

FEDERAL UNIVERSITY OF TECHNOLOGY,
SCHOOL OF PHYSICAL SCIENCES
DEPARTMENT OF GEOLOGY

COURSE TITLE: PETROLEUM GEOLOGY
COURSE CODE: GLY 502 SESSION 2017/2018
SEMESTER: HARMATTAN TIME ALLOWED 2 HOURS
DATE: August, 2018 INSTRUCTION: Answer Questions 4 and one other question from both Sections A and B (Total is 3 Questions in all)

Section A.

QUESTION 1

- What are the two dominant physical properties of oil and gas
- Explain in clear terms the sources of data on reservoir fluids
- When a core from a petroleum reservoir is cut and brought to the surface, its temperature and pressure decline to the levels that exist on the surface. What effects will this action have on reservoir fluids? And how will the ensuing discrepancies be remedied
- With good examples, how are reservoir fluids distribution and contacts used to predict i. hydrostatic conditions in reservoirs and ii. The geologic history of traps

QUESTION 2

- Define the following terms: bottom water, edge water, connate water, free water and interstitial water. What are the effects of interstitial water content of the reservoirs
- Marine organic Matter is the principal source of the most suitable sedimentary organic matter for petroleum generation. True/False. Do we have any other theories that contradict this?
- Describe the elemental method of kerogen study
- The evolution of organic matter with increasing depth of burial and rising temperature appears on the Van Krevelen diagram as a change of composition along the same evolution path. How?

QUESTION 3

- Mention and state the aim of initial geochemical investigations in hydrocarbon exploration.
- What is a geologic fence
- State 2 limiting factors each that influence origin and migration of petroleum
- Why do petroleum geologists undertake a study of some of the natural environmental conditions that are known to prevail in present pools?
- What are the overriding factors that determine the variations in composition of petroleum, which ensured no two petroleum to be exactly alike in composition?

QUESTION 4

- With necessary equations and diagrams show how hydrodynamic entrapment of petroleum is achieved?
- With equations differentiate between k and K . Also state why one is preferable in the oil industry
- What do you understand by external, internal and fluid barriers to petroleum migration?
- The origin of petroleum is a low temperature phenomenon. How?

SECTION B

- What do you understand by wet gas, associated and non-associated gas?
 - What is the main difference between condensate and liquefied petroleum gas (LPG). Give an example where such can be found in the Niger Delta
 - Niger Delta Crude is light colored, low gravity, rich in paraffin, while Californian, Venezuela and Mexican crudes are entirely the opposite of the qualities listed above. Succinctly discuss at least factors that caused these variations
- Use only a formula to represent API and classify crude oils using API values
 - Discuss one of the following: Tar Sand using Nigerian examples or the role of Bonny light and Brent crude in the global oil price.
 - Interpret the reservoir structure using transect line D or E
 - Attempt a reservoir description of your answer in (c), assuming that the rock type is orthoquartzites

Dr. S.O Onyekuru and Dr. Njoku I. O.

