

Questions for Exam Practice

NY

Surviving Biology Regents Exam

One Day at a Time

30 Days of practice question sets

for The New York State Biology Regents Exam
The Living Environment

With Answers and Explanations

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Format of this book

This book contains sets of Biology Regents exam practice questions organized into days. There are a total of 30 days of question sets.

Question sets are grouped into three categories that are listed below.

Multiple Choices: Questions for Part A and B-1 Practice.

There are eight days of question sets in this category. Practice questions in this category test your ability to answer straight forward multiple choice questions.

Multiple Choices: Questions with Graphs, Tables and Diagrams.

There are eight days of question sets in this category. Practice questions in this category are also for Part A and B-1 Regents exam practice. However, the multiple choice questions in this categories test your ability to recognize, interpret, and compare information in graphs, tables and diagrams.

Short Answers: Questions for Part B-2, C and D practice.

There are eight days of question sets in this category. Practice questions in this category vary from reading paragraphs to drawing and graphing.

Along with two sets of mixed practice questions and the two Regents practice exams, there are more than seven Regents exams worth of multiple choice questions available for practice in this book. There are almost five exams worth of short answer type questions available for practice in this book.

The set-by-set grouping of questions into different categories allows for these benefits to students:

1. To easily test and see which areas of questions they will perform well on.
2. Ability to focus their studying and practice on areas they are struggling on.

The small number of questions in each set allows for these benefits to students:

1. Quickly do and correct a few questions, and see the result and performance right away. No need of waiting to complete a whole exam before finding how well you are doing.
2. Less overwhelm in preparing for the regents exam so students can study and practice more often.

Answers and Explanations

Answers are given to all questions in this book. Answer explanations are given to all questions (except for the practice exams) . Unlike many other books, this book **does not just explain why** the answer given to a question is the correct one. Instead, with clean, clear, simplified, and easy-to-follow steps, this book **shows you how to pick out key information** from a question and **how to think through the question** to arrive at the correct answer given. This method of explanations offers you a more quality review and understanding of the biology concept tested, and a better opportunity to answer similar questions correctly. It is highly recommended that you read up and study the steps given in the explanations of answers to questions that you did not get correct.

Keeping Track of Points and Progress

At the end of each question set you are provided with a space to note the number of correct points after grading. This is a very important, often overlooked, element in preparing for a test like the Regents. By making a note of your points after each set:

- . You'll be able to easily see and keep track of your progress and improvement from one multiple choice (or short answer) set to the next.
- . You'll be able to easily see and track which category of questions you are doing great on, and which category you are struggling with
- . You'll be able to see if what you are doing is getting you better prepared for the exam as the exam date draws near

It is almost pointless to study day-after-day without knowing whether your studying and effort are getting you better prepared for the test. This book allows you to quickly and easily keep track of your points, which allows you to see progress, improvement, and readiness for your Biology Regents Exam.

Preparing for your Biology Regents Exam

Months, weeks, and days before the Exam

Pay attention and listen to your teacher.

Your teacher knows you better than authors of exams prep books. Pay attention in class, do what she or he says and recommends.

Attend Review Sessions.

Bring specific questions on concepts that you need the most help with. You'll get more out of a review session if your questions to specific problems are answered.

Practice Exam Quality Questions: Use This Book.

Start early (a month or so) and practice a set of questions a day at a time. Correct your answers and read up on explanations. Keep note of points of each set to track your progress and improvement.

Study notes and review packages

Focus your studying on concepts you have problems with because you may not have enough time to study everything. Make notes of concepts that are not clear, and bring them to your teacher.

Alternate between studying and practicing questions. It is highly recommended that you spend a little more time practicing questions and a little less time reading books and studying review packages.

Familiarize yourself with the current exam and scoring formats

The two full Practice Exams on Day 27 – 30 in this book are based on the most current Biology Regents exam format. The grading formats for all multiple choice questions and short answer questions are all based on the most current formats. Being aware of these formats is a very important element in preparing for Biology Regents Exam.

Night before the exam

Get a good night sleep, Relax!

Day of the exam

Eat a good meal. Relax!
Bring pencils, pens, and a calculator.

During the exam

Relax! Read and think through each question and choice thoroughly, and take your time. You know the answer to that question because you've worked hard and you've been taught well. And most of all,

You got Bio 😊

Good Luck !

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Easy does it

. Practice a set of questions one day at a time. You'll feel less overwhelmed.

Quality over Quantity

. Complete a set, correct a set, read up on explanations, and compare your performance to previous set of the same category. You'll see your progress.

Day 1: 10 Multiple Choice Questions
10 points *Part A and B1 practice*

Start: Answer all questions on this day before stopping.

