**Name_____** **Regents Practice Test 1**
**Ms. Scott**

**1.** Base your answers on the accompanying information and on your knowledge of biology.

A chemical known as fertex affects external fertilization of sea urchin eggs. An experiment was set up using three tanks to investigate the effect of fertex. Each tank had a different concentration of fertex: 1%, 2%, and 3%. Ten sea urchin eggs and 2 mL of sea urchin sperm were added to each of the three tanks. A fourth tank was set up as a control.

State *one* way the contents of the control tank would differ from the contents of the three experimental tanks. [1]

**2.** Base your answers on the accompanying information and on your knowledge of biology.

A chemical known as fertex affects external fertilization of sea urchin eggs. An experiment was set up using three tanks to investigate the effect of fertex. Each tank had a different concentration of fertex: 1%, 2%, and 3%. Ten sea urchin eggs and 2 mL of sea urchin sperm were added to each of the three tanks. A fourth tank was set up as a control.

Identify *two* factors that must be kept the same in all four tanks. [1]

**3.** Base your answers on the accompanying information and on your knowledge of biology.

In order to enroll in most schools, students must be vaccinated against certain viral diseases, such as mumps. Even with these vaccinations, many students still suffer from other diseases. Discuss how a vaccination works and why some students still become infected with other diseases. In your answer, be sure to:
*a.* identify what is present in a vaccine that stimulates an immune response [1]
*b.* describe how a vaccine protects against disease [1]
*c.* state why a student vaccinated against mumps can still be infected by the pathogens that cause other diseases, such as chicken pox [1]

**4.** Base your answers on the accompanying information and on your knowledge of biology.

**Beware of Dust Mites**

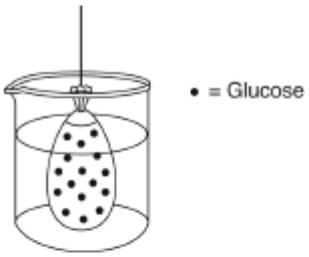
Quietly lurking within our mattresses, under our beds, and inside sofas and carpets are creatures too small to be seen without a microscope. Dust mites are arthropods closely related to spiders, scorpions, and ticks. They feed on the dead skin cells regularly shed by humans and their animal pets. The average human sheds about 10 grams of dead skin a week. Cats and dogs create even more dander for dust mites to eat. The mites also eat pollen, fungi, and bacteria. They do not drink water but absorb it from the air. Dust mites do not carry diseases and are harmless to most people. It's their bathroom habits that make some of us itch and sneeze. Many people develop severe allergies to dust mite feces (wastes). If you lie on a rug where dust mites live, you might develop itchy red bumps on your skin. Breathe in dust containing their feces and you might have more serious symptoms, such as difficulty breathing or a severe asthma attack.
Dust mites thrive in warm, humid environments—eating and nesting in dust-collecting bedding, fabric, and carpet. Think about this! A typical mattress can contain anywhere from 100,000 to 10 million dust mites. Nearly 100,000 dust mites can live in one square yard of carpet.
During a process called sensitization, a person's immune system mistakenly identifies the inhaled dust mite waste as an invader. The next time the person is exposed to the dust mite waste, the immune system launches an allergic reaction.

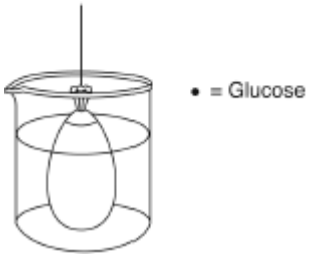
State *one* way, other than using a pesticide, that an individual could *decrease* the number of dust mites present in his home. [1]

**5.** Base your answer on the information below, the accompanying diagram, and on your knowledge of biology.

An artificial cell filled with a glucose solution was placed in a beaker of water, as represented. The beaker was left undisturbed for 20 minutes.

On the accompanying diagram or on a *separate piece of paper*, draw in the expected location of the glucose molecules after 20 minutes. [1]

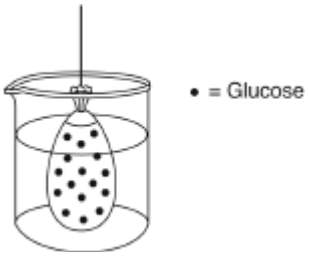



**6.** Base your answer on the information below, the accompanying diagram, and on your knowledge of biology.

An artificial cell filled with a glucose solution was placed in a beaker of water, as represented. The beaker was left undisturbed for 20 minutes.

