

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

LIVING ENVIRONMENT

Thursday, June 19, 2003 — 1:15 to 4:15 p.m., only

Student Name _____

School Name _____

Print your name and the name of your school on the lines above. Then turn to the last page of this booklet, which is the answer sheet for Part A. Fold the last page along the perforations and, slowly and carefully, tear off the answer sheet. Then fill in the heading of your answer sheet.

This examination has three parts. You must answer all questions in this examination. Write your answers to the Part A multiple-choice questions on the separate answer sheet. Write your answers for the questions in Parts B and C directly in this examination booklet. All answers should be written in pen, except for graphs and drawings which should be done in pencil. You may use scrap paper to work out the answers to the questions, but be sure to record all your answers on the answer sheet and in this examination booklet.

When you have completed the examination, you must sign the statement printed on the Part A answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

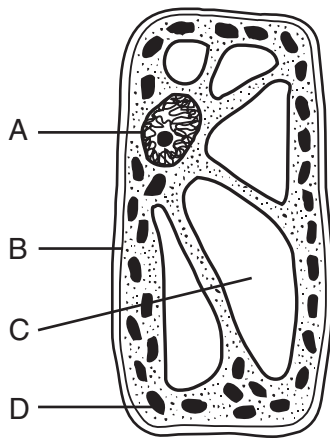
Part A

Answer all questions in this part. [35]

Directions (1–35): For *each* statement or question, write on the separate answer sheet the number of the word or expression that, of those given, best completes the statement or answers the question.

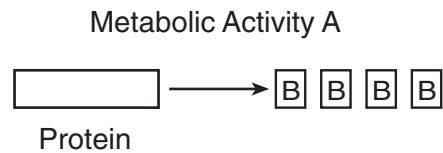
- 1 A student observes that an organism is green. A valid conclusion that can be drawn from this observation is that
- (1) the organism must be a plant
 - (2) the organism cannot be single celled
 - (3) the organism must be an animal
 - (4) not enough information is given to determine whether the organism is a plant or an animal
- 2 Why do scientists consider any hypothesis valuable?
- (1) A hypothesis requires no further investigation.
 - (2) A hypothesis may lead to further investigation even if it is disproved by the experiment.
 - (3) A hypothesis requires no further investigation if it is proved by the experiment.
 - (4) A hypothesis can be used to explain a conclusion even if it is disproved by the experiment.

3 Which letter indicates a cell structure that directly controls the movement of molecules into and out of the cell?



- (1) A
- (2) B
- (3) C
- (4) D

- 4 A great deal of information can now be obtained about the future health of people by examining the genetic makeup of their cells. There are concerns that this information could be used to deny an individual health insurance or employment. These concerns best illustrate that
- (1) scientific explanations depend upon evidence collected from a single source
 - (2) scientific inquiry involves the collection of information from a large number of sources
 - (3) acquiring too much knowledge in human genetics will discourage future research in that area
 - (4) while science provides knowledge, values are essential to making ethical decisions using this knowledge
- 5 The diagram below represents one metabolic activity of a human.

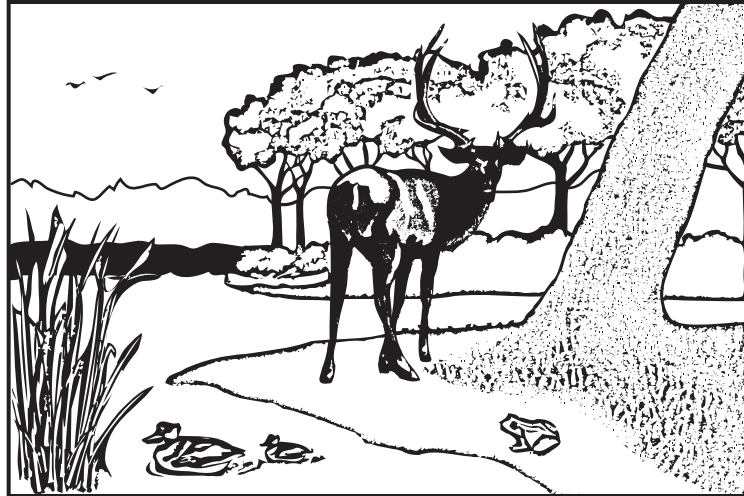


Letters *A* and *B* are best represented by which row in the chart?