1. Two closely related species of birds live in the same tree. Species *A* feeds on ants and termites, while species *B* feeds on caterpillars. The two species coexist successfully because
 - (1) each occupies a different niche
 - (2) they interbreed
 - (3) they use different methods of reproduction
 - (4) birds compete for food
2. A human liver cell is very different in structure and function from a nerve cell in the same person. This is best explained by the fact that
 - (1) different genes function in each type of cell
 - (2) liver cells can reproduce while the nerve cells cannot
 - (3) liver cells contain fewer chromosomes than nerve cells
 - (4) different DNA is present in each type of cell
3. The levels of organization for structure and function in the human body from least complex to most complex are
 - (1) systems —> organs —> tissues —> cells
 - (2) cells —> organs —> tissues —> systems
 - (3) tissues —> systems —> cells —> organs
 - (4) cells —> tissues —> organs —> systems
4. After a rabbit population reaches the carrying capacity of its habitat, the population of rabbits will most likely
 - (1) decrease, only
 - (2) increase, only
 - (3) alternately increase and decrease
 - (4) remain unchanged
5. Much of the carbon dioxide produced by green plants is *not* excreted as a metabolic waste because it
 - (1) can be used for photosynthesis
 - (2) is too large to pass through cell membranes
 - (3) is needed for cellular respiration
 - (4) can be used for the synthesis of proteins

Day 1: continue

6. Which part of a molecule provides energy for life processes?
- (1) carbon atoms
 - (2) oxygen atoms
 - (3) chemical bonds
 - (4) inorganic nitrogen
7. To increase chances for a successful organ transplant, the person receiving the organ should be given special medications. The purpose of these medications is to
- (1) increase the immune response in the person receiving the transplant
 - (2) decrease the immune response in the person receiving the transplant
 - (3) decrease mutations in the person receiving the transplant
 - (4) increase mutations in the person receiving the transplant
8. Competition between two species occurs when
- (1) mold grows on a tree that has fallen in the forest
 - (2) chipmunks and squirrels eat sunflower seeds in a garden
 - (3) a crow feeds on the remains of a rabbit killed on the road
 - (4) a lion stalks, kills, and eats an antelope
9. In order to reduce consumption of nonrenewable resources, humans could
- (1) burn coal to heat houses instead of using oil
 - (2) heat household water with solar radiation
 - (3) increase industrialization
 - (4) use a natural-gas grill to barbecue instead of using charcoal
10. Four environmental factors are listed below.
- A. energy
 - B. water
 - C. oxygen
 - D. minerals
- Which factors limit environmental carrying capacity in a land ecosystem?
- (1) A, only
 - (2) B, C, and D, only
 - (3) A, C, and D, only
 - (4) A, B, C, and D

Day 1

Stop. Correct your answers and note how many correct **Points**

Day 1: Answers and Explanations

1. **1** *Note:* Since each of the two Species feeds on different insect on the same habitat (tree), each is performing a different function or role within that habitat.

Recall: The word *niche* in Choice 1 best describes the different functions played by the two species in the same habitat.

2. **1** *Note:* The word *gene* in Choice 1 best describes why the two cells have different functions and structures.

Recall: Gene is a unit of heredity that holds instructions and information (genetic codes) for building and maintaining cells to perform certain function. One cell is different from the others because it contains different genetic code.

3. **4** *Note:* Choice 1 and 3 should be eliminated right away because the correct choice should start with cells, the basic and least complex unit of life.

Choice 4 is correct because **C**ells are the building materials for **T**issues, and tissues form **O**rgans, and a group of organs make up a **S**ystem that performs a certain life function. (**C-TOS**)

4. **3** *Recall:* Population growth of the rabbit in its habitat goes through a periodic increase (due to birth) and decrease (due to death) as a mean of maintaining population homeostasis.

Note: **Population homeostasis** is necessary for the survival of the rabbit (or any) species.

5. **1** *Note:* The key phrases in this question are "**carbon dioxide**" and "**green plants**"

Recall: **Carbon dioxide, CO₂**, is a key reactant in photosynthesis process that is carried out by green plants and algae.



photosynthesis

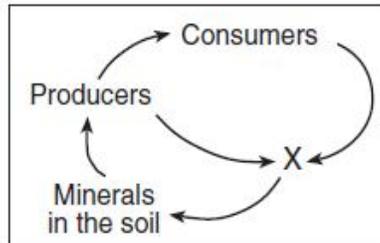
Day 1: Answers and Explanations

6. 3 *Recall:* Chemical bonds hold atoms of molecules together.
Potential energy is stored in **chemical bonds** of molecules
Energy is released for life processes when these bonds are broken and formed
7. 2 *Recall:* A transplant involve introducing a foreign organ into the organ recipient.
Recall: The recipient body is likely to reject this foreign organ by a mean of immune response to attack the foreign organ.
Therefore: Special medications given to the organ recipient serve to decrease the immune response (or lessen chance of rejection) and increase a chance of successful transplant.
Note: Choice 1 is incorrect because increase immune response means increase chance of rejection
Choice 3 and 4 are incorrect because mutations have nothing to do with organ transplants
8. 2 *Note:* The key word in this question is "competition"
Recall: Competition occurs when different species in the same habitat attempt to use the same resources for survival.
Note: Only Choice 2 indicates different species (chipmunks and squirrels) using the same resource (sunflower seeds) in the same habitat (garden)
9. 2 *Note:* One way of "reducing consumption of nonrenewable resources" is to use renewable resources for the same purpose.
Recall: Solar (sun) energy is a renewable resource than can be used as a heat source in place of burning up nonrenewable resources such as oil , coal and natural gases
10. 4 *Note:* All four factors are necessary for survival of species, and all four can be used up if the population of species gets too large in the land ecosystem.
Therefore: Carrying capacity of the land ecosystem depends on all four factors.