If both glucose and starch were added to the artificial cell, where would the starch be located after 20 minutes? [1]




**7.** State *one* advantage of using a stain to study frog skin cells with a microscope. [1]

**8.** Base your answer on the information below and on your knowledge of biology.

**Chickens as Drug Factories**

Scientists in Scotland have successfully produced five generations of chickens that lay eggs containing certain protein-based drugs. The scientists changed the DNA of the chickens so that two drugs, one used to treat skin cancer and the other used to treat multiple sclerosis, were present in the egg whites. Cows, sheep, and goats have already been altered to produce protein-based drugs in their milk. Chickens are considered good "drug factories" because they are inexpensive to care for, they grow fast, and their chicks inherit the special drug-producing ability.

Explain why scientists altered the DNA of the chickens instead of altering a protein already present in the chickens. In your answer, be sure to:

*a.* identify the technique used to alter the DNA [1]
*b.* state *one* reason why the scientists altered the DNA of the chickens instead of altering a protein already present in the chickens [1]
*c.* state *one* advantage of using chickens for this procedure [1]
*d.* state *one* reason why some people might *not* support this method of drug production [1]

**9.** Base your answers on the accompanying Universal Genetic Code Chart and on your knowledge of biology.

*a.* Complete the missing amino acid sequences for plant species *A* in the accompanying table. [1]

*b.* Complete the missing mRNA base sequences for plant species *B* in the table. [1]

*c.* Based on the information provided in the completed table, which plant species is most closely related to the endangered species? Support your answer. [1]

**Universal Genetic Code Chart**
**Messenger RNA Codons and the Amino Acids for Which They Code**

| FIRST BASE | SECOND BASE: U | SECOND BASE: C | SECOND BASE: A | SECOND BASE: G | THIRD BASE |
|---|---|---|---|---|---|
| U | UUU, UUC: PHE<br>UUA, UUG: LEU | UCU, UCC, UCA, UCG: SER | UAU, UAC: TYR<br>UAA, UAG: STOP | UGU, UGC: CYS<br>UGA: STOP<br>UGG: TRP | U C A G |
| C | CUU, CUC, CUA, CUG: LEU | CCU, CCC, CCA, CCG: PRO | CAU, CAC: HIS<br>CAA, CAG: GLN | CGU, CGC, CGA, CGG: ARG | U C A G |
| A | AUU, AUC, AUA: ILE<br>AUG: MET or START | ACU, ACC, ACA, ACG: THR | AAU, AAC: ASN<br>AAA, AAG: LYS | AGU, AGC: SER<br>AGA, AGG: ARG | U C A G |
| G | GUU, GUC, GUA, GUG: VAL | GCU, GCC, GCA, GCG: ALA | GAU, GAC: ASP<br>GAA, GAG: GLU | GGU, GGC, GGA, GGG: GLY | U C A G |

**Parts *a* & *b***

**Plant Species Table**

| | | | | | |
|---|---|---|---|---|---|
| Endangered plant species | DNA base sequence | AAT | CCG | AGT | GGA |
| | mRNA base sequence | UUA | GGC | UCA | CCU |
| | amino acid sequence | LEU | GLY | SER | PRO |
| Plant species A | DNA base sequence | AAC | CCA | AGT | GGA |
| | mRNA base sequence | UUG | GGU | UCA | CCU |
| | amino acid sequence | _____ | _____ | _____ | _____ |
| Plant species B | DNA base sequence | ATA | CCC | AGG | GGA |
| | mRNA base sequence | _____ | _____ | _____ | _____ |
| | amino acid sequence | TYR | GLY | SER | PRO |
| Plant species C | DNA base sequence | CAT | CCT | ATA | GGA |
| | mRNA base sequence | GUA | GGA | UAU | CCU |
| | amino acid sequence | VAL | GLY | TYR | PRO |

**10.** Base your answer on the information below, the accompanying data table, and your knowledge of biology.

Daphnia (water fleas) are sensitive to many changes in pond ecosystems. For this reason they are often used in bioassays, tests in which organisms are exposed to various levels of a chemical to determine what levels are safe. The results of these tests determine whether or not the chemical being tested will affect other pond organisms.
An experiment was designed to determine the toxicity of different salt solutions on cultures of daphnia. Five fish tanks were each filled with the same amount of water containing different concentrations of salt. Ten daphnia were placed into each tank. After 48

hours, the number of daphnia that had survived and the number of daphnia that had died in each tank were recorded and the percent mortality was calculated. The results of the experiment are shown in the accompanying data table.

Using the information in the data table, construct a line graph on the grid shown or on a separate piece of paper, following the directions.