Row	Metabolic Activity A	B
(1)	respiration	oxygen molecules
(2)	reproduction	hormone molecules
(3)	excretion	simple sugar molecules
(4)	digestion	amino acid molecules

- 6 When a person does strenuous exercise, small blood vessels (capillaries) near the surface of the skin increase in diameter. This change allows the body to be cooled. These statements best illustrate
- (1) synthesis
 - (2) homeostasis
 - (3) excretion
 - (4) locomotion

7 Which ecological term includes everything represented in the illustration below?



- (1) ecosystem
- (2) community

- (3) population
- (4) species

8 Which sequence represents the correct order of levels of organization found in a complex organism?

- (1) cells → organelles → organs → organ systems → tissues
- (2) tissues → organs → organ systems → organelles → cells
- (3) organelles → cells → tissues → organs → organ systems
- (4) organs → organ systems → cells → tissues → organelles

9 Scientific studies show that identical twins who were separated at birth and raised in different homes may vary in height, weight, and intelligence. The most probable explanation for these differences is that

- (1) original genes of each twin increased in number as they developed
- (2) one twin received genes only from the mother while the other twin received genes only from the father
- (3) environments in which they were raised were different enough to affect the expression of their genes
- (4) environments in which they were raised were different enough to change the genetic makeup of both individuals

10 When DNA separates into two strands, the DNA would most likely be directly involved in

- (1) replication
- (2) fertilization
- (3) differentiation
- (4) evolution

11 The instructions for the traits of an organism are coded in the arrangement of

- (1) glucose units in carbohydrate molecules
- (2) bases in DNA in the nucleus
- (3) fat molecules in the cell membrane
- (4) energy-rich bonds in starch molecules

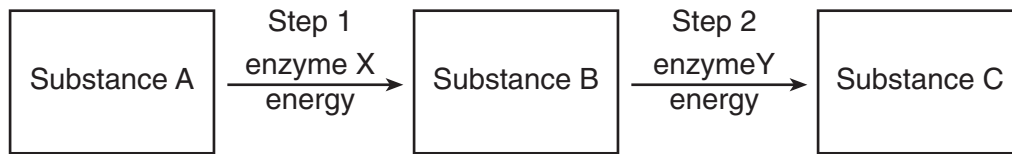
12 Which statement is true regarding an alteration or change in DNA?

- (1) It is always known as a mutation.
- (2) It is always advantageous to an individual.
- (3) It is always passed on to offspring.
- (4) It is always detected by the process of chromatography.

13 In heterotrophs, energy for the life processes comes from the chemical energy stored in the bonds of

- (1) water molecules
- (2) oxygen molecules
- (3) organic compounds
- (4) inorganic compounds

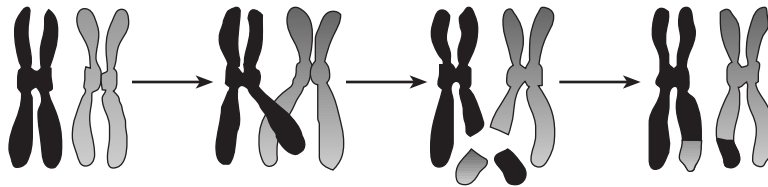
14 The diagram below represents the chemical pathway of a process in a human liver cell.



A particular liver cell is unable to make substance C. One possible explanation for the inability of this cell to make substance C is that

- (1) excess energy for step 2 prevented the conversion of substance B to substance C
- (2) an excess of enzyme X was present, resulting in a decrease in the production of substance B
- (3) nuclear DNA was altered resulting in the cell being unable to make enzyme Y
- (4) a mutation occurred causing a change in the ability of the cell to use substance C

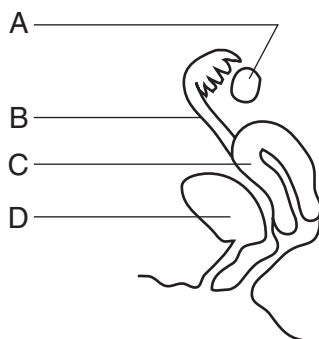
15 The diagram below shows a process that can occur during meiosis.



The most likely result of this process is

- (1) a new combination of inheritable traits that can appear in the offspring
- (2) an inability to pass either of these chromosomes on to offspring
- (3) a loss of genetic information that will produce a genetic disorder in the offspring
- (4) an increase in the chromosome number of the organism in which this process occurs

16 Structures in a human female are represented in the diagram below.



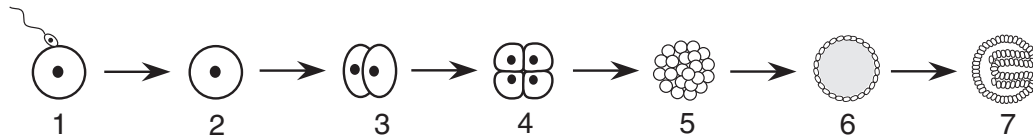
A heavy dose of radiation would have the greatest impact on genetic information in future offspring if it reached gametes developing within structure

- (1) A
- (2) B
- (3) C
- (4) D

17 Organism X appeared on Earth much earlier than organism Y. Many scientists believe organism X appeared between 3 and 4 billion years ago, and organism Y appeared approximately 1 billion years ago. Which row in the chart below most likely describes organisms X and Y?

Row	Organism X	Organism Y
(1)	simple multicellular	unicellular
(2)	complex multicellular	simple multicellular
(3)	unicellular	simple multicellular
(4)	complex multicellular	unicellular

18 The sequence of diagrams below represents some events in a reproductive process.



To regulate similar events in human reproduction, what adaptations are required?