Day 2: 10 Multiple Choice Questions with
10 points *Graphs, Tables and Diagrams*

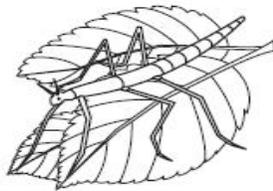
Start: Answer all questions on this day before stopping.

1. In the diagram below, what does *X* most likely represent?



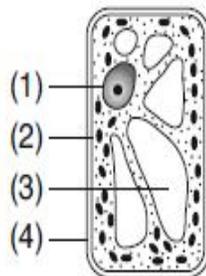
- (1) autotrophs
- (2) herbivores
- (3) decomposers
- (4) carnivores

2. The illustration below shows an insect resting on some green leaves. The size, shape, and green color of this insect are adaptations that would most likely help the insect to



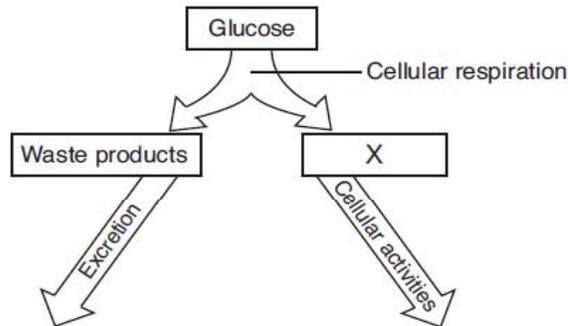
- (1) compete successfully with all birds
- (2) make its own food
- (3) hide from predators
- (4) avoid toxic waste materials

3. Which cell structure contains information needed for protein synthesis?



Day 2: continue

4. The diagram below represents a biochemical process. Which molecule is represented by X?



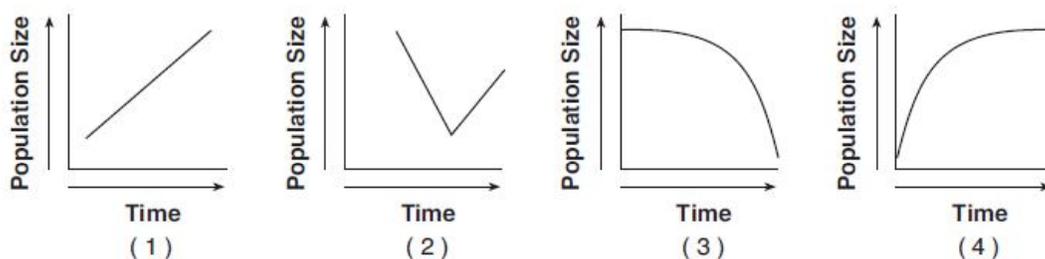
- | | |
|------------|-------------|
| (1) DNA | (3) protein |
| (2) starch | (4) ATP |

5. Which statement best explains the change shown in the diagram below?



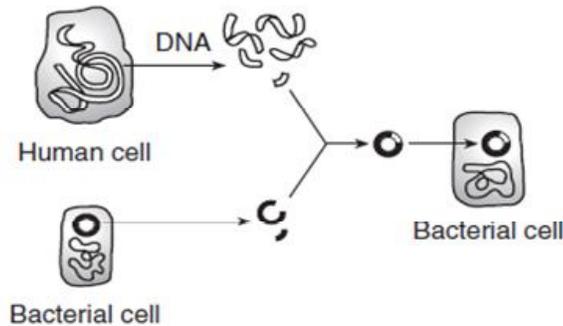
- (1) Gene expression in an organism can be modified by interactions with the environment.
- (2) Certain rabbits produce mutations that affect genes in specific areas of the body.
- (3) Sorting and recombination of genes can be influenced by very cold temperatures.
- (4) Molecular arrangement in existing proteins can be altered by environmental factors.

6. Which graph represents a population that grew and is maintained at the carrying capacity of its ecosystem?



Day 2: continue

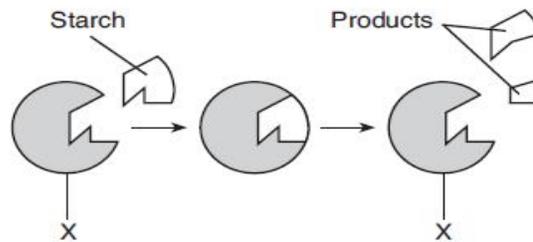
7. The diagram below represents a common laboratory technique in molecular genetics.



One common use of this technology is the

- (1) production of a human embryo to aid women who are unable to have children
- (2) change of single-celled organisms to multicellular organisms
- (3) introduction of a toxic substance to kill bacterial cells
- (4) production of hormones or enzymes to replace missing human body chemicals

Base your answers to questions 9 and 10 on the diagram below, which represents stages in the digestion of a starch, and on your knowledge of biology.



