**Biology 12**

**Cell Practice Test (Dec 2020)**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| --- | --- | --- | --- | --- | --- |
| **Learning Goals** | ***No Evidence******0*** | ***Beginning******1*** | ***Developing******2*** | ***Proficient******3*** | ***Sophisticated******4*** |
| I can explain the role of enzymes in the body |  |  |  |  |  |
| I can explain the structures and functions of the various parts of the cell and membrane |  |  |  |  |  |
| I can explain the process of DNA Replication |  |  |  |  |  |
| I can explain the process of protein synthesis and how it leads to mutations |  |  |  |  |  |

**Learning Goal #1: I can explain the role of enzymes in the body**

1. Which of the factors that can impact enzyme functioning is displayed in the graph below? Justify your answer.



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which of the factors that can impact enzyme functioning is displayed in the graph below? Justify your answer.



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why is a fever of 105 degrees too high? Why is it dangerous? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. There is an enzyme pepsin that works in the stomach (pH 2) but not in the small intestine (pH 8). Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Draw and label an enzyme and substrate. What are the various parts on an enzyme? What lands on an enzyme?
4. What are the two ways that vitamins and minerals impact an enzyme. Draw and explain this.

**Learning Goal #2: I will be able to label the various cell structures and their functions**

* + - 1. Label the following organelles:



**3. Match the organelle name with the function**

|  |  |  |
| --- | --- | --- |
| **Organelle matching letter** | **Function of organelle** | **Organelles** |
|  | The uncoiled genetic material in the nucleus | A = nucleus |
|  | The site of packaging of proteins for export of the cell | B = chromatin |
|  | The main control centre of the cell, because it holds the genetic material (DNA) | C = golgi body |
|  | The membrane bound organelle that holds water for the cell. It is a very large part of the plant cell | D = vacuole |
|  | The inner jelly of the cell that suspends the organelles inside the cell | E = cytoplasm |

1. Draw a phospholipid bilayer of the cell membrane, including all important structures. Label all parts.
2. What are the five ways that a material can move across the cell membrane? Describe the various methods and give an example of what type of molecule needs to move in that method:

|  |  |  |
| --- | --- | --- |
| Type of Movement | Description | Example molecule |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Learning Goal #3: I can explain the structure, role, and replication of DNA**

1. Draw the backbone of DNA with a series of 5 nitrogen base pairs with the proper complimentary pairings
2. Draw an mRNA strand that is complementary to the DNA strand below.

3’ ACGCGATTATATCCTACGGCGAATCGTATCATTGGTCAA 5’

1. Draw and label the process of DNA replication. Be sure to label:
2. Leading strand
3. Lagging strand
4. Okazaki fragments
5. Helicase
6. DNA polymerase III
7. DNA polymerase I
8. Single stranded binding proteins
9. Ligase
10. Nitrogen base pairs
11. 3’ and 5’ ends
12. topoisomerase

**Learning Goal #4: I will be able to explain the process of protein synthesis and mutations**

1. Below is a “normal” gene and a mutated gene. Write out the mRNA strand and predict the polypeptide that is formed (5 marks). Use the chart on the back page.

a) “Normal” Gene

DNA Strand 3’CTATACGTACATAAGCCTGACTGG5’

mRNA Strand 5’ 3’

Amino acid chain =

b) “Mutated” Gene

DNA Strand 3’CTATACGTACATAAGCCTGACAGG5’

mRNA Strand 5’ 3’

Amino acid chain =

What type of mutation was shown here? What is the repercussion of a mutation like this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_