



UNIVERSITY OF RUHUNA
FACULTY OF FISHERIES AND MARINE SCIENCES & TECHNOLOGY

Academic Year 2023/2024

Bachelor of Science Honours in Marine and Freshwater Sciences Degree

Level III Semester I Examination - October/November 2024

OCG 3181: Marine Chemistry

Time: 1 hour

Answer only Two (2) questions.

1.
 - a. Briefly describe the sources and fate of Polycyclic Aromatic Hydrocarbons (PAHs) once they are introduced into the marine environment. (15 marks)
 - b. Describe the sampling and analytical methods used to detect and measure Polycyclic Aromatic Hydrocarbons (PAHs) in the marine environment. (20 marks)
 - c. Explain how n-alkanes and the pristane/phytane ratio can be used as biomarkers in oil geochemistry and for assessing redox conditions in oceanic environments. (15 marks)
2.
 - a. Providing relevant diagrams, explain the interactions of dimethylsulfide (DMS) and carbon monoxide (CO) production, consumption, and emission pathways in a changing Arctic Ocean. (30 marks)
 - b. Explain how the release of dimethylsulfide (DMS) and carbon monoxide (CO) from the ocean affects the atmospheric chemistry and Earth's climate. (20 marks)
3.
 - a. Using relevant examples and diagrams, explain how geochemical tracers, along with their relationships, can be used to identify the processes associated with carbon and nitrogen cycling in suboxic or anoxic shelves. (30 marks)
 - b. Using relevant diagrams, explain how the relationship between $\delta^{13}\text{C}$ of dissolved inorganic carbon ($\delta^{13}\text{C}_{\text{DIC}}$) and nutrients can be employed to assess the anthropogenic CO_2 invasion in the ocean. (20 marks)

4. Write short notes on the following:
- a. Unresolved Complex Mixture (UCM)
 - b. Equilibrium fractionation of carbon isotopes
 - c. Ecological impacts of Polycyclic Aromatic Hydrocarbons (PAHs) in the ocean
 - d. Carbon Capture Storage (CCS) technology
 - e. Ecological Impacts of iron fertilization in High Nutrient, Low Chlorophyll (HNLC) regions

(10 marks x 5: 50 marks)

@@@@@@@@@@



Answer

- 1) "Mo
ecos
- 2) Expl
from
- 3) Disc
effic