



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

BSc DEGREE IN ENVIRONMENTAL HEALTH
MANAGEMENT & OCCUPATIONAL SAFETY AND HEALTH

JULY 2016 SUPPLEMENTARY EXAMINATION PAPER

Title of paper: INTRODUCTION TO TOXICOLOGY II

Course code: EHS 561

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

1. Answer ANY OTHER FOUR (4) questions
2. Each question is weighted 25 marks
3. Write neatly and clearly
4. Begin each question in a separate sheet of paper
5. Numbering within a chosen question should be in a sequential order

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

QUESTION 1

- a) Use a properly labeled graph to illustrate drug plasma concentration and explain what each label means (8 marks)
- b) Poor nutrition is one of the modifiers of metabolism. What are the 3 deficiencies that can decrease the ability to synthesize bio-transforming enzymes? (3 marks)
- c) Briefly explain how elimination can modify a toxicant in the body (4 marks)
- d) Name the 4 benchmarks that are used in calculating an ADI (4 marks)
- e) Scientist at times find it very difficult to agree on certain findings regarding some chemicals. What are the 3 main factors that are considered if one is to support the assertion that EDCs indeed cause some health effects to humans? (6 marks)

QUESTION 2

- a) List possible human effects that are associated with EDCs exposure (10 marks)
- b) What are the dire consequences that can be attributed to systemic toxicity? Use nephrotoxicity as an example? (6 marks)
- c) Name the 3 main factors that affect the absorption within the various sites of the Gastrointestinal Tract (6 marks)
- d) Outline 3 features that make the intestine to be favorable for toxicants absorption to take place (3 marks)

QUESTION 3

- a) Name the 3 types of biological markers and describe their individual functions in just one sentence each (6 marks)
- b) Outline the health benefits that can be derived from heavy metals (5 marks)
- c) Name the 4 major storage sites for xenobiotics (4 marks)
- d) The contamination of food by chemical hazards is a worldwide public health concern. How does food contamination with chemical occur? (6 marks)
- e) Differentiate between ecotoxicology and environmental toxicology (4 marks)

QUESTION 4

- a) DDT as an example of an environmental toxicant has a half-life of between 2 – 15 years and is converted in the body to 3 critical metabolites. Name the metabolites and the organ(s) that may experience the highest insult thereof (6 marks)
- b) What are the crucial parameters that can support the severity of a teratogen (6 marks)
- c) How would you define food allergy or hypersensitivity? (2 marks)
- d) List the 6 principles of toxicants action in the human body (6 marks)
- e) Bioavailability is 100% bioavailable for intravenous injection and for some other routes it is dependent on other parameters. What are these 4 parameters? (4 marks)
- f) Name the condition that can contribute to low bile flow (1 marks)

QUESTION 5

- a) Name 3 heavy metals that are excreted through the fecal route and 5 through sweat (8 marks)
- b) Which part of the body may be used as a bio-monitoring tool for metals? (2 marks)
- c) A substance is eliminated by the by the liver. What will be its 2 possible fate before final ejection by the body? (4 marks)
- d) List the 2 factors that affect the elimination of a substance by the kidney (4 marks)
- e) Which type of excretion is important for the elimination of xenobiotics that have a slow biotransformation, and how can this process be speeded up? (4 marks)
- f) Whilst going through a certain document, you come across information: $F_1 = 1$. How would you unpack this variable (3 marks)