- (1) the presence of genes and chemicals in each cell in stages 1 to 7
- (2) an increase in the number of genes in each cell in stages 3 to 5
- (3) the removal of all enzymes from the cells in stage 7
- (4) the elimination of mutations from cells after stage 5

19 Which statement best describes human insulin that is produced by genetically engineered bacteria?

- (1) This insulin will not function normally in humans because it is produced by bacteria.
- (2) This insulin is produced as a result of human insulin being inserted into bacteria cells.
- (3) This insulin is produced as a result of exposing bacteria cells to radiation, which produces a mutation.
- (4) This insulin may have fewer side effects than the insulin previously extracted from the pancreas of other animals.

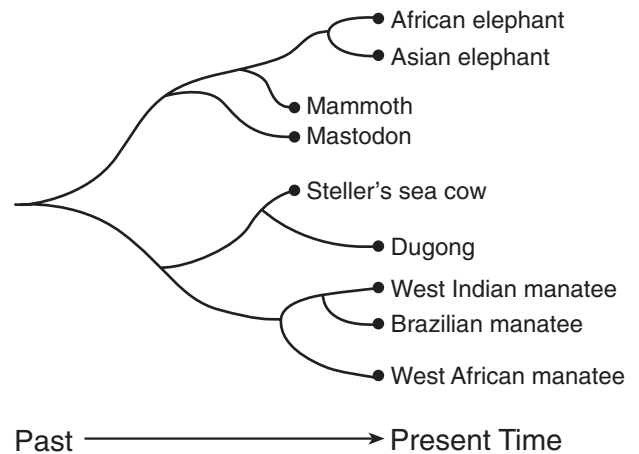
20 Which population of organisms would be in greatest danger of becoming extinct?

- (1) A population of organisms having few variations living in a stable environment.
- (2) A population of organisms having few variations living in an unstable environment.
- (3) A population of organisms having many variations living in a stable environment.
- (4) A population of organisms having many variations living in an unstable environment.

21 In animals, the normal development of an embryo is dependent on

- (1) fertilization of a mature egg by many sperm cells
- (2) production of new cells having twice the number of chromosomes as the zygote
- (3) production of body cells having half the number of chromosomes as the zygote
- (4) mitosis and the differentiation of cells after fertilization has occurred

22 The relationship of some mammals is indicated in the diagram below.



Which statement about the African elephant is correct?

- (1) It is more closely related to the mammoth than it is to the West African manatee.
- (2) It is more closely related to the West Indian manatee than it is to the mastodon.
- (3) It is not related to the Brazilian manatee or the mammoth.
- (4) It is the ancestor of Steller's sea cow.

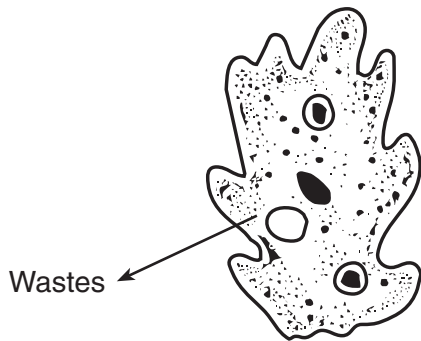
23 Which process normally occurs at the placenta?

- (1) Oxygen diffuses from fetal blood to maternal blood.
- (2) Materials are exchanged between fetal and maternal blood.
- (3) Maternal blood is converted into fetal blood.
- (4) Digestive enzymes pass from maternal blood to fetal blood.

24 Individual cells can be isolated from a mature plant and grown with special mixtures of growth hormones to produce a number of genetically identical plants. This process is known as

- (1) cloning
- (2) meiotic division
- (3) recombinant DNA technology
- (4) selective breeding

25 A single-celled organism is represented in the diagram below. An activity is indicated by the arrow.



If this activity requires the use of energy, which substance would be the source of this energy?

- (1) DNA
- (2) ATP
- (3) a hormone
- (4) an antibody

26 Which activity would stimulate the human immune system to provide protection against an invasion by a microbe?

- (1) receiving antibiotic injections after surgery
- (2) choosing a well-balanced diet and following it throughout life
- (3) being vaccinated against chicken pox
- (4) receiving hormones contained in mother's milk while nursing

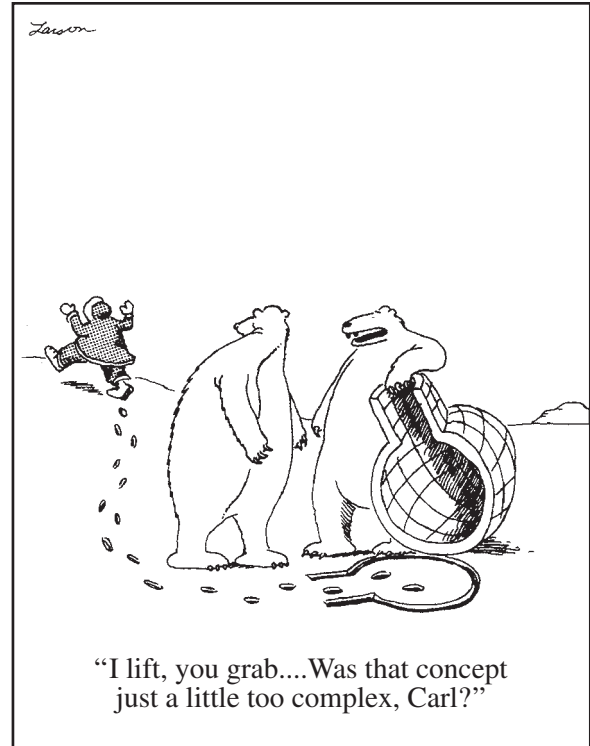
27 In an ecosystem, the presence of many different species is critical for the survival of some forms of life when

