

UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE (SPECIAL) DEGREE LEVEL I (SEMESTER II)
EXAMINATION – NOVEMBER 2016

SUBJECT: BOTANY
COURSE UNIT: ECOTOXICOLOGY (BOT 4202)

Time: Two hours

Index No.....

Answer **ONLY** three questions including question No. 1 and 2

1) A)

i) Circle true (T) or false (F) for the following statements

a) The term ecotoxicology was introduced by Paracelsus in 1969.

T F

b) Ecotoxicology is a multidisciplinary subject.

T F

c) An absorbed dose means the amount of toxicant reaching the organ.

T F

d) Bioaccumulation potential of chemicals is positively correlated with lipophilicity.

T F

e) Bioaccumulation may lead to a delayed showing toxicity.

T F

f) Hazard is the potential to cause harm .

T F

g) Systemic toxicity is an adverse or undesirable effect that can be seen at the toxicant's site of contact with the organism.

T F

h) Toxic effect is the interaction between a toxic agent and a biological system.

T F

i) The term xenobiotic is used to describe compounds that are 'foreign' to a particular organism.

T F

j) Toxicity is a result of a cascade of events starting with the distribution and metabolism of toxicant.

T F

k) Exposure is the contact of a stressor with a receptor.

T F

l) Clinical toxicology is the diagnosis and treatment of human poisoning.

T F

m) At present scientist consider dilution paradigm as a solution for environmental pollution.

T F

n) An additive toxic effect occurs when the combined effect of two chemicals is greater than the sum of the effects of each chemical given alone.

T F

o) Acute exposure is the exposure over a brief period of time (generally less than 24 h).

T F

p) After prolonged exposure, as much as 95% of the body burden of lead entered to the body is found in bone tissue.

T F

q) An increased excretion of d-aminolevulinic acid in urine provides evidence of increased Pb exposure.

T F

r) The disease Itai-Itai resulting from consumption of cadmium contaminated rice in Japan.

T F

s) The main organ of damage of human following long-term exposure of cadmium is the kidney.

T F

t) Microorganisms in the environment convert arsenic to dimethylarsenate.

T F

ii) List three different anthropogenic sources of metal pollutants.

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iii) Define the following terms

a) Toxicology

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b) Ecotoxicology

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iv) What do you mean by the term risk assessor?

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v) Name five different branches or sub disciplines of toxicology .

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B) i) Highlight three main objectives of ecotoxicology.

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ii) Draw a typical dose response curve and indicate EC₅₀.

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iii) What do you mean by LC₅₀?

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iv) Briefly explain the importance of dose response curve

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v) Differentiate the terms toxin and toxicant

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vi) What do you understand by the term anthropogenic enrichment factor (AEF) in toxicology?

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vii) Cadmium emission from the anthropogenic source is 8 and cadmium emission from natural source is 1. All values 10^6 kg/Year. Calculate the AEF for cadmium.

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(60 minutes)

2) i) Highlight the importance of characterization of contaminated or polluted matrix in the field of ecotoxicology.

ii) Assume you are given an assignment to characterise the toxicity of the effluent released from a medium scale batik industry by using *Lemna minor* as an indicator plants. Briefly outline the experimental procedure you would adopt in the given assignment .

iii) Briefly explain the importance of phytotoxicity assessment in ecotoxicity evaluation.

iv) Write three reason to be used *Allium cepa* test system in genotoxicity assessment.

(30 minutes)

3) Write an account on followings

i) Bioaccumulation of toxicants

ii) An abiotic and biotic degradation processes of toxicants.

(30 minutes)

4) “Ecological risk assessment is highly applied tool in ecotoxicological studies”.

Briefly describe the ecological risk assessment process.

(30 minutes)