THE OPEN UNIVERSITY OF SRI LANKA
CENTRE FOR ENVIRONMENTAL STUDIES AND SUSTAINABLE DEVELOPMENT
M.Sc. IN ENVIRONMENTAL SCIENCE 2017 /2018
ECO TOXICOLOGY AND POLLUTION MANAGEMENT – CYPA610/ NEP2223
FINAL EXAMINATION
DURATION: Three (03) Hours

Date: 01.12.2018 **Time: 9.30 a.m. – 12.30 p.m.**

Answer any **four (04)** questions out of six

1 a. Name five natural air pollutants. **(20 marks)**

b. Explain the atmospheric and health effects of natural air pollutants stated above. **(80 marks)**

2. a. Describe the mechanisms involved in following processes in transporting toxicants through the cell and organ membranes in biological organisms.

i. Simple diffusion
ii. Facilitated diffusion
iii. Active transport
iv. Receptor-mediated uptake

(100 marks)

3. Describe the factors considered in selecting a test organism for a laboratory toxicity test. **(100 marks)**

4. a. Describe the following terms as applied in chemical toxicology.

i. Threshold and Non threshold dose

ii. Detoxification process

iii. Reactive metabolites

iv. Response

(16 marks)

b. The dose response relationship is the most fundamental and essential concept in toxicology.

i. Name the **two (02)** main classifications of dose response curves?

ii. What is the major difference between them?

iii. Discuss **three (03)** ways that chemical mixture can interact. Draw a dose response curve to show the interaction in each case.

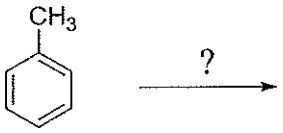
(24 marks)

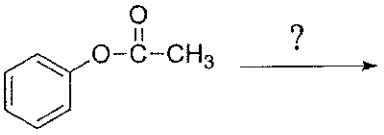
c. i. Compare Phase I and Phase II reactions in terms of enzyme and type of reaction involved.

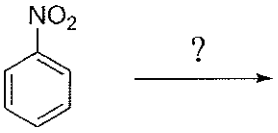
(12 marks)

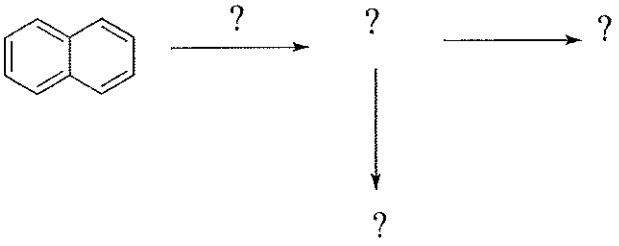
d. What metabolite would be formed when the following toxicants undergo phase I reaction? Indicate the enzyme involved in each case.

(28 marks)

i. 

ii. 

iii. 

iv. 

e. Briefly describe the biotransformation of vinylchloride ($CH_2 = CHCl$) by indicating the enzyme involved, and reactive metabolite. **(20 marks)**

5. a. Name **four (04)** toxic heavy metals. **(10 marks)**

b. Discuss how **one** of the above mentioned heavy metals damage proteins. **(20 marks)**

c. Briefly explain how the genetic code determines the primary structure of proteins. **(30 marks)**

d. Giving examples discuss the **three (03)** mechanisms involved in inhibition of neurotransmission. **(40 marks)**

6. a. Define the terms 'hazard' and 'risk.' **(20 marks)**

b. Discuss the hazards and risks associated with **any three (03)** of the following occupations.

i. Executive in the banking sector
ii. Paddy farmer
iii. Heavy vehicle driver
iv. Laboratory worker

(60 marks)

c. Discuss control measures to minimize risks for **one (01)** of the three occupations you selected in the above question (6.b.). **(20 marks)**

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