# Cellular Biology Unit Test Review

## Review the following topics

| |
|---|
| Cell theory, types of cells, microscopes |
| Plant and Animal Cells, parts and their functions |
| Using a Microscope, microscope parts and functions |
| Parts of the Cell Membrane, fluid Mosaic Model |
| Movement of Particles Through the Cell Membrane<br>Diffusion, osmosis, 3 types of solutions, factors affecting passive transport |
| Carbohydrates |
| Lipids |
| Proteins |
| Enzymes, Factors Affecting Enzyme Activity |

## Modified True/False

*Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.*

____ 1. Animals store carbohydrates as <u>starch</u>. _____

____ 2. Enzymes <u>speed up</u> chemical reactions. _____

____ 3. The attachment of the substrate to the enzyme's active site creates the <u>enzyme-substrate complex</u>. _____

____ 4. The <u>active site</u> is the location where a substrate binds to an enzyme. _____

## Multiple Choice

*Identify the letter of the choice that best completes the statement or answers the question.*

1. What statement about saturated fatty acids is correct?
   a. they contain only single bonds
   b. they contain triple bonds
   c. they are liquids at room temperature
   d. they contain several double bonds
2. The building block (monomer) of proteins is
   a. Glucose
   b. Amino acids
   c. Glycerol + 3 fatty acid chains
   d. nucleotides

3. Of the 20 amino acids found in the human body, how many are considered essential?

a. 2
b. 9
c. 12
d. 0

4. In brewing, baking, and winemaking, the enzymes found in yeast cells convert glucose to

a. Carbon dioxide and water
b. Lactic acid
c. alcohol and carbon dioxide
d. pyruvate

5. The movement of solutes across a cell membrane from an area of **low** concentration to **high** concentration is called

(b) Passive Transport
(c) Active transport
(d) Brownian motion
(e) Diffusion
(f) Osmosis

6. If a cell is placed in a **hypertonic** environment,

(a) There is a higher concentration of water outside the cell than inside the cell
(b) There will be a net movement of water into the cell causing it to swell
(c) There is a higher concentration of water inside the cell than outside the cell
(d) The concentrations of water inside and outside the cell are equal
(e) (a) and (b)

7. If skittles are placed in a beaker of water, the food colouring will disperse until all of the water becomes coloured. This is the result of

(a) Active transport
(b) Diffusion
(c) Osmosis
(d) Facilitated diffusion
(e) None of the above

8. The site of protein synthesis in the cell
   a. Ribosomes
   b. Mitochondrion
   c. Vacuoles
   d. Lysosomes
   e. Microtubules

9. Carbohydrates are polymers of . . .
   (a) glucose
   (b) amino acids
   (c) lipids
   (d) nucleotides
   (e) starch

10. What is osmosis?
   (a) a type of reverse diffusion
   (b) the movement of particles through a semi-permeable membrane
   (c) the movement of water through a semi-permeable membrane
   (d) the movement of any substance through a selectively permeable membrane
   (e) the movement of water particles without need for a membrane

11. Most body cells are continually being replaced as they wear out. The organelle responsible for breaking down worn-out cells is the
   (a) cell membrane
   (b) vacuole
   (c) vesicle
   (d) endoplasmic reticulum
   (e) lysosome

12. A plant vacuole serves as a storage space for
   (a) water
   (b) sugars
   (c) minerals
   (d) waste
   (e) all of the above

13. Which of the following statements about the cell membrane is correct?
   (a) Both ends of the phospholipid are hydrophilic.
   (b) Both ends of the phospholipid are hydrophobic.
   (c) There is one type of protein embedded in the bilayer.
   (d) A variety of proteins are embedded in the bilayer.
   (e) None of these statements is correct.

**Matching**

*Match each item related to **carbohydrates** to the correct statement listed below.*

a. Monosaccharide
b. Disaccharide
c. polysaccharide
d. Glycogen
e. Starch
f. cellulose

____ 1. simplest carbohydrate, consisting of a single sugar

____ 2. A molecule that stores energy in plants.

____ 3. two monosaccharides linked together

____ 4. A molecule that stores energy in animals

____ 5. A long chain consisting of many monosaccharides

____ 6. A molecule that gives plant cell walls their rigidity.

*Match each item related to **lipids** to the correct statement listed below.*

a. Unsaturated fats
b. Saturated fats
c. Trans fats
d. Glycerol + 3 fatty acid chains
e. Monounsaturated
f. polyunsaturated

____ 1. lipid molecules containing only **one** carbon–carbon double bond in their fatty acid chains

____ 2. Solids at room temperature, found in animals

____ 3. Lipid molecules that contain many carbon-carbon double in their fatty acid chains

____ 4. The building blocks of lipids

____ 5. Liquids at room temperature, found in plants

____ 6. Unsaturated fats that have been chemically modified to become saturated (i.e. margarine

*Match each item related to **enzymes** to the correct statement below.*

a. substrate
b. active site
c. enzyme-substrate complex
d. Catalyst
e. reactants
f. products

