Practice Test 3

AP® Environmental Science Exam

SECTION I: Multiple-Choice Questions

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

At a Glance

Total Time
1 hour and 30 minutes
Number of Questions
80
Percent of Total Grade
60%
Writing Instrument
Pencil required

Instructions

Section I of this examination contains 80 multiple-choice questions. Fill in only the ovals for numbers 1 through 80 on your answer sheet.

Indicate all of your answers to the multiple-choice questions on the answer sheet. No credit will be given for anything written in this exam booklet, but you may use the booklet for notes or scratch work. After you have decided which of the suggested answers is best, completely fill in the corresponding oval on the answer sheet. Give only one answer to each question. If you change an answer, be sure that the previous mark is erased completely. Here is a sample question and answer.

Sample Question	Sample Answer
Chicago is a	Ⓐ ● Ⓒ Ⓓ

(A) state
(B) city
(C) country
(D) continent

Use your time effectively, working as quickly as you can without losing accuracy. Do not spend too much time on any one question. Go on to other questions and come back to the ones you have not answered if you have time. It is not expected that everyone will know the answers to all the multiple-choice questions.

About Guessing

Many candidates wonder whether or not to guess the answers to questions about which they are not certain. Multiple-choice scores are based on the number of questions answered correctly. Points are not deducted for incorrect answers, and no points are awarded for unanswered questions. Because points are not deducted for incorrect answers, you are encouraged to answer all multiple-choice questions. On any questions you do not know the answer to, you should eliminate as many choices as you can, and then select the best answer among the remaining choices.

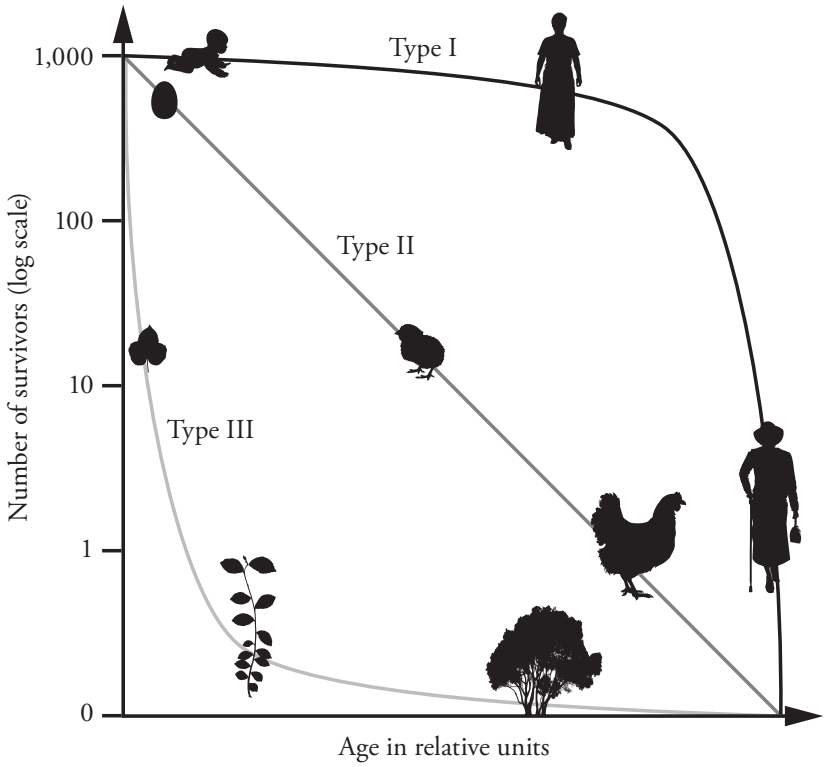
GO ON TO THE NEXT PAGE.

ENVIRONMENTAL SCIENCE
Section I
Time—90 minutes
80 Questions

Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the one that is best in each case and then fill in the corresponding oval on the answer sheet.

Questions 1 and 2 refer to the following graph.

A survivorship curve graph showing populations of humans, chickens, and a tree species is shown below.



Survivorship indicates the probability that a given organism will live to a certain age.

1 The survivorship curve for the tree species above is an example of a Type III curve. Which of the following species would show a similar curve?

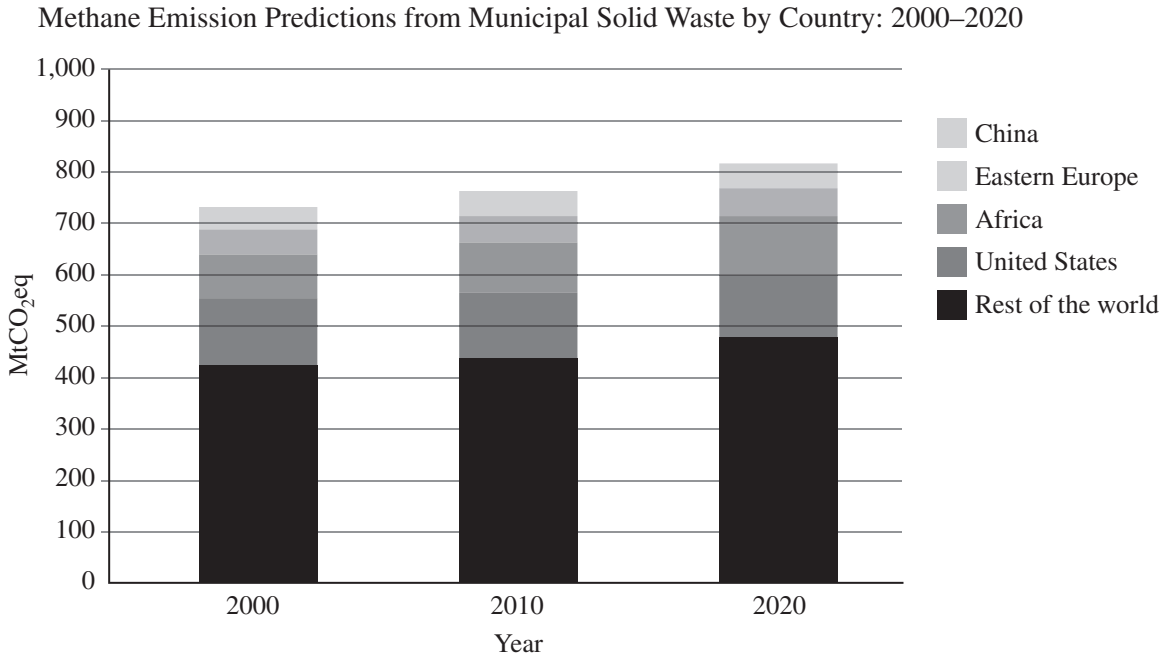
(A) Moose
(B) Songbirds
(C) Sea turtles
(D) Oysters