- (1) ecosystems remain stable over long periods of time
- (2) significant changes occur in the ecosystem
- (3) natural selection does not occur
- (4) the finite resources of Earth increase

28 The most immediate response to a high level of blood sugar in a human is an increase in the

- (1) muscle activity in the arms
- (2) blood flow to the digestive tract
- (3) activity of all cell organelles
- (4) release of insulin

29 Which ecological term best describes the polar bears in the cartoon below?



"I lift, you grab....Was that concept just a little too complex, Carl?"

(adapted)

- (1) herbivores
- (2) parasites
- (3) carnivores
- (4) producers

30 A new island formed by volcanic action may eventually become populated with biotic communities as a result of

- (1) a decrease in the amount of organic material present
- (2) decreased levels of carbon dioxide in the area
- (3) the lack of abiotic factors in the area
- (4) the process of ecological succession

31 Certain microbes, foreign tissues, and some cancerous cells can cause immune responses in the human body because all three contain

- (1) antigens
- (2) enzymes
- (3) fats
- (4) cytoplasm

32 Decomposers are important in the environment because they

- (1) convert large molecules into simpler molecules that can then be recycled
- (2) release heat from large molecules so that the heat can be recycled through the ecosystem
- (3) can take in carbon dioxide and convert it into oxygen
- (4) convert molecules of dead organisms into permanent biotic parts of an ecosystem

33 An environment can support only as many organisms as the available energy, minerals, and oxygen will allow. Which term is best described by this statement?

- (1) biological feedback
- (2) carrying capacity
- (3) homeostatic control
- (4) biological diversity

34 Communities have attempted to control the size of mosquito populations to prevent the spread of certain diseases such as malaria and encephalitis. Which control method is most likely to cause the *least* ecological damage?

- (1) draining the swamps where mosquitoes breed
- (2) spraying swamps with chemical pesticides to kill mosquitoes
- (3) spraying oil over swamps to suffocate mosquito larvae
- (4) increasing populations of native fish that feed on mosquito larvae in the swamps

35 Which animal has modified ecosystems more than any other animal and has had the greatest negative impact on world ecosystems?

- (1) gypsy moth
- (2) zebra mussel
- (3) human
- (4) shark

Part B

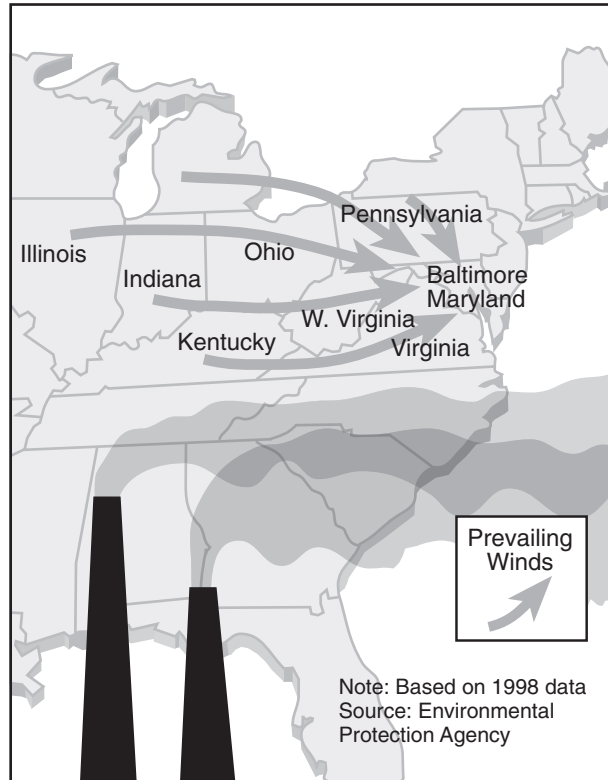
Answer all questions in this part. [30]

Directions (36–62): For those questions that are followed by four choices, circle the number of the choice that best completes the statement or answers the question. For all other questions in this part, follow the directions given in the question and record your answers in the spaces provided.