8. The products would most likely contain

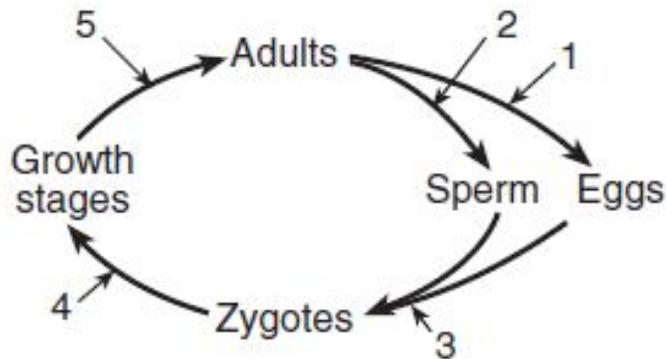
- (1) simple sugars
- (2) fats
- (3) amino acids
- (4) minerals

9. The structure labeled *X* most likely represents

- (1) an antibody
- (2) a receptor molecule
- (3) an enzyme
- (4) a hormone

Day 2: continue

10. The arrows in the diagram below illustrate processes in the life of a species that reproduces sexually.



Which processes result directly in the formation of cells with half the amount of genetic material that is characteristic of the species?

(1) 1 and 2

(2) 2 and 3

(3) 3 and 4

(4) 4 and 5

Day 2

Stop. Correct your answers and note how many correct **Points**

Day 2: Answers and Explanations

1. **3** *Note:* In the food chain diagram shown, X derive their energy from producers (green plants) and consumers (animals).
Recall: Of all the organisms listed, ONLY decomposers (X) derive their energy from decayed plants and animal tissues.
Note: When decomposers died they leave behind minerals in the soil. Producers then use these minerals grow, and start the food chain cycle all over again .
2. **3** *Note:* In the diagram shown, the insect is blended in (camouflaged) with the patterns on the leave.
Recall: By adapting features such as shape, size, and colors that allow blending in with its environment, the insect can **hide, and remain unnoticed from predators. (choice 3)**
Note: These adaptation features are not necessary for any of the other three behaviors of the insect listed in choices 1,2 and 4.
3. **2** *Recall:* Protein synthesis is carried out in the ribosomes of cells.
Note: In the plant cell diagram, ribosome is labeled with Choice 2
Note: Choice 1 is the nucleolus (contains chromosome, genetic info)
Choice 3 is the vacuole (stores materials such as water and starch)
Choice 4 is the cell wall (protects the cell)
4. **4** *Note:* The key information in the diagram is “cellular respiration”
Recall: In cellular respiration, glucose and oxygen are converted to water and carbon dioxide (waste products) , and energy in the form of ATP (X)
- $$\begin{array}{ccccccc}
 \text{C}_6\text{H}_{12}\text{O}_6 & + & \text{O}_2 & \text{-----} & > & \text{CO}_2 & + & \text{H}_2\text{O} & + & \text{ATP} \\
 & & & \text{cellular respiration} & & \text{waste products} & & & & X
 \end{array}$$
5. **1** *Note:* The obvious thing about this diagram is the color change of the rabbit’s fur from white to black where the ice packed was placed.
Recall: Characteristics (such as eye color, skin color, fur color) of an individual are all results of gene expressions. Environmental factors such as temperature change (ice pack) can alter gene expression of an individual, hence , change in characteristics (white to black fur) of the individual.

Day 2: Answers and Explanations

6. 4 *Note:* The key information in this question is that population “grew and is maintained”
- Note:* Only Choice 4 graph shows a rapid population increase (growth) but levels off (maintained) at a certain population size (carrying capacity).
7. 4 *Note:* The process depicted in the diagram is known as “Recombinant DNA”
- Recall:* In Recombinant DNA process, a portion of a DNA is moved from the donor cell (human) to the recipient cell (bacteria).
- This process will allow the bacteria cell to rapidly produce chemicals (hormones or enzymes) that the DNA section codes for.
8. 1 *Note:* In the diagram, the products are smaller units of the starch
- Recall:* Starches are complex carbohydrate, which are composed of smaller and simpler molecules of sugar.
9. 3 *Note:* In the diagram, substance X is unchanged during the chemical breakdown of the starch.
- Recall:* Substances that are unchanged during biological (or chemical) processes are called enzymes or catalysts.
- Therefore:* X is an enzyme because it is unchanged
10. 1 *Recall:* Egg (1) and sperm (2) cells each contains half the genetic materials of an individual as a result of meiosis.

Day 3: Short Answer Questions
10 points *Part B2, C and D Practice*

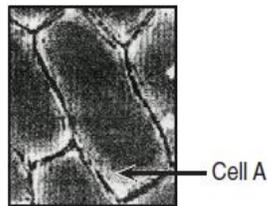
Start: Answer all questions on this day before stopping

1. Acetylcholine is a chemical secreted at the ends of nerve cells. This chemical helps to send nerve signals across synapses (spaces between nerve cells). After the signal passes across a synapse, an enzyme breaks down the acetylcholine. LSD is a drug that blocks the action of this enzyme. Describe *one* possible effect of LSD on the action of acetylcholine. [1]

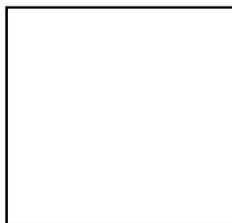
2. Mice store only a small amount of the energy they obtain from plants they eat. State what might happen to some of the remaining energy they obtain from the plants. [1]

3. State *one* reason that most foods must be digested before they can enter a cell. [1]

4. Cell A shown below is a typical red onion cell in water on a slide viewed with a compound light microscope.



- Draw a diagram of how cell A would most likely look after salt water has been added to the slide and label the cell membrane in your diagram. [2]



Day 3: continue

Base your answers to questions 5 and 6 on the information and data table below and on your knowledge of biology.

