2914/104
TAXONOMY, CYTOLOGY AND MICROBIOLOGY
June/July 2019
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY

MODULE I

TAXONOMY, CYTOLOGY AND MICROBIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
Scientific calculator (battery operated).
*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.
Candidates should answer the questions in English.

This paper consists of 4 printed pages.

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

Turn over

SECTION A (40 marks)

Answer ALL the questions in this section.

1. (a) State the aims of classifying organisms. (2 marks)

   (b) Describe the binomial nomenclature. (2 marks)

2. Slime mould resemble both protozoa and true fungi. Justify this statement. (4 marks)

3. (a) List the general characteristics of algae. (2 marks)

   (b) Classify baker's yeast up to order level. (2 marks)

4. Figure 1 shows the parts of a light microscope. Name the parts labelled A to H. (4 marks)

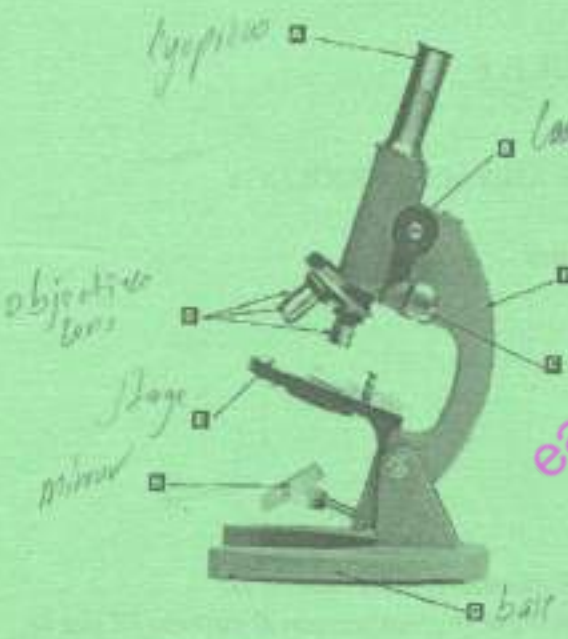

Fig. 1 - The light microscope

5. Draw a labelled diagram of a plant cell as seen under the light microscope. (4 marks)

6. (a) Differentiate between the daughter cells resulting from mitosis and meiosis. (2 marks)

   (b) (i) With reason, suggest what would happen if meisosis produced diploid gametes in human. (2 marks)

7. (a) Differentiate between gram positive and gram negative bacteria. (2 marks)

   (b) Classify rod-shaped bacteria based on cell arrangements. (2 marks)

8. (a) List **four** methods of dry heat sterilization. (2 marks)

(b) State any **two** advantages of moist heat sterilization. (2 marks)

9. Describe any **four** routes of exposure to infections in the laboratory. (4 marks)

10. Identify a suitable method for sterilizing each of the following:

(a) wire loop;

(b) infected serum;

(c) internal surface of a safety cabinet;

(d) glassware. (4 marks)

SECTION B (60 marks)

*Answer any **THREE** questions from this section.*

11. (a) Describe the phases of a bacteria growth curve. (12 marks)

(b) Compare and contrast selective and enrichment media. (4 marks)

(c) Explain the importance of transport media. (4 marks)

12. (a) Outline the collection of swab samples from a laboratory bench for microbiological analysis. (8 marks)

(b) State **six** reasons why a sample for microbiological analysis may be rejected. (6 marks)

(c) List **five** factors that affect the rate of diffusion. (6 marks)

13. Discuss the economic importance of kingdom monera. (20 marks)

14. Outline the following culture techniques:

(a) pour plate method; (10 marks)

(b) streak plate method. (10 marks)

15. (a) Outline the process of mitosis. (10 marks)

(b) Explain why cell membrane is selectively permeable. (2 marks)

(c) Account for the shape of a plant and an animal cell when they are placed in:

(i) Hypotonic solution.

(ii) Hypertonic solution.

(8 marks)

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