2013

Midterm Review

Student Name -- Key

Multiple Choice Section: Choose the response which best completes the statement or answers the question.

1. In an organism, the coordination of the activities that maintain homeostasis in a constantly changing environment is a process known as (1.) regulation (2.) digestion (3.) synthesis (4.) respiration

2. A characteristic of all known living things is that they (1.) use carbon dioxide (2.) use atmospheric oxygen (3.) carry on metabolic activities (4.) are capable of locomotion

3. It is known that laboratory rats do not require vitamin C in their diet. However, vitamin C is found in their tissues. This vitamin C is present due to the process known as (1.) excretion (2.) locomotion (3.) synthesis (4.) osmosis

4. Small molecules are combined to form large molecules by the life function of (1.) regulation (2.) synthesis (3.) excretion (4.) transport

5. Which term includes all the activities required to keep an organism alive? (1.) metabolism (2.) growth (3.) nutrition (4.) excretion

6. The life process of transport in an organism directly involves those activities used to (1.) release energy from food (2.) produce cellular waste products (3.) obtain and hydrolyze materials (4.) absorb and distribute materials

7. As a direct result of which life process does a plant make a variety of chemical substances such as poisons, drugs, and flavorings? (1.) synthesis (2.) digestion (3.) excretion (4.) respiration

8. A characteristic of all known living organisms is that they (1.) have complex nervous systems (2.) require oxygen for respiration (3.) carry on heterotrophic nutrition (4.) originate from preexisting life

9. In an ameba, materials are taken from the environment and then moved throughout its cytoplasm. These processes are known as (1.) absorption and circulation (2.) coordination and regulation (3.) energy release and synthesis (4.) food processing and energy release

10. Homeostatic regulation of the body is made possible through the coordination of all body systems. This coordination is achieved mainly by (1.) skeletal and excretory systems (2.) respiratory and reproductive systems (3.) nervous and endocrine systems (4.) circulatory and digestive systems

1

p1-3

11. A paramecium absorbs materials from its environment and circulates these materials throughout its cytoplasm. Which life function is described by these activities? (1.) reproduction (2.) transport (3.) synthesis (4.) respiration

12. Control of all physiological activities of an organism is necessary to maintain that organism's stability in it's environment. This life activity is known as (1.) nutrition (2.) regulation (3.) transport (4.) respiration

13. An activity carried on by every living plant and animal is (1.) reproduction (2.) respiration (3.) photosynthesis (4.) transpiration

14. Which life process prevents the accumulation of metabolic wastes in a bald eagle? (1.) nutrition (2.) excretion (3.) digestion (4.) ingestion

15. Which life function provides substances that may be used by an organism for its growth and for the repair of its tissue? (1.) nutrition (2.) excretion (3.) regulation (4.) reproduction

16. Which activity is an example of the life process known as synthesis? (1.) A large molecule is broken down into small molecules. (2.) Starch is formed from the chemical bonding of glucose. (3.) An organic compound is broken down and energy is released. (4.) Oxygen moves into a cell through the cell membrane.

Completion Questions

1. The removal of wastes from an organism is called excretion.

2. This is the one life process not necessary for any individual organism. This life process where by organisms make more of their own kind is called reproduction.

3. The taking in of food is called ingestion.

4. The process by which food is utilized to provide energy in a form the organism can use is called digestion/respiration.

5. The movement (circulation) of materials throughout an organism is called transport.

6. The making of larger more complex compounds from smaller compounds is called synthesis.

7. The overall process of taking in AND breaking down food to more soluble forms is called digestion (Hydrolisis).

8. The breakdown of food particles to smaller, more soluble forms is called digestion.

9. The increase in size of a living thing is called growth.

10. The study of living things is called biology.

11. Respiration using oxygen is called aerobic respiration.

12. The sum total of all life processes or activities is known as metabolism.

13. The tendency of organisms to maintain a stable internal environment or "steady state" is called homeostasis.

14. The energy molecule used by all cells is ATP.

Free Response Questions

1. Explain in one or more paragraphs how guard cells and stomata function to maintain water homeostasis in a plant cell.

2. Explain in one or more paragraphs how blood glucose homeostasis is maintained within the body.

3. Explain why the functioning of the hormone insulin in the regulation of blood glucose levels illustrates a
negative feedback mechanism.

