1.	The total number of genetic characteristics of a specific biological population is called:
a)	mutation
b)	genetic diversity
c)	competitive exclusion
d)	ecological gradient
e)	genetic drift
	Ans: b Difficulty: Easy Link to: 7.1

2.	Random changes in the frequencies of traits in a population are called:
a)	mutation
b)	genetic diversity
c)	competitive exclusion
d)	ecological gradient
e)	genetic drift
	Ans: e Difficulty: Easy Link to: 7.2

3.	Principle that species with identical requirements cannot coexist in a habitat:
a)	mutation
b)	genetic diversity
c)	competitive exclusion
d)	ecological gradient
e)	genetic drift
	Ans: c Difficulty: Easy Link to: 7.6

4.	This chapter introduced some of the aspects of species diversity. The figure below illustrates the concept of "shape diversity". Which one of the following statements about the figures is correct?
a)	Figure (a) has greater shape richness than Figure (b)
b)	Figure (a) has greater shape dominance than Figure (b)

c)	Figure (a) has less shape habitat diversity than Figure (b)
d)	Figure (a) has less shape richness than Figure (b)
e)	Figure (a) has greater shape evenness than Figure (b)

Ans: e
Difficulty: Medium
Link to: 7.3

5.	A habitat with a variety of local sub-environments has all of the following characteristics **except**:
a)	it leads to greater species diversity
b)	it can offer refuges to rare species
c)	it follows the Principle of Competitive Exclusion
d)	it provides a large number of habitats
e)	it provides a large number of ecological niches

Ans: c
Difficulty: Medium
Link to: 7.6

6.	"Ecological gradient" refers to:
a)	the Competitive Exclusion Principle
b)	the variation in the number of species from the equator to the poles
c)	increasing extinction of species through time
d)	interaction of species to benefit one another
e)	change in the relative abundance of a species over an area

Ans: e
Difficulty: Easy
Link to: 7.2

7.	In which of the following situations is adaptive radiation most likely to occur:
a)	where species evenness is high
b)	where species diversity is high
c)	in stable environments, with little change over time
d)	in arid climates
e)	where populations are isolated from the rest of the world

Ans: e
Difficulty: Medium
Link to: 7.2

8.	The Mississippi River delta of Louisiana is a very special environment. The combined effect of geological subsidence, opening of shipping lanes through the delta, channelization of the river and its distributaries is an example of:
a)	biological evolution
b)	human interaction with the environment
c)	introduction of exotic species
d)	genetic engineering
e)	geographic isolation
	Ans: b Difficulty: Medium Link to: 7.8

9.	The World Health Organization's $6 billion push to rid the world of malaria failed because the microorganisms that cause the disease and the mosquitoes that carry the disease _____.
a)	were named as endangered species
b)	were impervious to any pesticide or drug
c)	were not the actual causes of the disease
d)	developed resistance to the chemicals being used
e)	survived in remote and inaccessible locations
	Ans: d Difficulty: Easy Link to: A Closer Look 7.1

10.	The World Health Organization's $6 billion push to rid the world of malaria failed because the microorganisms that cause the disease and the mosquitos that carry the disease developed resistance to the chemicals being used. This resistance developed as a result of:
a)	species diversity
b)	genetic predisposition
c)	natural selection
d)	genetic engineering
e)	symbiosis
	Ans: c Difficulty: Easy Link to: A Closer Look 7.1

11.	The graph below demonstrates that:

a)	the wolf population controls the size of the moose population
b)	the wolves prey heavily on the moose
c)	the biggest single cause of death of wolves is lack of moose to eat
d)	we cannot infer any relationship between moose population density and wolf population density on the basis of this graph
e)	the biggest single cause of death of moose is lack of plants to eat

Ans: d
Difficulty: Difficult
Link to: 7.7

12.	Which population is <u>most</u> likely to exhibit an evolutionary response to a change in its environment?
a)	A population in which all organisms are genetically identical and which has a high reproductive rate
b)	A population which has high genetic variability
c)	A population in which the effect of intraspecific competition is reduced by behavioral adaptations
d)	A population which undergoes genetic drift
e)	A population on an isolated island

Ans: b
Difficulty: Easy
Link to: 7.2

13.	Processes that lead to changes in gene frequency include all the following **except**:
a)	natural selection
b)	mutation
c)	genetic drift
d)	self reproduction
e)	migration

