ORDRE DES INGÉNIEURS DU QUÉBEC

MAY 2020 SESSION

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

14-EC-3

SUSTAINABILITY, ENGINEERING AND THE ENVIRONMENT

This exam is composed of 4 independent questions.

1- Our current economic model is mainly linear. It is based on a high consumption of resources and generates waste at all stages of the production-consumption chain. In order to begin the inescapable energy, economic and social transition, several economists propose to engage in circular economy. Industrial ecology is positioned as one of the important pillars of this new circular economic model. (25 %)

1-1) Present the basic principles of industrial ecology (9%)

1-2) Present the central theme of industrial ecology (8%)

1-3) Present the advantages or strengths of the concept of industrial ecology (8%)

2- Consumers, but especially institutional buyers, want more and more objective, credible and verifiable environmental information about the environmental performance of the products and services they buy. Environmental Product Declarations (EPD) are a way to communicate environmental performance over the entire life cycle of a product or service. EPD are based on the results of environmental life cycle assessment (LCA), hence the growing interest in this sustainable engineering tool (25%).

2-1) Present, with precise terms, the main steps in carrying out a LCA (10%).

2-2) Present, with precise terms, the main steps in carrying out an EPD (15%)

3- The BNQ 21000 approach (Standard and method) guides small and medium enterprises in Quebec and elsewhere, in the progressive adoption of sustainable management practices (25 %).

3-1) Briefly present the BNQ 21000 approach and its objectives (15%)

3-2) Name and present 2 international references or standards used as a basis for the development of the BNQ 21000 standard (10%)

4- Like all economic activities, engineering must also take a turn towards greater sustainability. These issues are now unavoidable and engineers will have to apply sustainable engineering principles (25%).

4-1) Present what sustainable engineering is, and how it differs from traditional engineering (10%).

4-2) Present two or three principles or guidelines that you feel are important and that enable the engineer to incorporate sustainable development issues into engineering practice in order to move towards sustainable engineering (15%).