

# THE UNIVERSITY OF ZAMBIA

## SCHOOL OF VETERINARY

### EXAM PAPERS 2019/2020

1. EPH 7310 – Biodiversity and Interface Health
2. FRS 7130 – Food Safety Management
3. FRS 7140 – Food Safety in Primary Production
4. FRS 7160 – Risk Analysis
5. OHD 7130 – Molecular Biology and Bioinformatics
6. OHD 7140 – Advance Diagnostic Parasitology
7. TDZ 7311 – MSc Tropical Infectious Diseases and Zoonoses Immunology of Infectious Diseases
8. VMB 2100 - Veterinary Gross Anatomy Paper II
9. VMB 2110 – Veterinary Histology and Embryology Paper I
10. VMB 2200 – Veterinary Biochemistry
11. VMB 2302 – Introductory Veterinary Physiology
12. VMB 2500 – Animal Production and Nutrition
13. VMB 2511- Animal Welfare and Behaviour

14. VMB 3311 – Veterinary Physiology
15. VMB 3600 – Veterinary Pharmacology
16. VMB 4611 – Veterinary Toxicology
17. VMC 4101 – Propaedeutics to Clinical Veterinary Medicine
18. VMC 4200 – Principles and Introduction to Veterinary Surgery and Diagnostic Imaging
19. VMC 4309 – Introduction to Veterinary Reproduction and Obstetrics
20. VMD 4201 – Epidemiology
21. VMC 5149 – Companion Animal Medicine
22. VMC 5210 – Veterinary Operative Surgery
23. VMC 5319 – Veterinary Reproduction and Gynaecology
24. VMD 4102 – Veterinary Clinical Pathology
25. VMD 5300 – Veterinary Infectious Diseases
26. VMD 5302 – Diseases of Wildlife, Fish and Epiculture
27. VMD 5400 – Veterinary Public Health
28. VMD 6401 – Avian Medicine
29. VMD 6501 – Preventive Veterinary Medicine
30. VMD 6601 – Professional Jurisprudence, Ethics, Extension and Rural Sociology

31. VMM 7120 – Applied Food Microbiology and Nutritional Toxicology
32. VMM 7310 – Food Safety Management
33. VMM 7610 – Zoonotic Diseases and Infectious (One Health Food Safety)
34. VMM 7802 – One Health Economics, Policy, Monitoring and Evaluation
35. VMM 7901 – One Health Research Methodology
36. VMM 8201 – Surveillance and Risk Analysis
37. VMM 8711 – Health Promotion and Education
38. VMM 8911 – Ethics in Food Safety Practice
39. VMP 3100 – Veterinary Pathology
40. VMP 3300 – Veterinary Microbiology and Immunology
41. VMP 3400 – Veterinary Parasitology

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**BIODIVERSITY & INTERFACE HEALTH (EPH 7310)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions
3. **ALL** questions carry equal marks
4. Write in a legible handwriting
5. Five minutes perusal time.

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**QUESTION 1**

The earth holds a vast diversity of living organisms, which includes different kinds of plants, animals, insects, and microorganisms. The earth also holds an immense variety of habitats and ecosystems. The total diversity and variability of living things and of the system of which they are a part is generally defined as biological diversity, i.e. the total variability of life on earth. In other words it also refers to the totality of genes, species and ecosystems in a region. However, due to different population structures, “interface areas” have been identified. Using your own understanding, describe in detail what you understand by “interface areas” and what they encompass.

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**20 MARKS**

## QUESTION 2

- i. Define Biodiversity within species, between species and of ecosystems (2 Marks)
- ii. Describe the three hierarchical levels of Biological diversity (2 Marks)
- iii. Why is Biodiversity important and what is the use? (2 Marks)
- iv. In terms of Biodiversity, what makes a community stable? (2 Marks)
- v. State the difference between endemic and exotic species (2 Marks)
- vi. Differentiate between species diversity and ecological diversity. (2 Marks)
- vii. How can the loss of one species lead to the extinction of another? (2 Marks)
- viii. What are the factors that determine a species as threatened? (2 Marks)
- ix. How can the loss of biodiversity be prevented? (2 Marks)
- x. Explain the ecosystem service. (2 Marks)

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20 MARKS

## QUESTION 3

A keystone species is an organism that helps define an entire ecosystem. Without its keystone species, the ecosystem would be dramatically different or cease to exist altogether. Given its importance, in your own words, describe in detail what you understand by “Keystone species.”