Ans: d
Difficulty: Easy
Link to: 7.2

14.	Why have Gry Wolves been removed from the endangered species list?
a)	wolves only hunt deer and moose and don't eat domestic livestock

b)	their population has reached more than 5,000, and appears to be growing
c)	conservationists requested the removal from the list
d)	biologists requested the removal from the list
e)	American citizens requested the removal from the list

Ans: b
Difficulty: Easy
Link to: case study

15.	During the first period of advanced multi-cellular life, called the Cambrian Era:
a)	the first fish ventured on land
b)	living organisms remained in the ocean
c)	organisms were affected by the lack of oxygen in the ocean
d)	plants had already invaded the land
e)	birds were flying in the air

Ans: b
Difficulty: Easy
Link to: 7.3

16.	Biological evolution matches most closely to which of the following descriptions:
a)	genetic drift over time
b)	self-reproduction of a population over time
c)	the change of inherited characteristics of a population
d)	the preservation of endangered species
e)	the origins of life

Ans: c
Difficulty: Easy
Link to: 7.2

17.	Which population of predators is potentially most stable?
a)	a population that specializes on one type of prey
b)	a population that is composed primarily of juveniles
c)	a population at its maximum sustainable yield
d)	a population that feeds on many types of prey
e)	a population that is composed of fertile adults

	Ans: d Difficulty: Medium Link to: 7.7

18.	What is biological diversity?
a)	the relative abundance of all species on Earth
b)	the adaptation of living things to their environment
c)	the variety of life forms on earth
d)	the environmental variability of species
e)	the complexity of life forms on earth
	Ans: c Difficulty: Easy Link to: 7.3

19.	All of the following are examples of the relationship: (1) inhabitant, (2) ecological niche or habitat, (3) activity of the inhabitant in the niche, **except**:
a)	surfer, ocean, beach
b)	flour beetle, flour, eating flour
c)	bus driver, town, bus driving
d)	wolf, northern forest, predating on animals
e)	squirrel, trees, feeding on seeds
	Ans: a Difficulty: Medium Link to: 7.7

20.	In the figure below, the event which occurs at Time 3 is an example of: The graph above shows the growth of populations of two different species of wombats in the same ecosystem. Species A is shown by the dashed line; Species B is the solid line. Both species use the same resources.
a)	the niche concept
b)	competitive exclusion principle
c)	optimal - foraging theory
d)	stable limit cycles
e)	Lotka-Volterra equations

	Ans: b Difficulty: Medium Link to: 7.6

21.	Through most of the period between Times 2 and 4 in the figure below, Species A is increasing _____. The graph above shows the growth of populations of two different species of wombats in the same ecosystem. Species A is shown by the dashed line; Species B is the solid line. Both species use the same resources.	
a)	negative exponentially	
b)	exponentially	
c)	by a constant number	
d)	organically	
e)	linearly	
	Ans: e Difficulty: Medium Link to: 7.7	

22.	In the figure below, the growth of Species A between Times 2 and 4 suggests that: The graph above shows the growth of populations of two different species of wombats in the same ecosystem. Species A is shown by the dashed line; Species B is the solid line. Both species use the same resources.	
a)	space was not limiting	
b)	predation limited the population	
c)	competition for limited resources limited the population	
d)	food was not a limiting factor	
e)	the question cannot be answered from the information provided	
	Ans: c Difficulty: Medium Link to: 7.7	

23.	Processes that lead to changes in gene frequency include all the following **except**:	
a)	natural selection	
b)	mutation	

c)	genetic drift
d)	self reproduction
e)	migration
	Ans: d Difficulty: Easy Link to: 7.2

24.	Mutation:
a)	is exclusively a result of radiation damage to DNA
b)	can result in a new species
c)	simply adds variety to inherited characteristics
d)	leads to a new species which cannot survive the present environment
e)	always leads to positive change in DNA structure
	Ans: b Difficulty: Easy Link to: 7.2

25.	An introduced species is found to have a fundamental niche identical to that of a native species. A possible outcome is:
a)	one or the other species will go extinct
b)	evolutionary change will tend to cause their niches to diverge
c)	they will exhibit distinct realized niches and coexist
d)	if the introduced species has a very low population density it may go extinct for non-competitive reasons
e)	all of these
	Ans: e Difficulty: Medium Link to: 7.7

26.	Humans have, and have had in the past, great influence on the biological diversity in their surrounding environment as a result of:
a)	hunting
b)	habitat destruction
c)	introduction of non-native species
d)	pollution of the environment
e)	all of these