36 The map below shows the movement of some air pollution across part of the United States.

**For Teacher
Use Only**

Movement of Air Pollution



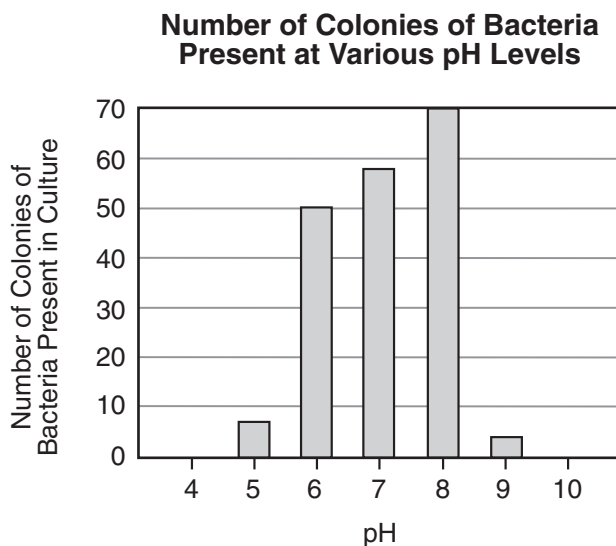
Which statement is a correct inference that can be drawn from this information?

- (1) Illinois produces more air pollution than the other states shown.
- (2) The air pollution problem in Baltimore is increased by the addition of pollution from other areas.
- (3) There are no air pollution problems in southern states.
- (4) The air pollution problems in Virginia clear up quickly as the air moves toward the sea.

36

Base your answers to questions 37 and 38 on the graph below and on your knowledge of biology. The graph illustrates a single species of bacteria grown at various pH levels.

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37 The most likely reason there are no colonies in cultures of this species at pH 4 and at pH 10 is that

- (1) these bacteria could successfully compete with other species of bacteria at these pH values
- (2) there are more predators feeding on these bacteria at pH 4 and pH 10 than at other pH levels
- (3) at pH 4 and pH 10 the environment is too acidic or too basic for the bacteria to grow
- (4) fertilization cannot occur in these bacteria at pH 4 or pH 10

37

38 Which statement is supported by data from this graph?

- (1) All species of bacteria can grow well at pH 7.
- (2) This type of bacterium would grow well at pH 7.5.
- (3) This type of bacterium would grow well at pH 2.
- (4) Other types of bacteria can grow well at pH 4.

38

39 In an experiment, DNA from dead pathogenic bacteria was transferred into living bacteria that do not cause disease. These altered bacteria were then injected into healthy mice. These mice died of the same disease caused by the original pathogens. Based on this information, which statement would be a valid conclusion?

- (1) DNA is present only in living organisms.
- (2) DNA functions only in the original organism of which it was a part.
- (3) DNA changes the organism receiving the injection into the original organism.
- (4) DNA from a dead organism can become active in another organism.

39

40 Dodder is a creeping vine that is parasitic on other plants. Which characteristic does dodder share with all other heterotrophs?

- (1) It produces nutrients by photosynthesis.
- (2) It must grow in bright locations.
- (3) It consumes preformed organic molecules.
- (4) It remains in one place for its entire life.

40

41 In a forest community, a shelf fungus and a slug live on the side of a decaying tree trunk. The fungus digests and absorbs materials from the tree, while the slug eats algae growing on the outside of the trunk. These organisms do not compete with one another because they occupy

- (1) the same habitat, but different niches
- (2) the same niche, but different habitats
- (3) the same niche and the same habitat
- (4) different habitats and different niches

41

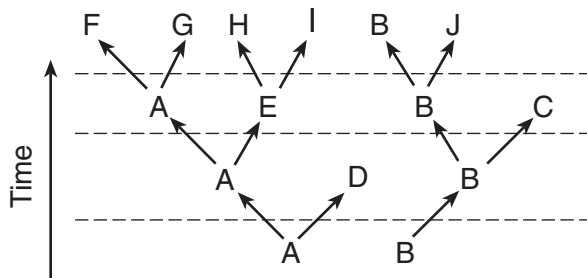
42 Studies of fat cells and thyroid cells show that fat cells have fewer mitochondria than thyroid cells. A biologist would most likely infer that fat tissue

- (1) does not require energy
- (2) has energy requirements equal to those of thyroid tissue
- (3) requires less energy than thyroid tissue
- (4) requires more energy than thyroid tissue

42

Base your answers to questions 43 and 44 on the diagram below and on your knowledge of biology. Letters *A* through *J* represent different species of organisms. The vertical distances between the dotted lines represent long periods of time in which major environmental changes occurred.

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Use Only**



43 Which species was the first to become extinct?

- (1) *E*
- (2) *J*
- (3) *C*
- (4) *D*

43

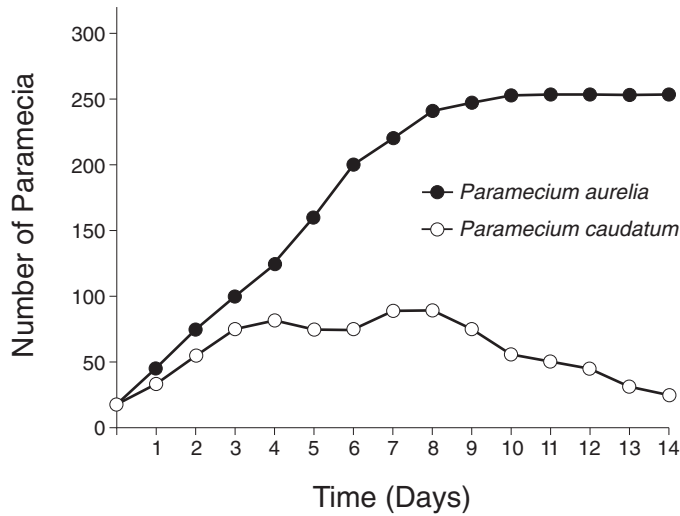
44 Which species appears to have been most successful in surviving changes in the environment over time?

