



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF PURE AND HEALTH SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR BACHELOR IN INDUSTRIAL MICROBIOLOGY  
AND BIOTECHNOLOGY

AAB 4303:PETROLEUM GEOMICR BIOLOGY (PAPER 2)

END OF SEMESTER EXAMINATION: APRIL 2016 SERIES

TIME                                  2 HOURS

DATE

## 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)(i) Describe chemical origin and accumulation of petroleum 8marks

(ii) Explain the role of biosurfactants in petrology 7marks

(b)(i) Discuss the importance of microorganisms in the Ocean 8 marks

(ii) Explain the effect of pressure on the distribution of aquatic organisms. 7 marks

## **QUESTION TWO**

(a)(i) Describe the structure and distribution of phosphatic microfossils 8 marks

(ii) Briefly describe the Earth's lithosphere. 7marks

(b)(i) Before the emergence of life, what gases composed the earth's primitive atmosphere?  
3marks

(ii) What are the major distinctions between prokaryotes and eukaryotes? 2 marks

## **QUESTION THREE**

(a)(i) Describe geologic history of oxygen 8 marks

(ii) Discuss methods of petroleum exploration

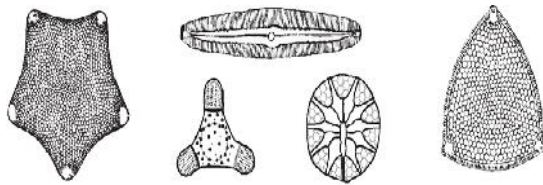
7 marks

(b)(i) Distinguish between lotic system ecology and lentic system ecology

2marks

(ii) Identify the microfossils shown and state how they associated with formation of petroleum

3 marks



#### QUESTION FOUR

(a)(i) Discuss microbial enhanced oil recovery method in petrology

8 marks

(ii) Describe the uses of microbial biosensors

6marks

(b) (i) Define the term bioleaching and importance in metal mining

2 marks

(ii) State factors Influencing petroleum hydrocarbon degradation 4 marks

(iii) State any two hydrocarbonoclastic bacteria 2 marks

### **QUESTION FIVE**

(a)(i) Explain the role of geomicrobiology in removal and disposal of heavy metals and Pollutants  
8 marks

(ii) State the interacting mechanisms required for hydrocarbon degradation 5marks

(b)(i) Explain the consequences of build up of oxygen in the early atmosphere 3 marks

(ii) Describe the use of microorganisms in the exploration of oil 4mark