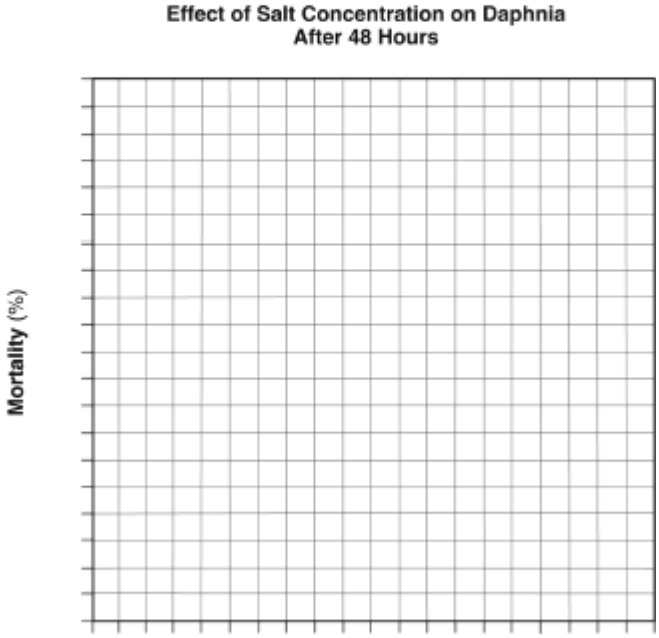
*a.* Label the *x*-axis. Be sure to include units. [1]

*b.* Mark an appropriate scale, without any breaks, on each axis. [1]

*c.* Plot the data for mortality on the grid. Surround each point with a small circle and connect the points. (see example image) [1]

**Effect of Salt Concentration on Daphnia After 48 Hours**

| Salt Concentration (g/L) | Number that Survived | Number that Died | Mortality (%) |
|---|---|---|---|
| 0.63 | 8 | 2 | 20 |
| 1.25 | 7 | 3 | 30 |
| 2.5 | 10 | 0 | 0 |
| 5.0 | 3 | 7 | 70 |
| 10.0 | 0 | 10 | 100 |




**Part C**

Example: 

**11.** Base your answer on the accompanying information and data table and on your knowledge of biology.

Daphnia (water fleas) are sensitive to many changes in pond ecosystems. For this reason they are often used in bioassays, tests in which organisms are exposed to various levels of a chemical to determine what levels are safe. The results of these tests determine whether or not the chemical being tested will affect other pond organisms.

An experiment was designed to determine the toxicity of different salt solutions on cultures of daphnia. Five fish tanks were each filled with the same amount of water containing different concentrations of salt. Ten daphnia were placed into each tank. After 48 hours, the number of daphnia that had survived and the number of daphnia that had died in each tank were recorded and the percent mortality was calculated. The results of the experiment are shown in the data table that follows.

Which salt concentration is most likely closest to the concentration of salt found in the natural environment of this species of daphnia? Support your answer. [1]

**Effect of Salt Concentration on Daphnia After 48 Hours**

| Salt Concentration (g/L) | Number that Survived | Number that Died | Mortality (%) |
|---|---|---|---|
| 0.63 | 8 | 2 | 20 |
| 1.25 | 7 | 3 | 30 |
| 2.5 | 10 | 0 | 0 |
| 5.0 | 3 | 7 | 70 |
| 10.0 | 0 | 10 | 100 |

**12.** Which system is correctly paired with its function?

**1.** immune system--intake and distribution of oxygen to cells of the body

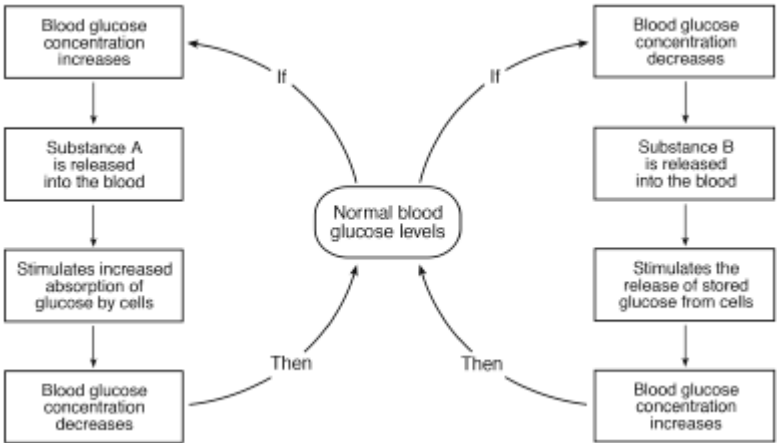
**2.** excretory system--remove potentially dangerous materials from the body

**3.** digestive system--transport energy-rich molecules to cells

**4.** circulatory system--produce building blocks of complex compounds

**13.** Base your answer on the accompanying diagram and on your knowledge of biology. The diagram represents the effect of two chemical substances, *A* and *B*, in maintaining the level of glucose in the blood in humans.

Which statement is correct regarding the substances involved in these interactions?




