Study Guide for Exam 1

Course Title:	**Terminología Especializada en Documentos de Tecnología e Ingeniería**
Course ID:	**IT0627 (Marron, 25-2)**
Cohort ID:	**6A2**
Exam Date:	**13 Feb 2025**

General Instructions: A detailed and thorough study and review of the following tasks will prepare you for our first (partial) exam.

Task 1

Be able to write a condensed summary from your paper on the history of a scientific discipline in Mexico. Your condensed summary should certainly recount the history of the scientific discipline you selected, but it must focus on the present state of the discipline in Mexico. You should be able to write this condensed summary in both English and Spanish.

Task 2

Describe the mental process that engineers and scientists use to solve a problem. More specifically,

1. Given a design or conceptual problem, what is a first step that engineers and scientists are likely to take? Why?
2. What are the accepted foundations for conceptualizing a problem? That is, what is the worldview or the overarching mental model that lies at the very foundation of science and engineering? What are the components of this worldview?
3. What ASSUMPTIONS are made, consciously or not, when engineers and scientists begin modeling a problem?
4. When are models useful for reaching a solution to a problem? If no solution presents tself what can the engineer or scientist do?

Task 3

Jargon is defined as the set of special words or expressions that are used by a particular profession or group and are difficult for others to understand. Answer the following related to jargon:

1. Why does jargon evolve in virtually any human endeavor?
2. Is scientific language considered jargon? Explain.
3. Compare and contrast " good" and " bad" jargon.

Task 4

The following is a description of a simple system

A metal pot filled with water is placed on a stove and heated. The system is defined as the metal pot plus the water. As the water heats up, some of it evaporates into the air. The temperature of the water increases, and the volume of the remaining liquid decreases.

1. Is this system open, closed, or isolated? Explain your reasoning.
2. What is entering the system? What is leaving the system? What remains unchanged in the system?

3. Identify whether each of the following properties is intensive or extensive. Justify your answer.
    - Temperature
    - Mass of the water
    - Density of the water
    - Volume of the water

Task 5
Give a definition of the following terms in both English and Spanish:
- mass
- charge
- linear momentum
- angular momentum
- energy

Task 6
Be prepared to translate the abstract from a scientific paper from English to Spanish and/or vice versa. For example, select either the English or Spanish version of the abstract below. Translate to the second language and compare your translation to the one provided by the authors..

RESUMEN
El presente trabajo propone un modelo para la medición de ácido láctico de manera no invasiva. El modelo puede usarse de manera efectiva para medir ácido láctico en atletas de alto rendimiento. Se presentan diversos modelos que tratan de resolver el problema haciendo una correlación de variables físicas medibles. Los resultados indican que los modelos predicen en forma efectiva la cantidad de lactato en las pruebas físicas aplicadas a tres atletas. En las pruebas de campo presentadas el modelo ideal ponderado presenta la mejor exactitud en general. Al comparar los resultados de los modelos con mediciones de muestras de sangre en un analizador electrónico, el modelo ideal mejorado obtiene una eficiencia (exactitud) máxima del 94.71% y el Modelo Ideal básico obtiene una eficiencia mínima de 90.61%. Todos los modelos generan un margen de error alrededor del 5%. Las eficiencias son un indicativo de qué tan cerca está el modelo con respecto a la medición de un analizador electrónico de muestras de sangre. Palabras clave: Ácido láctico, metodología de modelación, modelo experimental, analizador de muestras de sangre.

ABSTRACT
The following article proposes a model to perform a non-invasive measurement of lactic acid. The model could be used effectively to measure lactic acid in high performance athletes. Several models are presented that intend to correlate measurable physical variables. The results indicate that the models predict effectively lactate quantities during physical tests applied to athletes. The best overall accuracy is provided by the ponderated-ideal-model. Comparing the results with blood test measurements from an electronic analyzer, the improved-ideal- model obtains a maximum efficiency (accuracy) of 94.71%, while the basic-ideal-model obtains a minimum efficiency of 90.61%. Both models generate an error margin of around 5%. The efficiencies are indicative of how close the model can be to measurements performed by an electronic blood sample analyzer device.