UANL

VISIÓN UANL 2040

La excelencia por principio la educación como instrumento

PORTFOLIO OF EVIDENCES

EXTRAORDINARY 2° OPPORTUNITY

FUNDAMENTS OF GENETICS AND BIOTECHNOLOGY

Student name: _____

Group: _____

Student ID: _____ Date: _____

Teacher: _____

The present portfolio is part of 50% of your grade. This value will be obtained as long as it meets the following requirements:

1. Write your complete identification data.
2. The portfolio must be delivered person as a requirement the day of the exam.

FOLLOW THE INSTRUCTIONS PROVIDED BY YOUR TEACHER FOR THE COMPLETION OF THIS PORTFOLIO

¡¡¡WARNING!!!

Plagiarisms and trade of academic material contained in this portfolio will be punished under the terms of the University Legislation.

FUNDAMENTALS OF GENETICS AND BIOTECHNOLOGY

Second Opportunity Portfolio.

INSTRUCTIONS: ANSWER THE FOLLOWING EXERCISES AS COMPLETELY AND ACCURATELY AS POSSIBLE, USING YOUR TEXTBOOK OF FUNDAMENTALS OF GENETICS AND BIOTECHNOLOGY

GUDELINES:

- **The assignment must be submitted in person on the day of the exam.**
- **Include your name on each page.**
- **Concepts that are NOT taken from the textbook will be awarded fewer points.**

STAGE 1. CELL REPRODUCTION

Learning Objective: Examine the basics and biological significance of the cell cycle and its relationship to the processes of mitosis and meiosis at the cellular level in the organism; highlight the importance of both processes in growth, development, and inheritance, and relate this to research on stem cells and bioethics.

Complete the following terms:

Binary fission

_____

_____

_____

Sexual reproduction

_____

_____

_____

Asexual reprodcution

_____

_____

_____

Cell cycle

_____

_____

_____

Zygote

_____

_____

_____

Mitosis

_____

_____

_____

Cancer

_____

_____

_____

Apoptosis

_____

_____

_____

Angiogenesis

_____

_____

_____

Cyclins

_____

_____

_____

Metastasis

_____

_____

_____

II. Answer the following questions about the phases of mitosis correctly

1. List the four phases of mitosis in order.

_____

2. Chromatin condenses to form chromosomes, which are easily visible under a light microscope. _____

3. The phase of mitosis in which chromosomes separate into the two chromatids that compose them. _____

4. It is during this stage of cell division that the chromosomes align at the center or equatorial plane of the cell. _____

5. Phase in which the microtubules disassemble and the nuclear membrane is restructured around each group of chromosomes._____

5. Once mitosis is complete, the cytoplasm divides through a process called: _____

IV. Correctly describe the phases of interphase, which is the first phase of the cell cycle.

Phase G1: _____

_____

_____

Phase S: _____

_____

_____

Phase G2: _____

_____

_____

V. Complete the following sentences using the words in the box. Topic: Meiosis and Stem Cells.

Kinetochore - Stem cells - Sperm - Germ cells
Specific organs - Blastomeres - Trophoblast - Blastocoel
Gametogenesis - Crossing over - Budding - Cell division
Synapsis - Embryonic stem cells - Fragmentation - Ovule
Checkpoints - Microtubules - Meiosis

1. _____ refers to the formation of gametes, or sex cells.

2. During prophase I_____ occurs, in which homologous chromosomes align and pair up next to one another in a process known as.

3. _____ consists of the mutual exchange of equivalent segments of DNA between homologous chromosomes.

4.The _____ are cells that have the potential to develop into any type of cell in the body.

5. _____ are cells that have the ability to divide and have not yet completed the process of differentiation.

6.In _____cells reproduce, and a parent cell gives rise to two daughter cells.

7. _____ are formed in the testicles and consist of 23 chromosomes.

8.Through _____ a new organism is formed from a segment of the original organism.

9._____ cells are found in the gonads during early fetal development

10. _____cells cannot develop into any type of cell; they can only develop into organs or tissues.

11._____, _____ and _____ are the components that make up the blastocys

12.The _____ is the female gamete consisting of 23 chromosomes.

13.The _____ is the formation of a bud or shoot on the parent cell that remains attached to it as it grows and develops, eventually separating to form a new organism.

14.The _____ allow for the correction of problems and verification that the cycle will continue until everything is in order.

15.The _____ are small tubes that originate from the centrioles and form a dynamic network

16.The _____ is the protein structure to which microtubules attach on chromosomes.