**1.** Substance *A* is insulin, which is released by cells in the pancreas.

**2.** Substance *B* is a chemical receptor molecule produced by blood cells.

**3.** Both substances *A* and *B* are classified as biological catalysts.

**4.** Substance *A* is a chemical that is produced by specialized blood cells.

**14.** In an experiment to determine the effect of exercise on pulse rate, a student checks his pulse rate before and after exercising for several minutes. The purpose of checking his pulse rate before exercising is that it

**1.** serves as the conclusion for the experiment

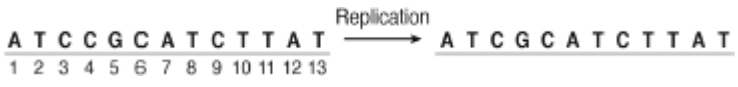
**2.** is needed to justify the sample size

**3.** serves as a control for the experiment

**4.** is needed to formulate a hypothesis

**15.** The accompanying diagram shows an alteration that occurred during the replication process of a portion of a gene. The numbers identify the locations of specific bases in the sequence.

This alteration is most likely the result of




**1.** a substitution at base 2

**3.** an insertion of base 3

**2.** a deletion of base 2

**4.** a deletion of base 4

**16.** DNA is able to control cellular activities most directly by regulating the process of

**1.** meiotic division

**2.** protein synthesis

**3.** active transport

**4.** selective breeding

**17.** During the process of cellular respiration, energy is released from

**1.** carbon dioxide

**2.** oxygen atoms

**3.** water molecules

**4.** chemical bonds

**18.** Cells of the immune system are able to respond to the presence of invading organisms because they recognize the

**1.** antigens present on the invaders

**2.** antibodies present in invading pathogens

**3.** DNA pattern in the nuclei of viruses

**4.** antibiotics released from microbes

**19.** In order to enter cells and be useful to the body, starch must be

**1.** absorbed through the skin

**2.** broken down into fats and water

**3.** digested into simple sugars

**4.** converted to carbon dioxide and ATP

**20.** Single-celled organisms are able to maintain internal stability because they

**1.** have multiple organ systems

**2.** work with other cells

**3.** contain structures that perform life functions

**4.** carry out photosynthesis to produce food

**21.** A similarity between humans and many other multicellular animals is that they

**1.** occupy the same niche in most food webs

**2.** are composed of organ systems

**3.** have the same DNA sequences

**4.** carry out autotrophic nutrition

**22.** How do cells in the ovary detect a hormone from the brain?

**1.** The brain sends a nerve impulse to the ovary.

**2.** White blood cells bring the hormone to the ovary.

**3.** Receptor molecules on the cells of the ovary bind with the hormone.

**4.** Vacuoles within the ovary bind with the hormone.

**23.** The first successful transplant of insulin-producing cells from a living donor pancreas was completed in April 2000 in Japan. This enabled the body of the recipient to

**1.** regulate fat concentration by a feedback mechanism

**2.** provide protection against an infectious disease

**3.** slow down the heart rate after a period of activity ends

**4.** maintain blood sugar levels throughout the day

**24.** A 6-year-old child ate a peanut butter sandwich at snack time in school. Five minutes later, her throat became swollen and she collapsed. This allergic reaction occurred because her body

**1.** recognized an antigen in peanut butter and produced antibiotics against it

**2.** digested the white blood cells that can recognize an antigen in peanut butter

**3.** did not recognize an antigen in peanut butter and could not produce antibodies against it

**4.** recognized an antigen in peanut butter and produced an immune response

**25.** The accompanying photograph shows two penguins of the same species displaying different feather color patterns.

The newly discovered all-black penguin had only black feathers since emerging from the egg. The sudden appearance of this characteristic was most likely due to

Source: http://green.yahoo.com/blog/guest_bloggers/24/all-black-penguin-discovered.html

**1.** a change in environmental conditions
**2.** deposition of oil on the feathers due to pollution
**3.** a random change in the sequences of bases in DNA
**4.** a change in the diet of the penguin chick

**26.** Riding a bicycle requires balance and constant adjustment and monitoring by the rider in order to continue cycling. Successfully riding a bicycle most directly results from the ability to

**1.** sexually reproduce
**2.** grow and develop
**3.** detect and respond to change
**4.** metabolize food for energy

**27.** Melanoma is a type of cancer in which abnormal skin cells divide uncontrollably. Some chemotherapy drugs, which stop the growth of the cancer, directly interfere with the process of

