



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF PUBLIC HEALTH

PPH 216: PUBLIC HEALTH ENTOMOLOGY

DATE: 26/9/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

1. Answer question 1 in section A and any two questions in Section B.
2. Illustrate your answers with well labeled diagrams wherever appropriate.

SECTION A

QUESTION 1 COMPULSORY

- a. State three main functions of public health 3 marks
- b. Describe the regulation of insecticide use in Kenya. 3 marks
- c. Identify three important details contained in an insecticide label. 3 marks
- d. Identify the species of the vector for the following diseases: 3 marks
 - i. Human African trypanosomiasis
 - ii. Cerebral malaria
 - iii. Visceral Leishmaniasis
- e. Identify up to species and sub species levels the three Anopluran ectoparasites of man and indicate their predilection sites. 3 marks
- f. Explain the economic public health importance of the following organisms: 4 marks
 - i. *Tunga penetrans*
 - ii. *Xenopsilla infestans*
- g. Differentiate between *control* and *eradication* during the management of an insect pest species. 2 marks

- h. Distinguish between culex and anopheles mosquitoes. 2 marks
- i. Explain the biological control of mosquitoes 3 marks
- j. Briefly explain the mode of action of nerve poisons used in vector control. 3 marks

SECTION B. Answer any two questions

QUESTION 2.

- a. Explain legislation in the use of insecticides in Kenya 10 marks
- b. Giving examples, classify insecticides based on their chemical compositions 10 marks

QUESTION 3

- a. Discuss the management issues of a vector control programme in a village. 10 marks
- b. Describe the concept of Integrated Pest and Vector Management 10 marks

QUESTION 4

- a. Explain the economic importance of culex and anopheles mosquitoes 8 marks
- b. Describe the issues involved in safe use of insecticides in public health 10 marks

QUESTION 5

- a. Outline the economic importance of rodents in public health 8 marks
- b. Describe the methods of control of rodents 12 marks



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DEPARTMENT OF BIOLOGICAL SCIENCES

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
POPULATION HEALTH**

HEH 216: ENVIRONMENTAL PARASITOLOGY

DATE: ----- TIME: -----

INSTRUCTIONS:

1. Answer question 1 in section A and any two questions in Section B.
2. Illustrate your answers with well labeled diagrams wherever appropriate.

SECTION A

Question 1 COMPULSORY

- a. Tabulate the infective stage, intermediate stage and vectors of parasites below 3 marks

Parasite	Infective stage	Intermediate host	Vector
<i>Trypanosoma</i>			
<i>Wuchereria</i>			
<i>Schistosoma</i>			

- b. Briefly explain why parasites may persist in the cerebro spinal fluid of man after they have cleared from the bloodstream 3 marks
- c. Explain polymorphism with specific reference to the trypanosome parasite 3 marks
- d. Outline three methods of control of ectoparasites of man. 3 marks
- e. Define the following terms as used in parasitology 3 marks
- i. Obligate parasite
 - ii. Indirect life cycle
 - iii. Zoonosis
- f. Briefly explain how development of parasites can be controlled by the endocrine system of a host. 3 marks
- g. State three requirements for which an endoparasite may depend on its host. 3 marks
- h. Briefly explain why the liver favours habitation by a variety of parasites 3 marks

- i. Identify three protozoan parasites of the alimentary canal of man, and their predilection sites
3 marks

SECTION B. Answer any two questions

Question 2

- a. Briefly discuss acquired immunity arising from infection from *Plasmodium*. 5 marks
b. Discuss methods used in the management of malaria in Kenya. 15 marks

Question 3.

With the use of examples, discuss the environment of the human alimentary canal as an habitat for parasite infestations
20 marks

Question 4

- a. Outline the actions of a host to infection by parasites 6 marks
b. Using examples, discuss the effects of parasite infections on their hosts 14 marks

Question 5

Use an annotated diagram to describe and explain the lifecycle of the parasite *Fasciola hepatica*.
20 marks



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**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE) AND BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION**

SZL 201 INVERTEBRATE ZOOLOGY

DATE: ----- TIME: -----

INSTRUCTIONS:

1. Answer question 1 in section A and any two questions in Section B.
2. Illustrate your answers with well labeled diagrams wherever appropriate.