- (1) *A*
- (2) *B*
- (3) *C*
- (4) *H*

44

45 The graph below shows the growth of two populations of paramecia grown in the same culture dish for 14 days.

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Which ecological concept is best represented by the graph?

- (1) recycling
- (2) equilibrium
- (3) competition
- (4) decomposition

45

46 Two different types of cells from an organism are shown below.

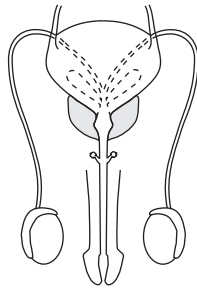


Explain how these two different types of cells can function differently in the same organism even though they both contain the same genetic instructions. [1]

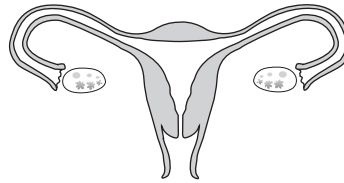
46

Directions (47–49): The diagrams below represent organs of two individuals. The diagrams are followed by a list of sentences. For each phrase in questions 47 through 49, select the sentence from the list below that best applies to that phrase. Then record its *number* in the space provided.

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Individual A



Individual B

Sentences

1. The phrase is correct for both Individual A and Individual B.
2. The phrase is not correct for either Individual A or Individual B.
3. The phrase is correct for Individual A, only.
4. The phrase is correct for Individual B, only.

47 Contains organs that produce gametes [1]

47

48 Contains organs involved in internal fertilization [1]

48

49 Contains a structure in which a zygote divides by mitosis [1]

49

Base your answers to questions 50 and 51 on the information below and on your knowledge of biology.

**For Teacher
Use Only**

Amphibians have long been considered an indicator of the health of life on Earth. Scientists are concerned because amphibian populations have been declining worldwide since the 1980s. In fact, in the past decade, twenty species of amphibians have become extinct and many others are endangered.

Scientists have linked this decline in amphibians to global climatic changes. Warmer weather during the last three decades has resulted in the destruction of many of the eggs produced by the Western toad. Warmer weather has also led to a decrease in rain and snow in the Cascade Mountain Range in Oregon, reducing the water level in lakes and ponds that serve as the reproductive sites for the Western toad. As a result, the eggs are exposed to more ultraviolet light. This makes the eggs more susceptible to water mold that kills the embryos by the hundreds of thousands.

50 The term used to identify the worldwide climatic changes referred to in the passage is

- (1) global warming
- (2) deforestation
- (3) mineral depletion
- (4) industrialization

50

51 State *two* ways the decline in amphibian populations could disrupt the stability of the ecosystems they inhabit. [2]

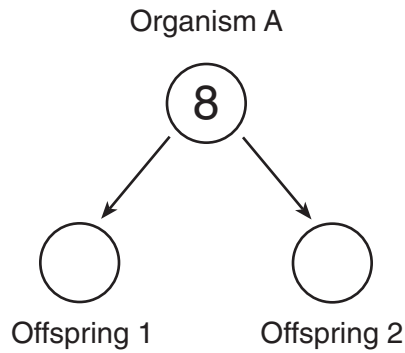
- 1. _____

- 2. _____

51

52 The diagram below represents reproduction of single-celled organism A, which has a normal chromosome number of 8.

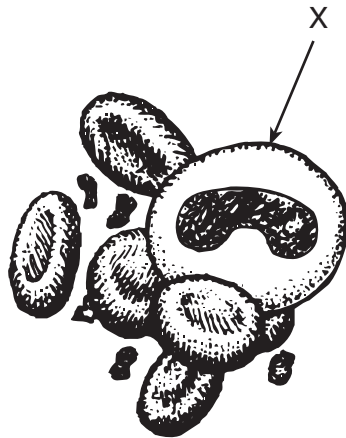
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In the circles representing offspring 1 and offspring 2, write the number of chromosomes that result from the normal asexual reproduction of organism A. [1]

52

Base your answers to questions 53 and 54 on the structures in the diagram of human blood below that help to maintain homeostasis in humans.



