



UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCE
DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCES
SUPPLEMENTARY EXAMINATION JULY, 2014

Title of paper: INTRODUCTION TO TOXICOLOGY I

Course code: EHS 560

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

- 1) Answer ANY FOUR (4) questions of your choice**
- 2) Each question is weighted 25 marks**
- 3) Write neatly and clearly**
- 4) Begin each question on a separate sheet of paper**

This paper is not to be opened until the invigilator has granted permission

QUESTION 1

- a) Outline the questions that a Health Risk Assessor may address under hazard identification in order to implicate a certain xenobiotic to an adverse effect (8)**
- b) Define the objective of toxicity testing (8)**
- c) Toxicants undergo certain processes in the body, can you clearly explain the following: (9)**
 - i. Biotransformation**
 - ii. Disposition**
 - iii. Distribution**

QUESTION 2

- a) Deposition of particles in the respiratory system is dependent on the aerodynamic behaviour of the particles. Discuss these behaviours (12)**
- b) Some xenobiotics are able to be taken up by the circulatory system but are excreted directly. What is this process called, discuss how this phenomenon occurs? (10)**
- c) Name the 3 chemicals that disrupt the testicular vasculature in the Blood Testis Barrier (BTB) (3)**

QUESTION 3

- a) Just name the type of toxicity that is likely to be caused by the following chemicals (6)**
 - i. Bromobenzene**
 - ii. Vinyl chloride**
 - iii. Dimethylnitrosamine**
- b) The BTB is exposed to a different array of toxicological insult like Cadmium (Cd). However, there are some chemicals that can prevent Cd toxicity in this system, which are these chemicals? (4)**

c) You are an Environmentalist based at Nsenga Royal Kraal. Every Saturday when you attend community meetings, the residents complain of a compound that is affecting them after they have drunk water. How will you go about as an environmental toxicologist in solving this predicament? (10)

d) What is the theorized shape of a dose – response curve, and what are its assumptions? (5)

QUESTION 4

a) Define a completed exposure pathway to xenobiotics and list the components thereof (10)

b) Differentiate between an exposure and a dose (4)

c) Discuss the factors that determine toxicity in test animals (4)

d) Test animals may be exposed to the same chemicals and yet some of them may not develop a response to that particular chemical, what do we call this response? (3)

e) Name the 2 factors that determine the rate of passive transfer of xenobiotics (4)

QUESTION 5

a) Selection of test organisms is guided by some supposed favorable criteria on the experiment to be performed. What could these criteria be? (6)

b) Name the reactions that are undergone by both Phases 1 and II reactions (8)

c) What are the conditions that you may need in order to measure exposure in a more precise manner? (4)

d) Which four (4) primary systems enzymes are responsible for impeding the first pass effect of a drug? (7)