food chain is more efficient than eating high on it. However according to the Environmental Science text, conversion of all present rangeland to crop land would increase environmental damage because:
a)	agriculture contributes methane, a greenhouse gas, to the atmosphere, but grazing does not
b)	contrary to common belief, grazing is beneficial to the environment, increasing ecological diversity and resilience
c)	the process of land conversion itself is more damaging than any single, sustained type of land-use
d)	not all land is suitable for agriculture; some is better suited to grazing
e)	agriculture requires clearing of the land, whereas grazing cattle can be done without clearing sensitive tropical forests
	Ans: d Difficulty: Medium Link to: 12.4, 12.9

12.	About one-third (~33%) of the Earth's land has climates that should produce deserts, but about 43% actually is desert. What one dominant force is believed to be the cause of this excess desert land?
a)	irrigation
b)	global warming
c)	changing climates since the last Ice Age
d)	human activities
e)	agriculture
	Ans: d Difficulty: Medium Link to: 12.10

13.	Which of the following is not a major symptom of desertification?
a)	lowering of the water table
b)	increased salt content of the soil
c)	increased soil erosion
d)	loss of natural native vegetation
e)	pollution by sediment, fertilizers, and pesticides
	Ans: e Difficulty: Easy Link to: 12.10

14.	No-till agriculture is an agricultural technique where:

a)	only natural pesticides and herbicides are used
b)	chemical wastes are naturally degraded by application to the land
c)	the land is not plowed
d)	fall plowing is favored
e)	no crop rotation takes place

Ans: c
Difficulty: Easy
Link to: 12.5

15.	In the recent past, the single most effective method to reduce soil erosion has been:
a)	increased use of herbicides
b)	increased irrigation
c)	introduction of genetically modified crops
d)	crop rotation
e)	contour plowing

Ans: e
Difficulty: Easy
Link to: 12.5

16.	Overgrazing of pasture lands occurs when:
a)	the water table falls
b)	vegetative diversity of the pasture is reduced
c)	vegetation is seriously or permanently reduced by domesticated animals
d)	the carrying capacity of the pasture is reached
e)	the pasture is not irrigated

Ans: c
Difficulty: Easy
Link to: 12.9

17.	Deserts occur naturally where:
a)	there is low temperature and low rainfall throughout the year
b)	there is too little water for substantial plant growth
c)	overgrazing removes water-holding vegetation
d)	sand supply exceeds the ability of wind to transport it away
e)	there is insufficient soil to grow plants

	Ans: b Difficulty: Easy Link to: 12.10

18.	What is the main reason that DDT is still being used in large areas of the world?
a)	need to maximize crop yields in populous developing countries
b)	coercion by U.S. chemical manufacturers
c)	the chemical breaks down in tropical climates to a benign form
d)	pests have developed a resistance to it
e)	to combat malaria
	Ans: e Difficulty: Easy Link to: 12.6

19.	When a pest develops resistance to a chemical, all of the following are true except:
a)	natural selection took place
b)	it developed adaptations during times of secondary pest outbreaks
c)	mutation and genetic drift took place
d)	evolution selected for individuals better resistant to the chemical
e)	higher quantities of pesticide will be required in the next application
	Ans: c Difficulty: Easy Link to: 12.6

20.	All of the following measures can help prevent desertification except:
a)	proper irrigation
b)	using trees as windbreaks
c)	maximum use of marginal land
d)	no-till agriculture
e)	reforestation
	Ans: c Difficulty: Easy Link to: 12.6

21.	The type of soil at a particular site depends on many factors. Which of the following is not a factor influencing the soil type?
a)	climate
b)	slope
c)	biomagnification
d)	biological activity
e)	parent material
	Ans: c Difficulty: Easy Link to: 12.3

22.	What practice has greatly increased the farm yield per unit area
a)	irrigation
b)	contour plowing
c)	modern fertilizers
d)	pest control
e)	weed control
	Ans: c Difficulty: Medium Link to: 12.5, 12.6

23.	Practices that can sustain the fertility of soils include all of the following except:
a)	plowing in the fall
b)	plowing up and down slopes to channel runoff away quickly
c)	multiculture
d)	strip cropping
e)	crop rotation
	Ans: b Difficulty: Easy Link to: 12.3, 12.4

24.	Rice cultivation in the Sacramento Valley, California (Environmental Issue, Chap. 12 in the textbook) illustrates some of the effects of agriculture on the environment. Adverse effects of cultivating rice include:
a)	low demand for water
b)	reduction of wetland habitats
c)	reduced pesticide use
d)	reduced herbicide use

e)	air pollution from smoke

Ans: e
Difficulty: Easy
Link to: Critical Thinking Issue

25. Agriculture can be linked to the threat of global warming by which of the following mechanism?

I.	fires used to clear land release ozone into the atmosphere
II.	use of fossil fuels by mechanized agriculture
III.	clearing of land leads to decomposition of organic matter and incre atmospheric CO_2

a)	I only
b)	II only
c)	III only
d)	I and III
e)	I, II, and III

Ans: e
Difficulty: Medium
Link to: 12.4

26. What is the principle drawback of broad-spectrum pesticides?

a)	reduced crop yields
b)	toxic to beneficial organisms and humans
c)	not only toxic, but carcinogenic
d)	they target only a single pest species
e)	they contribute to sediment pollution

