

## TECHNICAL UNIVERSITY OF MOMBASA

| FACULTY OF PURE AND HE   | ALTH SCIENCES                              |                     |
|--|--|---------------------|
| DEPARTMENT OF PURE AN  | D APPLIED SCIENCES                         |                     |
| UNIVERSITY EXAMINATION AND BIOTECHNOLOGY   | N FOR BACHELOR IN INDUS                    | STRIAL MICROBIOLOGY |
| AAB 4303: PETROLEUM GEO  | OMICRBIOLOGY (PAPER 2)                     |                     |
| END OF SEMESTER EXAMIN   | NATION: APRIL 2016 SERIES                  | 3                   |
| TIME 2 HO  | URS  |                     |
| DATE   |  |                     |
| INSTRUCTIONS TO CANDID   | <u>ATES</u>                                |                     |
| You should have the following for<br>-Answer Booklet, examination<br>THIS PAPER CONSISTS OF F<br>(Compulsory) AND ANY OTHI | pass and student ID  IVE QUESTIONS. ATTEMP | QUESTION ONE        |
| Do not write on the question par   | per.                                       |                     |
| QUESTION ONE   |  |                     |
| (a)(i) Describe chemical origin an   | d accumulation of petroleum                | 8marks              |
|  |  |                     |
| (ii) Explain the role of biosurfact  | ants in petrology                          | 7marks              |

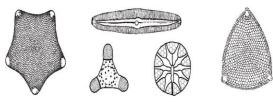
8 marks

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

| (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 atm 3marks | osphere? |
| (ii) What are the major distinctions between prokaryotes and eukaryotes?                  | 2 marks  |
| QUESTION THREE  |          |
|   |          |
| (a)(i) Describe geologic history of oxygen  | 8 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 Pollutants 8 | vy metals and<br>marks |
| (ii) State the interacting mechanisms required for hydrocarbon degradation               | on 5marks              |
| (b)(i) Explain the consequences of build up of oxygen in the early atmosph               | here 3 marks           |
| (ii) Describe the use of microorganisms in the exploration of oil                        | 4mark                  |