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20 MARKS

## QUESTION 4

In Ecology, there are a number of terminological considerations. Very briefly and where possible with necessary detail, describe the following

- a. Ecological footprint (2 Marks)
  - b. Ecosystem (2 Marks)
  - c. Ecosystem degradation (2 Marks)
  - d. Habitat degradation (2 Marks)
  - e. Ecological niche (2 Marks)
  - f. Biota (2 Marks)
  - g. Biodiversity (2 Marks)
  - h. Abiotic (2 Marks)
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- i. Biomes (2 Marks)
- j. Ecological community (2 Marks)

20 MARKS

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**QUESTION 5**

In Ecology, it's very important to measure Biodiversity. Biodiversity is shown also as a collage but according to three main facets/circles in biodiversity.

- a. Describe how you can measure biological diversity? (10 marks)
- b. How can biodiversity support ecosystem services? (10 marks)

20 MARKS

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**QUESTION 6**

The greatest threat to biodiversity is loss of 'habitat' which refers to extreme changes that make them unable to support more than a fraction of their original processes and species. Within your own understanding, describe the process of habitat loss and fragmentation. Feel free to even make a simple diagram.

20 Marks

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**QUESTION 7**

- a. With necessary information, describe the "niche concept" of competitive exclusion.
- b. Briefly describe resource partitioning in Ecology
- c. Briefly describe character displacement in Ecology
- d. Differentiate Sympatric Vs. Allopatric Species
- e. What do you understand by
  - i. Cryptic coloration in predation
  - ii. Aposematic coloration
  - iii. Batesian mimicry

20 Marks

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.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**DEPARTMENT OF DISEASE CONTROL**  
**END OF YEAR EXAMINATIONS NOVEMBER/DECEMBER 2019/20 ACADEMIC**  
**YEAR**

**FOOD SAFETY MANAGENT (FRS 7130/VMM7130)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer any **FIVE** questions
  3. Answer each question in a separate answer booklet
  4. Write in a legible handwriting
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**QUESTION ONE**

Good Agricultural Practices (GAPs), Good Manufacturing Practices (GMPs) and, if applicable, HACCP are important instruments to control hazards in the ingredient processing and feed production.

- a) Define the term Good Manufacturing Practice. **(2 Marks)**
- b) Briefly describe the hazards associated with ingredient processing and feed production and how to minimize these risks. **(8 Marks)**
- c) In brief, describe the various codes of practices (Codex Codes) designed to prevent contamination of feed ingredients and feed. **(10 marks)**

**QUESTION THREE**

- a) Describe the institutional and legal framework of your country's national food control system. **(10 Marks)**.
- b) Describe the roles and the responsibilities for each sector including an analysis of their strengths and weakness. **(10 Marks)**.

**QUESTION FOUR**

- a) List the six different groups of pathogens. **(2 marks)**
- b) What is the difference between commensal and pathogenic bacteria? **(2 marks)**
- c) Describe at least five (5) benefits of commensal bacteria to the host? **(4 marks)**
- d) Define antimicrobial resistance (AMR) and describe the ways in which AMR is spread? **(4 marks)** - food - transduction - transformation - conjugation
- e) What is the impact of AMR on food safety and on public health? **(4 marks)**
- f) Explain the one health approach to prevent, control and minimise AMR? **(4 marks)**

*ben. prescrib. presc. presc. prescrib. 1. multi-sector. collabative. Horiz. Horiz. zontal. gave. cellula. beca. rece.*



**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**DEPARTMENT OF DISEASE CONTROL**  
**END OF YEAR EXAMINATIONS NOVEMBER/DECEMBER 2019/20 ACADEMIC**  
**YEAR**

**FOOD SAFETY IN PRIMARY PRODUCTION (FRS 7140)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer any FIVE questions
  3. Answer each question in a separate answer booklet
  4. Write in a legible handwriting
- 

**QUESTION ONE**

Fruit and vegetable producers are required to implement good agricultural practices as a prerequisite for procurement to ensure produce quality and safety.