4. In a paragraph, explain how temperature homeostasis is maintained within the body when we get too cold or too warm.

3

Correctly complete each of the following statements or answer the following questions.

1. Which is found in the nucleus? (1.) ribosome (2.) centrosome (3.) vacuole (4.) lysosome (5.) chromosome

2. Which structure composed mainly of proteins and lipids, aids in maintaining homeostasis in the cell? (1.) chromosome (2.) centrosome (3.) nucleolus (4.) cell membrane (5.) cell wall

3. Which cellular component can NOT be seen with the compound microscope? (1.) DNA (2.) cell wall (3.) nucleus (4.) cytoplasm (5.) cell membrane

4. In which organelle would water and dissolved minerals be stored? (1.) food vacuole (2.) contractile vacuole (3.) lysosome (4.) nucleus (5.) ribosome

5. The organelle most directly involved in cellular aerobic respiration is the (1.) ribosome (2.) mitochondrion (3.) nucleus (4.) lysosome (5.) golgi apparatus

6. The rigidity (support) of a plant cell is due primarily to the presence of the (1.) DNA (2.) centrosomes (3.) cell membrane (4.) cell wall (5.) lysosomes

7. In the laboratory, when iodine solution is used to stain a cell, the cell structure most readily seen is the (1.) vacuole (2.) cytoplasm (3.) golgi complex (4.) lysosome (5.) nucleus

8. Which structure permits the entry and exit of dissolved materials in an animal cell? (1.) lysosome (2.) chromosome (3.) vacuole (4.) cell wall (5.) cell membrane

9. The structure most closely associated with the destruction of worn out cell organelles is the (1.) lysosome (2.) centrosome (3.) vacuole (5.) golgi apparatus (4.) chromosome

10. Krystal observes a cell under the microscope. She identifies it as a green plant cell and not a human cheek cell because of the presence of a (1.) nucleus (2.) cell membrane (3.) lysosome (4.) cell wall (5.) mitochondrion

11. Which structure is found ONLY in animal cells? (1.) cell wall (2.) vacuoles (3.) centrioles (4.) chloroplasts (5.) ribosomes

12. The organelle most closely associated with the manufacture of proteins within the cell is the (1.) ribosome (2.) lysosome (3.) nucleolus (4.) cell wall (5.) cell membrane

13. Which structure chiefly functions in intracellular transport? (1.) vacuole (2.) mitochondrion (3.) golgi apparatus (4.) endoplasmic reticulum (5.) nucleolus

14. Amanda is viewing cells using a light microscope. In her observations, she views a nucleus and a cell wall. Which additional organelle is she most likely to observe using the light microscope in this observation? (1.) ribosome (2.) cilia (3.) lysosome (4.) chloroplast (5.) endoplasmic reticulum

15. The cell wall is (1.) selectively permeable (2.) contains cellulose (3.) living (4.) the structure that pumps out excess water from cells (5.) a hardened cell membrane

16. While studying a cell with the electron microscope, a scientist notes the following: numerous ribosomes, a well developed endoplasmic reticulum, chloroplasts, and a cell wall. Which organism is most likely the source of this cell? (1.) a fungus (2.) an animal (3.) a bacterium (4.) a plant (5.) a virus

17. The cell's primary site of ATP production is the (1.) mitochondria (2.) lysosomes (3.) nucleus (4.) nucleolus (5.) vacuoles

18. Cells involved with resorption of themselves, such as those in the tail of a tadpole, would most likely contain many (1.) chloroplasts (2.) lysosomes (3.) nuclei (4.) chromosomes (5.) golgi bodies

19. Which structure chiefly functions in intracellular transport? (1.) vacuole (2.) mitochondrion (3.) golgi apparatus (4.) endoplasmic reticulum (5.) nucleolus

20. Cyanide, a metabolic poison, interferes with the cellular aerobic production of ATP. Which cell organelle does cyanide most directly influence first in this situation? (1.) nucleus (2.) lysosome (3.) mitochondria (4.) ribosomes (5.) endoplasmic reticula

21. Which structure chiefly functions in intracellular transport? (1.) vacuole (2.) mitochondrion (3.) golgi apparatus (4.) endoplasmic reticulum (5.) nucleolus

22. The structure surrounding and selectively regulating the flow of materials from the control center of the cell is the (1.) vacuole (2.) nuclear membrane (3.) cell membrane (4.) lysosome (5.) nucleolus

Complete each of the following statements correctly.