2. Which of the following is an accurate description of a Type II curve?

(A) High survival probability in early and middle life, followed by a rapid decline in later life
(B) Roughly constant survival probability regardless of age
(C) High mortality in early life, followed by relatively high survival probability for those surviving the bottleneck
(D) Relatively high survival probability in early and late life, with a bottleneck of high mortality in the middle of the lifespan

GO ON TO THE NEXT PAGE.

Questions 3 and 4 refer to the following chart.



3. According to the chart, approximately what percentage of global methane emissions from municipal solid waste in 2010 were predicted to come from the United States?

   (A) 7%

   (B) 17%

   (C) 57%

   (D) 73%

4. The amount of emissions of methane from municipal solid waste was predicted to remain the most stable in which region over the period given?

   (A) China

   (B) Africa

   (C) United States

   (D) Rest of the world

GO ON TO THE NEXT PAGE.

Questions 5 and 6 refer to the following map.

5. The map shows an area of eutrophication ("dead zone") in the Gulf of Mexico. Which of the following accurately describes the chain of events leading to its formation?

   (A) Mississippi River carries fertilizer and sewage into the Gulf—phytoplankton and zooplankton experience major population decrease—detritus from dead phytoplankton and zooplankton feeds bacteria at sea floor—bacteria metabolize available oxygen while decomposing this food source

   (B) Mississippi River carries fertilizer and sewage into the Gulf—phytoplankton and zooplankton experience population explosion—less detritus from dead phytoplankton and zooplankton to feed bacteria at sea floor—bacteria produce less oxygen while decomposing this food source

   (C) Mississippi River carries fertilizer and sewage into the Gulf—phytoplankton and zooplankton experience major population decrease—less detritus from dead phytoplankton and zooplankton to feed bacteria at sea floor—bacteria produce less oxygen while decomposing this food source

   (D) Mississippi River carries fertilizer and sewage into the Gulf—phytoplankton and zooplankton experience population explosion—detritus from dead phytoplankton and zooplankton feeds bacteria at sea floor—bacteria metabolize available oxygen while decomposing this food source

6. Which of the following is NOT an effect of the presence of this "dead zone"?

   (A) Collapse of the shrimp and shellfish industries in the area

   (B) Nothing that depends on oxygen can grow in the zone from May to September

   (C) Reproductive problems in fish involving decreased size of reproductive organs, low egg counts, and lack of spawning

   (D) Mass migration of fish to other areas of the Gulf

GO ON TO THE NEXT PAGE.

Questions 7 and 8 refer to the following information.

Ecosystem services are benefits that humans receive from the ecosystems in nature when they function properly. There are four categories: **provisioning services**: providing humans with water, food, medicinal resources, raw materials, energy, and ornaments; **regulating services**: waste decomposition and detoxification, purification of water and air, pest and disease control and regulation of prey populations through predation, and carbon sequestration; **cultural services**: use of nature for science and education, therapeutic and recreational uses, and spiritual and cultural uses; and **supporting services** (the ones that make other services possible): primary production, nutrient recycling, soil formation, and pollination.

7. Which of the following is an example of a regulating service?

   (A) In New York City, authorities worked to restore the polluted Catskill Watershed, restoring soil absorption and filtration of chemicals via soil and its microbiota, improving water quality.

   (B) Restoration of wild bee populations to an area relieves large-scale farms from having to import non-native honeybees to pollinate crops.

   (C) In the Roman Empire, water-powered mills produced flour from grain, and were also utilized for power to saw timber and cut stone.

   (D) In modern ecotherapy, patients are encouraged to spend time in nature to enhance their physical, mental, and emotional well-being.

8. All of the following are negative consequences to humans of the disruption of ecosystem services EXCEPT

   (A) lower crop yields due to depletion of soil nutrients and microbiota

   (B) outbreaks of diseases carried by insect vectors due to habitat loss in predator species

   (C) higher costs of mining due to depletion of mineral resources

   (D) greater availability of habitats in different stages of ecological succession for scientific study due to human development

Questions 9–11 refer to the following information.

The greenhouse effect is a natural process that warms the Earth's surface and the layer of the atmosphere closest to the Earth's surface by reducing radiative loss from the Earth's surface to space. In other words, the sun's energy warms the Earth's surface, and some is radiated back toward space; certain gases in the troposphere absorb some heat and reradiate it downward again, effectively trapping heat that would otherwise be lost. The most important greenhouse gases are carbon dioxide, methane, water vapor, nitrous oxide, and chlorofluorocarbons (CFCs).