- a) Define the term good agricultural practices (GAPs). **(4 Marks)**
- b) Describe the hazards associated with fruits and vegetables at primary production as well as the measures to prevent, control or minimize contamination. **(8 Marks)**
- c) The codes of practices (Codex Codes) designed to prevent contamination of fruits and vegetables specifies the requirements, in the form of modules, to be met with respect to Good Agricultural Practice (GAPs). Briefly discuss the purpose and a single element for each module. **(8 Marks)**

**QUESTION TWO**

- a) Define good agricultural practices and state 3 GAPs applicable to beef production. **(11 marks)**
- b) State 3 codes of practices (Codex Codes) designed to prevent contamination of beef at primary production **(9 marks)**

### QUESTION THREE

Polycyclic Aromatic Hydrocarbons (PAHs) are a large class of organic compounds containing two or more fused aromatic (benzene) rings made up of carbon and hydrogen atoms. The concern about environmental PAH pollution arises from the bioaccumulation risk in the food chain.

- a) List the sixteen (16) priority PAHs. **(16 marks)**
- b) List four (4) methods that are used to remove PAHs from the environment. **(4 marks)**

### QUESTION FOUR

The Stockholm Convention called for the elimination and/or phasing out of 12 Persistent Organic pollutants (POPs), called the 'dirty dozen' that cause environmental pollution. Polychlorinated biphenyls (PCBs) are on the list of the 'dirty dozen'; discuss the global concern, mechanism of toxicity and health hazards associated with these chemicals. **(20 Marks)**

### QUESTION FIVE

- a) Describe the hazards associated with milk production at primary production as well as the measures to prevent, control or minimize contamination. **(10 Marks)**
- b) Describe the hazards associated with fish production at primary production as well as the measures to prevent, control or minimize contamination. **(10 Marks)**

### QUESTION SIX

- a) What do you understand by the term "Animal welfare"? **(2.5 marks)**
- b) What do you understand by the term "Ethics"? **(2.5 marks)**
- c) Discuss animal welfare issues at primary production. **(10 marks)**
- d) Briefly discuss the principles for monitoring suppliers at primary production **(5 marks)**

### QUESTION SEVEN

Discuss in details the application of official controls at primary production? **(20 marks)**

.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL  
END OF YEAR EXAMINATIONS NOVEMBER/DECEMBER 2019/20 ACADEMIC  
YEAR**

**RISK ANALYSIS (FRS 7160)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer any FIVE questions
  3. All questions carry equal marks
  4. Write in a legible handwriting
- 

**QUESTION ONE**

a) Precisely and concisely define any five of the following:

- i. Variability (2 marks)
- ii. Hazard (2 marks)
- iii. Data (2 marks)
- iv. Risk (2 marks)
- v. Risk analysis (2 marks)
- vi. Outbreak (2 marks)

b) Answer any four the following questions:

- i. Compare and contrast qualitative and quantitative risk assessment (2.5 marks)
- ii. A common-source-point source and continuous common-source outbreak (2.5 marks)
- iii. Discuss the benefits of undertaking a risk analysis (2.5 marks)
- iv. Outline the risk management questions that one should ask in a risk analysis (2.5 marks)
- v. What are the attributes of a good risk assessment (2.5 marks)

**QUESTION TWO**

Entry assessment is one of the steps in conducting an import risk assessment. It consists of describing the biological pathways necessary for an importation activity to introduce pathogenic agents into a particular

environment, and estimating the probability of that complete process occurring, either qualitatively (in words) or quantitatively (as a numerical estimate). The entry assessment describes the probability of the 'entry' of each of the hazards (the pathogenic agents) under each specified set of conditions with respect to amounts and timing, and how these might change as a result of various actions, events or measures. Discuss the factors that would aid you derive inputs for an entry assessment. **(20Marks)**

