

Name _____

Index No. _____

Candidate's Signature _____

2528/2/13
29/2/2015
ENVIRONMENTAL MICROBIOLOGY
December 2013
Duration: 3 hours

Date _____



7 JAN 2015



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY
MODULE II

ENVIRONMENTAL MICROBIOLOGY
3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
You should have a non-programmable scientific calculator for this examination.
This paper consists of TWO Sections: A and B.
Answer ALL the questions in Section A and any THREE questions from Section B in the spaces provided in this question paper.
Each question in Section B carries 4 marks while each question in Section B carries 20 marks. Marking marks for questions in Section B are as indicated.
Candidates should answer the questions in English.

For Examiner's Use Only

| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|-------------------|---|---|---|---|---|---|---|---|---|----|-------|
| Candidate's score | | | | | | | | | | | |

| Question | SECTION A | | | | | SECTION B | | | | | GRAND TOTAL | |
|-------------------|-----------|----|----|----|----|-----------|----|----|----|----|-------------|----|
| | 11 | 12 | 13 | 14 | 15 | Total | 16 | 17 | 18 | 19 | | 20 |
| Candidate's score | | | | | | | | | | | | |

If the paper consists of 16 printed pages, Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (40 marks)

Answer ALL the questions from this section in the space provided.

1. Name any four classes of microorganism.

(4 marks)

2. State any four characteristics of algae.

(4 marks)

3. Name any four modes of action of antimicrobial drugs.

(4 marks)



4. Identify four factors which limit growth in the stationary phase of a bacterial growth curve.

(4 marks)

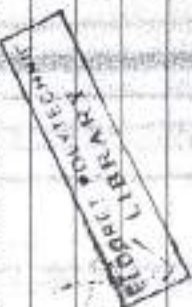
$\mu = 0$
 $\frac{dN}{dt} = 0$
 $\frac{dS}{dt} = 0$

5. Explain the two methods of bacterial fixation.

(4 marks)

6. Differentiate between facultative anaerobes and obligate anaerobes.

(4 marks)



7. State any two functions of each of the following parts of bacterial cell:

(a) cell wall;

(2 marks)

(b) cell appearance

(2 marks)

6. Explain the two functions of iodine during Gram Staining of microorganisms.

(4 marks)



9. State any four reasons for supplying ... of a solid media.

(4 marks)

10. Distinguish between simple staining and differential staining.

(4 marks)



SECTION B: (60 marks)

Answer any THREE questions from this Section in the space provided after Question 15.

11. (a) Describe the structure of a yeast cell.

(5 marks)

(b) Outline the five stages of binary fission.

(5 marks)

(c) With the aid of a diagram, explain the working principle of a septic tank in wastewater treatment.

(10 marks)

12. (a) Explain any four factors influencing sterilization.

(8 marks)

(b) Describe the following methods of sterilization:

- (i) U.V. radiation;
- (ii) Autoclave;
- (iii) Hot air Oven.

(4 marks)

13. (a) Draw a labelled diagram of a light microscope.

(8 marks)

(b) Explain any six safety measures when handling a microscope.

(12 marks)

14. (a) Name any four ingredients of a culture medium.

(4 marks)

(b) Describe the following processes in beer production:

- (i) mashing;
- (ii) malting.

(6 marks)

(c) Explain any two health effects of alcohol abuse.

(4 marks)

Turn over

15. (a) Explain the four personal safety precautions in a microbiology laboratory. (8 marks)

(b) Explain any four factors that control growth of microorganisms. (12 marks)



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