A student cut three identical slices from a potato. She determined the mass of each slice. She then placed them in labeled beakers and added a different solution to each beaker. After 30 minutes, she removed each potato slice from its solution, removed the excess liquid with a paper towel, and determined the mass of each slice. The change in mass was calculated and the results are shown in the data table below.

Change in Mass of Potato in Different Solutions

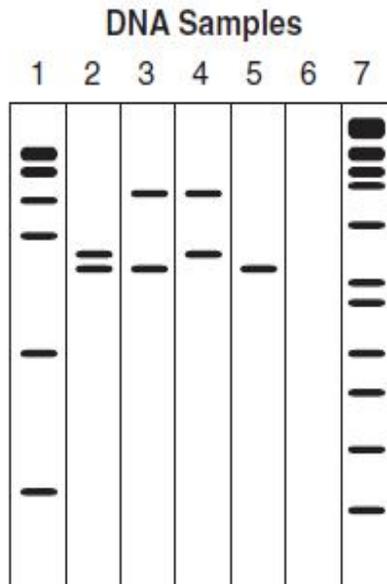
Beaker	Solution	Change in Mass
1	distilled water	gained 4.0 grams
2	6% salt solution	lost 0.4 gram
3	16% salt solution	lost 4.7 grams

5. Identify the process that is responsible for the change in mass of each of the three slices. [1]

6. Explain why the potato slice in beaker 1 increased in mass. [1]

Day 3: Continue

Base your answers to questions 8 through 10 on the diagram below and on your knowledge of biology. The diagram shows the results of a technique used to analyze DNA.



7. This technique used to analyze DNA directly results in
- (1) synthesizing large fragments of DNA
 - (2) separating DNA fragments on the basis of size
 - (3) producing genetically engineered DNA molecules
 - (4) removing the larger DNA fragments from the samples

8. This laboratory technique is known as
- (1) gel electrophoresis
 - (2) DNA replication
 - (3) protein synthesis
 - (4) genetic recombination

9. State *one* specific way the results of this laboratory technique could be used. [1]

Day 3: Answers and Explanations

1. 1 point

Note: According to the paragraph:
Acetylcholine helps to carry nerve signals.
A special enzyme is present to destroy acetylcholine
LSD blocks action of the enzyme that destroys acetylcholine.

Question: What is the indirect effect of LSD on action of acetylcholine

Acceptable responses include BUT not limited to .

The work of acetylcholine would occur continuously.

Nerve signals would not be turned off.

Cell communication would be disrupted.

2. 1 point

Recall: Energy is needed for many life functions of living organisms.

Acceptable responses include BUT not limited to:

Much of the energy is lost as heat (during cellular respiration).

Some of the energy is used by the mice for life functions.

3. 1 point

Recall: Nutrients in food are made up of large molecules.

Digestion breaks down these large molecules into smaller ones

Acceptable responses include BUT not limited to:

Certain food molecules are too large to pass through the cell membrane.

Only small molecules can pass through cell membranes.

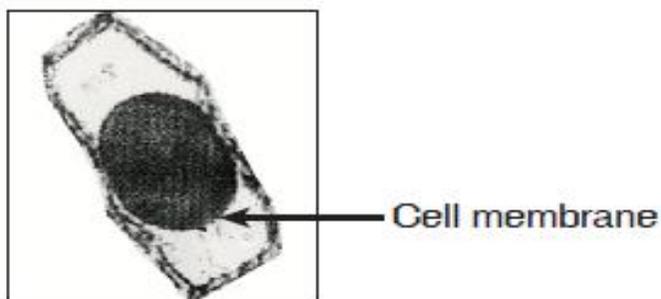
Day 3: Answers and Explanations

4. 2 point

Recall: A cell placed in hypertonic solution (salt water) will lose water through osmosis. This loss of water causes the internal compartment (cytoplasm) to shrink and pull away from the cell wall.

Since your diagram will vary from example shown below, Acceptable drawing must show:

- . The cytoplasm of the cell should be plasmolyzed (smaller, rounded) with the cell membrane away from the cell wall. (1 point)
- . The cell membrane should be clearly labeled. (1 point)



5. 1 point

Note: Based on the data given, the change in mass is due to movement of water either into a potato slice (Beaker 1) or out of a potato slice (Beaker 2 and 3).

Acceptable response will be any process that describes movement of water from one area to another.

Osmosis

Diffusion

Passive transport

6. 1 point

Note: There is a higher concentration of water in Beaker 1 (distilled water) than inside a potato slice

Acceptable responses include, but are not limited to:

Water diffused into the cells of the potato because there is a higher concentration of water outside than inside the slice.

The potato slice increased in water content.

Day 3: Answers and Explanations

7. 1 point 3

Note: The diagram shown is from a result of gel electrophoresis.

Recall: Gel electrophoresis separates fragments of a biological molecule (such as DNA) by sizes. Largest size fragments on top, smallest size fragments at the bottom.

8. 1 point 1

Recall: During **gel electrophoresis process**, samples containing a mixture of polarized DNA fragments are separated (by using electrical current) according to their sizes.