### **QUESTION THREE**

There are suspected cases of patulin contamination in apple juice that is imported from Chambia Republic. The local food authority has requested his scientific committee to carry out a Risk Assessment in order to determine the risks linked to the presence of patulin in apple juice. You have been given a consultancy to carry out a risk assessment and advise as to whether they should ban or not ban the importation of this apple juice from Chambia Republic. Discuss how you would go about conducting this risk assessment? **(20 marks).**

### **QUESTION FOUR**

Assume a scenario where a metal processing facility is located on the bank of the Kafue River in Kafue town. Liquid waste effluent from the plat operations is discharged directly into the river. The factory operates 24 hours per day and 7 days per week. Additional information on the plant operations, such as the rate of production and the content of the liquid waste, is not available. Further assume that the River flows directly through the community of Kafue town, which is a short distance downstream of the processing facility. Water from the River is used by the residents for drinking, cooking, bathing and gardening. Preliminary research by scientists from Eden University has identified cadmium as a by-product of chrome processing operation and subsequent component of the effluent. The government is not really sure on the risk that this chemical represents to the human population in Kafue district. As an expert in chemical risk assessment, discuss how you could address this public health concerns in evaluating the potential health risks of cadmium being released into the Kafue River? **(20 Marks)**

### QUESTION FIVE

Zambia is prospecting importation of milk from the Panda Republic. However, there is an undetermined risk of importing milk contaminated with brucellosis, a bacterial zoonosis. Using the codex framework, discuss how you would go about estimating the risk **(2 marks)**

### QUESTION SIX

Compare and contrast any FOUR of the following:

- a) . Uncertainty and variability **(5 marks)**
- b) Qualitative and quantitative risk assessment **(5 marks)**
- c) Risk communication and risk management **(5 marks)**
- d) Chemical risk assessment and microbiological risk assessment **(5 marks)**
- e) Codex and the OIE risk assessment frameworks **(5 marks)**

### QUESTION SEVEN

Discuss the following:

- a) The role of government in risk analysis **(5 marks)**
- b) The role of the industry risk analysis **(5 marks)**
- c) The role of world trade organisation in risk assessment **(5 marks)**
- d) International bodies that set standards in risk assessment for food, infectious diseases and plant quarantine pests **(5 marks)**

.....**END OF EXAMINATION**.....



THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE

MOLECULAR BIOLOGY AND BIOINFORMATICS OHD 7130 EXAMINATION

INSTRUCTIONS: Answer all Questions    Time: 3 hours    Date: 20<sup>th</sup> November, 2020

QUESTION 1.

- a) State three main variants of chromatographic methods that can be used in separation of proteins and for each of the named variant state the property or properties that are utilised in the named variant? [3 marks]
- b) Write short notes on the secondary covalent bond found in proteins and briefly describe one method which can be used to disrupt such bonds. Hence, explain why it would be necessary to disrupt such bonds when analysing proteins using Sodium dodecylsulphate - polyacrylamide gel electrophoresis. [6 marks]
- c) State a chemical labelling strategy for relative quantification which is coupled with protein purification you could use for a protein with a secondary covalent bond and hence, briefly but with an illustration(s), describe how the stated strategy works. [11 marks]

QUESTION 2.

- a) Define the genome and the proteome and hence specifically explain why and how the complexity of the proteome increases from the genome [9 marks]
- b) Protein sequence determination using mass spectrometric analysis is divided into two general categories which use two different mass database search strategies. State the two general categories referred above and, describe the advantages and disadvantages of each of the named two general categories. [11 marks]

### QUESTION 3.

Describe the replication mechanism of DNA in eukaryotic cells and using this description, provide an argument as to why the semi-conservative method is the accepted model for DNA replication [20 marks]

### QUESTION 4.

- a) Define transposable elements and state the different classes of transposable elements recognised [4 marks]
- b) In detail, describe the transposition of transposomes versus retrotransposomes [16 marks]

