NOUN
NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SCIENCES
DEPARTMENT OF ENVIRONMENTAL SCIENCE AND RESOURCE MANAGEMENT
Plot 91, Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
2024_1 EXAMINATION.

COURSE CODE: ESM 444
COURSE TITLE: INDUSTRIAL WASTE AND INDUSTRIAL WATER SYSTEM
CREDIT: 2 Units
TIME ALLOWED: 2 Hours
Instruction: Attempt question number ONE (1) and any other TWO (2) questions. Question number one (1) carries 30 marks, while the other questions carry (20) marks each.

QUESTION 1
i.   Define the term industrial waste with examples (5mks)
ii.   List and describe five reasons why boiler water treatment is required (10mks)
iii. Describe the three (3) main methods of waste collection (10mks)
iv.   State five reasons for continuous polluting of environment in Nigeria (5mks)

QUESTION 2
i.   Mention the three (3) different types of recirculation water system (3mks)
ii.   State at least five (5) components of the cooling system (5mks)
iii. List six (6) advantages and disadvantages of waste management (12mks)

QUESTION 3
i.   State the reason of transferring heat absorbed in the closed recirculation system to open recirculation system (3mks)
ii.   Differentiate between biodegradable and non- biodegradable (8mks)
iii. Mention three major types of wastewaters, source, examples and discuss briefly on them (9mks)

QUESTION 4
i.   Define the term pollution (2mks)
ii.   State the 3Rs in waste management and discuss on each of them with at least five examples of each (14mks)
iii. State the three (3) main function of Oxygen Scavengers used for Boiler Treatment (4mks)

QUESTION 5
i.   Mention five (5) impacts of industrial waste on the environment (5mks)
ii.   Discuss on the four processes of solids removal from industrial wastewater(9mks)
iii. Define water and describe the three various states of water (6mks)