Ans: b
Difficulty: Medium
Link to: 12.5, 12.7

27. Even fertile land not naturally threatened can undergo desertification. Around the world, this has been most widely caused by:

a)	monoculture
b)	contour plowing
c)	overgrazing
d)	application of pesticides
e)	degradation of soils by toxic chemicals

	Ans: c Difficulty: Easy Link to: 12.10

28.	What is a / are major advantage/s of contour plowing? I. reduces topsoil erosion II. is more fuel efficient III. is more time efficient
a)	I only
b)	II only
c)	III only
d)	I and III
e)	I, II, and III
	Ans: e Difficulty: Easy Link to: 12.4

29.	Which of the following is a true statement about insect pests in agriculture:
a)	slash-and-burn agriculture eliminates pest problems
b)	DDT is no longer used anywhere
c)	the only effective control method is chemical pesticides
d)	insect pests are the leading cause of lost crop production
e)	the cheapest and most effective method is biological
	Ans: d Difficulty: Easy Link to: 12.5, 12.7

30.	Cattle can be maintained at relatively high densities on grazing land with:
a)	arid conditions
b)	polar climates
c)	moist conditions
d)	urban environments
e)	cattle can be maintained anywhere because cows adapt to any climatic conditions

	Ans: c Difficulty: Medium Link to: 12.9

31.	Desertification can be reduced by all of the following measures except:
a)	soil conservation
b)	decreased emissions of greenhouse gases
c)	cessation of ocean dumping
d)	proper irrigation
e)	forest management
	Ans: c Difficulty: Easy Link to: 12.10

32.	Poor agricultural practices commonly lead to loss of soil fertility over time. The rate of that loss is commonly measured as:
a)	the time required for the soil to lose one half of its original storage of chemical nutrients
b)	the degree of molecular disorder of the chemical elements necessary for crops
c)	the ratio of crop production to the amount of chemical residue after each production period
d)	the number of years it for crop land to restore depleted chemical elements
e)	the amount of chemical fertilizer necessary for crops per production unit per year
	Ans: a Difficulty: Medium Link to: 12.3, 12.4

33.	Major symptoms of desertification include:
a)	higher water tables
b)	decreased salt content in the soil
c)	more abundant surface water
d)	decreased soil erosion
e)	loss of natural, native vegetation
	Ans: e Difficulty: Easy Link to: 12.10

34.	Integrated Pest Management:
a)	is concerned with the effects of insect pests on agricultural crops
b)	will lead to increased pesticide use
c)	costs farmers more to control pests
d)	considers effects of the pest-control method on the entire ecosystem
e)	eliminates pests without any other environmental impact
	Ans: d Difficulty: Easy Link to: 12.7

35.	List three effects of modern, intensive agriculture that can deplete the fertility of crop land and pasture land.
Ans:	overgrazing plowing soil erosion (by both wind and water) salinization
	Difficulty: Medium Link to: 12.4, 12.9, 12.10

36.	Agricultural scientists refer to the ultimate, most desirable pesticide as a "magic bullet". What do they mean by this expression?
Ans:	A "magic bullet" is a chemical that is lethal only to a single crop species and rapidly seeks out individuals of that species and kills them with no effect on any other form of life.
	Difficulty: Medium Link to: 12.5, 12.7

37.	In spite of declining natural fertility, crop yields from most agricultural land in the U.S. remain high. What is the one main method that farmers use to maintain crop yields?
Ans:	applying artificial fertilizer to the soil
	Difficulty: Easy Link to: 12.3

38.	Name at least three effects of overgrazing of rangeland.
Ans:	reduction in the diversity of plant species reduction of vegetation growth dominance of plant species that are relatively undesirable to cattle increase in soil loss by erosion overall damage to the rangeland through mechanical action of the cattle
	Difficulty: Medium Link to: 12.9

39.	List four of the major symptoms of desertification.
Ans:	lowered water table increased salt content in the soil reduced surface water increased soil erosion loss of natural vegetation
	Difficulty: Easy Link to: 12.10

40.	In the ideal world, agriculture is an example of utilization of a completely renewable resource. However, the high crop yields achieved by modern agriculture are made possible by using a number of non-renewable resources. Name three of these.
Ans:	soil, chemical fertilizer, fuel, metals for farm machinery
	Difficulty: Easy Link to: 12.11