### QUESTION 5.

- a) Describe why phylogenetics and bioinformatics is are important for public health [3 marks]
- b) Concisely describe an experiment that you would set up to determine the strain/lineage and transmission pattern of a particular pathogen [17 marks]

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**2019/20 ACADEMIC YEAR EXAMINATIONS**

**ADVANCE DIAGNOSTIC PARASITOLOGY (OHD 7140)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **ONLY FIVE** questions
  3. **EACH Question** must be answered in a **separate answer booklet**
  4. **ALL** questions carry equal marks
  5. Write in a legible handwriting
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**QUESTION 1**

Discuss the morphological differences between species belonging to the genera of *Rhipicephalus* and *Amblyomma*. Mention the major pathogens transmitted by some species of these genera to vertebrate hosts.

**QUESTION 2**

Discuss briefly on any **FOUR** (4) of the following topics:

- a) Effects of parasites on hosts (**5 marks**)
- b) Diagnosis, prevention and control of taeniasis (**5 marks**)
- c) Prevention and control of amoebiasis (**5 marks**)
- d) How schistosomes cause disease (**5 marks**)
- e) *Sarcocystis bovi hominis* (**5 marks**)
- f) Toxoplasmosis (**5 marks**)
- g) Diagnosis of blood flukes (**5 marks**)
- h) Morphological differences between *Taenia solium* and *Taenia saginata* (**5 marks**)

### **QUESTION 3**

Discuss briefly on any **FOUR** (4) of the following topics:

- a) Neglected tropical diseases (5 marks)
- b) Morphologic diagnostic features of a male Ixodidae of any genera (5 marks).
- c) Direct effects of ticks on vertebrate hosts (5 marks).
- d) *Sarcoptes scabiei* (5 marks)
- e) Effects of tsetse flies on human and animal life (5 marks)
- f) Direct laboratory examination methods (5 marks)
- g) Tungiasis (5 marks)
- h) Basic laboratory design of Bio-safety level 1 (5 marks)

### **QUESTION 4**

Trypanosomiasis is one of the neglected but re-emerging zoonoses especially in some rural parts of Africa. Write **SHORT NOTES** on the following:

- a. The identification features of the biological vector of trypanosomiasis (5 marks)
- b. The life cycle of the biological vector of trypanosomiasis (5 marks)
- c. The species of the biological vector of trypanosomiasis found in Zambia (5 marks)
- d. Environmentally friendly methods of controlling and monitoring the biological vector of trypanosomiasis (5 marks)

### **QUESTION 5**

Larval echinococcosis is a zoonotic tapeworm infection causing serious disease in humans in tropical as well as temperate zones of the world.

- a) List the two common causative agents of larval echinococcosis and mention where they are normally found whether in tropics or in temperate zones. (5 marks)
- b) Discuss in detail the life cycle of the causative agent of this disease (10 marks).
- c) How is it diagnosed? (2.5 marks)
- d) Discuss the prevention and control strategies of this disease (2.5 marks)

### **QUESTION 6**

With reference to schistosomiasis, discuss in detail the biology, diagnosis prevention and control of the causative agent (20 marks).

**END OF EXAMINATION**

**University of Zambia  
School of Veterinary Medicine  
Department of Disease Control  
End of Year University Examinations: 2019/2020 Academic Year**

**MSc Tropical Infectious Diseases and Zoonoses  
Immunology of Infectious Diseases (TDZ 7311) Examination**

**Friday, November 20, 2020**

**09:00 -12:00**

**Instructions**

1. This paper contains two sections: A and B. You are required to answer ALL questions from Section A and THREE (3) questions from Section B. Please read each questions carefully.
2. Each question MUST be answered in a SEPARATE answer booklet. Ask for additional booklets, if required
3. It is essential that you indicate your STUDENT NUMBER, the SECTION and NUMBER of each questions you have attempted on the cover of every answer booklet used.
4. All answer booklets should be handed in, tied together, and will be collected before you leave your seat.
5. Time allowed: 3 hours.

