



TECHNICAL UNIVERSITY OF MOMBASA

Main Paper

Faculty of Applied and Health Sciences

Department of Pure & Applied Sciences

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY

AAB 4303:PETROLEUM GEOMICROBIOLOGY

END OF SEMESTER EXAMINATION

SERIES: JULY 2025

TIME: 2 HOURS

DATE: N/A JUL 2025

Main Paper

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- a) Define the following terminologies in the context of Petroleum Geomicrobiology
 - i) Fossil fuel
 - ii) Tar
 - iii) Crude oil
 - iv) Bioremediation
 - v) Ocean acidification (5 mks)
- b) Describe swamp and stagnant water formation for sediment basin creation and gas production (5 mks)
- c) Discuss thermal maturation and cooking of organic matter to form source rock (5 mks)
- d) Discuss oil decomposition and formation of natural gas, char and graphite rocks (5 mks)
- e) Discuss oil decomposition and formation of natural gas, char and graphite rocks (5 mks)
- f) Discuss chemical evolution as the origin of atmosphere and biosphere (5 mks)

Question TWO

- 2a) Discuss microbial petroleum biodegradation in natural environments (10 mks)
- 2b) Discuss the role of microorganisms in oil mining and recovery (10 mks)

Question THREE

- a) Describe sedimentary rock and metalliferous sediment chemical and mineral composition during diagenesis (10 mks)
- b) Kerogen is a precursor of hydrocarbons that lead to oil and gas for formation. Discuss (10 mks)

Question FOUR

- a) Discuss abiogenic origin of petroleum and the tenets supporting its occurrence (10 mks)
- b) Discuss microbial petroleum biodegradation in natural environments (10 mks)

Question FIVE

- a) Discuss the role of microorganisms in oil mining and recovery (10 mks)
- b) Describe swamp and stagnant water formation for sediment basin creation and gas production (10 mks)