



UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE
JULY 2016 SUPPLEMENTARY EXAMINATION

Title of paper: INTRODUCTION TO TOXICOLOGY 1

Course code: EHS 560

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

- 1) Answer ANY FOUR (4) questions
- 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) If two chemicals are mixed together they produce different reactions that can either be more potent or even less than the parent one. Explain the following reaction that usually occur when chemicals are mixed together. (10 marks)
- i. Antagonism
 - ii. Synergism
 - iii. Additivity
 - iv. Potentiation
 - v. Covalent bonding
- b) Name the factors that affect absorption of toxicants through the dermal route (6 mark)
- c) Write short notes on why the Blood Brain Barrier is vulnerable to toxicants (9 marks)

QUESTION 2

- a) Discuss dose fractioning and give an illustration thereof (10 marks)
- e) What are the physiological features that make the Blood Placental Barrier vulnerable to toxic insults (10 marks)
- f) Write brief notes on the following (5 marks)
- i. Critical path
 - ii. RfD,
 - iii. Biologically effective dose
 - iv. Phagocytosis
 - v. Critical group

QUESTION 3

- a) Selection of test organisms is guided by certain favorable criteria on the experiment to be performed. What are these criteria? (6 marks)
- b) What are the conditions that you may need in order to measure exposure in a more precise manner? (4 marks)
- c) Which four (4) primary systems enzymes are responsible for impeding the first pass effect of a drug? (7 marks)
- d) Outline the interrelationship between PELs and TLVs (6 marks)
- e) How do toxic concentrations values differ from any other exposure values? (2 marks)

QUESTION 4

- a) Contrast lethal values with lethal concentration values (4 marks)
- b) List the procedures that manufactures and inspectors from environmental agencies can establish in order to ensure authenticity of data obtained from experiments. (5 marks)
- c) When dealing with EPA inspectors, they audit the accuracy and integrity of data. What do they normally check about the employees? (4 marks)
- d) Why is it vital for instruments to be periodically calibrated during experimentation with animals? (2 marks)
- e) Animals are supposed to be quarantined if they be used for experimentations. How long should this quarantine be and what is its purpose? (4 marks)
- f) Name 3 categories of toxicants that can kill test animals if the following amount of toxicants have been taken (6 marks)
 - A few drops,
 - Over a teaspoon, and
 - Over an ounce.

QUESTION 5

- a) Indicate the probable oral lethal dose of a practically non-toxic pesticide that can effect a kill in test animals (2 marks)
- b) Which exposure is shorter than chronic exposure but longer than sub-acute and indicate the length of time thereof? (4 marks)
- c) List the requirements of a Code of Experimental Conduct that testing facilities should put in place for good laboratory practices. (8 marks)
- d) List four types of poisoning that can be classified under acute poisoning. (4 marks)
- e) Name the dose that is analogous to the RfD. (2 marks)
- f) For the following indicate your response by False or True. (4 marks)
 - TOLERANCE: This is a state of increased responsiveness to a toxic effect of a chemical, resulting from previous exposures.
 - Dispositional tolerance: This is reduced responsiveness of an organ due to an increased amount of drug reaching the site cellular.
- g) Which toxicologist is responsible for service and pre-clinical toxicology during chemical development? (1 mark)