Exam 3

Course Title:	**Terminología Especializada en Documentos de Tecnología e Ingeniería**
Course ID:	**IT0627 (Marron, 25-2)**
Cohort ID:	**6A2**
Exam Date:	**10 Apr 2025**

General Instructions: Print your name in the upper right-hand corner of this paper. Read each item carefully. Be sure that you understand exactly what is being asked of you. Begin your answers on the backside of this paper if possible and add extra sheets of paper as needed. Be sure to write your name on any and all extra sheets of paper. Staple all exam papers together when you are finished.

Do not look at other student's exams. If you have a question or a request during the exam, raise your hand and the instructor will call on you.. Do not leave your desk without permission. If you finish early, raise your hand and the instructor will call on you.

This is a closed book exam, however, you may reference your last homework. Attempt to answer all questions, even if you are uncertain. Whenever possible, provide answers in bullet list format with complete content. Tasks will be evaluated by sub-tasks. Three (3) points are available for each sub-task: Accuracy (1 pt), Completeness (1 pt), and Sufficiency (1 pt). Points will be awarded in 0.1 increments. Answer in English unless requested to do so otherwise.

Task 1 (6 pts)

The production of lithium-ion batteries for the rapidly growing clean energy sector apparently has a substantial environmental cost (see Guelfo, J.L., Ferguson, P.L., Beck, J. *et al.* Lithium-ion battery components are at the nexus of sustainable energy and environmental release of per- and polyfluoroalkyl substances. *Nat Commun* **15**, 5548 (2024).)

a) Translate the following into Spanish

> *Polyfluoroalkyl substances (PFAS) are used globally in the production of lithium-ion batteries, PFAS are recognized internationally as recalcitrant contaminants. The clean energy sector is an unrecognized and potentially growing source of international PFAS release. Results underscore that environmental impacts of clean energy infrastructure merit scrutiny to ensure that reduced CO2 emissions are not achieved at the expense of increasing global releases of persistent organic pollutants.*

b) What does it mean if a chemical is a recalcitrant, mobile, and toxic?

Task 2 (3 pts)

In the paper by Trancoso, R., Syktus, J., Allan, R.P. *et al. (*Trancoso, R., Syktus, J., Allan, R.P. *et al.* Significantly wetter or drier future conditions for one to two thirds of the world's population. *Nat Commun* **15**, 483 (2024) the authors demonstrate that large numbers of the world's population are likely to experience substantially wetter or drier conditions under global warming.

a) Explain the basic methodology used by the authors to arrive at their conclusions.

Task 3 (6 pts)

In their empirical study of ChatGPT's capacities, Schulze Balhorn, L., Weber, J.M., Buijsman, S. *et al.* (Schulze Balhorn, L., Weber, J.M., Buijsman, S. *et al.* Empirical assessment of ChatGPT's answering capabilities in natural science and engineering. *Sci Rep* **14**, 4998 (2024)) evaluate this AI's science-based knowledge.

a) Briefly describe the methodology used in the study and the findings (results).
b) Note that the work in this paper was done with ChatGPT 3.5, and not ChatGPT 4.o,. Because ChatGPT 4.o is substantially more robust (trained on roughly 1 trillion parameters compared GPT-3.5's 175 billion), what do you predict would be the outcomes of the same study done with ChatGPT 4.o?

Task 4 (6 pts)

Define the following terms in English and Spanish:

- alkaline
- ANOVA
- bioaccumulation
- hydrology
- leachate
- teratogenic