17. _____ is the process by which gametes are produced in organisms that reproduce sexually.

RUBRIC	**Nivel Muy Bueno 12 PUNTOS**	**Nivel Bueno 9 PUNTOS**	**Nivel Suficiente 6 PUNTOS**	**Nivel Insuficiente 3 PUNTOS**
Answer the assigned exercises correctly	Correctly answered ALL of the required exercises	Correctly answered MOST of the required exercises	Correctly answered HALF of the required exercises	Incorrectly answered the required exercises
The answers match those in the textbook	All answers were taken from the textbook	Most of the answers were taken from the textbook	Half of the answers were taken from the textbook	None of the answers were taken from the textbook
The student answered the assigned exercises	Answered ALL of the requested exercises.	Answered most of the requested exercises.	Answered half of the requested exercises.	Answered very few exercises.

STAGE 2. MENDELIAN GENETICS

Learning objective: Use the basic concepts that explain the fundamental principles and laws of inheritance to explain how biological information is passed from one generation to the next. Also, explain the relationship between human genetic disorders caused by individual genes and the process of nondisjunction to assess their significance.

Dimension 1: Correctly define the following concepts:

Chromosomes

_____

_____

_____

Alleles

_____

_____

_____

Dominant allele

_____

_____

_____

Recessiveallele

_____

_____

_____

Gregor Mendel

_____

_____

_____

Genotype

_____

_____

_____

Phenotype

_____

_____

_____

Homozygous

_____

_____

_____

Heterozygous

_____

_____

_____

Punnett square

_____

_____

_____

Family trees

_____

_____

_____

Genes

_____

_____

_____

Purebred

_____

_____

_____

Hybrid

_____

_____

_____

Heterozygous

_____

_____

_____

Self-fertilization

_____

_____

_____

Cross-fertilization

_____

_____

_____

III. List the laws of genetics or inheritance.

( ) The law of independent assortment states that alleles on an organism's chromosomes segregate independently of other alleles ( ) All members of the F1 generation are hybrids or heterozygotes with an Aa genotype and are uniform because they all exhibit the same phenotype, which is determined by the dominant allele inherited from one of their parents. ( ) This means that homologous chromosomes in organisms have a pair of alleles (A and a) at the same locus.	a) Law of uniformity of F1 hybrids or the principle of dominance b) Monohybrid cross c) Law of independent assortment of traits

IV- Read the following statements carefully and fill in the blanks with the appropriate terms.

1- The _____ is a condition that occurs when an extra chromosome is added to chromosome pair 21.

2- The _____ states that alleles on an organism's chromosomes segregate independently of other alleles.

3- The _____ It is characterized by the fact that no allele is dominant over another.

4- The _____ are those that code for more than one trait in a population.

5- The _____ refers to certain phenotypic traits that are determined by the interaction of several genes.

6- The _____ is caused by the absence of the enzyme phenylalanine hydroxylase, which is responsible for the metabolism of the amino acid phenylalanine.

7- The _____ are caused by changes in the nucleotide sequence, which can lead to various cellular and functional abnormalities.

SIGNATURE	**Very Good Level 12 POINTS**	**Good Level 9 POINTS**	**Sufficient Level 6 POINTS**	**Insufficient Level 3 POINTS**
Answer the requested exercises correctly	Answer ALL the requested exercises correctly	Answer MOST of the exercises correctly	Answer HALF of the required exercises correctly	Answers the requested exercises incorrectly
The answers match those found in the textbook.	All the answers were taken from the textbook	Most of the answers were taken from the textbook	Half of the answers were taken from the textbook	None of the answers were taken from the textbook
The student completed the assigned exercises	The student completed ALL the assigned exercises.	The student completed most of the assigned exercises.	The student completed half of the assigned exercises.	The student answered very few questions.

STAGE 3: HEREDITARY MATERIAL: DNA, RNA, AND PROTEIN SYNTHESIS

Learning objective: Examine the structure and function of the DNA molecule as the carrier of genetic information, relating it to the processes of transcription, translation, and protein synthesis, as well as the various types of mutations that result in genetic and chromosomal alterations, in order to explain the molecular basis of inheritance in living organisms.

Dimension 1: Answer the questions as asked.

What is DNA?

_____

What is RNA?

_____

What are the nitrogenous bases found in DNA?

_____

What are the nitrogenous bases found in RNA?