Electric field is then used to pull the polarized fragments through the gel. Smaller size DNA fragments move faster and appear as blots at the bottom. Larger size DNA fragments move more slowly, and appear as blots closer to the top.

9. 1 point

Note: The purpose of gel electrophoresis is to separate DNA fragments by size, and then compare the blot patterns to that of a known source.

Question is: For what purpose would one compare DNA patterns?

Acceptable responses include, but are not limited to:

Determining evolutionary relationships

Gene testing for diagnosis

Paternity testing

Determining identity

Solving crimes

Day 29: Biology Regents. Practice Exam 2
Part A and B-1

Start: Answer all questions in Part A and B-1 before stopping.

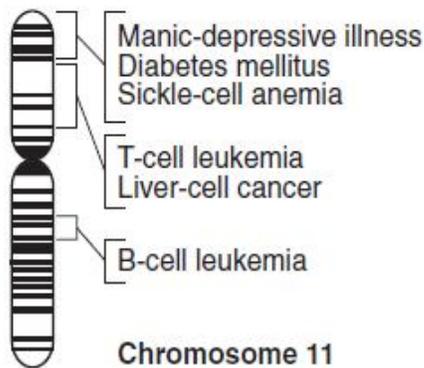
Part A: Answer all questions in this part. [30 points]

Directions (1–30): For *each* statement or question, write on your separate answer sheet the *number* of the word or expression that, of those given, best completes the statement or answers the question.

- 1 Which phrase is an example of autotrophic nutrition?
- (1) a cow eating grass in a field
 - (2) a mushroom digesting a dead log
 - (3) an apple tree making its own food
 - (4) a tapeworm feeding in the body of a dog
- 2 The ability of estrogen to affect certain cells depends directly on
- (1) amino acids
 - (2) receptor molecules
 - (3) gametes
 - (4) nerve cells
- 3 By studying the chemicals in rare plants that grow only in rain forests, scientists hope to discover new life-saving medicines. Chances of finding such new medicines are reduced by
- (1) predation by carnivores
 - (2) homeostasis in organisms
 - (3) recycling of materials in food webs
 - (4) loss of species due to human activities
- 4 When a species includes organisms with a wide variety of traits, it is most likely that this species will have
- (1) a high proportion of individuals immune to genetic diseases
 - (2) a greater chance to survive if environmental conditions suddenly change
 - (3) less success competing for resources
 - (4) limitless supplies of important resources, such as food and water
- 5 Some diseases and their causes are listed below.
- A. Flu—influenza virus
 - B. Lung cancer—smoking
 - C. Cystic fibrosis—genes
 - D. Dysentery—parasitic ameba
- Which disease would individuals have the greatest difficulty preventing in themselves?
- (1) A
 - (2) B
 - (3) C
 - (4) D

Day 29: Biology Regents. Practice Exam 2
***Part A and B-1* continue**

6 The diagram below represents the banding pattern for human chromosome 11, with some of the bands labeled.



The bands represent

- | | |
|--------------|--------------|
| (1) proteins | (3) starches |
| (2) genes | (4) enzymes |

7 A liver cell can make enzymes that a heart cell can *not* make because liver cells

- (1) digest large, complex molecules
- (2) contain more DNA than heart cells
- (3) use different genes than the heart cells use
- (4) remove carbon dioxide from blood

8 As male children get older, some begin to closely resemble their fathers and have no resemblance to their mothers. Which statement best explains this observation?

- (1) Several sperm fertilized the egg, so the fertilized egg contained more genes from their father.
- (2) More genes are inherited from the sperm cell of their father than from the cell of their mother, so most traits will be like those of their father.
- (3) More genes from their father are expressed in traits that can be seen, and more genes from their mother are expressed in traits that cannot be seen, such as blood type or enzyme function.
- (4) Genes from their father are stronger than genes from their mother, so the

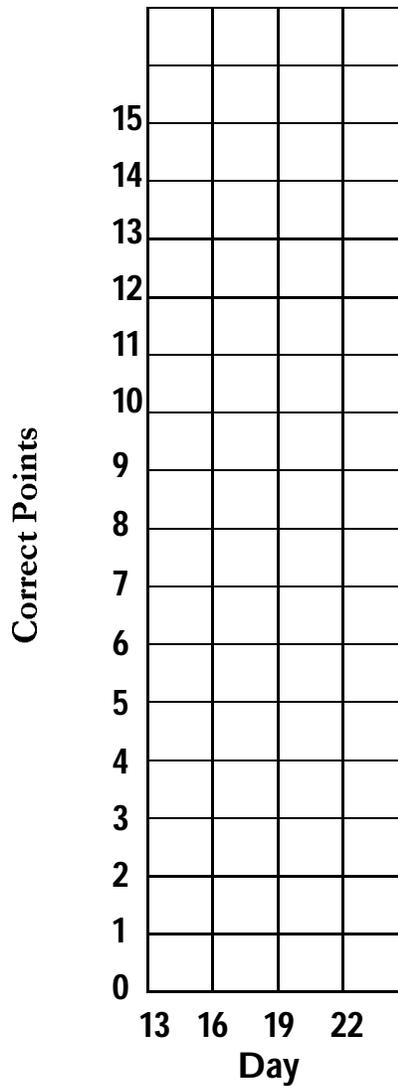
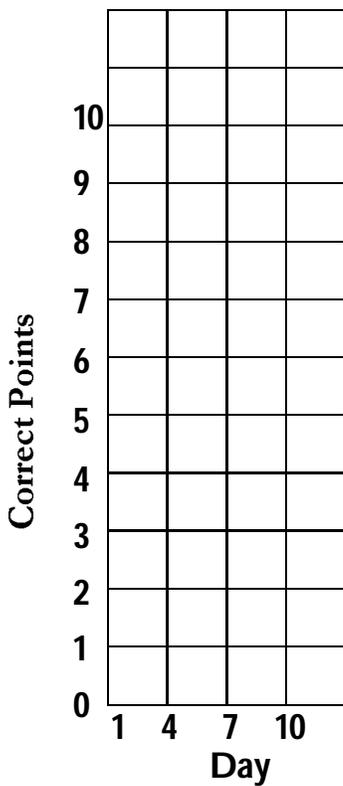
Track Your Progress