9. Which of the following greenhouse gases is NOT a significant contributor to global climate change?

   (A) CFCs

   (B) Methane

   (C) Water vapor

   (D) Carbon dioxide

10. The enhanced, or anthropogenic, greenhouse effect refers to a strengthening of the greenhouse effect due to human activities that are contributing to global climate change. Which of the following is NOT true of this anthropogenic effect?

    (A) Depletion of the stratospheric ozone layer is a contributing factor.

    (B) It is mainly due to increases in emissions of greenhouse gases and pollutants, as well as to changes in land use.

    (C) Some of its effects include sea level rise, changes in ocean properties, and an increase in extreme weather events.

    (D) Possible effects on the biosphere include changes in biomes, mass migrations and extinctions, spread of disease vectors, and changes in population dynamics.

11. Global warming potential (GWP) is a measure of how much heat a greenhouse gas can trap in the atmosphere, relative to the reference point of carbon dioxide. Which of the following greenhouse gases has the highest GWP?

    (A) Chlorofluorocarbons

    (B) Nitrous oxide

    (C) Carbon dioxide

    (D) Methane

GO ON TO THE NEXT PAGE.

12. Exposure to which of the following noises would cause the most damage to a person's hearing?

    (A) A vacuum cleaner

    (B) A chain saw

    (C) A factory

    (D) The firing of a rifle

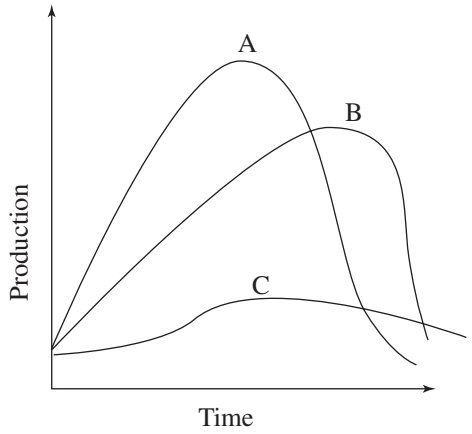
13. The phrase that best defines population density is

    (A) the number of individuals in a certain geographic area

    (B) the rate at which a population increases

    (C) the maximum number of individuals that a habitat can sustain

    (D) the time it takes for a population to increase to carrying capacity



14. The graph above represents possible depletion curves of a nonrenewable resource. Curve C best describes the resource as it

    (A) has just been discovered and no technology exists to use the resource

    (B) is quickly used up and is not recycled

    (C) is newly discovered and in high demand

    (D) has expanding reserves and consumption is reduced

15. The shrinking of the Aral Sea and the ecological disaster that followed was mainly caused by

    (A) the diversion of the sea's two feeder rivers for agricultural use

    (B) withdrawing groundwater from the area

    (C) a major earthquake that hit the region

    (D) the massive use of pesticides

16. Which of the following is a negative result of overfishing a particular species of edible fish?

    I. Loss of so many fish that there is no longer a breeding stock
    II. The removal of non-target species
    III. The reduction of other species that rely on the edible species as food

    (A) II only

    (B) I and II only

    (C) II and III only

    (D) I, II, and III

17. Which type of irrigation results in the greatest amount of water lost to evaporation and runoff?

    (A) Flood irrigation

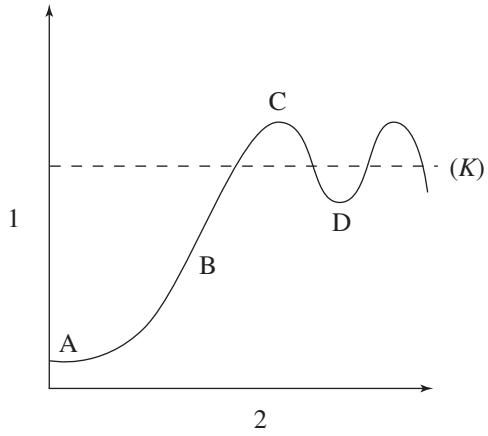
    (B) Drip irrigation

    (C) Furrow irrigation

    (D) Spray irrigation

GO ON TO THE NEXT PAGE.

Questions 18–21 refer to the following graph.



18. The population is growing at its highest rate at which letter?

    (A) A
    (B) D
    (C) B
    (D) C

19. Which of the following phrases best describes line *K* in the graph above?

    (A) The rate of population growth
    (B) The carrying capacity of the environment
    (C) The time it takes for the population to double in size
    (D) The birth rate of the population

20. The best label for the axis labeled 2 in the graph above is

    (A) time
    (B) population number
    (C) logistic growth rate
    (D) environmental resistance

21. Which of the following statements is true concerning the events occurring at point D in the graph above?

    (A) Environmental resistance is high.
    (B) Environmental resistance is low.
    (C) The population will continue to fall.
    (D) The population is above its carrying capacity.

22. The long-term storage of phosphorus and sulfur is in which of the following forms?

    (A) Rocks
    (B) Water
    (C) Plants
    (D) Atmosphere

23. The movement of sections of the Earth's lithosphere is known as

    (A) mass depletion
    (B) plate tectonics
    (C) background extinction
    (D) migration

24. Which of the following best defines the Green Revolution?

    (A) An international effort to stop the construction of nuclear power plants
    (B) A group whose goal is to improve how nations affect the environment
    (C) Increasing the yield of farmland by using more fertilizer, better irrigation, and faster growing crops
    (D) A method that makes a viable soil conditioner by using household waste

25. Which of the following best defines the term "infant mortality rate"?

    (A) How many children live in each square hectare
    (B) The number of births in a population
    (C) The number of infant deaths per 1,000 people aged zero to one
    (D) The difference between the birth rate and the death rate in a population

26. The release of chemicals from underground storage tanks is most likely to pollute which of the following?

    (A) A landfill
    (B) The atmosphere
    (C) The ecotone
    (D) Aquifers

GO ON TO THE NEXT PAGE.

