2914/104
TAXONOMY, CYTOLOGY
AND MICROBIOLOGY
Oct./Nov. 2021
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY

MODULE I

TAXONOMY, CYTOLOGY AND MICROBIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **TWO** sections; **A** and **B**.*
*Answer **ALL** questions in section **A** and any **THREE** questions from section **B** in the answer booklet provided.*
*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 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.

SECTION A (40 marks)

Answer ALL questions in this section.

1. Classify a leopard using the hierarchical taxonomic system. (4 marks)

2. Differentiate between archaebacteria and eubacteria in terms of:

   (a) cell organization; (1 mark)

   (b) habitat; (1 mark)

   (c) cell morphology; (1 mark)

   (d) cell wall. (1 mark)

3. Explain the economic importance of red dinoflagellates. (4 marks)

4. State the functions of each of the following parts of a light compound microscope:

   (a) revolving nose piece; (1 mark)

   (b) dust shield; (1 mark)

   (c) sub-stage; (1 mark)

   (d) stage. (1 mark)

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

6. Describe the events within the cell during the S-phase of the cell cycle. (4 marks)

7. Differentiate between mitosis in plant and animal cells. (4 marks)

8. Identify the suitable dry heat sterilization method for each of the following materials:

   (a) wire loops; (1 mark)

   (b) mouth of culture bottle; (1 mark)

   (c) waste surgical dressings; (1 mark)

   (d) glassware. (1 mark)

9. State **four** functions of the cytoplasmic membrane of a bacteria. (4 marks)

10. Outline collection of blood from the ear of a rabbit. (4 marks)

SECTION B (60 marks)

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

11. (a) Describe cultivation of microorganisms using McIntosh and Filde's anaerobic jar. (12 marks)

(b) For each of the following types of culture media, identify their composition and uses:

(i) Deoxycholate citrate agar; (4 marks)

(ii) Loeffler's serum slope. (4 marks)

12. (a) Outline the general characteristics of fungi. (10 marks)

(b) Differentiate between zygomycota and ascomycota. (4 marks)

(c) Name **six** plant - like protists. (6 marks)

13. (a) (i) Outline the rules of binomial nomenclature (7 marks)

(ii) State **five** advantages of binomial nomenclature. (5 marks)

(b) (i) List **five** divisions in Kingdom Protista. (5 marks)

(ii) State any **three** characteristics of protists. (3 marks)

14. Describe the characteristics and corrective measures of **five** lens defects. (20 marks)

15. (a) Distinguish between prokaryotes and eukaryotes in relation to:

(i) cell division;

(ii) protein synthesis;

(iii) flagella;

(iv) respiration;

(v) nitrogen fixing. (10 marks)

(b) Differentiate between osmosis and diffusion. (10 marks)

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