Multiple Choice Questions: Part A and B-1

How well have you been improving on the multiple choice questions?
It's easy to find out.

Get the correct points that you noted at the end of each multiple choice questions for Part A and B-1 practice sets.

Plot the points on the graphs below. You hope to see an upward trend on each graph.



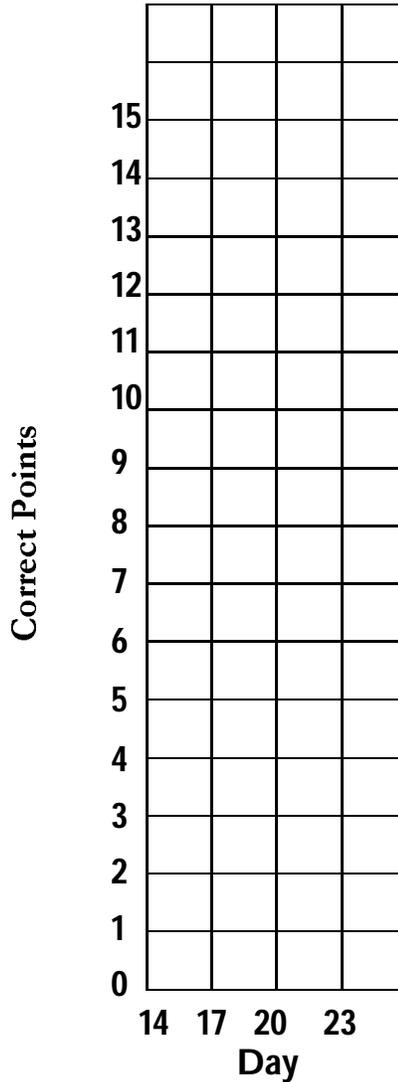
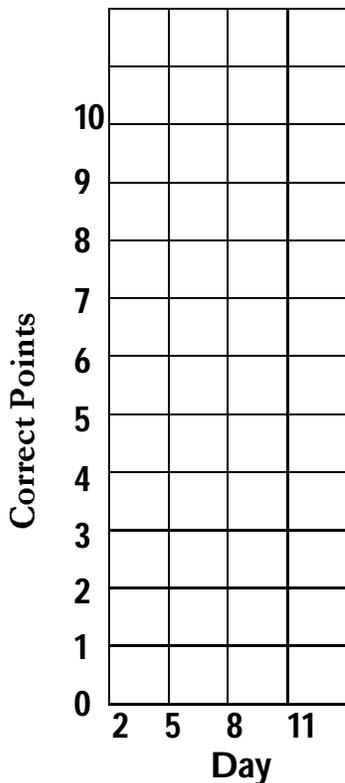
Track Your Progress

Multiple Choice Questions: Graphs, Tables, and diagrams

How well have you been improving on the multiple choice questions with Graphs, Tables, and Diagrams? It's easy to find out.

Get the correct points that you noted at the end of each multiple choice questions with Graphs, Tables, and Diagrams.

Plot the points on the graphs below. You hope to see an upward trend on each graph.