27. The United States Congress failed to ratify which of the following international agreements that is designed to control the release of carbon dioxide?

    (A) CITES agreement

    (B) Kyoto Protocol

    (C) Montreal Protocol

    (D) Clean Air Act

28. Which of the following is the most sustainable way to ensure sufficient energy for the future?

    (A) Find more fossil fuels

    (B) Develop more effective solar power generators

    (C) Build more nuclear reactors

    (D) Reduce waste and inefficiency in electricity use and transmission

29. Which of the following best describes the goals of the CAFE standards?

    (A) Reduce pollution by coal-fired power plants

    (B) Improve the quality of air around cities

    (C) Protect certain endangered species

    (D) Improve the fuel efficiency of automobiles in the United States

30. Which of the following best describes the use of DDT?

    (A) It supplies needed nitrogen to plants.

    (B) It kills weeds and unwanted plants.

    (C) It decreases the amount of pollution from car exhaust.

    (D) It is an insecticide.

31. Which of the following best explains why pesticides become ineffective over time?

    (A) Pesticide manufacturers learn how to cut corners and sell an inferior product.

    (B) Pests acquire resistance to the pesticide during exposure to the pesticide.

    (C) Pests resistant to the pesticide survived and passed on their resistance to the next generation.

    (D) Pests acquired resistance to the pesticide and passed on their resistance to the next generation.

32. For every ton of plastic recycled, 0.3 fewer tons of plastic is required to be manufactured. If 150 million tons of plastic are produced and 50 million tons of plastic are recycled each year in North America, how many tons of plastic need to be newly manufactured each year?

    (A) 1.5 million tons

    (B) 15 million tons

    (C) 115 million tons

    (D) 135 million tons

33. All of the following statements about the degradation of soil by climate change are true EXCEPT

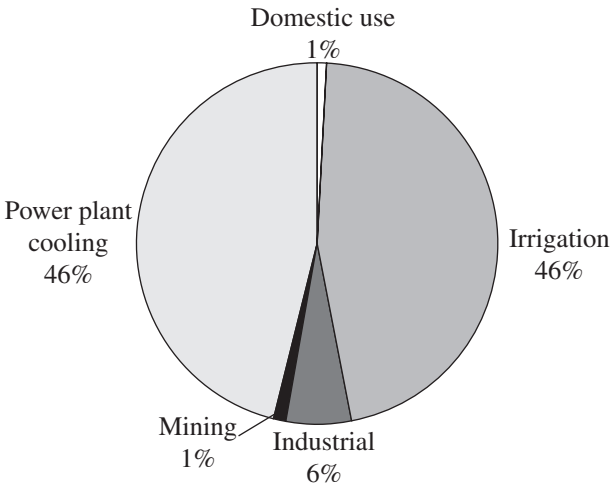
    (A) increased flooding in coastal areas leads to soil desalinization

    (B) increased global temperature produces more deserts

    (C) increased evaporation of water leads to soil salinization

    (D) increased global temperature leads to increased loss of organic material in soil

Freshwater Usage in the United States, 2000



34. According to the diagram above, cooking, showering, and using toilets accounted for approximately what percentage of total water use?

    (A) 92 percent

    (B) 46 percent

    (C) 6 percent

    (D) 1 percent

GO ON TO THE NEXT PAGE.

35. One result of increased troposphere temperatures that is observed today is

    (A) an increase in skin cancers in people

    (B) an increase of 10 to 20 cm in the average global sea level

    (C) more radon seepage into people's homes

    (D) a deeper permafrost in Arctic regions

36. All of the following are major components of air pollution EXCEPT

    (A) sulfur dioxide

    (B) lead

    (C) arsenic

    (D) ozone

37. Which of the following is the root cause of habitat loss, especially in less developed nations?

    (A) Road building

    (B) Poverty

    (C) Conversion of forest to farmland

    (D) Capturing exotic animals for resale

38. All of the following are causes of urban sprawl EXCEPT

    (A) increased number of roads

    (B) higher crime rates in urban areas

    (C) higher levels of air and noise pollution in cities

    (D) increased oil prices

39. The motion of tectonic plates accounts for most of the Earth's

    (A) CO_2 emissions

    (B) river formation

    (C) changes of season

    (D) volcanic activity

40. "*K*" and "*r*" are used to describe which of the following aspects of populations?