____ 1. starting materials of a chemical reaction

____ 2. enzyme with its substrate attached to the active site

____ 3. the molecule an enzyme acts on in a chemical reaction

____ 4. the results of a chemical reaction

____ 5. location where the substrate binds to the enzyme

____ 6. speeds up a chemical reaction

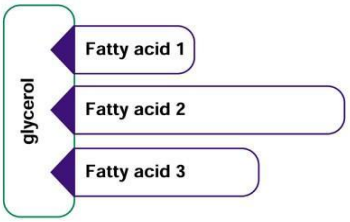
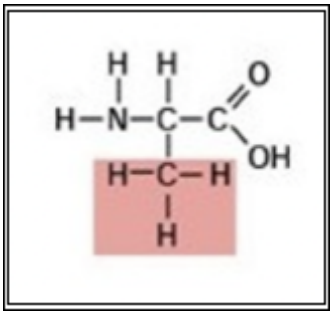
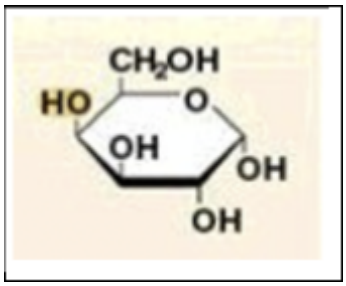
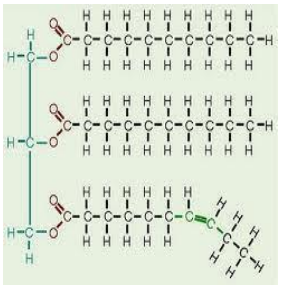
## Tables

Complete the following table describing the indicators used to test for food molecules.

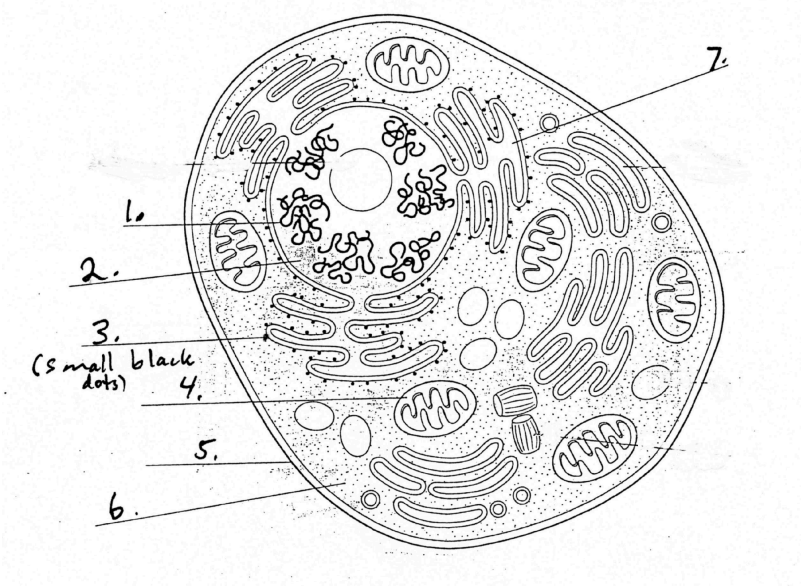
| Name of Indicator | Molecule Tested For | Colour Change Observed |
|---|---|---|
| Biuret's Reagent | | |
| | Starch | |
| Benedict's Reagent | | |
| | Oil or Lipids | |