	Ans: e Difficulty: Easy Link to: 7.9

27.	The three basic kinds of interaction between species are:
a)	competition, symbiosis and predation-parasitism
b)	competition, parasitism and adaptive radiation
c)	symbiosis, predation-parasitism and migration
d)	migration, symbiosis and adaptive radiation
e)	there are more than three basic kinds of interaction
	Ans: a Difficulty: Easy Link to: 7.7

28.	On land, <u>what</u> species live <u>where</u> depends on all of the following factors **except**:
a)	geological substrate
b)	ecological attitudes of the species
c)	climate
d)	environmental change over time
e)	it's hard to pick any factor that <u>doesn't</u> affect the distribution of species
	Ans: e Difficulty: Easy Link to: 7.2

29.	The Norway rat and the black rat were both introduced to this country from Europe. The Norway rat is found only in cities and inhabits most cities in the U.S. The black rat can live in cities and rural areas but in New Jersey is only found in rural areas. Some cities in New Jersey which previously had only black rats, now have only Norway rats. This is an example of:
a)	evolution by natural selection
b)	carrying capacity
c)	competitive exclusion
d)	density-dependent population regulation
e)	commensualism
	Ans: c Difficulty: Medium Link to: 7.6

30.	Genes:
a)	are made of deoxyribonucleic acid
b)	are made of chromosomes
c)	are copies of daughter cells
d)	can break the DNA apart and can change inherited information
e)	always undergo mutation
	Ans: a Difficulty: Easy Link to: 7.2

31.	The two processes that lead to biological evolution are:
a)	self-reproduction and natural selection
b)	changing cell structures and self-reproduction over time
c)	mutation and changing cell structures over time
d)	natural selection and mutation
e)	reproduction and natural selection
	Ans: d Difficulty: Medium Link to: 7.2

32.	Why does a moderately grazed pasture have a greater variety of plant species than ungrazed pasture?
Ans:	A pasture that has been grazed has a greater variety of plant species because the grazing herbivores reduce the dominant plants and limit competitive exclusion among the plants.
	Difficulty: Difficult Link to: 7.7

33.	The Norway rat and the black rat were both introduced to the U.S. from Europe. The Norway rat is found only in cities and inhabits most cities in the U.S. The Black rat can live in cities and rural areas, but in New Jersey is only found in rural areas. Some cities in New Jersey which previously had only Black rats, now have only Norway rats. What is the realized niche of the Norway rat? What is the fundamental niche of the Black rat?
Ans:	cities cities and rural areas

	Difficulty: Medium Link to: 7.7

34.	Name the two reasons why genetic drift can be dangerous for rare and endangered animals?	
Ans:	Characteristics that are less adapted to the present environmental conditions may dominate and make the chance of survival less likely. Genetic drift can reduce the variability of a species. As a result, the ability of the species to adapt to future changes in the environment has been reduced.	
	Difficulty: Difficult Link to: 7.2	

35.	Compare the concepts of fundamental and realized niches:	
Ans:	Fundamental niche: all conditions under which a species could persist with or without competitors Realized niche: all conditions under which a species does persist with competitors	
	Difficulty: Medium Link to: 7.7	

36.	Species interact in a variety of ways. In the Environmental Science text, several kinds of interactions are discussed. The following are statements of these interactions. In the space provided, give the name of the interaction that best fits the following: (a) A resident bacteria that helps a mammal's digestion and in turn receives nutrients. Interaction between the mammal and the bacteria: (b) A lion kills and eats a zebra. Interaction between lion and zebra: (c) When you take an antibiotic for a bacterial infection, it kills those bacteria. Interaction between bacteria and you before the antibiotic: (d) Two students both steal reserve readings from the library in order to get the highest grades on the curve. Interaction between the two students:

Ans:	(a) symbiosis (b) predation (c) parasitism (d) competition
	Difficulty: Medium Link to: 7.7

37.	You are asked to design a closed life support system for space travel that provides food, water, and oxygen. (A) energy flow (B) heavy metals in the soil (C) heavy metals in the water (D) recycling of elements (E) constant temperature (F) mutation of micro-organisms (G) carnivores (a) Which of the above parameters are necessary characteristics or elements of such a system? (b) Which of the parameters above may begin at tolerable conditions, but are most likely to destabilize the system later in time?
Ans:	(a) A, D (b)A, C, F
	Difficulty: Difficult Link to: 7.8, 7.9