    (A) The place in a habitat where these organisms live

    (B) The number of males and females in the population

    (C) The reproductive tactics used by the populations

    (D) The time it takes a population to double

41. Convectional heating and cooling of the atmosphere transfers which of the following to other parts of the Earth?

    I. Heat
    II. Moisture
    III. Nutrients

    (A) I only

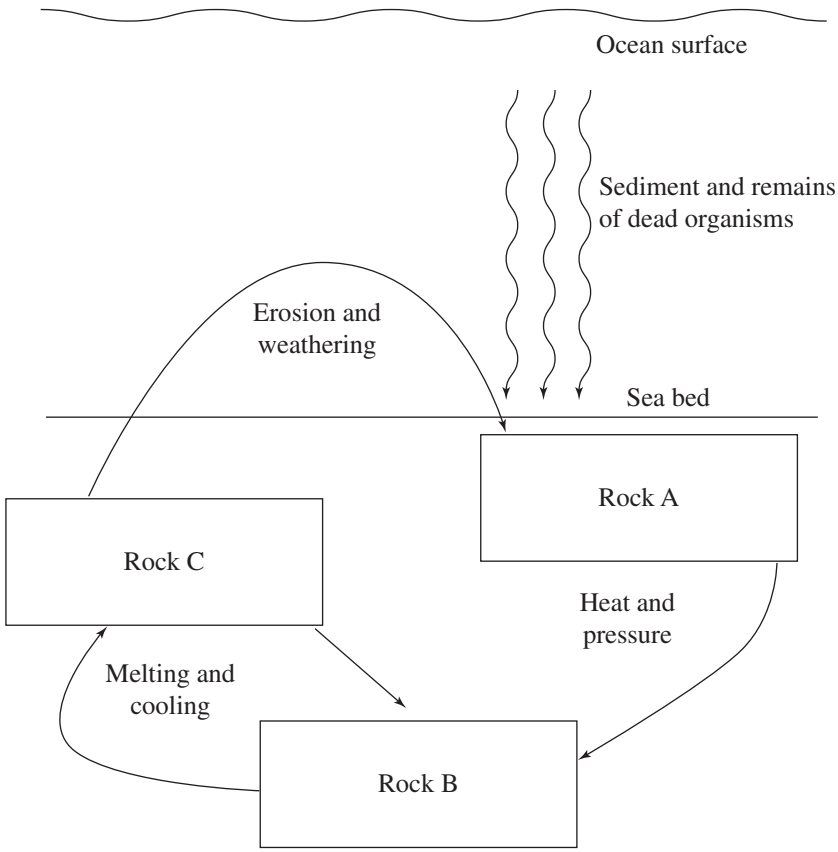
    (B) II only

    (C) I and II only

    (D) I, II, and III

GO ON TO THE NEXT PAGE.

Questions 42 and 43 refer to the following diagram.



42. Which of the following gives the correct sequence in the rock cycle shown above?

    (A) Rock A—Metamorphic/Rock B—Igneous/ Rock C—Sedimentary

    (B) Rock A—Sedimentary/Rock B—Metamorphic/ Rock C—Igneous

    (C) Rock A—Igneous/Rock B—Sedimentary/ Rock C—Metamorphic

    (D) Rock A—Sedimentary/Rock B—Igneous/ Rock C—Metamorphic

43. Which of the following rock types would contain the greatest number of fossils?

    (A) Igneous rock only

    (B) Metamorphic rock only

    (C) Sedimentary rock only

    (D) Sedimentary and igneous rock

GO ON TO THE NEXT PAGE.

44. The North Atlantic Current provides which of the following for Europe and North America?

(A) Fish to feed predators such as killer whales
(B) Warm water that moderates land temperatures
(C) Large amounts of CO_2 to promote photosynthesis
(D) Mineral-rich waters to reduce depleted mineral reserves

45. Which of the following indoor air pollutants is composed of microscopic mineral fibers that can produce lung cancer in humans?

(A) Nitrogen oxides
(B) Asbestos
(C) Radon
(D) Formaldehyde

46. Which of the following is an example of commensalism?

(A) Cheetahs and antelope
(B) Bees and flowers
(C) Humans and tapeworms
(D) Barnacles and whales

47. Which two countries together are responsible for 40% of global greenhouse gas emissions?

(A) United States and Great Britain
(B) United States and China
(C) China and India
(D) Great Britain and Russia

48. Nuclear reactors use which of the following to absorb neutrons in the reactor core?

(A) A steam condenser
(B) Control rods
(C) A heat exchanger
(D) Fuel rods

49. Riparian areas are vital to the preservation of high-quality

(A) mountain slopes
(B) grazing land
(C) rivers and streams
(D) ocean beaches

50. Which of the following fishing techniques is most damaging to ocean bottom ecosystems?

(A) Trawling
(B) Drift nets
(C) Long lines
(D) Purse seine

51. Which of the following treaties is responsible for lower levels of CFC production worldwide?

(A) Montreal Protocol
(B) Kyoto Protocol
(C) Clean Air Act
(D) The Rio Earth Summit of 1972

52. DDT is an insecticide sprayed to control insects. Years after it was introduced, DDT was found in large predatory birds, such as the osprey. Which of the following processes caused the DDT to be found in the osprey?

I. Biomagnification
II. Bioremediation
III. Bioaccumulation

(A) I only
(B) III only
(C) I and III only
(D) I, II, and III

53. Doing which of the following could most cost effectively reduce acid rain and acid deposition?

(A) Reducing the use and waste of electricity
(B) Making taller smokestacks
(C) Adding lime to acidified lakes
(D) Moving power plants to desert areas

54. Which of the following forms of radiation is most harmful to humans?

(A) Alpha
(B) Gamma
(C) Beta
(D) Infrared

GO ON TO THE NEXT PAGE.

55. Which of the following ecosystems does NOT use solar energy as its ultimate energy source?

    (A) Pond

    (B) Deep-sea hydrothermal vent

    (C) Rain forest

    (D) Tundra

56. All of the following are true about CO_2 sequestering EXCEPT

    (A) it can be accomplished by pumping CO_2 into carbonated beverages

    (B) it can be accomplished by pumping CO_2 into crop lands

    (C) it can be accomplished by pumping CO_2 deep under the ocean floor

    (D) it can be accomplished by pumping CO_2 deep underground into dried-up oil wells

57. Which of the following is NOT true concerning invasive species?

    (A) They can outcompete native species in a habitat.