SECTION A

Question 1 COMPULSORY

- a. outline three key characteristic features of the phylum Porifera. 3 marks
- b. Describe the significance of the intermediate host of the parasite *Taenia solium*. 4 marks
- c. Use an annotated diagram to illustrate the structure of a named Ciliophora 4 marks
- d. Describes four types of nematocytes found in coelenterates 4 marks
- e. State three adaptative features of cestodes to a parasitic mode of life 3 marks
- f. Outline four negative economic importance of insects 4 marks
- g. Illustrate diagrammatically the structures observed on a cross –section of an arm of starfish. 5 marks
- h. Outline three differences between insects and arachnids 3 marks

SECTION B. Answer any two questions

Question 2

- a. Outline the classification of Phylum Annelida 10 marks
- b. Discuss why insects are very successful in surviving on earth. 10 marks

Question 3

- c. Explain alternation of generations in coelenterates 8 marks
- d. Use an annotated diagram to describe the life cycle of *Taenia solium*. 12 marks

Question 4

- a. Using examples, identify the osmoregulatory structures in invertebrates. 6 marks
- b. Describe the phenomenon of torsion in molluscs 14 marks.

Question 5

- a. Based on the coelomic space, briefly outline the evolution of invertebrates 8 marks
- b. Explain the diversity of species in the Phylum **Arthropoda** 12 marks



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**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)**

SZL 100: GENERAL ZOOLOGY

DATE: ----- TIME: -----

INSTRUCTIONS:

1. Answer question 1 in section A and any two questions in Section B.
2. Illustrate your answers with well labeled diagrams wherever appropriate.

SECTION A. compulsory

- Q1. a. Briefly explain "Panspermia". (3 marks)
- b. State the economic importance of any three named members of Kingdom Protista.(3 marks)
- c. Identify any three proteins present in the cell membrane and state their functions (3 marks)
- d. Outline the components of the respiratory system in animals (3 marks)
- e. State three functions of the nucleoplasm (3 marks)
- f. Describe three functions of cytoskeleton in eukaryotic cells (3 marks)
- g. Explain the feedback mechanisms in the regulation of internal environment of cells.(3 marks)
- h. Explain the role of the hypothalamus in temperature regulation in homeotherms. (3 marks)
- i. Explain three principal roles of the lymphatic system. (3 marks)
- j. State the key methods of normal protection against infectious diseases in man. (3 marks)

SECTION B. Answer any other two questions

Question 2.

- a. Compare the structures of an eukaryotic and a prokaryotic cell. (6 marks).
- b. Outline the General characteristics of Phylum Mollusca (7 marks)
- c. Explain the locomotory apparatus in animal - like Protists and their roles. (9 marks)

Question 3

Differentiate between micro – evolution and macro – evolution and explain the evolution mechanisms involved (20 marks)

Question 4

Discuss the composition of the nervous and endocrine systems of the mammalian body and relate them to function (20 marks)

Question 5

Using a well labelled diagram, describe the structure of the nephron. (10 marks)



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**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)**

SZL 105: LABORATORY METHODS AND TECHNIQUES IN ZOOLOGY / BIOLOGY

DATE: ----- TIME: -----

INSTRUCTIONS:

1. Answer question 1 in section A and any two questions in Section B.
2. Illustrate your answers with well labeled diagrams wherever appropriate.

SECTION A

Question 1 COMPULSORY

- a. Explain three advantages of adopting open laboratory designs as opposed to closed laboratories. 3 marks.
- b. Advance three reasons why modern research laboratories are very energy demanding in comparison to older designs. 3 marks
- c. Outline three most desired characteristics of a laboratory 3 marks
- d. Explain why laboratory preserved biological specimens should be handled with care 3 marks
- e. Explain any three items that should be contained in a chemical inventory 3 marks
- f. Describe three modern techniques used in histology 3 marks
- g. Explain three safety measures to follow after cleaning up a chemical spill that constitutes a fire hazard. (3 marks)
- h. Explain three items of personal protective equipment (PPE) commonly used while working in the laboratory 3 marks
- i. Explain the risk involved in dispensing a flammable liquid from a larger container to smaller containers and how the risk can be mitigated. 3 marks
- j. Outline the role of the laboratory technologist / supervisor in the maintenance of laboratory equipment. 3 marks

SECTION B. Answer any two questions

Question 2

- a. Breakage of glass containers and chemical spills are common hazards in a museum. Discuss ways that promote protection of the museums specimens and staff 5 marks
- b. Discuss the contemporary use of cryopreservation. 5 marks
- c. Outline the potential hazards involved in cryopreservation and the guidelines to protect staff working with tissues frozen in liquid nitrogen 10 marks

Question 3

- a. i. Explain six golden rules for labelling scientific specimens 6 marks
- b. Outline the primary purpose and general guidelines for proper chemical storage. 4 marks
- c. Discuss the safety measures involved in proper storage of laboratory chemicals. 10 marks

Question 4

- a. Outline the issues you would consider before working with a new and unfamiliar chemical reagent. 10 marks
- b. Explain any ten sections contained in a Material safety Data sheet for a laboratory chemical. 10 marks.

Question 5

Explain the process of preparing histological samples for microscopic examination. 20 marks