1. The nucleus is the control center of the cell containing most of its DNA.

2. The centrioles is an organelle which appears to play a role in animal cell division.

3. Transport channels within the cell are described as the endoplasmic reticulum

4. The lysosome stores and digests most food in the cell.

5. The Chloroplast is responsible for carrying on photosynthesis within plants.

6. The cell mem. selectively regulates the flow of materials to and from the cell.

7. This structure found within the nucleus contains much RNA. This structure is called the ~~ribosome~~ nucleolus.

8. The ribosome is responsible for protein synthesis in the cell.

9. These structures are used to package secretions for export from the cell. These structures are called the golgi body.

10. These cell organelles carry on aerobic respiration within the cell. These organelles are the mitochondria.

11. The lysosome destroys worn out cells or cell organelles. Sometimes this is called the "suicide sac". this sac contains hydrolytic enzymes for this purpose.

12. The cell wall is found in plants. It is composed mostly of cellulose and gives the plant cell support.

13. The Contractile vacuole pumps excess water from the cell helping to maintain homeostasis.

SHORT ANSWER QUESTION

State three parts of the cell theory.

- all living things are composed of cells
- basic unit of structure + function
- new cells arise from pre existing cells

1. Diffusion is the movement of materials from a higher to a lower concentration.

2. Passive transport involves processes such as osmosis and diffusion.

3. Pinocytosis is the pinching in of materials through the cell membrane.

4. Phagocytosis is the engulfing of materials by an organism or a cell with its psuedopodia.

5. osmosis is the diffusion of water.

6. Active transport is the movement of materials from lower concentration to higher concentration as in the processes of phagocytosis and pinocytosis.

7. Active transport requires energy in the form of ATP to occur.

8. The cell or plasma membrane is composed chiefly of two layers of phospholipids with globular proteins floating in these layers.

9. Most cell membrane transport occurs through the proteins embedded in its membrane.

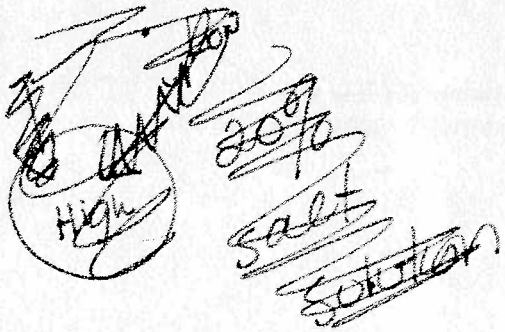
An freshwater organism is placed in a 20% saline solution.

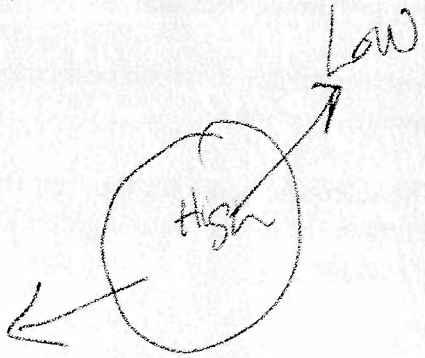
(a.) Explain why water moves through the cell membrane faster than does the salt in the saline solution.

(b.) Indicate the direction of osmotic flow using a picture.

(a) water moves faster

+ concentration is greater





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Choose the kingdom or kingdoms described by each of the following statements. Some choices may be used once, more than once, or not at all.