    (B) They are highly specialized and have narrow niches.

    (C) They alter the biodiversity of the area they are invading.

    (D) They are introduced into a habitat and are not native.

58. The Second Law of Thermodynamics is best exemplified by which of the following?

    (A) The amount of solar radiation going into an ecosystem is equal to the total amount of energy going out of that system.

    (B) The amount of carbon in the atmosphere has increased due to the combustion of fossil fuels.

    (C) As electricity is transmitted through wires, some of the power is lost to the environment as heat.

    (D) Wind-generated electricity has more power than electricity generated at a hydropower plant.

59. Salinization of soil can be caused by all of the following EXCEPT

    (A) flooding in coastal areas

    (B) rising temperatures

    (C) excessive irrigation

    (D) drip irrigation

60. Which of the following is true about early loss populations, such as fish?

    (A) The chances of an adult dying are about the same as a child dying.

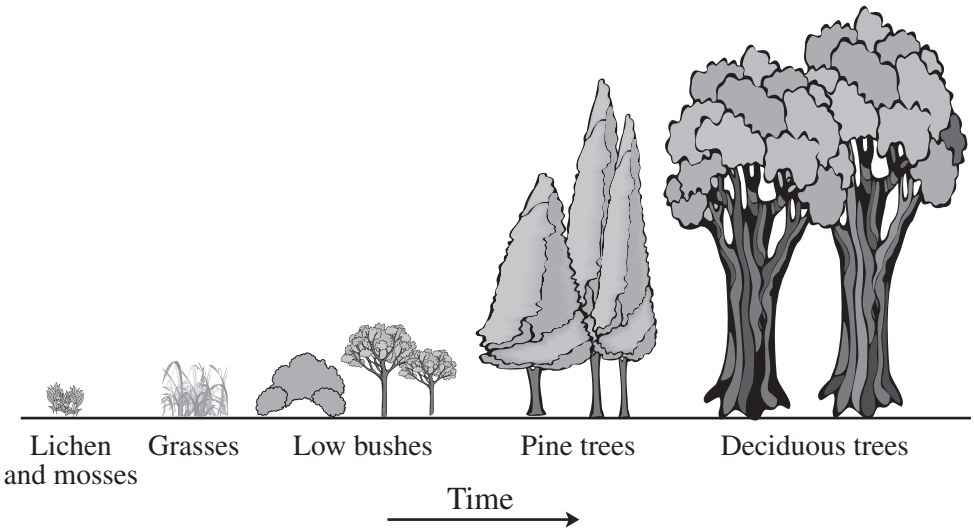
    (B) The maturation process is slow.

    (C) The populations are close to the carrying capacity.

    (D) Many individuals die at an early age.

GO ON TO THE NEXT PAGE.

Questions 61 and 62 refer to the illustration of succession below.



61. A farmer stops farming a certain tract of land, and small bushes soon grow there. The land then progresses to the deciduous tree stage. This process is known as

    (A) pioneer succession
    (B) wetland succession
    (C) secondary succession
    (D) primary succession

62. According to the diagram, low species diversity and small-sized plants are characteristics of which stage of succession?

    I. Late-stage succession
    II. Midstage succession
    III. Early-stage succession

    (A) I only
    (B) II only
    (C) III only
    (D) I and III only

GO ON TO THE NEXT PAGE.

63. Ozone depletion is occurring most rapidly in the Earth's polar regions because

(A) the atmosphere is thicker at the poles, so ozone destruction is easier to observe

(B) large amounts of chlorofluorocarbons (CFCs) can accumulate on ice crystals formed in the cold atmosphere

(C) the upper atmosphere winds form a pattern of high- and low-pressure systems that can cause the destruction of ozone

(D) the solar UV radiation is stronger at the poles, promoting the breakdown of ozone

64. Smaller forest fires are beneficial to forests for all of the following reasons EXCEPT

(A) combustion of dried leaves or needles, which reduces the threat of large fires

(B) burning the crowns of trees

(C) germinating seeds of certain plant species

(D) making burned matter available as a nutrient

65. What are the negative impacts of dams on ecosystems?

I. Loss of silt in the river downstream from the dam
II. Generation of low pollution electricity
III. Loss of terrestrial biodiversity in areas surrounding the dam

(A) I only

(B) III only

(C) I and III only

(D) I, II, and III

66. Which of the following best illustrates the process of evolution?

(A) A parasite population becomes resistant to a drug

(B) Rabbits can have brown fur in summer and white fur in winter

(C) Frogs burrow deep into the mud during winter

(D) A baby is born and has a different color hair than his or her parents

67. Which of the following is a renewable energy source?

(A) Crude oil

(B) Coal

(C) Natural gas

(D) Hydrogen cells

68. The energy necessary to produce stratospheric ozone comes from which of the following?

(A) Sunlight

(B) Radioactive decay

(C) Magma

(D) Wind

69. Which of the following chemicals can cause lung irritation in the troposphere but is very helpful to humans in the stratosphere?

(A) O_2

(B) O_3

(C) Chlorofluorocarbons

(D) H_2SO_4

70. Which of the following is true of primary and secondary pollutants?

(A) Primary pollutants rise up the smokestack before secondary pollutants are formed.

(B) Primary pollutants are formed from secondary pollutants interacting in the water.

(C) Secondary pollutants are formed from primary pollutants interacting in the atmosphere.

(D) Secondary pollutants are directly created by the burning of coal and primary pollutants from the burning of oil.