38.	Mountain lions eat deer in the woodlands of the Rocky Mountains of North America. African lions eat a variety of large mammalian herbivores in the plains and savannahs of East and Southern Africa. Based on this information, what is the habitat of the mountain lion?
Ans:	the woodlands
	Difficulty: Easy Link to: 7.2

39.	Name three possible mechanisms for density-dependent population regulation.

Ans:	territoriality exploitative intraspecific competition cannibalism when resources are scarce spreading of contagious disease
	Difficulty: Medium Link to: 7.7

40.	Two species are competing in the same habitat and have the same requirements. (a) What will happen to the two species? (b) In a second case, a predator feeds on the more abundant species. What will happen to the two species?
Ans:	(a) one species will win (b) the predator keeps the prey species in check and both species might coexist
	Difficulty: Medium Link to: 7.7

41.	What is the major difference between the effect of a predator on its prey and the effect of parasites on their hosts?
Ans:	The **predator** kills prey. The predator feeds on the prey, who thereby suffer a direct negative effect. The **parasite** usually does not kill its host. The parasite benefits from its host without killing it immediately (long-term effects on the host).
	Difficulty: Medium Link to: 7.7

42.	Name four of the seven factors that tend to decrease the diversity of species.

Ans:	environmental stress extreme environments severe limitations in the supply of an essential resource extreme amounts of disturbance a wide variation in environmental conditions at nondisturbance times recent introduction of exotic species geographic isolation
	Difficulty: Medium Link to: 7.8

43.	The North American Gray Squirrel, a herbivore, has been introduced into Great Britain where it is increasing rapidly and is causing a great decline in the numbers of native squirrels. Both species utilize the same food resources. (a) What type of interaction is illustrated by this case? (b) If this trend continues and causes the extinction of the native squirrels, this would be an example of:
Ans:	(a) competition (b) the Competitive Exclusion Principle
	Difficulty: Medium Link to: 7.7

44.	What is the major difference between the effect of a predator on its prey and the effect of parasites on their hosts?
Ans:	The **predator** kills prey. The predator feeds on the prey, who thereby suffer a direct negative effect. The **parasite** usually does not kill its host. The parasite benefits from its host without killing it immediately (long-term effects on the host).
	Difficulty: Medium Link to: 7.7

45.	Species interact in a variety of ways. In the Environmental Science text, several kinds of interactions were discussed. The following are examples of these interactions. In the space provided, give the name of the interaction that best fits the example. (a) Mountain lion hunting large herbivorous animals (b) The interaction between cellulose-digesting bacteria in the stomach of a reindeer and the reindeer (c) Two species of limpets live in the same area, and both feed on a limited supply of microalgae
Ans:	(a) predation (b) symbiosis (c) competition
	Difficulty: Easy Link to: 7.7

46.	You set up a closed system – an aquarium with only snails and bacteria. The snails eat bacteria and the bacteria feed on snails. Explain why this system can't persist.
Ans:	This system is a closed system. It does not get energy from the outside, but relies on its own resources which are constantly declining.
	Difficulty: Difficult Link to: 7.8

47.	In the tropics, two species of mites (small arthropods, relatives of spiders) live in flowers that hummingbirds visit. The hummingbirds feed on flower nectar and spread pollen from flower to flower. The mites feed on the nectar. They travel from flower to flower by riding on the beak of the hummingbirds. No flower contains both species of mites, and experiments have shown that male mites of different species act aggressively toward each other. In the space provided, give the name of the interaction that fits best. (a) hummingbird and flower (b) the two mite species (c) flower and mites
Ans:	(a) symbiosis (b) competition (c) parasitism

	Difficulty: Medium Link to: 7.7

48.	Species interact in a variety of ways. In the reading, several kinds of interactions were discussed. The following are statements of these interactions. In the space provided, give the name of the interaction that best fits the example. (a) bubonic plague (b) Figs are pollinated only by a particular type of wasp. The wasp lay eggs only in figs and the larva feed on the developing fruit. (c) Wood ducks (native) and starlings (introduced) both nest in cavities in tree trunks. Nest sites are usually in limited supply. At a particular pond wood ducks declined after introduction of starlings.
Ans:	(a) parasitism (b) parasitism (c) competition and parasitism
	Difficulty: Medium Link to: 7.7