

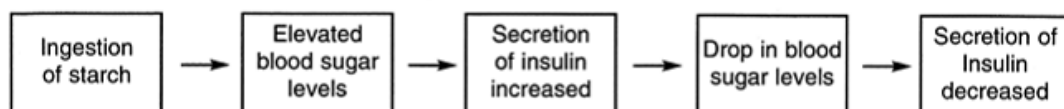
Keystone 5

Grade: «grade»
Subject: «subject»
Date: «date»

Apr 11-10:35 AM

1

What is represented by the sequence below?

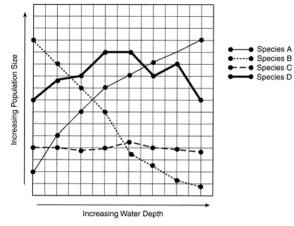


- (1) a feedback mechanism in multicellular organisms (3) differentiation of organic molecules
(2) an immune response by cells of the pancreas (4) the disruption of cellular communication

Apr 11-10:30 AM

2

As the depth of the ocean increases, the amount of light that penetrates to that depth decreases. At about 200 meters, little, if any, light is present. The graph below illustrates the population size of four different species at different water depths.



Which species most likely performs photosynthesis?

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

Apr 11-10:34 AM

3

Which structure is best observed using a compound light microscope?

- (1) a cell
- (2) a virus
- (3) a DNA sequence
- (4) the inner surface of a mitochondrion

Apr 11-10:35 AM

4

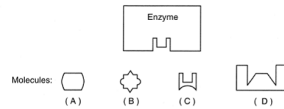
Which words best complete the lettered blanks in the two sentences below?
 Organic compounds, such as proteins and starches, are too A to diffuse into cells. Proteins are digested into B and starches are digested into C.

- (1) A—large, B—simple sugars, C—amino acids
- (2) A—small, B—simple sugars, C—amino acids
- (3) A—large, B—amino acids, C—simple sugars
- (4) A—small, B—amino acids, C—simple sugars

Apr 11-10:37 AM

5

An enzyme and four different molecules are shown in the diagram below.



The enzyme would most likely affect reactions involving

- (1) molecule A, only
- (2) molecule C, only
- (3) molecules B and D
- (4) molecules A and C

Apr 11-10:38 AM

6

The analysis of data gathered during a particular experiment is necessary in order to

- (1) formulate a hypothesis for that experiment
- (2) develop a research plan for that experiment
- (3) design a control for that experiment
- (4) draw a valid conclusion for that experiment

Apr 11-10:49 AM

7

Which statement concerning simple sugars and amino acids is correct?

- (1) They are both wastes resulting from protein synthesis.
- (2) They are both building blocks of starch.
- (3) They are both needed for the synthesis of larger molecules.
- (4) They are both stored as fat molecules in the liver.

Apr 11-10:50 AM

8

The sequence of subunits in a protein is most directly dependent on the

- (1) region in the cell where enzymes are produced
- (2) DNA in the chromosomes in a cell
- (3) type of cell in which starch is found
- (4) kinds of materials in the cell membrane

Apr 11-10:50 AM

9

The cells that make up the skin of an individual have some functions different from the cells that make up the liver because

- (1) all cells have a common ancestor
- (2) different cells have different genetic material
- (3) environment and past history have no influence on cell function
- (4) different parts of genetic instructions are used in different types of cells

Apr 11-10:51 AM

10

The production of certain human hormones by genetically engineered bacteria results from

- (1) inserting a specific group of amino acids into the bacteria
- (2) combining a portion of human DNA with bacterial DNA and inserting this into bacteria
- (3) crossing two different species of bacteria
- (4) deleting a specific amino acid from human DNA and inserting it into bacterial DNA

Apr 11-10:52 AM

11

Leaves of green plants contain openings known as stomates, which are opened and closed by specialized cells allowing for gas exchange between the leaf and the outside environment. Which phrase best represents the net flow of gases involved in photosynthesis into and out of the leaf through these openings on a sunny day?

- (1) carbon dioxide moves in; oxygen moves out
- (2) carbon dioxide and oxygen move in; ozone moves out
- (3) oxygen moves in; nitrogen moves out
- (4) water and ozone move in; carbon dioxide moves out

Apr 11-10:54 AM

12

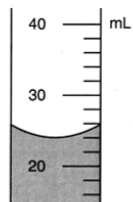
After switching from the high-power to the low-power objective lens of a compound light microscope, the area of the low-power field will appear

- (1) larger and brighter
- (2) smaller and brighter
- (3) larger and darker
- (4) smaller and darker

Apr 11-10:56 AM

13

The diagram below shows a portion of a graduated cylinder.



What is the volume of the liquid in this cylinder?

- (1) 22 mL
- (2) 24 mL
- (3) 25 mL
- (4) 26 mL

Apr 11-10:57 AM

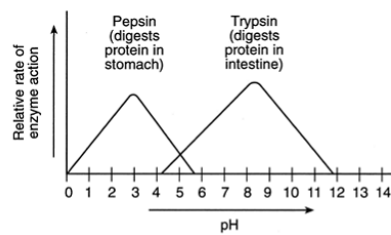
14

A mutation occurs in a cell. Which sequence best represents the correct order of the events involved for this mutation to affect the traits expressed by this cell?

- (1) a change in the sequence of DNA bases → joining amino acids in sequence → appearance of characteristic
- (2) joining amino acids in sequence → a change in the sequence of DNA bases → appearance of characteristic
- (3) appearance of characteristic → joining amino acids in sequence → a change in the sequence of DNA bases
- (4) a change in the sequence of DNA bases → appearance of characteristic → joining amino acids in sequence

Apr 11-10:57 AM

15

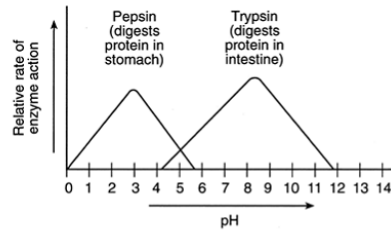


Pepsin works best in which type of environment?

- (1) acidic, only
- (2) basic, only
- (3) neutral
- (4) sometimes acidic, sometimes basic

Apr 11-10:58 AM

16



Neither enzyme works at a pH of

- (1) 1
- (2) 5
- (3) 3
- (4) 13

Apr 11-10:59 AM

17

In DNA, a sequence of three bases is a code for the placement of a certain amino acid in a protein chain. The table below shows some amino acids with their abbreviations and DNA codes.

Amino Acid	Abbreviation	DNA Code
Phenylalanine	Phe	AAA, AAG
Tryptophan	Try	ACC
Serine	Ser	AGA, AGG, AGT, AGC, TCA, TCG
Valine	Val	CAA, CAG, CAT, CAC
Proline	Pro	GGA, GGG, GGT, GGC
Glutamine	Glu	GTT, GTC
Threonine	Thr	TGA, TGG, TGT, TGC
Asparagine	Asp	TTA, TTG

Which amino acid chain would be produced by the DNA base sequence below?

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

- (1) Val | Glu | Phe | Asp | Thr | Asp
- (2) Val | Pro | Phe | Asp | Asp | Thr
- (3) Val | Glu | Phe | Asp | Asp | Thr
- (4) Val | Glu | Phe | Thr | Asp | Asp

Apr 11-10:59 AM