53 Identify the cell labeled X. [1]

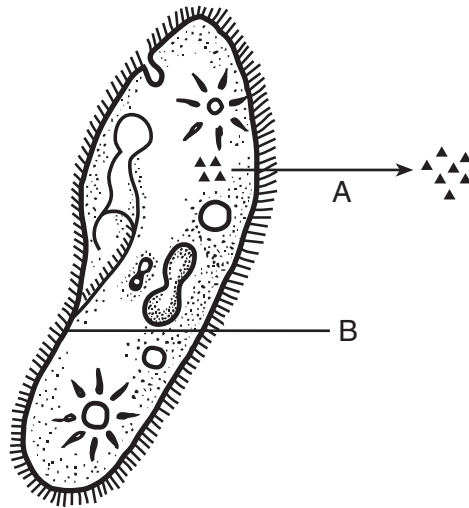
53

54 State *one* way a cell such as cell X helps to maintain homeostasis. [1]

54

Base your answers to questions 55 and 56 on the diagram below, which represents a unicellular organism in a watery environment. The ▲s represent molecules of a specific substance.

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55 Arrow A represents active transport. State *two* ways that active transport is different from diffusion. [2]

1. _____

2. _____

55

56 In cells of multicellular organisms, structure B often contains molecules involved in cell communication. What specific term is used to identify these molecules? [1]

56

57 Diagram A below represents a microscopic view of the lower surface of a leaf. Diagram B represents a portion of the human body.

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Diagram A

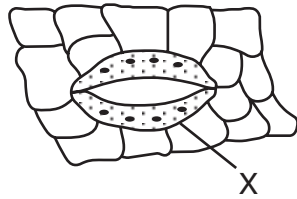
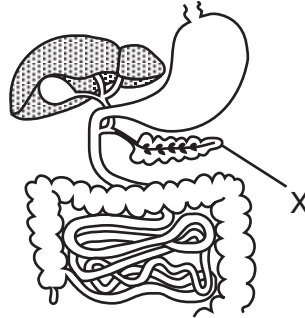


Diagram B



a Choose *one* diagram and record its letter, A or B, in the space provided.

Diagram: _____

b Identify the structure labeled X in the diagram you chose. [1]

c State *one* problem for the organism that would result from a malfunction of the structure you identified. [1]

57



Base your answers to questions 58 through 62 on the information below and on your knowledge of biology.

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Use Only**

In an investigation, plants of the same species and the same initial height were exposed to a constant number of hours of light each day. The number of hours per day was different for each plant, but all other environmental factors were the same. At the conclusion of the investigation, the final height of each plant was measured. The following data were recorded:

8 hours, 25 cm; 4 hours, 12 cm; 2 hours, 5 cm; 14 hours, 35 cm;
12 hours, 35 cm; 10 hours, 34 cm; 6 hours, 18 cm

58 Organize the data by completing both columns in the data table provided, so that the hours of daily light exposure *increase* from the top to the bottom of the table. [1]

Data Table

Daily Light Exposure (hours)	Final Height (cm)

58

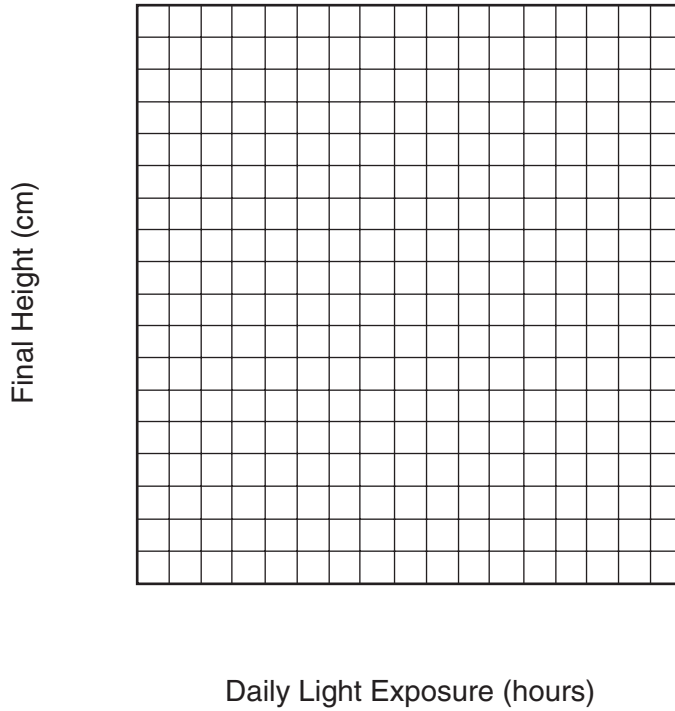
59 State *one* possible reason that the plant exposed to 2 hours of light per day was the shortest. [1]

59

Directions (60–61): Using the information given, construct a line graph on the grid provided, following the directions below.

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Effect of Light Exposure on Plant Growth



60 Mark an appropriate scale on each axis. [1]

60

61 Plot the data for final height on the grid. Surround each point with a small circle and connect the points. [1]



61

62 If another plant of the same species had been used in the investigation and exposed to 16 hours of light per day, what would the final height of the plant probably have been? Support your answer. [1]

62

Part C

Answer all questions in this part. [20]

Directions (63–72): Record your answers in the spaces provided in this examination booklet.

