

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

**JUNE/JULY EXAMINATION**

**COURSE CODE: ESM444**

**COURSE TITLE: INDUSTRIAL WASTES AND INDUSTRIAL WATER TREATMENT**

**TIME ALLOWED:2 HOURS**

**INSTRUCTION: Answer any four questions**

Q1

1. Describe the closed recirculation water system. (3½ marks)
2. Explain how scales and corrosion can be controlled in a closed recirculation water system (5 marks)
3. List six advantages of closed recirculating water system(6 marks)
4. Explain briefly the industrial applications of closed recirculation water system (3 marks)

Q2

1. Describe the need for External and Internal treatments for boilers(7½ marks)
2. List four important features of an Industrial boiler water treatment (4 marks)
3. Discuss problems associated with the use of boilers(6 marks)

Q3

(a) Identify the various sources and composition of industrial wastewaters.(5 marks)

(b) Industrial Wastewaters are treated to obtain good quality water for specific purposes. List the different procedures used in industrial wastewater treatment.(5 marks)

(c) Describe briefly the Preliminary and Primary treatments for an industrial wastewater.

(7½ marks)

Q4

(a) Identify some industries that generate waste and comment on the types of waste they generate(8 marks)

(b) Discuss briefly the Impact of Industrial Waste on the Environment(10 marks)

Q5

1. Discuss the integrated methods of waste disposal (10 marks)
2. List 5 methods of waste reduction (7½ marks)

Q6

(a) What is recycling in waste management?(7 marks)

(b) What is meant by ‘biological reprocessing’?(6 marks)

(c) List 5 advantages of recycling. (5 marks)