

UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE IN FISHERIES AND MARINE SCIENCES DEGREE
Level IV Semester I Examination

July /August 2015

OCG 4122 - Hydrocarbons and Mineral Resources

Time: 01 ½ hours

Answer **any three (03)** questions

01. a. Briefly explain the three main biogeochemical processes sediment undergoes during petroleum formation.
- b. "At times during the mid-Cretaceous (122-90 my), dysoxic and anoxic conditions developed in oxygen minimum zones along continental margins of the tropical Tethys Sea, in restricted epicontinental seas, and in basins of the widening North and South Atlantic Ocean basins. The mid-Cretaceous was also a time of rapid radiation and turnover in the marine plankton"
- i. Would the mid Cretaceous period be suitable for petroleum source rock formation? Explain
- ii. If you assume that petroleum would be formed during this period, what is the main type of kerogene that could be formed? List the characteristics of this kerogene type.
- iii. Giving examples, briefly explain in what kind of environments petroleum formation could be initiating today?
02. Landmass of Sri Lanka is composed of high grade metamorphic rocks, usually devoid of oil and gas. However, since there are a few sedimentary formations in Sri Lanka, assume that you are assigned to explore whether there is a potential to occur petroleum resources within the landmass.
- a. Briefly describe exploration methods to find and locate suitable sedimentary basins
- b. Assuming you found a suitable sedimentary basin, design an exploration program to identify its petroleum potential.
03. a. Compare and contrast natural gamma and gamma ray density techniques used in wireline logging
- b. If you have to identify oil/gas reservoirs in a formation consist of alternating sandstone/limestone/shale layers, what logging tools you would use. Explain why you deploy them.

04. a. Write a brief description about two main beach placer mineral deposits around Sri Lanka
- b. Figure 1 shows the proposed extended continental shelf of Mauritius, situated on the Central Indian Ridge (mid ocean ridge) of the Indian Ocean.
- i. If proposed extended shelf area is potential for mineral resources what could be the most potential types of deposits?
 - ii. Describe the origin of these deposits.

Figure 1 – Location of the proposed extended shelf of Mauritius with respect to Central Indian Ridge