Base your answers to questions 63 through 65 on the article below which was written in response to an article entitled “Let all predators become extinct.”

**For Teacher
Use Only**

Predators Contribute to a Stable Ecosystem

In nature, energy flows in only one direction. Transfer of energy must occur in an ecosystem because all life needs energy to live, and only certain organisms can change solar energy into chemical energy.

Producers are eaten by consumers that are, in turn, eaten by other consumers. Stable ecosystems must contain predators to help control the populations of consumers.

Since ecosystems contain many predators, exterminating predators would require a massive effort that would wipe out predatory species from barnacles to blue whales. Without the population control provided by predators, some organisms would soon overpopulate.

- 63 Draw an energy pyramid in the space below that illustrates the information underlined in the second paragraph. Include *three* different, specific organisms in the energy pyramid. [1]

63



64 Explain the phrase “only certain organisms can change solar energy into chemical energy;” in the underlined portion of the first paragraph. In your answer be sure to identify:

- the type of nutrition carried out by these organisms [1]
- the process being carried out in this type of nutrition [1]
- the organelles present in the cells of these organisms that are directly involved in changing solar energy into chemical energy [1]

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64

65 Explain why an ecosystem with a variety of predator species might be more stable over a long period of time than an ecosystem with only one predator species. [1]

65

Base your answers to questions 66 and 67 on the information and data table below and on your knowledge of biology.

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Use Only**

Trout and black bass are freshwater fish that normally require at least 8 parts per million (ppm) of dissolved oxygen (O_2) in the water for survival. Other freshwater fish, such as carp, may be able to live in water that has an O_2 level of 5 ppm. No freshwater fish are able to survive when the O_2 level in water is 2 ppm or less.

Some factories or power plants are built along rivers so that they can use the water to cool their equipment. They then release the water (sometimes as much as 8°C warmer) back into the same river.

The Rocky River presently has an average summer temperature of about 25°C and contains populations of trout, bass, and carp. A proposal has been made to build a new power plant on the banks of the Rocky River. Some people are concerned that this will affect the river ecosystem in a negative way.

The data table below shows the amount of oxygen that will dissolve in fresh water at different temperatures. The amount of oxygen is expressed in parts per million (ppm).

Data Table

Temperature ($^\circ\text{C}$)	Fresh Water Oxygen Content (ppm)
1	14.24
10	11.29
15	10.10
20	9.11
25	8.27
30	7.56

66 State *one* effect of temperature change on the oxygen content of fresh water. Support your answer using specific information from the data table. [2]

66

67 Explain how a new power plant built on the banks of the Rocky River could have an environmental impact on the Rocky River ecosystem downstream from the plant. Your explanation must include the effects of the power plant on:

- water temperature [1]
- dissolved oxygen [1]
- fish species [1]

67

68 Enzyme molecules are affected by changes in conditions within organisms.

Explain how a prolonged, excessively high body temperature during an illness could be fatal to humans. Your answer must include:

- the role of enzymes in a human [1]
- the effect of this high body temperature on enzyme activity [1]
- the reason this high body temperature can result in death [1]

68

Base your answers to questions 69 through 71 on the quotation below and on your knowledge of biology.

“Today I planted something new in my vegetable garden — something very new, as a matter of fact. It’s a potato called the New Leaf Superior, which has been genetically engineered — by Monsanto, the chemical giant recently turned “life sciences” giant — to produce its own insecticide. This it can do in every cell of every leaf, stem, flower, root, and (here’s the creepy part) spud [the potato].”

Source: *New York Times Sunday Magazine*,
Michael Pollan, 10/25/98

**For Teacher
Use Only**

69 State *two* reasons that a gardener might choose to grow this new variety of plant. [2]

1. _____

2. _____

69

70 State *one* possible *disadvantage* of the synthesis of an insecticide by potatoes. [1]

70

71 Explain why every cell in the New Leaf Superior potato plant is able to produce its own insecticide. [1]

71

Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

LIVING ENVIRONMENT

Thursday, June 19, 2003 — 1:15 to 4:15 p.m., only

ANSWER SHEET

Student Sex: Female
 Male

Teacher

School Grade

Part	Maximum Score	Student's Score
A	35	_____
B	30	_____
C	20	_____
Total Raw Score (maximum Raw Score: 85)		<input type="text"/>
Final Score (from conversion chart)		<input type="text"/>
Raters' Initials		
Rater 1 Rater 2		

Record your answers to Part A on this answer sheet.

Part A

- | | | |
|----------|----------|----------|
| 1 | 13 | 25 |
| 2 | 14 | 26 |
| 3 | 15 | 27 |
| 4 | 16 | 28 |
| 5 | 17 | 29 |
| 6 | 18 | 30 |
| 7 | 19 | 31 |
| 8 | 20 | 32 |
| 9 | 21 | 33 |
| 10 | 22 | 34 |
| 11 | 23 | 35 |
| 12 | 24 | |

The declaration below must be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

Signature

Tear Here

Tear Here

Tear Here