71. A sample of radioactive iodine-131 is found to have an activity level of 4×10^{-6} curies and a half-life of 8 days. How much time must pass before the activity level of the radioactive waste drops to 2.5×10^{-5} curies?

(A) 4 days

(B) 8 days

(C) 16 days

(D) 32 days

GO ON TO THE NEXT PAGE.

72. Coal, oil, and natural gas were all formed as a result of
    (A) the decay of organic matter
    (B) the movement of magma in volcanoes
    (C) sedimentary rock turning into metamorphic rock
    (D) the radioactive decay occurring inside the Earth

73. All of the following are negative impacts of food production EXCEPT
    (A) increased erosion
    (B) air pollution from fossil fuels
    (C) bioaccumulation of pesticides
    (D) lower death rates

74. Soils found in mid-latitude grasslands would be most accurately described as having
    (A) a high acid content with little organic matter
    (B) a deep layer of humus and decayed plant material
    (C) a layer of permafrost right below the O-horizon
    (D) a high content of iron oxides and very little moisture

75. All of the following are useful methods for reducing domestic water use EXCEPT
    (A) using low-flow shower heads
    (B) using low-flush-volume toilets
    (C) fixing leaks as soon as they start
    (D) lowering the temperature of the water heater

76. Biodiversity is a direct result of which of the following?
    (A) Deforestation
    (B) Respiration
    (C) Erosion
    (D) Evolution

77. Students studying a river found high levels of fecal coliform bacteria. They concluded that
    (A) this water is fit to swim in
    (B) a nearby treatment plant added chlorine to the waste water
    (C) they can safely drink the water
    (D) untreated animal waste was put into the water

78. During an El Niño-Southern Oscillation, weather events change in which of the following areas?
    (A) The Pacific and Indian Oceans
    (B) The Atlantic and Indian Oceans
    (C) The Arctic Sea
    (D) The Indian and Antarctic Oceans

79. Which of the following pairs correctly matches the source of gray water with its most frequent use in the home?
    (A) Dishwasher and sink water used to flush toilets
    (B) Flushed toilet water used to irrigate garden plants
    (C) Dishwasher and sink water used to irrigate garden plants
    (D) Water collected from rainfall used to flush toilets

80. The Clean Water Act did all of the following EXCEPT
    (A) set water quality standards for all contaminants in surface waters
    (B) make it unlawful for any person to discharge any pollutant from a point source into navigable waters
    (C) demand that an environmental impact statement be prepared for any major development
    (D) fund the construction of sewage treatment plants

END OF SECTION I

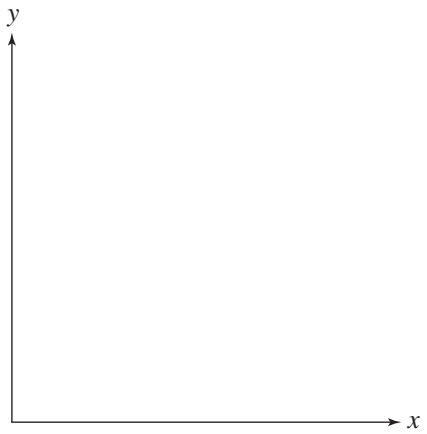
ENVIRONMENTAL SCIENCE
Section II
Time—70 minutes
3 Questions

Directions: Answer all three questions, which are weighted equally; the suggested time is about 23 minutes for answering each question. Where calculations are required, clearly show how you arrived at your answer. Where explanation or discussion is required, support your answers with relevant information and/or specific examples.

1. A class wished to determine the LD_{50} of a particular herbicide, Chemical *X*, on seedlings of the most common type of pest plant at a local tree farm. Using standard laboratory apparatus and glassware, they accurately made the following dilutions: 1.0M, 10^{-1}M, 10^{-2}M, 10^{-3}M, 10^{-4}M, and 10^{-5}M. They grew the seedlings under standard conditions, varying only the concentrations of Chemical *X*. Finally, they determined the percentage of seedlings that germinated at each concentration.

   (a) Use the description of the experiment above to answer the following questions.
      i. **Identify** a reasonable hypothesis that this experiment could test.
      ii. **Describe** the experimental control group and offer ONE method for performing repeated trials.

   (b) **Identify** a set of hypothetical results.
      i. Using the axes below, graph your results. Properly **identify** and label the axes and provide a title for the graph.
      ii. **Calculate** and identify the LD_{50} concentration on your graph. **Show** your work.

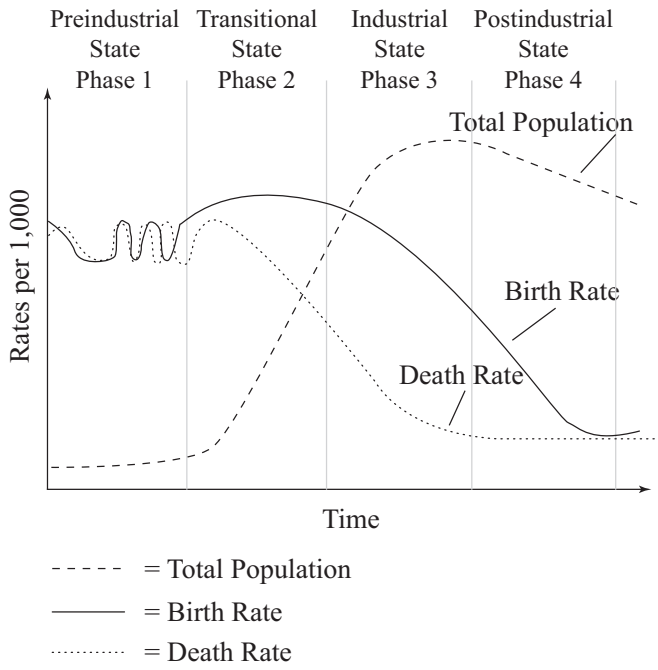


   (c) **Describe** ONE positive outcome and TWO negative outcomes of using herbicides in the environment.

