

BINDURA UNIVERSITY OF SCIENCE EDUCATION

CHEMISTRY DEPARTMENT

CH404: ENVIRONMENTAL MANAGEMENT

2 HOURS

APR 2025

ANSWER QUESTION 1 AND FOUR (4) OTHER QUESTIONS. EACH QUESTION CARRIES 20 MARKS

1. (a) (i) Describe how acid rain affects the environment. [8 marks]
(ii) Give any 2 formulae for the formation of acid rain [2 marks]
- (b) Noise pollution is not usually placed among the top environmental problems; however, it is one of the more frequently encountered sources of pollution in everyday life. What are the stress reactions that are associated with continuous exposures to sound exceeding 70 dB [4 marks]
- (c) ISO standards are developed according certain principles. What are the principles? [6 marks]
2. (a) Define the following with regard to forms of regulation or legislation in environmental management
(i) Law
(ii) Treaty
(iii) Declaration
(iv) Convention
(v) Protocol [5 × 2 marks]
- (b) Illustrate the major decision making steps in a typical environmental management process. [10 marks]
3. Describe the principles of Green Chemistry. [20 marks]
4. (a) A binary separator, a magnet, is to separate a product, ferrous materials, from a feed stream of shredded refuse. The feed rate to the magnet is 1000 kg/hr and contains 50 kg of ferrous materials. The product stream weighs 40 kg, of which 35 kg are ferrous materials. What is the percent recovery of ferrous materials, their purity, and the overall efficiency? [6 marks]
- (b) Describe the factors that affect siting considerations hazardous waste management facilities. [14 marks]

5. (a) The effluent from this wastewater treatment must meet the following effluent standards:
Waste water Treatment
BOD < 15 mg/L
SS < 15 mg/L
P < 1 mg/L.
- Define
(i) BOD
(ii) SS [4 marks]
- (b) Waste water treatment includes primary, secondary and tertiary treatment. Describe these stages of treatment [5+5+6 marks]
6. Discuss the aims and achievements of the Kyoto Protocol of 1997. [20 marks]