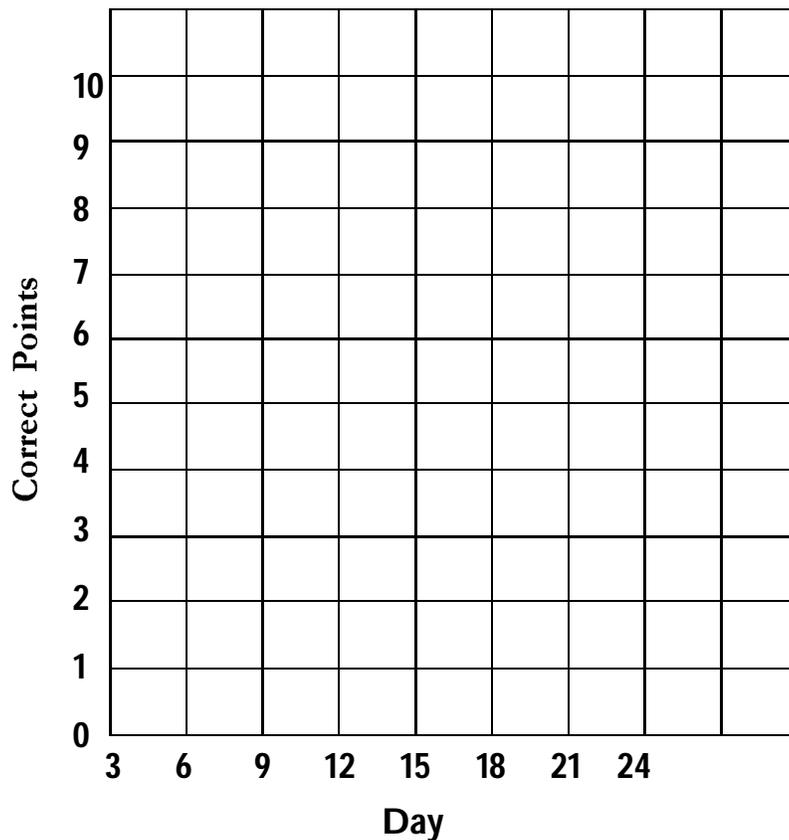
Track Your Progress

Short Answers Questions: Part B-2, C and D Practice

How well have you been improving on the Short Answer Questions.
It's easy to find out.

Get the correct points that you noted at the end of each Short Answer questions Part B-1, C and D practice sets.

Plot the points on the graphs below. You hope to see an upward trend on the graph.



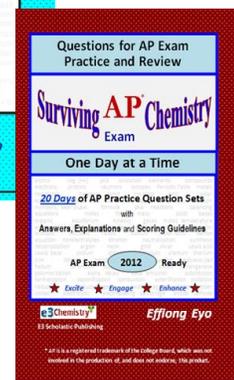
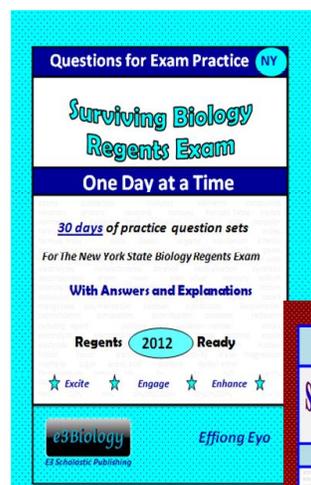
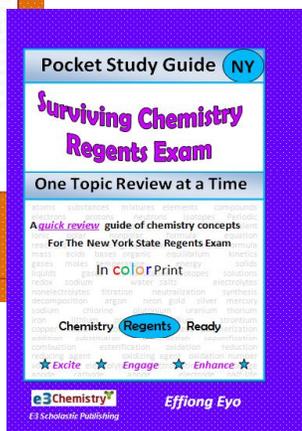
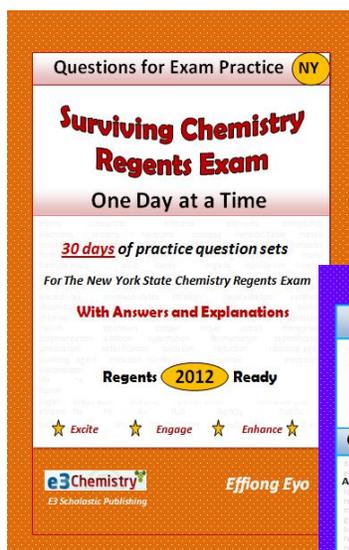
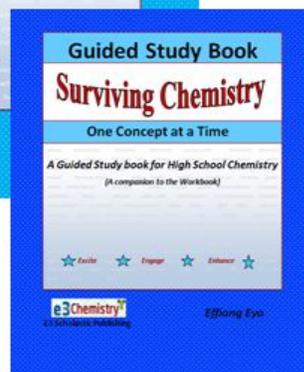
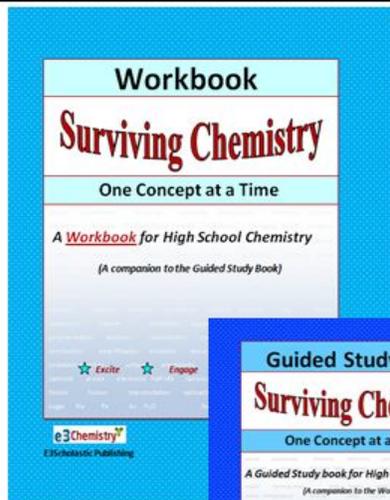
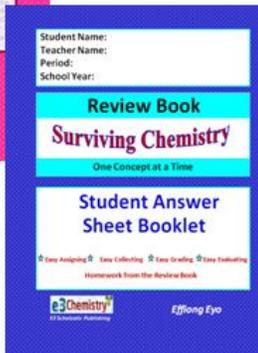
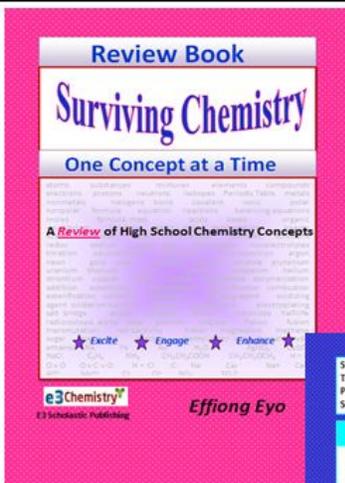
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