00017

The Open University of Sri Lanka
Faculty of Natural Sciences

Department	: Chemistry
Level	: Level 10
Name of the Examination	: Final Examination
Course Code and Title	**: CYPA610: Eco-Toxicology and Pollution Management**
Academic Year	: 2018/19
Date	: 01.03.2020
Time	: 9.30 a.m. – 12.30 p.m.

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of six **(06)** questions in **four (04)** pages.
3. Answer **any four (04)** questions only. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. Draw fully labelled diagrams where necessary
5. Relevant log tables are provided where necessary.
6. Having any unauthorized documents/ mobile phones in your possession is a punishable offense
7. Use blue or black ink to answer the questions.
8. Circle the number of the questions you answered in the front cover of your Answer script.
9. Clearly state your index number in your answer script

1.a. Define the term "Ecotoxicology".

(25 marks)

b. Describe the following terms used in ecotoxicology

i. LD_{50}
ii. EC_{50}
iii. LC_{50}
iv. IC_{50}

(50 marks)

c. What is the difference between acute toxicity and chronic toxicity?

(25 marks)

2.a Describe the following terms for a toxic substance.

i. Critical concentration for a cell
ii. Critical organ concentration
iii. Critical effect

(30 marks)

b. Explain the factors influencing absorption rate, distribution in the body, biotransformation and/or excretion rate of toxicants

(70 marks)

3. Write short notes on following:

i. Flow through toxicity tests
ii. Static toxicity tests
iii. Recirculation toxicity tests
iv. Sediment-toxicity testing

(100 marks)

4. a. Describe the terms as applied in Eco Toxicology.

i. Threshold dose

ii. Detoxification process

iii. Antagonistic effects

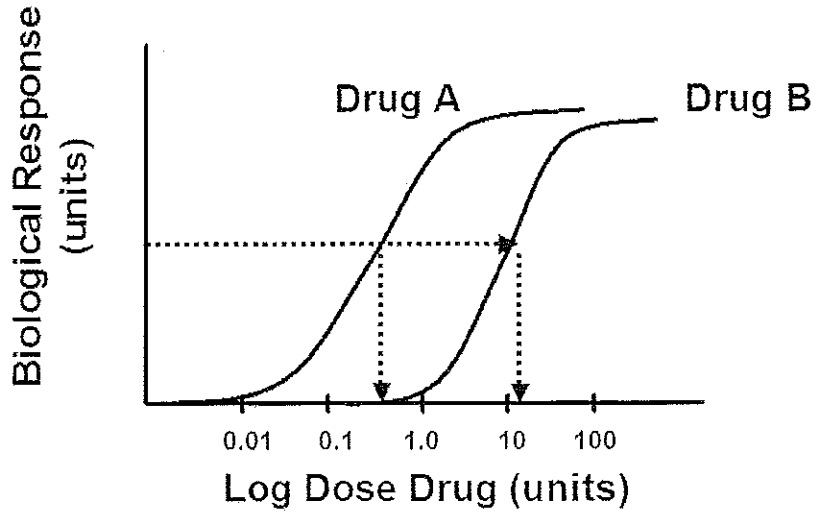
iv. Reactive metabolites

(20 marks)

b. The relationship of dose to response can be illustrated as a graph called as Dose-Response curve. It describes the change in effect on an organism caused by differing levels of exposure (or doses) to a chemical after a certain exposure time.

i. Distinguish between Graded Dose - Response curve and Quantal Dose-Response curve.

ii. Describe the relative toxicity of toxicants A and B shown in the following Dose- Response curve.



iii. What is meant by synergistic effects of toxicants?

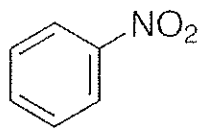
iv. Draw a Dose-Response curve showing two toxicants that are synergistic.

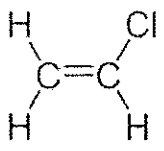
(50 marks)

c. Biotransformation is a specific term used for chemical transformation of xenobiotic substances in the body/ living organisms. This is the process by which a xenobiotic substance is changed from one chemical to another by a chemical reaction within the body.

i. Distinguish the **two main** phases of biotransformation that toxicants can undergo in human body.

ii. Write down the metabolites that can be formed when the following xenobiotic compounds undergo Phase I reaction.





(30 marks)

5. Explain the following.

a. How the free radical are formed in the body.

(25 marks)

b. The effect of free radicals on macromolecules

(25 marks)

c. Cadmium toxicity.

(50 marks)

6. a. Define the term "Threshold Limit Value" (TLV)

(20 marks)

b. Describe giving examples the mode of entry of chemicals to the human body.

(30 marks)

c. Discuss measures to control such chemical hazards.

(50 marks)

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