



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science
May 2015 Main Examination

Title of paper: INTRODUCTION TO TOXICOLOGY II

Course code: EHS 561

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

- 1) QUESTION 1 IS COMPULSORY**
- 2) Then answer ANY OTHER THREE (3) questions**
- 3) Each question is weighted 25 marks**
- 4) Write neatly and clearly**
- 5) Begin each question in a separate sheet of paper**
- 6) 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) In target toxicity what would be the best description of the following conditions due to toxicity insult to the body? (20)

Only write the letter and not the full statement; e.g. i = Pyroptosis

- i. There is observed skin keratinization
- ii. The body feeds upon itself
- iii. It results from toxic agents interfering with ATP generation
- iv. Cells programmed for removal undergo suicidal action
- v. Mature tissue homeostasis
- vi. It contributes to cell atrophy
- vii. Pus is the evidence of this cell death
- viii. It results from acute disease condition like acute toxicity
- ix. It is a form of traumatic cell death
- x. The nuclear degenerates and the cells drop from the skin surface

b) List the morphological characteristics of type 3 cell death (4)

c) Define pathogenesis (1)

QUESTION 2

a) Name the 3 types of genetic change that an organism can go through if there is genotoxicity (6)

b) What is the severity of a teratogen dependent on (6)

c) Organogenesis is the most sensitive period of gestation, which period is this? (4)

d) Name the anatomical parts where DDT causes organ toxicity in both males and females (6)

e) Some chemicals can mimic oestrogen in females, what are the effects thereof? (3)

QUESTION 3

a) Name the 2 parts that are essential in extrapolation of experimental data from animal studies to humans (4)

b) Name the 5 parameters that are used in calculating an ADI (5)

c) How can one acquire tolerance to a xenobiotic? (4)

d) If you were to do interspecies comparison for a research project, what would be the 3 variables that you would be comparing (3)

e) Write briefly as to how xenobiotics are excreted by the following (8)

i. Faeces

ii. Saliva

- f) What do regulatory toxicologists consider in real life situations other than just the toxicity of a chemical? (1)

QUESTION 4

- a) Name the different types of metabolites that DDT is usually converted to in the body (6)
- b) Lead is known to be both abortifacient and is able to cause teratospermias. Unpack this statement (6)
- c) With regards to hepatic clearance, what is the extraction ratio? (4)
- d) Define a signal transduction cascade (4)
- e) The fetal period in developmental toxicity is critical for susceptibility. Do you agree or disagree with this statement and why? (5)

QUESTION 5

- a) Write formulae of the following (3)
- i. Elimination rate
 - ii. AUC
 - iii. Biological half- life
- a) Differentiate between high intrinsic and low drug clearance (4)
- b) What are biomarkers used for? (4)
- c) What do biomarkers of health effect signal? (5)
- d) What features of the CNS make it vulnerable to toxicant insults? (7)
- e) Name the 2 distinct parts in the human body where DDT normally shows pathological changes? (2)