_____

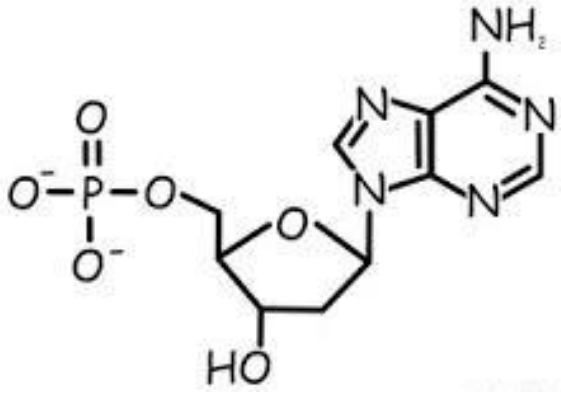
Identify which nucleotides are PURINES:

_____

Identify which nucleotides are pyrimidines:

_____

In the image below, circle the nitrogenous base, the sugar, and the phosphate group, and label them.



Dimension 2: Correctly define the following concepts:

DNA polymerase

_____

_____

_____

DNA ligase

_____

_____

_____

DNA gyrase

_____

_____

_____

DNA helicase

_____

_____

_____

RNA polymerase

_____

_____

_____

Point mutations

_____

_____

_____

Silent mutations

_____

_____

_____

Nonsense mutations

_____

_____

_____

Chromosomal mutations

_____

_____

_____

Reverse mutations

_____

_____

_____

Exon

_____

_____

_____

Prologue

_____

_____

_____

Stretching

_____

_____

_____

Transcript

_____

_____

_____

Translation

_____

_____

_____

Codon

_____

_____

_____

Excerpts from Okazaki

_____

_____

_____

Dimension 3: Briefly answer the following questions.

A sequence of three nitrogenous bases in messenger RNA that codes for a specific amino acid.

_____

These are defined as changes or damage at the level of a DNA sequence.

_____

A universal language that is unambiguous and consists of three nitrogenous bases that code for a specific amino acid.

_____

These are all physical, chemical, and biological agents that can cause damage to a DNA sequence.

_____

What causes Tay-Sachs disease?

_____

_____

List the three stages of translation and define them.

1. _____

_____

2._____ _____

_____

3. _____

_____

SIGNATURE	**Very Good Level 13 POINTS**	**Good Level 9 POINTS**	**Sufficient Level 6 POINTS**	**Insufficient Level 3 POINTS**
Answer the requested exercises correctly	Answer ALL the exercises correctly	Answer MOST of the exercises correctly	Answer HALF of the required exercises correctly	Answers the requested exercises incorrectly
The answers match those found in the textbook.	All the answers were taken from the textbook	Most of the answers were taken from the textbook	Half of the answers were taken from the textbook	None of the answers were taken from the textbook
The student completed the assigned exercises	The student completed ALL the assigned exercises.	The student completed most of the assigned exercises.	The student completed half of the assigned exercises.	The student answered very few of the exercises.

STAGE 4: BIOTECHNOLOGY

Learning objective: Examine the applications of genetic engineering and biotechnology in relation to bioethics.

Section 1. Define the following words correctly.

Penicillin

_____

_____

_____

Antibiotic

_____

_____

_____

Biotechnology

_____

_____

_____

Genetic diversity

_____

_____

_____

Selective breeding

_____

_____

_____

Inbreeding

_____

_____

_____

Natural hybridization

_____

_____

_____

Eugenics

Hybridization

Genetic engineering

Transduction

recombinant DNA technology

Polymerase Chain Reaction

Horizontal gene transfer

Gel electrophoresis

GMOs (Genetically Modified Organisms)

Cloning

RCT or short tandem repetition

Cell therapy

Insulin

Bioethics

Gene therapy

SIGNATURE	**Very Good Level 13 POINTS**	**Good Level 9 POINTS**	**Sufficient Level 6 POINTS**	**Insufficient Level 3 POINTS**
Answer the requested exercises correctly	Answer ALL the requested exercises correctly	Answer MOST of the exercises correctly	Answer HALF of the required exercises correctly	Answers the requested exercises incorrectly
The answers match those found in the textbook.	All the answers were taken from the textbook	Most of the answers were taken from the textbook	Half of the answers were taken from the textbook	None of the answers were taken from the textbook
The student completed the assigned exercises	The student completed ALL the assigned exercises.	The student completed most of the assigned exercises.	The student completed half of the assigned exercises.	The student answered very few questions.

Review for the Second Chance Exam

https://www.daypo.com/repaso-2da-op-fgb.html#test

Prepared by: Evelyn Nalely Muñiz Guzmán, M.Sc.