Plant (P)
Fungi (F)
Animal (A)
Monera (M)
Protist (Pr)
Archaebacteria (Arch)

A 1. Cats, dogs, and sponges are in this kingdom.
Pr 2. Ameba, paramecium, and the euglena are in this kingdom.
Arch 3. Blue-green algae and bacteria are representatives of this kingdom.
A/F 4. Multicellular organisms which can NOT make their own food. (2 answers here)
F 5. Mushrooms and molds are examples.
M 6. Unicellular organisms with the nuclei NOT in a distinct nuclear membrane.
Pr/A 7. Unicellular organisms with the nucleus in a distinct nuclear membrane.
P 8. These are multicellular photosynthetic organisms.
M 9. Have branched filaments and no chlorophyll. These nonphotosynthetic organisms are multicellular.
P 10. Mosses are in this kingdom.
Arch 11. This is the Kingdom which is most newly recognized, consisting of single celled organisms that often live in extreme environments.

Answer each of the following short answer questions.

genus, species 12. List the two parts of a scientific name. (ex. Homo sapiens)
Latin 13. This language is used for making scientific names of organisms.
Taxon 14. This is the two name system used for naming organisms.
species 15. This is the fundamental unit of classification/taxonomy.
Linnaeus 16. This scientist devised the current scientific method of naming organisms.
T 17. True or False .... Our current system of organism classification uses evolutionary, structural, embryological, and biochemical relationships to classify organisms.

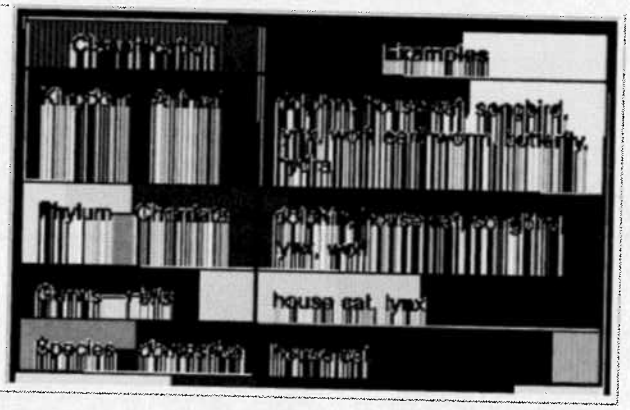
Multiple-Choice Section

Choose the response which best completes the following statements or answers the following questions.

1. The scientific name for the fruit fly is Drosophila melanogaster. The word Drosophila refers to the classification group known as 1. kingdom 2. genus 3. phylum
(4) species

2. A classification scheme is shown at the right.

This classification scheme indicates that the house cat is most closely related to the
1. dolphin 2. songbird 3. lynx
4. wolf



3. Organisms have several different organizational levels. Using the chart below, which sentence would best describe A and B on the chart below.

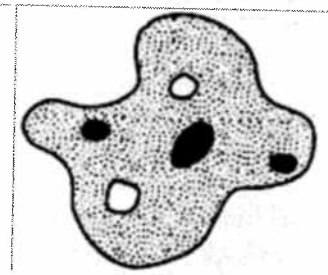
horse	tulip
cell	cell
heart	A
B	leaf vein

1. A is a tissue and B is an organ system.
2. A is an organism and B is a tissue.
3. A is a tissue and B is an organism.
4. A is an organ and B is a tissue.

4. Which would best represent levels of organism organization from the simplest to the most complex organizational level?
1. cells, tissues, organ systems, organs
2. cells, organs, tissues, organ systems
3. cells, tissues, organs, organ systems
4. tissues, organism, organs, cells

5. Canus nipponicus refers to a proposed scientific name for an imaginary organism. This proposed scientific name indicates the 1. kingdom and phylum
2. genus and species 3. phylum and genus 4. kingdom and species

6. How should the organism shown in the diagram be classified?
1. bacterium 2. moneran
3. fungus 4. protist



7. Plants A and B are classified as members of the same species. Plants C and D are classified in the same genus as A and B, but not the same species as A and B. According to this information, which statement is correct?
   1. Plant A has many characteristics in common with plant B.
   2. Plants A and B belong to a different kingdom than plants C and D.
   3. Plant C cannot be the same species as plant D.
   4. Plants A, B, C, and D must all belong to different phyla.