**1.** meiosis
**2.** coordination
**3.** mitosis
**4.** recombination

**28.** The failure of the human body to effectively maintain dynamic equilibrium can result in

**1.** reproductive success
**2.** gene manipulation
**3.** differentiation
**4.** disease

**29.** Which sequence best represents sexual reproduction?

**1.** mitosis -> gametes -> zygote -> fertilization
**2.** gametes->meiosis->mitosis->fertilization
**3.** fertilization -> gametes -> meiosis -> zygote
**4.** meiosis -> gametes -> fertilization -> zygote

**30.** The reproductive system of a male mammal provides

**1.** support for the internal development of the embryo
**2.** materials through the placenta
**3.** a means for the delivery of gametes
**4.** the ovaries for gamete production

**31.** The energy used to obtain, transfer, and transport materials within an organism comes directly from

**1.** ATP
**2.** DNA
**3.** sunlight
**4.** starch

**32.** In an organism, a muscle cell has the same DNA as a nerve cell, yet the cells perform different functions. This is possible because

**1.** different mutations occur in each cell type, changing the genetic instructions
**2.** temperature variations within the body alter DNA
**3.** proteins in each cell type change the structure of DNA
**4.** different parts of the genetic instructions are used in each type of cell

**33.** In order for the human body to maintain homeostasis, the breakdown of glucose to release energy must be followed by the

**1.** production of oxygen
**2.** division of the cell
**3.** removal of wastes
**4.** production of receptor molecules

**34.** Chlorophyll gives plants their green color. Chlorophyll is produced only when plants are exposed to light, so plants kept in darkness have no chlorophyll and appear white. The best explanation for this is that

**1.** chlorophyll is not needed by green plants at night
**2.** darkness mutates the chlorophyll genes, causing them to produce a white color
**3.** light is required for chlorophyll genes to be expressed
**4.** genetic information in cells is not influenced by the outside environment

**35.** The processes of deletion, insertion, and substitution can alter genes in a skin cell. The altered genes will most likely be passed on to

**1.** sperm cells
**2.** egg cells
**3.** every cell that develops from that skin cell
**4.** only a few of the cells that develop from that skin cell

**36.** Before starch can enter a cell, it must be

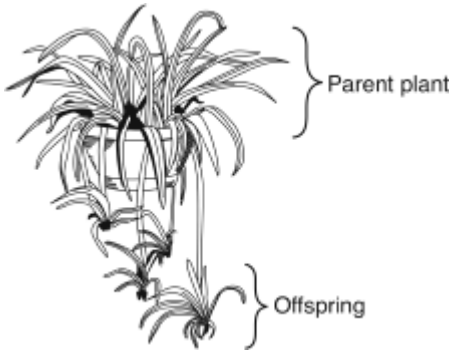
**1.** absorbed by simple sugars
**2.** diffused into simple sugars
**3.** digested to form simple sugars
**4.** actively transported by simple sugars

**37.** In a cell, protein synthesis is the primary function of

**1.** ribosomes
**2.** mitochondria
**3.** chloroplasts
**4.** vacuoles

**38.** Spider plants can reproduce both sexually and asexually. The accompanying diagram represents a spider plant reproducing asexually by a method known as vegetative propagation.

Which statement best describes the relationship between the parent plant and the offspring in the diagram?




**1.** The cells of the offspring contain half the amount of DNA as the cells of the parent plant.
**2.** The parent plant provides genetic material to the offspring through its gametes.
**3.** The cells of the offspring have the same genetic content as the cells of the parent plant.
**4.** The cells of the parent plant have more genetic diversity, compared to the cells of the offspring.

**39.** In a multicellular organism, organs carry out a variety of life functions. In a single-celled organism, these functions are performed by

**1.** tissues
**2.** organelles
**3.** organ systems
**4.** organs

**40.** Goats have been genetically modified to produce an anticlotting protein in their milk. The protein is extracted from the milk and given to people who have inherited a disorder that causes their bodies to produce blood clots, which can be fatal. A benefit of the technology used to produce this protein is that it

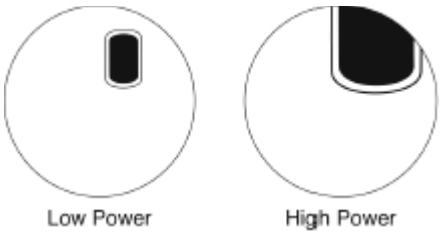
**1.** can be used to overcome the effects of a harmful mutation
**2.** can provide people with a new kind of nutrient-rich
**3.** will result in healthier goats with more nutritious milk for their offspring
**4.** will reduce blood clots in other farm animals that are