41.	One effect of overgrazing is the dominance of plant species that are relatively undesirable to cattle. Explain how this happens.
Ans:	Desirable plant species are eaten by the cattle so fast that these species do not have the chance to recover properly. At the same time, the undesirable plant species have no competitors and can grow and reproduce easily.
	Difficulty: Medium Link to: 12.9

42.	Agriculture contributes to environmental effects at a range of scales. List one local, one regional, and one global effect of agriculture.
Ans:	e.g. soil erosion, sedimentation, global warming
	Difficulty: Easy Link to: 12.3

43.	How can desertification be prevented? List at least three such measures.
Ans:	soil conservation proper irrigation practices good farming and foresting practices appropriate to the climate and soil
	Difficulty: Medium Link to: 12.9

44.	Rice cultivation in the Sacramento Valley, California (Environmental Issue, Chapter 12) illustrates some of the effects of agriculture on the environment. Most of the acres where rice is grown have alkaline, hard-pan soils, unsuited to other crops. If rice were not grown on this land, it probably would be developed for housing. Each acre of rice requires 5 acre-feet of water per year. Less than 1 acre-foot could supply a family of four for a year. If 1000 acres were converted from rice cultivation to housing, and housing lots were one-eighth of an acre and all housed families of four, A) How many acre-feet of water would be used in a year? B) Which uses more water, an acre of rice or an acre of housing? C) Who would use the argument outlined in A) and B) above, a real estate developer or a rice farmer?
Ans:	A) 8,000 acre-feet/year B) housing C) the rice farmer
	Difficulty: Difficult Link to: Critical Thinking Issue

45.	Although DDT was believed to be close to the ideal pesticide, major problems appeared in long term. What attributes of DDT made it so desirable as a pesticide?

Ans:	DDT had no short-term effect on people and seemed to kill only insects. It is also relative insoluble in water. It was believed that DDT would not pose an environmental hazard by being transported off the sites into other environments.
	Difficulty: Medium Link to: A Closer Look 12.2

46.	Name three leading causes of desertification
Ans:	bad farming practices overgrazing conversion of rangelands in marginal areas to crop lands poor foresting practices heavy irrigation in arid areas and salinization of soil
	Difficulty: Easy Link to: 12.10

47.	Explain how irrigation of soil in arid areas can lead to desertification.
Ans:	When irrigation water evaporates, a residue of salts is left behind. Over time, the salts builds up in the soil.
	Difficulty: Medium Link to: 12.10

48.	How can overgrazing be prevented?
Ans:	proper management of the livestock using appropriate lands for grazing keeping livestock at a sustainable yield
	Difficulty: Medium Link to: 12.9

49.	List at least three long-term effects of DDT which were discovered after years of use as a pesticide.
Ans:	DDT affects the ability of birds to produce eggs possible increase in cancer in humans biomagnification The storage of DDT in fats and oils allows the chemical to be transferred biologically

	Difficulty: Easy Link to: A Closer Look 12.2

50.	Explain how large-scale irrigation causes environmental problems.
Ans:	construction of reservoirs reduce wildlife habitats stream patterns change erosion rates increase salinization of soil rapid leaching of nutrients into the lower part of the soil
	Difficulty: Medium Link to: 12.9

51.	In the 1930s, soil erosion became a major issue in the United States. Large areas of the American Midwest became the so-called Dust Bowl. Explain how this happened.
Ans:	Intense plowing of fertile prairie lands, combined with a major drought, loosened the soil over large areas. Once the deep-rooted prairie grasses were plowed, wind, sun, and rain further loosened the soil which then easily eroded away.
	Difficulty: Medium Link to: 12.2

52.	What birds have been most affected by the long-term effects of DDT and why?
Ans:	Birds which are predators, and therefore high up in the food chain, have been most affected due to biomagnification.
	Difficulty: Medium Link to: A Closer Look 12.2

53.	Agriculture has significant effects on the environment from the local scale to the global. List four of the most important effects.

Ans:	climatic effects addition of particulates and CO_2 to the atmosphere widespread pollution of freshwater and coastal waters through sediment pollution soil erosion ---> all this leads to large-scale changes in the biochemical cycles
	Difficulty: Medium Link to: Chapter 12

54.	Agriculture has significant effects on the environment at all scales, from local, to regional, to global. List some of the major effects at each of these three scales.
Ans:	Local effects: erosion, loss of soil, increase of downstream sedimentation Regional effects: desertification, large-scale pollution events, increases of sedimentation in major rivers and at the mouths of rivers, changes in the fertility of soils over large areas Global effects: climatic change, extreme changes in the chemical cycles
	Difficulty: Medium Link to: Chapter 12

55.	Name at least five major environmental problems resulting from agriculture.
Ans:	deforestation desertification soil erosion overgrazing water pollution eutrophication of rivers, lakes, and ponds degradation of water resources salinization of the soil toxic metal accumulation in the soil accumulation of toxic organic compounds in the soil
	Difficulty: Medium Link to: Chapter 12