

June – 2022

EN1102-Environmental Pollution Remediation and Toxicology

Structured and Essay Type

Time: 2 Hours and 30 Minutes

Index Number

INSTRUCTIONS

Answer ALL questions.

Answer to the structured questions in Part A must be written in the spaces provided.

Answers to essay type questions in Part B must be written on the answer books.

All questions carry equal marks.

Only non-programmable calculators are permitted.

Mobile Phones are not allowed

PART A – Structured Type - Answer ALL Questions

1. Risk analysis is very important in the determination of threats due to the environmental pollution.

a. List the major steps in risk analysis.

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(05 Marks)

b. How do you differentiate hazard and risk?

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(05 Marks)

c. List the reasons for the environmental risk assessment.

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(10 Marks)

d. List the steps in Risk assessment with a brief description of each step.

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(20 Marks)

e. Dose Response Assessment is performed during the environmental risk assessment.

- What does it mean by the Dose Response Assessment?

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(10 Marks)

- RfD, NOAEL, Actual Threshold, LOAEL are frequently used terms in environmental risk assessment. Explain them using suitable sketches.

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(20 Marks)

c. Distinguish between PM10 and PM2.5

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(10 Marks)

d. Briefly describe what are the reasons for oboe categorization of particulate matter

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(20 Marks)

e. State 3 methods which can applied for particulate pollution control from the source.

- 1.....
- 2.....
- 3.....

(10 Marks)

f. State three methods which can applied for NOx emission control from the source.

- 1.....
- 2.....
- 3.....

(10 Marks)

g. State three methods which can applied for SOx emission control from the source.

- 1.....
- 2.....
- 3.....

(10 Marks)

What is meant by emission inventory?

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(10 Marks)

i. State four areas which gathered information from emission inventories can be applied in the air quality management plan/system.

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1. (a). What does remediation mean with respect to the environmental pollution? Briefly explain. (10 Marks)
- (b). The small tank near the gate of the Faculty of Agriculture, University of Ruhuna have been polluted. Faculty Administration requests you to look into the matter and identify the sources of pollutions and make a longlasting plan to prevent the pollution further.
- What are the very basic steps to be followed to identify the pollution problem? (15 Marks)
 - What are the steps you would follow for the preparation of pollution prevention plan. (15 Marks)
- (c). What are the major anthropogenic activities that accelerate the environmental pollution? (20 Marks)
- (d). Once a toxicant enters into the body, the actual effect of a toxic chemical on the target organ determined by several processes. What are those processes? Explain them briefly. (30 Marks)
- (e). List major pollutants that release to the environment due to agricultural activities (including animal husbandry) (10 Marks)
2. (a). Phase distribution is very important in pollution distribution. What is meant by phase distribution? (20 Marks)
- (b). How do you use following coefficients for the phase distribution?
- Sorption coefficient
 - Henry's constant (20 Marks)
- (c). Following soil properties were determined in a contaminated site.
- Soil water content - 28 % (volume basis)
 - Soil gas content - 12%
 - Bulk density of the soil - 1.5 g/cm^3
- The concentration of a particular pollutant in soil water is 6.5 mg/L . If the sorption coefficient and the Henry's constant of the pollutant in the site is 10 mL/g and 0.25 , respectively; Determine the unit mass of the contaminant in the site (25 Marks)
 - Determine the pollutant fraction in water, air and retained by soil solids. (15 Marks)
 - If the volume of contaminated soil in the site is 550 m^3 , calculate the total contaminant mass. (20 Marks)
3. Noise generation is associated with most of our daily activities. A healthy human ear responds to a very wide range of SPL from - the threshold of hearing at zero dB, uncomfortable at 100-120 dB and painful at 130-140 dB. Due to the various adverse impacts of noise on humans and environment, noise should be controlled.
- Write an account on strategic noise management plan for the industry with noise generation activities describing all steps involved starting from best approach. (60 Marks)
 - Write technical illustration about noise control measures taken by industry visited at your field exposure visit. (40 Marks)

4. a. Explain what emission trading is and how it may be used to promote reduced emissions between international neighbours.

(10 Marks)

b. Fill the following table

Pollutant	Sources	Effects on human, plants and environment
i. CO		
ii. NO ₂		
iii. SO ₂		
iv. CFC		
v. Pb		
vi. Hg		
vii. VOC		
viii. PAN		
ix. Tropospheric Ozone		
x. Furan		

(40 Marks)

c. What is the SDG related to air pollution and explain its target

(20 Marks)

d. Describe a biological and chemical indoor air pollutant (2 different pollutants), its potential health impacts and describe two (2) potential engineering remedies to reduce their health impacts.

(30 Marks)

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