milk modified in this way

**41.** Base your answer on the accompanying information and on your knowledge of biology.

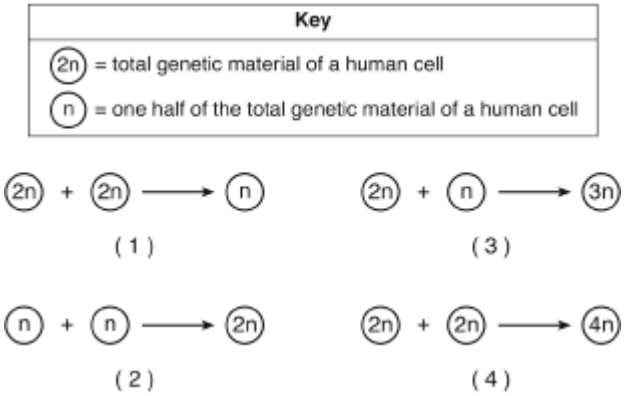
A student observes a red onion cell with a compound light microscope using low, then high power. The two views are represented in the accompanying diagrams.

The best explanation for the changes observed by the student is that, when switching from low to high power, the




**1.** diameter of the field of view decreases
**2.** slide was accidentally moved
**3.** diameter of the field of view increases
**4.** image is inverted and reversed

**42.** Which diagram correctly represents a step in the normal process of human reproduction?




**43.** In the cells of the human body, oxygen molecules are used directly in a process that

**1.** releases energy
**2.** digests fats
**3.** synthesizes carbohydrate molecules
**4.** alters the genetic traits of the cell

**44.** Which statement explains the importance of maintaining a constant internal environment to ensure proper enzyme functioning?

**1.** Changes in pH and temperature will cause the enzyme reaction rate to be too fast.
**2.** Temperature and pH determine amino acid sequences in enzymes.
**3.** Changes in pH will change the genetic instructions of enzymes.
**4.** Increasing the temperature and pH can alter the specific shape of enzymes.

**45.** Testosterone directly affects the

**1.** formation of a zygote
**2.** changes within an ovary
**3.** production of sperm cells
**4.** development of a placenta

**46.** Base your answer on the accompanying information and data table and on your knowledge of biology.

Daphnia (water fleas) are sensitive to many changes in pond ecosystems. For this reason they are often used in bioassays, tests in which organisms are exposed to various levels of a chemical to determine what levels are safe. The results of these tests determine whether or not the chemical being tested will affect other pond organisms.
An experiment was designed to determine the toxicity of different salt solutions on cultures of daphnia. Five fish tanks were each filled with the same amount of water containing different concentrations of salt. Ten daphnia were placed into each tank. After 48 hours, the number of daphnia that had survived and the number of daphnia that had died in each tank were recorded and the

percent mortality was calculated. The results of the experiment are shown in the data table that follows.

Which salt concentration was most toxic to the daphnia in this experiment?

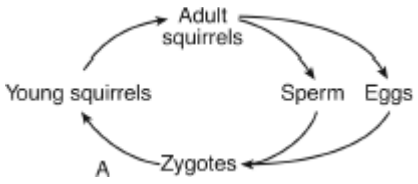
**Effect of Salt Concentration on Daphnia After 48 Hours**

| Salt Concentration (g/L) | Number that Survived | Number that Died | Mortality (%) |
|---|---|---|---|
| 0.63 | 8 | 2 | 20 |
| 1.25 | 7 | 3 | 30 |
| 2.5 | 10 | 0 | 0 |
| 5.0 | 3 | 7 | 70 |
| 10.0 | 0 | 10 | 100 |

**1.** 1.25 g/L
**2.** 2.5 g/L
**3.** 5.0 g/L
**4.** 10.0 g/L

**47.** Base your answer on the accompanying diagram and on your knowledge of biology. The diagram represents the reproductive cycle of a squirrel species with 40 chromosomes in each zygote.

A liver cell in this species of squirrel would have




**1.** 20 chromosomes
**2.** 40 chromosomes
**3.** 60 chromosomes
**4.** 80 chromosomes

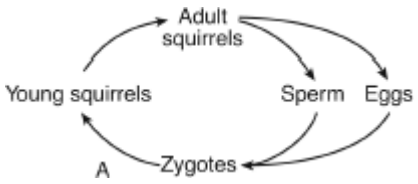
**48.** A sample of body cells and samples of sex cells received from four members of a species are screened for the presence of a specific gene mutation. The results of the gene-testing procedure conducted on the cells are shown in the accompanying table.

Which species member would be *unlikely* to pass the gene mutation on to its offspring?

| Species Member Tested | Type of Cells Tested and the Result (+ = mutation present, – = mutation absent) | | |
|---|---|---|---|
| | Body Cells | Sperm | Egg |
| 1 | + | | + |
| 2 | + | + | |
| 3 | – | | + |
| 4 | + | – | |

**49.** Base your answer on the accompanying diagram and on your knowledge of biology. The diagram represents the reproductive cycle of a squirrel species with 40 chromosomes in each zygote.