8. A scientist recently discovered a pond organism that is unicellular, contains chloroplasts and other membrane-bound organelles, and possesses a flagellum. In which kingdom is this organism classified? 1. monera 2. fungi 3. protista 4. plant

9. Members of a population of greysquirrels, Sciurus carolinensis , are classifed in the same species because they
   1. obtain their food in the same manner
   2. produce enzymes by synthesis
   3. can mate and produce fertile offsring
   4. live in the same area

[Short Answer Question]

1. State the order of the classification/taxonomic hierarchy from the most complex to the simplest subdivision.

Kingdom
Phylum
Class
order
family
Genus
Species

1. The process by which fatty acid molecules and glycerol are joined to form a fat is called (1.) hydrolysis (2.) synthesis (3.) photosynthesis (4.) oxidation

2. Which could not be a compound from which a protein could be directly formed? (1.) oil (2.) amino acid (3.) dipeptide (4.) polypeptide

3. Which group of organic compounds includes the enzymes? (1.) proteins (2.) starches (3.) carbohydrates (4.) lipids

4. Which food substance is most likely to contain the element nitrogen? (1.) meat (2.) vinegar (3.) pure corn oil (4.) table sugar

5. Which is a building block used in the formation of carbohydrates? (1.) glycerol (2.) monosaccharide (3.) amino acid (4.) dipeptide

6. The breaking of a peptide bonds in splitting a dipeptide apart is accompanied by the (1.) release of oxygen (2.) addition of water (3.) addition of hydrogen (4.) release of water

hydrolysis

7. Lipids are formed by a chemical reaction between (1.) two glucose molecules (2.) a glycerol molecule and three fatty acids (3.) two amino acid molecules (4.) DNA & RNA

8. A hydrolysis reaction occurs when (1.) two simpler molecules are combined and water is split out in the reaction (2.) a complex molecule is split into simpler molecules by the addition of water (3.) one element is exchanged for another in a compound (4.) fats are formed from smaller organic molecules

9. Disaccharides are formed by a chemical reaction between (1.) two amino acid molecules (2.) two glucose molecules (3.) a glycerol molecule and three fatty acids (4.) DNA & RNA

10. A polypeptide is an example of a(n) (1.) protein (2.) carbohydrate (3.) lipid (4.) nucleic acid

11. A common characteristic of carbohydrates, proteins and nucleic acids is that they (1.) have hydrogen and oxygen atoms present in a two to one ratio (2.) use dehydration synthesis to combine their basic building blocks (3.) are used as organic catalysts in biochemical reactions (4.) use monosaccharides as their basic building units

12. The complete hydrolysis of carbohydrates usually results in the production of (1.) carbon dioxide (2.) simple sugars (3.) glycogen (4.) urea

13. Which substances are commonly used as the building blocks in the synthesis of some proteins? (1.) sugars (2.) amino acids (3.) fatty acids and glycerol (4.) amino acids and glycerols

Use the choices below to answer the questions being asked in numbers 14 through 18. Some choices may be used once, more than once, or not at all.

a. Glycerol

b. Fatty Acid

c. Amino Acid

d. A neutral lipid (fat)

e. Glucose

C 14. This is a building block of a protein.

F 15. This is a building block of a disaccharide.

B 16. Three of these are needed to join in aiding with the formation of a lipid.

a 17. In addition to the compound in # 16, this compound is also needed to form a lipid.

E 18. This compound contains the elements carbon, hydrogen, and oxygen. The ratio of hydrogen to oxygen in this compound is 2:1.

1 19. Protein has a great potential for variation of structure because (1.) many amino acids may combine in a number of ways (2.) different amino acids occur in pairs (3.) fatty acids may vary (4.) nucleotides may vary

20. Water is produced as a waste product of the process of (1.) protein ingestion (2.) synthesis (3.) hydrolysis (4.) carbohydrate digestion

21. Which compound has a chemical composition most closely related to maltose? (1.) starch (2.) ATP (3.) protein (4.) RNA

22. Which pair of compounds could be classified as inorganic? (1.) nucleic acids and minerals (2.) water and salt (3.) proteins and carbohydrates (4.) proteins and water

23. Cellulose is formed from glucose molecules by a process known as (1.) hydrolysis (2.) cellular respiration (3.) synthesis (4.) photosynthesis

