



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
2021_2 EXAMINATION

COURSE CODE: EMT 304

COURSE TITLE: Hazardous Substances Management

CREDIT: 2 Units

TIME ALLOWED: 2 Hour

Instruction: Attempt question number ONE (1) and any other THREE (3) questions. Question number one (1) is compulsory and carries 25 marks, while the other questions carry equal marks (15) each.

1a) List and explain the two basic terms used to describe harmful substance effects on human beings (4marks)

1b) With vivid examples, explain how hazardous substance gets to the environment through natural source (5 marks)

1c) With an example, describe how hazardous substance anthropogenic source (5 marks)

1d) Briefly describe the routine and accidental release of hazardous substance? (4 marks)

1e) List four criteria used to classify hazardous substance (4 marks)

1f) What are the consequences of hazardous substance? (3 marks)

2a) Write explanatory notes on radioactive waste (7 marks)

2b) Explain the term 'Aerated Lagoon.' (5 marks)

2c) Discuss the process of anaerobic digestion of sludge production during the treatment of waste water (3 marks)

3a) Outline the characteristics of waste water parameters during the operation of biological treatment process (5 marks)

3b) Describe the acclimation process of biological treatment of hazardous waste (5 marks)

3c) Discuss the following terms of thermal treatment of hazardous waste:

i. Plasma Arc

ii. Molten salt (5 marks)

4a) Discuss atomized suspension of incineration (5 marks)

4b) Outline five advantages of fluidized bed incineration (5 marks)

4c) With aid of diagram, show the key considerations of the minimization program for low- and intermediate- level radioactive wastes (5 marks)

5a Discuss bioreactor system (5 marks)

5b) Explain composting (5 marks)

5c) What do you understand by microbial inocular? (5 marks)