A process that could be represented by *A* is

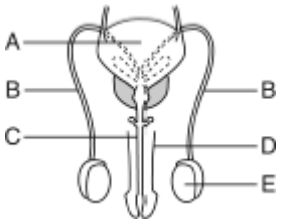



**1.** fertilization
**2.** meiosis
**3.** mitosis
**4.** mutation

**50.** Base your answer on the accompanying diagram and on your knowledge of biology. The letters in the diagram indicate

structures present in a human male.

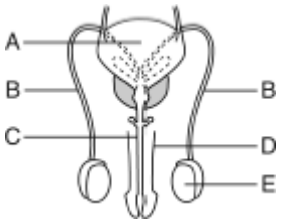
What change would occur immediately if both structures labeled *B* were damaged or blocked?




**1.** Structure *A* would decrease in size.
**2.** The blood supply to structure *E* would decrease.
**3.** Gametes would no longer be transported to structure *C*.
**4.** Structure *D* would be able to deliver more gametes.

**51.** Base your answer on the accompanying diagram and on your knowledge of biology. The letters in the diagram indicate structures present in a human male.

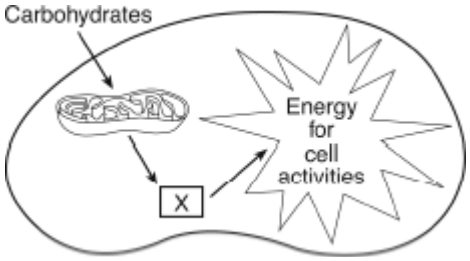
Which structure produces the male hormone responsible for characteristics such as muscle development, deep voice, and gamete production?




**1.** *A*
**2.** *B*
**3.** *E*
**4.** *D*

**52.** The accompanying diagram represents a series of events that occur in living cells.

Which molecule is indicated by *X*?




**1.** glucose
**2.** ATP
**3.** carbon dioxide
**4.** protein

**53.** Base your answer on the information below and on your knowledge of biology.

Diabetes is a condition characterized by elevated blood sugar levels. One form of diabetes occurs when insulin fails to properly regulate blood sugar levels. Complications from diabetes can include nerve cell damage and poor blood flow, especially in the feet and legs. In individuals with diabetes, wounds usually take longer than normal to heal.

The failure of a cell to react in a normal manner to insulin is most likely the result of a problem with

**1.** vacuoles
**2.** receptors
**3.** mitochondria
**4.** sugars

**54.** Which statement describes a similarity between all enzymes, antibodies, and hormones?

**1.** Their chemical structure is critical to their ability to function.

**2.** Their ability to replicate identical copies ensures continuation of the species.

**3.** They work better at 100ºC than 37ºC.

**4.** They are made by and carried by the blood.

**55.** An increase in the amount of ultraviolet light entering the atmosphere through holes in the ozone layer will most likely

**1.** reduce the rate of photosynthesis in fungi

**2.** result in rapid recycling of finite resources

**3.** prevent animal migration

**4.** cause an increase in the rate of certain mutations

**56.** A pesticide that kills an insect by interfering with the production of proteins in the insect would most directly affect the activity of