1. Which of the following enzymes would digest a fat? (1.) sucrase (2.) fatase (3.) protease (4.) lipase

2. At high temperatures, the rate of enzyme action decreases because the increased heat (1.) changes the pH of the system (2.) alters the active site of the enzyme (3.) neutralizes the acids and bases in the system (4.) increases the concentration of the enzyme

3. Enzymes influence chemical reactions in living systems by (1.) providing the substrate required for the reaction to occur (2.) affecting the rate at which reactions occur (3.) absorbing water released when polymers are formed (4.) combining with excess hydrogen to form gaseous wastes

4. Which group of organic compounds includes the enzymes? (1.) proteins (2.) starches (3.) carbohydrates (4.) lipids

5. The "lock and key hypothesis" attempts to explain the mechanism of (1.) vacuole formation (2.) pinocytosis (3.) sharing of electrons (4.) enzyme specificity

6. Any substance that is acted upon by an enzyme is called a(n) (1.) coenzyme (2.) substrate (3.) vitamin (4.) polypeptide

7. An enzyme that hydrolyzes protein will not act upon starch. This fact is an indication that enzymes are (1.) hydrolytic (2.) specific (3.) catalytic (4.) synthetic

8. At 25 C. the optimum reaction rate of a certain enzyme occurs at a pH of 7. A greater reaction rate could probably be attained by (1.) increasing the temperature to 35 C and keeping the pH at 7 (2.) increasing both the temperature and the pH (3.) decreasing the pH and increasing the temperature (4.) increasing the pH and keeping the temperature at 25 C.

9. At about 0 C., most enzymes are (1.) inactive (2.) active (3.) destroyed (4.) replicated

10. Vitamins are essential to the survival of organisms because vitamins usually function as (1.) substrates (2.) nucleic acids (3.) coenzymes (4.) nucleotides

11. Which chemical is classified as an enzyme? (1.) galactose (2.) lipid (3.) protease (4.) manganese dioxide

12. Which element is present in maltase, but not in maltose? (1.) carbon (2.) hydrogen (3.) oxygen (4.) nitrogen

13. In enzyme controlled reactions, the role of certain vitamins such as niacin is to act as (1.) an enzyme (2.) a substrate (3.) a coenzyme (4.) a polypeptide

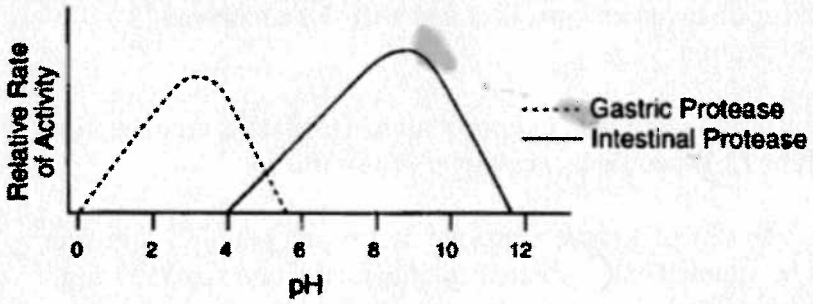
14. Salivary amylase is an enzyme in humans that breaks down starch. The optimum pH for this reaction is 6.7. The rate of this reaction would not be affected by (1.) maintaining

the pH of the reaction at 6.7 (2.) substrate concentration (3.) enzyme concentration (4.) decreasing the temperature of the reaction by 5°C

15. A certain enzyme will hydrolyze egg white but not starch. Which statement best explains this observation? (1.) Starch molecules are too large to be hydrolyzed. (2.) Enzyme molecules are specific in their actions. (3.) Egg white acts as a coenzyme for hydrolysis. (4.) Starch is composed of amino acids.

16. Which environmental condition would most likely have the LEAST effect on the rate of enzyme controlled hydrolytic reactions in humans? (1.) the pH of the solution (2.) the temperature of the solution (3.) the amount of enzyme present (4.) the amount of light present

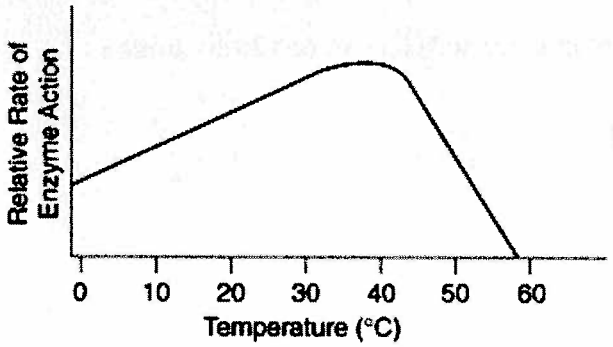
17. Which statement best expresses the information represented in the graph shown?



