ORDRE DES INGÉNIEURS DU QUÉBEC

NOVEMBER 2021 SESSION

Open-book examination Calculators: only authorized models Duration: 3 hours

14-EC-3 SUSTAINABILITY, ENGINEERING AND THE ENVIRONMENT

This exam has 4 independent questions

1- General knowledge and reflections on sustainable development. (25%)

- *1-a. Present a founding principle of sustainable development. (Origin, statement, objective ...). (10%)*

- *1-b. Present how engineers can implement the concepts of sustainable development in the practice of their profession. (15%) (think about sustainable engineering)*

2- ISO 14001- Environmental management system (EMS). (25%)

The ISO 14001 standard sets out the establishment of an environmental management system that allows the company to integrate environmental performance monitoring into day-to-day management.

- *2-a. What are the main steps in setting up an EMS for ISO 14001 certification? (15%)*

- *2-b. Present the minimum obligations for a company that implements an ISO14001 EMS. (10%)*

3- Environmental product declaration and life cycle analysis. (30%)

In order to disseminate objective, credible and ascertainable environmental information about the environmental performance of the products and services they design, engineers can use Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD).

- *3-a. Describe in a few lines what an LCA is, its objectives, its stages. (15%)*

- *3-b. Present the main steps in carrying out an EPD. (15%)*

4- Environmental law in Quebec. (20%)

The engineer, like any professional, must propose solutions and work in accordance with environmental laws and regulations. These legal frameworks make it possible, for example, to participate in the fight against climate change. Under the Environment Quality Act (LQE), the Quebec government has adopted a mechanism to regulate greenhouse gas (GHG) emissions.

- *4-a. According to the EQA (LQE), what system is in place in Quebec to meet the GHG emission reduction targets? (10%)*

- *4-b. Describe the key features of this system for reducing GHG emissions. (10%)*

End