**SECTION A**

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**This section contains 4 questions. Attempt ALL questions. Each question MUST be answered in a SEPARATE answer booklet. Each question is worth 10 marks.**

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1. What makes the fungal immune response predominantly a T-cell immune response? (10 marks)
  2. Briefly explain how the innate immune system recognizes invasion of pathogens (Be specific to mentioned specific molecular ligands on pathogen as specific cellular receptors) (6 marks). How is normal flora maintained? (4 marks)
  3. Using specific viral pathogens, briefly discuss five mechanisms that viruses use to evade host immune responses (10 marks)
  4. How do interferons prevent viral infections? (10 marks)

## Section B

**Essay-Type Questions. This section contains 4 questions. Attempt only THREE (3) the questions. Each question MUST be answered in a SEPARATE answer booklet. Each question is worth 20 marks.**

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1. Explain in full the mechanisms involved in the removal of viruses from the body by antibodies before they get the chance to infect a cell.  
(20 marks)
2. Describe how the immune system might respond to a bacterial infection.  
(20 marks)
3. Using polio vaccines as an example, explain in detail the safety profile of inactivated vaccines and why oral polio vaccine (OPV) is slowly being replaced by inactivated polio vaccine (IPV).  
(20 marks)
4. The care of one's microbiome has been likened to gardening
  - a) Discuss factors that can lead to changes in a host's microbiome
  - b) Write short notes on the "hygiene theory".  
(20 marks)

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**End of Examination**

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**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE**

END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS-2020 ACADEMIC YEAR

VETERINARY GROSS ANATOMY (VMB 2100)

**PAPER II**

TIME: THREE (3) HOURS

INSTRUCTIONS:

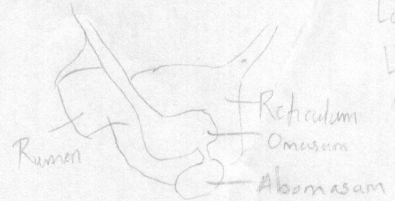
1. Answer **FIVE (5)** questions only
  2. Write as clearly as possible as poor handwriting cannot be marked
  3. Answer each question in a separate answer book
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**QUESTION 1** <sup>15</sup> ✓

Describe the thorax of ruminants under the following headings.

(20 marks)

- (i) Boundaries
- (ii) Thoracic wall
- (iii) Examples of organs of the thorax
- (iv) Clinical anatomy



**QUESTION 2** <sup>10</sup> ✓

Describe the external and internal features of the ruminant stomach.

(20 marks)

**QUESTION 3**

Describe in details the hip joint in the ox. Comment on how you would locate this joint in the live animal.

(20 marks)

**QUESTION 4**

Describe the following structures and explain their clinical relevance in the cow. (20 marks)

- (i) Milk vein
- (ii) Caudal mediastinum lymph nodes
- (iii) Obturator nerve
- (iv) Point of the elbow

**QUESTION 5**

Write short notes on the following in ruminants.

(20 marks)

- (i) Jugular groove
- (ii) Caudal mammary lymph nodes
- (iii) Cervix
- (iv) Wall of the hoof

**QUESTION 6**

Compare and contrast the anatomy of the kidney in the canine and the bovine species.

(20 marks)

**QUESTION 7**

Describe in detail the anatomy of the pelvic canal of the cow.

(20 marks)

**QUESTION 8**

Describe the reproductive system of the cow under the following heading.

(20 marks)

- (i) Ovary
- (ii) Uterus
- (iii) Vagina
- (iv) Blood supply

END OF EXAMINATION

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**

END OF YEAR SUPPLEMENTARY FINAL EXAMINATIONS– 2020 ACADEMIC YEAR

**VMB 2110 – VETETRINARY HISTOLOGY AND EMBRYOLOGY- PAPER I**

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**INSTRUCTIONS:**

1. DURATION: 3 HOURS
  2. CHOOSE AND ANSWER ONLY **FIVE (5)** QUESTIONS
  3. EACH QUESTION SHOULD BE ANSWERED IN A SEPARATE ANSWER BOOKLET
  4. ALL QUESTIONS CARRY EQUAL MARKS
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**QUESTION 1**

Outline at least 4 histological elements seen in the following organs when viewed under a light microscope:

- a) Tongue of a dog **(4 marks)**
- b) Ovary of a bitch **(4 marks)**
- c) Lung of a pig **(4 marks)**
- d) Vein of a dog **(4 marks)**
- e) Teat of a goat **(4 marks)**

**QUESTION 2**

Cytology is the study of individual cells without regard to the architectural patterns that characterize the tissue of origin.

