

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
MINERAL PHYSICS**

GPHY 215: PETROLEUM GEOLOGY

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 13/04/2023

11.30 A.M. – 1.30 P.M.

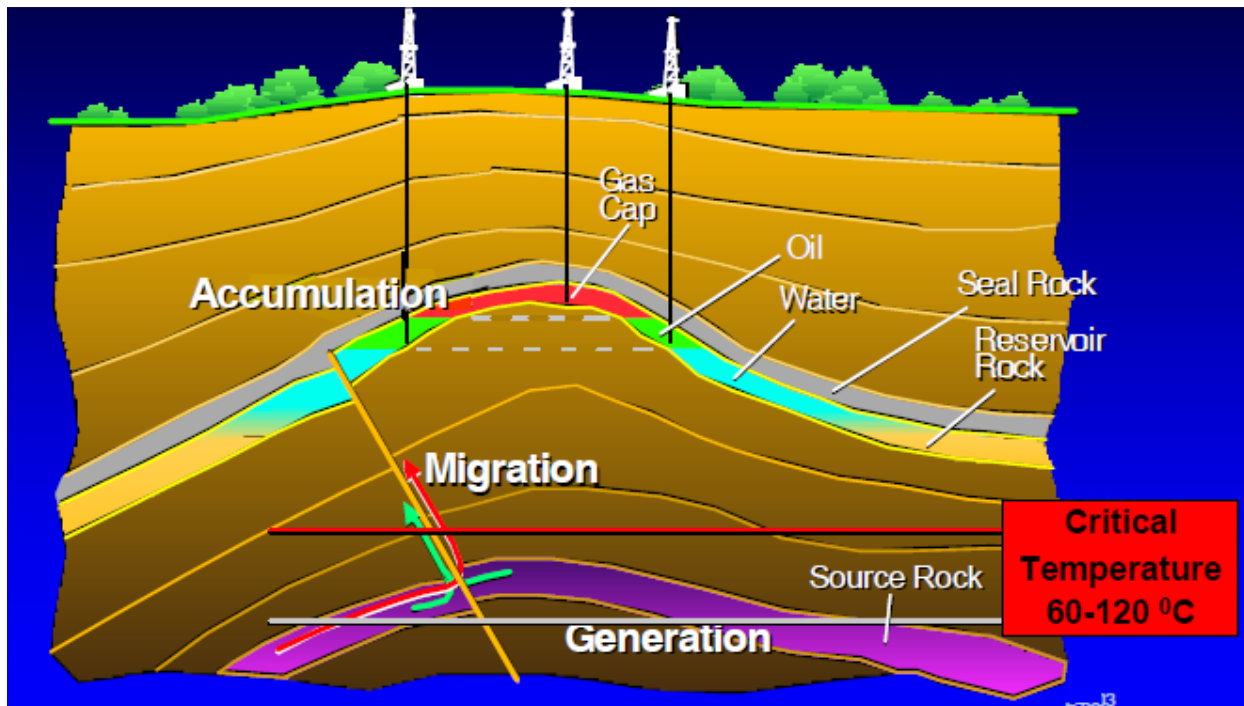
INSTRUCTIONS

Answer question one and any other two questions

QUESTION ONE (30 MARKS)

- a) Explain the origin of oil in terms of geological and chemical occurrences [4 marks]
- b) List the regions with high production of petroleum [2 marks]
- c) Explain the distribution of productivity listed in (b) above [3 marks]
- d) What is the difference between primary and secondary migration [2 marks]
- e) Explain how primary migration occurs [5 marks]
- f) Explain the process that leads to overpressuring in primary migration [4 marks]
- g) State the difference between petroleum and hydrocarbon [2 marks]
- h) Discuss the four major groups of substances present in petroleum [4 marks]
- i) Explain any two different types of traps [4 marks]

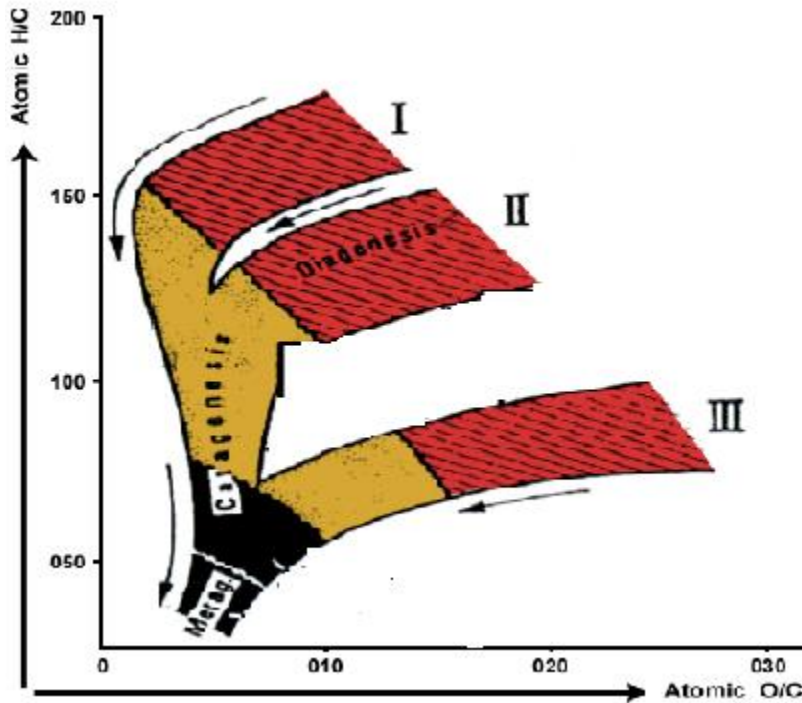
QUESTION TWO (20 MARKS)



- 2 a) What type of trap is represented in the above model? Explain [2 marks]
- b) Using the model diagram above, describe the characteristics of the seal rock and reservoirs [12 marks]
- c) Based on the temperature differences, explain the splitting of crude oil into simpler mixtures by fractional distillation [6 marks]

QUESTION THREE (20 MARKS)

3. a) Discuss the three processes that takes place in the conversion of Kerogen to oil and gas. [15 marks]
- b) Explain the curve for Kerogen evolution shown below [5 marks]



QUESTION FOUR (20 MARKS)

3. a) Explain the formation of rift and passive margin basins [10 marks]
- b) Give the structure of the following hydrocarbons
- i) Ethene
 - ii) Methyl [4 marks]
- c) Explain the following refinery processes
- i) Separation process
 - ii) Primary distillation
 - iii) Secondary distillation [6 marks]

QUESTION FIVE (20 MARKS)

4. a) Explain the application of the following geophysical methods in oil exploration
- i) Magnetic method [6 marks]
 - ii) Gravity method [6 marks]
 - iii) Seismic method [8 marks]