(1.) The action of enzymes varies with pH. (2.) A pH of 7 provides the optimum environment for digestive enzymes (3.) Gastric juice is active at a pH extending from 0 to 12. (4.) Acids have a pH greater than 7.

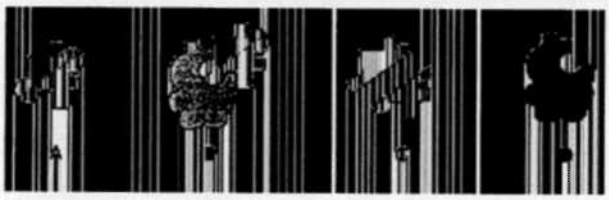
18. Lipase, maltase, and protease are members of a group of catalysts known as (1.) hormones (2.) carbohydrates (3.) lipids (4.) enzymes

19. The effect of temperature on the relative rate of action of an enzyme is represented in the graph below.



The optimum temperature for the action of this enzyme is approximately (1.) 15 C (2.) 22 C (3.) 37 C (4.) 50 C

20. Here are of some stages of an enzyme-controlled reaction .

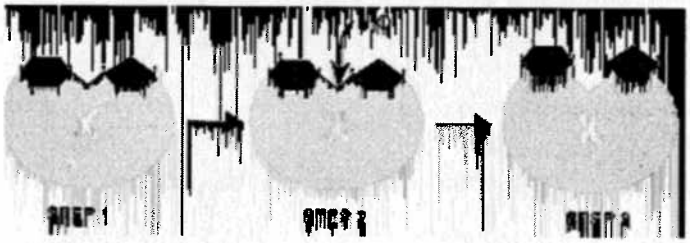


not clear

An enzyme-substrate complex is represented by diagram (1.) A (2.) B (3.) C (4.) D

Use the information provided in question 21 to answer questions 21 and 22 which follow.

21. The diagram below represents three steps in the hydrolysis of a molecule of sucrose.



In this diagram, structure X is most likely (1.) a molecule of oxygen (2.) the end product (3.) an organic catalyst (4.) the substrate

22. List at least two reasons supporting your answer in question # 21.

Use your knowledge of the living environment and the diagram below to answer questions 23 through 25 which follow.

23. Which molecule is not associated with the reaction that is occurring in the solution? (1.) A (2.) B (3.) C (4.) D (5.) E

24. Which enzyme represents an enzyme functioning in this reaction? (1.) A (2.) B (3.) C (4.) D (5.) E

25. Using a complete sentence, explain why you chose the choice you made in question 24.

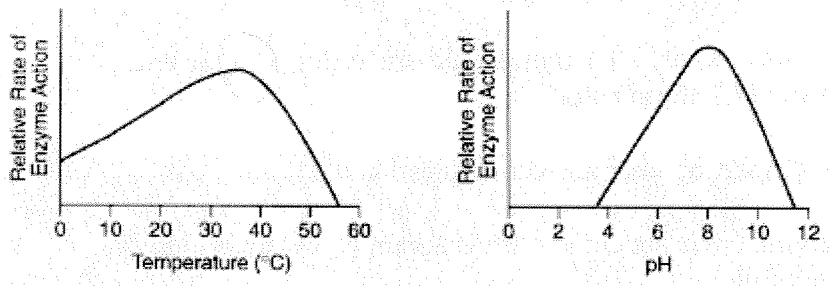
26. The fact that amylase in the human small intestine works best at normal body temperature suggests that (1.) amylase is denatured at temperatures below 37 degrees C (2.) amylase can function only in the small intestine (3) the lock-and-key model of enzyme action does not apply to amylase (4.) the optimum temperature for amylase is 37 degrees C