   (d) Given the possible negative effects of herbicide use, **propose** ONE alternative strategy the tree farm could employ to control this pest plant.

GO ON TO THE NEXT PAGE.

2. The diagram below illustrates the demographic transition model of the relationship between economic status and population.



(a) In Phases 2 and 3, there is a large difference between the birth rate and the death rate. **Describe** the effects on the overall population as a result of this difference. **Explain** why the population doubling time during these phases is short.

(b) Choose ONE of the four phases and **identify** an economic factor that would account for the differences between birth rate and death rate.

(c) **Describe** ONE biological method of birth control.

(d) Population experts have reported that in some developing countries, the population is experiencing a reverse transition from Phase 2 to Phase 1. **Describe** what would happen to a country's population during such a reverse transition and **make a claim** about one event that could cause this reverse transition.

GO ON TO THE NEXT PAGE.

3. Under certain conditions, an internal combustion car engine produces approximately 3 grams of NO_x per kilometer driven. In Country *C*, there are 300 million cars, and each car is driven only 20,000 km per year.

   (a) **Calculate** the number of metric tons of NO_x produced by the cars in Country *C* under these conditions in one year. 1 metric ton = 1,000,000 g.

   (b) **Identify** a secondary pollutant that is derived from the NO_x produced by Country *C*, **explain** how it is produced, and **explain** how that pollutant travels to adjacent countries.

   (c) **Describe** ONE abiotic and ONE biotic impact that the NO_x pollution will have on any countries adjacent to Country *C*.

   (d) **Propose** and **describe** one method that Country *C* could employ to reduce the amount of emitted NO_x.

STOP

END OF EXAM

The Princeton Review

Completely darken bubbles with a No. 2 pencil. If you make a mistake, be sure to erase mark completely. Erase all stray marks.

1. YOUR NAME: _____
(Print) Last First M.I.

SIGNATURE: _____ **DATE:** ___/___/___

HOME ADDRESS: _____
(Print) Number and Street

_____
City State Zip Code

PHONE NO. : _____
(Print)

5. YOUR NAME

First 4 letters of last name					FIRST INIT	MID INIT
A	A	A	A		A	A
B	B	B	B		B	B
C	C	C	C		C	C
D	D	D	D		D	D
E	E	E	E		E	E
F	F	F	F		F	F
G	G	G	G		G	G
H	H	H	H		H	H
I	I	I	I		I	I
J	J	J	J		J	J
K	K	K	K		K	K
L	L	L	L		L	L
M	M	M	M		M	M
N	N	N	N		N	N
O	O	O	O		O	O
P	P	P	P		P	P
Q	Q	Q	Q		Q	Q
R	R	R	R		R	R
S	S	S	S		S	S
T	T	T	T		T	T
U	U	U	U		U	U
V	V	V	V		V	V
W	W	W	W		W	W
X	X	X	X		X	X
Y	Y	Y	Y		Y	Y
Z	Z	Z	Z		Z	Z

IMPORTANT: Please fill in these boxes exactly as shown on the back cover of your test book.

2. TEST FORM

_____

3. TEST CODE

0	A
1	B
2	C
3	D
4	E
5	F
6	G
7	
8	
9	

4. REGISTRATION NUMBER

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

6. DATE OF BIRTH

Month	Day		Year	
JAN				
FEB				
MAR	0	0	0	0
APR	1	1	1	1
MAY	2	2	2	2
JUN	3	3	3	3
JUL		4	4	4
AUG		5	5	5
SEP		6	6	6
OCT		7	7	7
NOV		8	8	8
DEC		9	9	9

7. SEX

MALE
FEMALE

The Princeton Review

Section I

Start with number 1 for each new section.
If a section has fewer questions than answer spaces, leave the extra answer spaces blank.

1. A B C D	21. A B C D	41. A B C D	61. A B C D
2. A B C D	22. A B C D	42. A B C D	62. A B C D
3. A B C D	23. A B C D	43. A B C D	63. A B C D
4. A B C D	24. A B C D	44. A B C D	64. A B C D
5. A B C D	25. A B C D	45. A B C D	65. A B C D
6. A B C D	26. A B C D	46. A B C D	66. A B C D
7. A B C D	27. A B C D	47. A B C D	67. A B C D
8. A B C D	28. A B C D	48. A B C D	68. A B C D
9. A B C D	29. A B C D	49. A B C D	69. A B C D
10. A B C D	30. A B C D	50. A B C D	70. A B C D
11. A B C D	31. A B C D	51. A B C D	71. A B C D
12. A B C D	32. A B C D	52. A B C D	72. A B C D
13. A B C D	33. A B C D	53. A B C D	73. A B C D
14. A B C D	34. A B C D	54. A B C D	74. A B C D
15. A B C D	35. A B C D	55. A B C D	75. A B C D
16. A B C D	36. A B C D	56. A B C D	76. A B C D
17. A B C D	37. A B C D	57. A B C D	77. A B C D
18. A B C D	38. A B C D	58. A B C D	78. A B C D
19. A B C D	39. A B C D	59. A B C D	79. A B C D
20. A B C D	40. A B C D	60. A B C D	80. A B C D