- a) State the clinical/medical importance of studying cytology **(2 marks)**
- b) What are cytoplasmic inclusions? Discuss in detail the various cytoplasmic inclusions that can be seen on cytological smears **(12 marks)**
- c) Define chromatin and outline the three types of chromatin **(4 marks)**
- d) State two reasons why cells divide **(2 marks)**

**QUESTION 3**

Describe the structure and function of the following blood cells.

- a) Neutrophils **(4 marks)**
- b) Eosinophils **(4 marks)**
- c) Basophils **(4 marks)**
- d) Macrophages **(4 marks)**
- e) Lymphocytes **(4 marks)**

**QUESTION 4**

Epithelial tissue is an important part of the body performing many vital functions. Describe the structure, location and function of the following.

- a) Simple cuboidal epithelium **(5 marks)**
- b) Pseudostratified epithelium **(5 marks)**
- c) Transitional epithelium **(5 marks)**
- d) Stratified squamous epithelium **(5 marks)**

### **QUESTION 5**

In detail discuss the following:

- a) The Brachydont teeth (**10 marks**)
- b) The Endocardium (**5 marks**)
- c) The Elastic arteries (**5 marks**)

### **QUESTION 6**

Discuss the following:

- a) Types of capillaries (**10 marks**)
- b) Histology of the liver (**5 marks**)
- c) The Nephron (**5 marks**)

### **QUESTION 7**

In detail discuss the conducting and distributing arteries (**20 marks**)

### **QUESTION 8**

Write short notes on the following connective tissues.

- a) Brown adipose tissue (**4 marks**)
- b) Reticular (**4 marks**)
- c) Dense irregular (**4 marks**)
- d) Muroid (**4 marks**)
- e) Loose (**4 marks**)

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*END OF EXAM*

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF BIOMEDICAL SCIENCES**

**END OF YEAR DECEMBER UNIVERSITY EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**VETERINARY BIOCHEMISTRY (VMB 2200)**

**DURATION:** Three (3) Hours.

**INSTRUCTIONS:**

1. Please read instructions and each question carefully
  2. Answer **ANY** five (5) questions only
  3. All questions carry equal marks
  4. Write the answer(s) to each question in a separate answer booklet
  5. Write in a legible handwriting
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**QUESTION ONE**

Various pathways in a mammalian cell are integrated but this integration is dictated by the prevailing conditions in the cell. For instance, glucose 6-phosphate can be used and generated in several different ways depending on the conditions obtaining in the cell at a given time.

- a) Name three enzymes and their substrates that **directly** lead to formation of glucose 6-phosphate. **(3 marks)**
- b) State the metabolic pathway and main use of the glucose 6-phosphate in a rapidly dividing cell, giving two reasons for your choice of use and pathway. **(4 marks)**
- c) Define substrate level of phosphorylation and with as much details (including structures) as possible, outline reactions involved in substrate level of phosphorylation degradation of glucose 6-phosphate in a cell under anaerobic conditions **(10 marks)**
- d) During intense exercise or provision of draught animal power, show how the final product of glucose 6-phosphate oxidation in (c) above can be utilised for energy generation. **(3 marks)**

**QUESTION TWO**

Using as much detail as possible, describe the synthesis of glycogen including specific bonds and enzymes, the addition of glucosyl units to a growing chain of glycogen molecule and hence the branching of a glycogen molecule being synthesised. **(20 marks)**

### QUESTION THREE

Write short notes on ANY FOUR of the following:-

- a) Functions of monosaccharides (5 marks)
- b) Carbamoyl Phosphate Synthetase I (CPSI). (5 marks)
- c) Define a Glucogenic amino acid and using your definition show how Asparagine (Asn) can be classified as a glucogenic amino acid. (5 marks)
- d) Ureotelic organisms and nitrogen excretion. (5 marks)
- e) Secondary covalent bond found in proteins. (5 marks)