**1.** ribosomes

**2.** minerals

**3.** chloroplasts

**4.** mitochondria

**57.** Which situation results in a characteristic that is inheritable?

**1.** A limb is lost when two marine organisms fight.

**2.** A puppy learns to beg for food by watching an older dog perform tricks.

**3.** A gene is inserted into a bacterium, allowing the organism to produce insulin.

**4.** A random mutation causes the immediate death of a microbe.

**58.** The major function of the placenta is to

**1.** cushion the fetus so it won't be hurt when the mother moves

**2.** exchange food, oxygen, and waste between mother and fetus

**3.** store food for the fetus

**4.** support the egg for the process of fertilization

**59.** During the process of photosynthesis, energy from the Sun is converted into

**1.** chemical energy in the bonds of inorganic molecules

**2.** chemical energy in the bonds of organic molecules

**3.** enzymes used to produce inorganic molecules

**4.** enzymes used to produce organic molecules

**60.** The accompanying diagram represents genetic material.

The expression of the section labeled *X* may be modified by


**1.** temperature, only

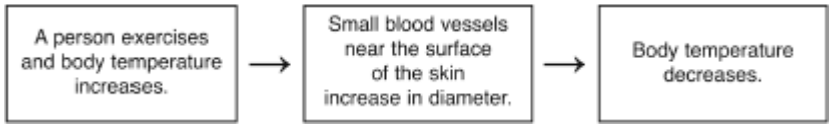
**2.** asexual reproduction

**3.** the environment

**4.** pH, only

**61.** The accompanying diagram represents an activity that occurs in the human body.

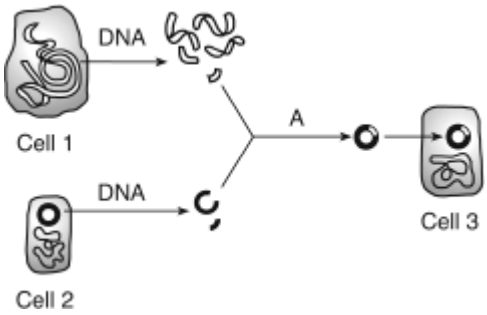
This diagram best illustrates




**1.** active transport
**2.** maintenance of homeostasis
**3.** synthesis of nutrients
**4.** differentiation

**62.** A laboratory technique is represented in the accompanying diagram. Letter *A* represents a process.

Which specific chemicals are needed to successfully carry out the process shown at *A*?




**1.** receptor molecules
**2.** carbohydrates
**3.** enzymes
**4.** starch molecules

**63.** An alteration of genetic information is shown below.

A-G-T-A-C-C-G-A-T --> A-G-T-G-A-T

This type of alteration of the genetic information is an example of?

**1.** deletion
**2.** insertion
**3.** substitution
**4.** recombination

**64.** One characteristic of all living things is that they

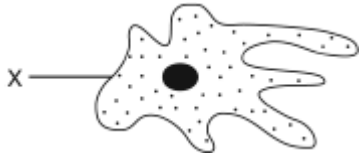
**1.** develop organ systems
**2.** produce identical offspring
**3.** maintain internal stability
**4.** synthesize only inorganic matter

**65.** Which substance can enter a cell by diffusion without having to be digested?

**1.** water
**2.** protein
**3.** starch
**4.** fat

**66.** A single-celled organism is represented in the accompanying diagram.

Structure *X* carries out a function most similar to which structure in a human?




**1.** lung
**2.** brain
**3.** ovary
**4.** heart

**67.** Base your answer on the accompanying information and on your knowledge of biology.

**Beware of Dust Mites**

Quietly lurking within our mattresses, under our beds, and inside sofas and carpets are creatures too small to be seen without a

microscope. Dust mites are arthropods closely related to spiders, scorpions, and ticks. They feed on the dead skin cells regularly shed by humans and their animal pets. The average human sheds about 10 grams of dead skin a week. Cats and dogs create even more dander for dust mites to eat. The mites also eat pollen, fungi, and bacteria. They do not drink water but absorb it from the air. Dust mites do not carry diseases and are harmless to most people. It's their bathroom habits that make some of us itch and sneeze. Many people develop severe allergies to dust mite feces (wastes). If you lie on a rug where dust mites live, you might develop itchy red bumps on your skin. Breathe in dust containing their feces and you might have more serious symptoms, such as difficulty breathing or a severe asthma attack.

Dust mites thrive in warm, humid environments—eating and nesting in dust-collecting bedding, fabric, and carpet. Think about this! A typical mattress can contain anywhere from 100,000 to 10 million dust mites. Nearly 100,000 dust mites can live in one square yard of carpet.

During a process called sensitization, a person's immune system mistakenly identifies the inhaled dust mite waste as an invader. The next time the person is exposed to the dust mite waste, the immune system launches an allergic reaction.

The immune system of an individual who is allergic to dust mite waste produces

**1.** specialized chemicals that mark dust mite waste for destruction

**2.** viruses that combat dust mites

**3.** white blood cells that attack human skin cells

**4.** white blood cells that attack the skin cells of cats and dogs

**68.** DNA samples can be separated according to size using the technique of

**1.** chromatography

**2.** electrophoresis

**3.** replication

**4.** dissection

**69.** An experiment was designed to test whether students could squeeze a clothespin more times in 1 minute after resting or after exercising. What would be a hypothesis for the experiment?

**1.** Do students squeeze clothespins more often in 1 minute after exercising?

**2.** Can most students squeeze a clothespin more times after they rest?

**3.** Ten students who exercise before squeezing a clothespin squeezed it more times in 1 minute than ten students who rested first.

**4.** Students who rest before squeezing a clothespin will squeeze it fewer times in 1 minute than students who exercise beforehand.

**70.** The accompanying diagram represents the results of a laboratory procedure.

This procedure is used to

**1.** separate molecules in a liquid mixture
**2.** determine the rate of photosynthesis in plants
**3.** detect glucose in a solution
**4.** examine the gene sequences of organisms

**71.** Base your answers on the accompanying information and on your knowledge of biology.

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An allergic reaction occurs when the immune system

**1.** does not respond to pathogens
**2.** maintains homeostasis
**3.** responds to usually harmless environmental substances
**4.** undergoes rapid, uncontrolled cell division