27. Hydrogen peroxide (H2O2) is a toxic by-product of cellular metabolism in aerobic organisms. The reaction shown occurs within the cells to prevent the accumulation of hydrogen peroxide.

$$2H_2O_2 \xrightarrow{\text{catalase}} 2H_2O + O_2$$

In this reaction, catalase functions as an (1.) indicator in the detection of hydrogen peroxide (2.) emulsifier in the digestion of hydrogen peroxide (3.) enzyme in the synthesis of hydrogen
peroxide (4.) enzyme in the breakdown of hydrogen peroxide

28. Which statement best describes the enzyme represented in the graphs below?



(1.) This enzyme works best at a temperature of 35 C and a pH of 8. (2.) This enzyme works best at a temperature of 50 C and a pH of 12. (3.) Temperature and pH have no influence on the activity of this enzyme. (4.) This enzyme works best at a temperature above 50 C and a pH above 12

Use the chart below and your knowledge of the living environment to answer questions 29 through 31 which follow.

Enzyme	Effective Temperature Range (°C)	Optimum pH
A	60–80	3
B	30–40	3.5
C	20–38	9
D	20–27	7

29. If enzyme C is functioning at 25°C and a pH of 7, under which conditions would the rate of enzyme action probably increase? (1.) The temperature is decreased to 22 C and the pH is kept the same. (2.) The temperature is kept the same and the pH is decreased to 6. (3.) The temperature is increased to 44 C and the pH is kept the same. (4.) The temperature is increased to 30 C and the pH is increased to 8.

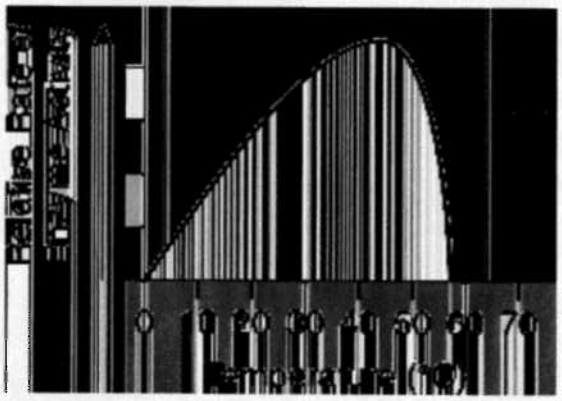
30. At what temperature would enzyme D most likely be denatured? (1.) 15 C (2.) 20 C (3.) 25 C (4.) 39 C

31. Which enzyme would most likely be functional in bacteria living in a hot spring that is 35°C above normal human body temperature? (1.) A (2.) B (3.) C (4.) D

(37°)

32. Which factor does not alter the rate of hydrolysis of maltose? (1.) temperature of the environment of the reaction (2.) pH of the environment of the reaction (3.) number of enzyme molecules present (4.) size of the substrate molecule

33. Which statement is a valid conclusion based on the information in the graph below?



(1.) The maximum rate of human digestion occurs at about 45 C. (2.) The maximum rate of human respiration occurs at about 57 C. (3.) Growth can be controlled by enzyme action. (4.) Temperature can influence the action of an enzyme.

Use the equations below and your knowledge of the living environment to answer questions 34 and 35 which follow.

Chemical Reactions

(1) maltose + water $\xrightarrow{A}$ glucose + B

(2) fat + water $\xrightarrow{C}$ glycerol + fatty acids

34. Letter A in chemical reaction one most likely represents (1.) a substrate (2.) a neurotransmitter (3.) an organic catalyst (4.) a hormone

35. Which substance most likely represents letter C in reaction two? (1.) amylase (2.) protease (3.) sucrase (4.) lipase

36. A student placed groups of 50 seeds in a variety of temperatures ranging from 0 to 50 C. A difference in the rate of germination observed in the groups at different temperatures was most likely due to the effect of temperature on (1.) ammonia (2.) acids (3.) enzymes (4.) cellulose

Free Response Section

1. Using your knowledge of enzyme structure and function, explain why a prolonged period of high fever is dangerous to humans.

2. Explain the Lock and Key Theory of enzyme function.

3. List three different factors which influence the rate of enzyme activity and specifically explain their influence on this activity.