**Diagrams**

1. Complete the following table.

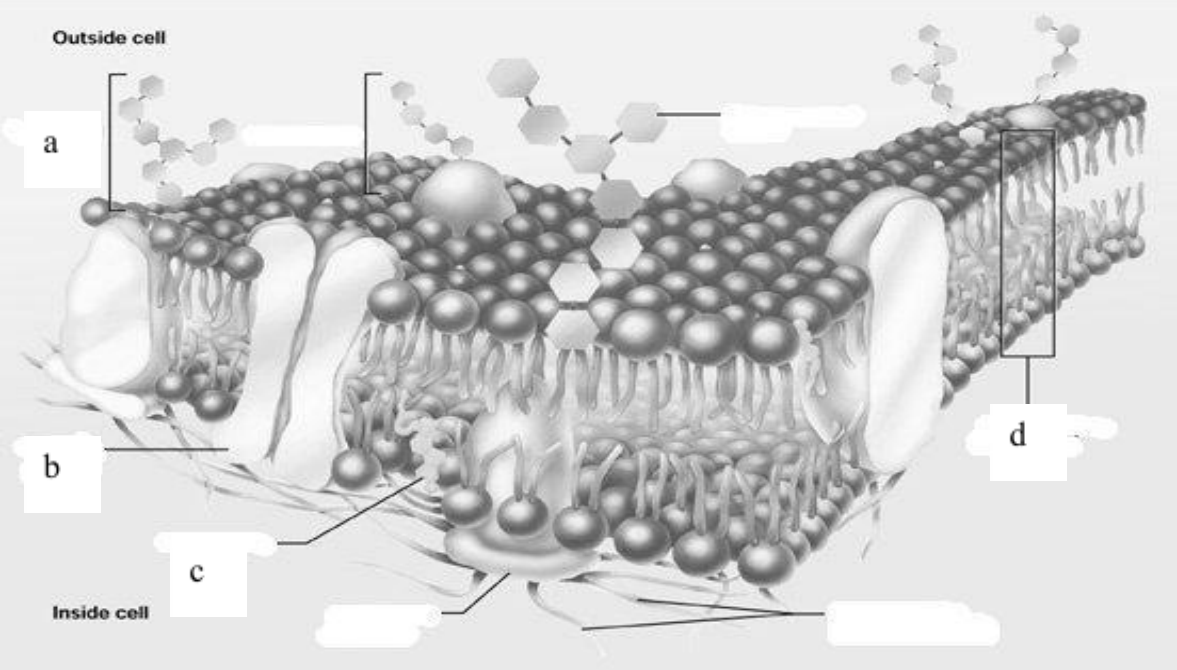
| Type of Molecule | Sketch or Diagram | Function in the body |
|---|---|---|
| |  Figure 1.13. On this simple model of a triglyceride (fat) macromolecule, the triangles represent glycerol's three reaction sites. | |
| |  | |
| |  | |
| |  | |

2. Label the parts and indicate the functions of each part in the diagram below.



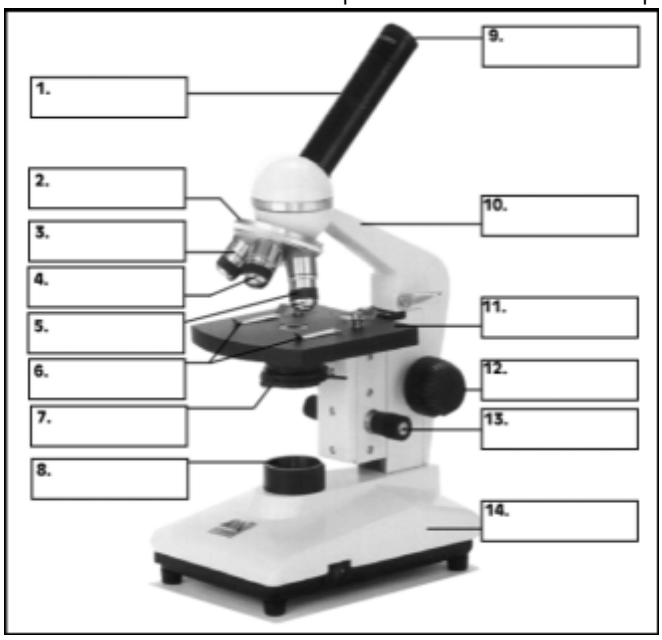

| Number | Name of Part | Function |
|---|---|---|
| **1** | | |
| **2** | | |
| **3** | | |
| **4** | | |
| **5** | | |
| **6** | | |
| **7** | | |

3. Use the following cell membrane diagram to complete the table below.



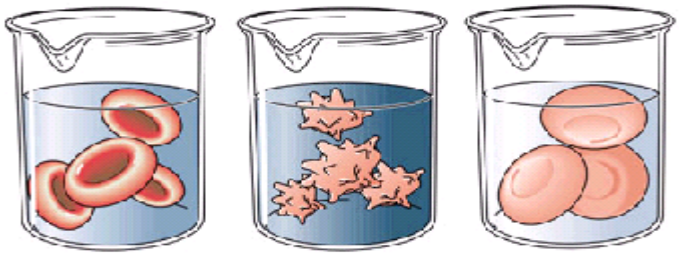

| | Name of Structure | Function |
|---|---|---|
| a | | |
| b | | |
| c | | |
| d | | |

4. Label the indicated parts of the microscope. [5]




5. The cells below are in three different solutions. Review the images and answer the questions below.

**Beaker A** **Beaker B** **Beaker C**



A: _____ B: _____ C: _____

(a) In the space below each beaker, identify each solution as hypotonic, hypertonic or isotonic.

(b) Explain what has happened to the cells in beaker B?

**Short Answer**

1. Describe three differences between saturated and unsaturated fats.

2. What are essential amino acids? How many amino acids are considered essential?

3. How does the presence of an enzyme affect the rate (speed) of a chemical reaction? Explain why.

4. What are two similarities and two differences between facilitated diffusion and osmosis?

5. How is the rate of diffusion affected by a decrease in the concentration gradient?

6. Describe one similarity and two differences between facilitated diffusion and active transport.

7. State three differences between plant and animal cells.

8. Complete the following three statements that make up cell theory.

a) All living things are _____.

b) Cells are the basic _____ and _____ units of life.

c) All cells come from _____ .