



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 7 Examination in Engineering: March 2022

Module Number: ME 7211

Module Name: Energy Technology (C-18)

[Three Hours]

[Answer all questions, each question carries ten marks]

All assumptions must be stated clearly. Sketches and diagrams are to be provided where required. Symbols stated herein denote standard parameters.

- Q1 a) Briefly describe the formation process of Petroleum Oil Deposits. [4.0 Marks]
- b) Discuss the possible reasons for the recent fossil fuel price increase in the world market. [3.0 Marks]
- c) State two non-conventional fossil fuel sources. Discuss their advantages and disadvantages. [3.0 Marks]
- Q2 a) What is called the "Green House Effect" and how does it lead to "Global Warming"? [4.0 Marks]
- b) State three Green House Gases (GHGs) emitted to the atmosphere due to the usage of Fossil Fuels and discuss their main human activity sources and Global Warming Potential (GWP). [6.0 Marks]
- Q3 a) List out the four (04) biomass technologies available in the world. [4.0 Marks]
- b) What are the methods available for direct combustion of biomass in the industry? Briefly explain two of these methods with suitable sketches. [6.0 Marks]
- Q4 a) State the definition of biogas? What would be the normal composition of biogas? [2.0 Marks]
- b) What are the triple important benefits you can obtain from Biogas Technology? [1.5 Marks]
- c) By drawing a schematic diagram, briefly explain three stages of anaerobic fermentation of biomass. [1.5 Marks]
- d) Name five (05) factors that influence biogas production. [2.5 Marks]
- e) Based on the construction, what are the three main types of simple biogas plants available in the world? With an appropriate sketch briefly explain the function of any biogas plant stated above. [2.5 Marks]

- Q5 a) Point out the five (05) main methods of ocean energy extraction. [3.0 Marks]
- b) "Ocean is considered as the world largest thermal collector and also there are obstacles for harnessing energy from the ocean". Give reasons in point form to verify the above statement. [4.0 Marks]
- c) State the types of wave energy extraction devices with sketches and briefly describe them. [3.0 Marks]