

2528/203
2922/203
ENVIRONMENTAL MICROBIOLOGY
Oct./Nov. 2011
Time: 3 hours



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

ENVIRONMENTAL MICROBIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Non-programmable Scientific Calculator.

This paper consists of TWO sections: A and B.

Answer ALL questions in section A and any THREE questions from section B.

Each question in section A carries 4 marks while each question in section B carries 20 marks.

Maximum marks for each part of a question are indicated.

This paper consists of 3 printed pages.

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

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Turn over



SECTION A: (40 marks)

Answer ALL questions in this section.

1. Identify any four classes of microorganisms: **12/24** (4 marks)
2. Name any four inoculating apparatus used in microbiology. (4 marks)
3. Describe the stab slope technique of culturing microorganisms. **15/15** (4 marks)
4. Differentiate between facultative anaerobes and microaerophilic. (4 marks)
5. Draw the shapes of the following bacteria:
 - (a) cocci; (1 mark)
 - (b) spirochete; (1 mark)
 - (c) vibrio; **1/1** (1 mark)
 - (d) spirillum; (1 mark)
6. State the method of staining bacterial capsule. (1 mark)
 - (b) List the steps of staining bacterial capsule. (3 marks)
7. Identify any four morphological characteristics of Ascomycetes fungi. (4 marks)
8. List any four cytotoxic effects of viruses on their host cells. (4 marks)
9. Name the four morphological shapes of viruses. (4 marks)
10. State any two functions of each of the following parts of a microscope:
 - (a) arm; (2 marks)
 - (b) revolving nose piece. (2 marks)



SECTION B (60 marks)

Answer any THREE questions in this section.

11. (a) Using a diagram, explain the formation of a spore in bacterial cell. (14 marks)
- (b) Explain any three effects of bacterial spores in food industry. (6 marks)
12. (a) Outline the steps involved in industrial beer production. (12 marks)
- (b) Explain any two harmful effects of alcoholic drinks in human body. (8 marks)
13. (a) Explain any four modes of action of drugs on microbes. (12 marks)
- (b) Describe the procedure of wet preparation in microbial examination. (8 marks)
14. (a) Explain any five effects of sewage in the environment. (10 marks)
- (b) Describe the biological treatment of sewage. (10 marks)
15. (a) Describe the procedure by which cow dung can be used to produce biogas. (8 marks)
- (b) The figure 1 represent normal bacterial growth curve.



- Figure 1
- (i) Name the phases I, II, III and IV. (4 marks)
 - (ii) Describe each of the phases in figure 1. (8 marks)