### QUESTION FOUR

- a) Translation is divided into three (3) main phases with an additional step at the beginning and at the end. One of the main mechanistic difference between Prokaryotic and Eukaryotic translation is the existence of polycistronic mRNA whose transcription is coupled to translation.
  - i) Define Translation and state the components of a complete initiation complex? (5 marks)
  - ii) Define polycistronic mRNA and hence explain what the phrase "transcription is coupled to translation" means? (2 marks)
  - iii) Briefly, describe how the prokaryotes initiating AUG is distinguished from an internal AUG in a protein coding sequence? (4 marks)
- b) A second-year Vet student was given the following nascent (new) prokaryotic protein (fMet-Cys-Gly-Ser-Lys-His) for the study of activation and post translation processing or modifications.
  - i) Define "post translation processing or modifications" and hence name the two broad types of post translation modification? (2 marks)
  - ii) Clearly, outline by way of reaction equations (without structures) the activation of fMet-Cys-Gly-Ser-Lys-His which only becomes functional in the absence of the formylated Met. (3 marks)
  - iii) What is the purpose of using initiator fMet and not Met in prokaryotic Translation? (1 marks)
  - iv) Identify the amino acid residues in the activated protein in (ii) above that can undergo post-translation modification and hence name one post translation modification each of the identified amino acid can undergo. (3 mark)

### **QUESTION FIVE**

With the aid of a pathway, give a concise and complete description on how energy is transferred from the liver to other body tissues. **(20 Marks)**

### **QUESTION SIX** ✓

DNA is the molecule of life as it holds the key information required for smooth function of a living cell. With respect to this:-

- a) Outline the features of DNA. **(5 Marks)**
- b) Outline the functions of the various enzymes involved in DNA replication. **(15 marks)**

### **QUESTION SEVEN** ✓

Describe how ruminants utilize energy from plant material for the synthesis of organic molecules that are required for milk production. Use clearly interconnected pathways in your description. **(20 marks)**

### **QUESTION EIGHT**

Complete oxidation of fatty acids occurs in different types, one of them is beta oxidation. With respect to this, describe with the aid of a pathway, the complete oxidation of the fatty acid linoleate and state the total number of acetyl CoA and ATP produced. **(20 Marks)**

.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**FINAL EXAMINATIONS 2019/20 ACADEMIC YEAR**

**INTRODUCTORY VETERINARY PHYSIOLOGY (VMB 2302)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **FIVE (5)** questions only
  3. **ALL** questions carry equal marks
  4. Write in a legible handwriting
  5. Answer each question in a **separate** booklet
- 

**QUESTION 1**

Water (fluid) is an important component of the animals' body and is necessary for normal body function

- a) Describe the distribution of water (fluids) in the body, mention the proportions (percentages) and locations. **(10 marks)**
- b) What do you understand by water balance? Explain how the body achieves water balance and mention the various ways by which water is gained or lost. **(10 marks)**

**QUESTION 2**

Blood is an important fluid in the body, having a number of functions that support life.

- a) What is haemostasis? Describe the 3 phases of haemostasis. **(8 marks)**
- b) Describe the steps in the intrinsic pathway of clot formation. **(10 marks)**
- c) What is fibrinolysis? **(2 marks)**

**QUESTION 3**

Give brief explanatory notes on each of the following:

- a) Hepatic jaundice **(3 marks)**
- b) Factors affecting haemoglobin affinity. **(8 marks)**
- c) Plasma proteins and their functions. **(6 marks)**
- d) Polycythaemia **(3 marks)**

#### QUESTION 4

In the intact body, the process of smooth muscle cell contraction is regulated principally by receptor and mechanical (stretch) activation of the contractile proteins myosin and actin. A change in membrane potential, brought on by the firing of action potentials or by activation of stretch-dependent ion channels in the plasma membrane, can also trigger contraction.

- a) **List** the properties of single unit smooth muscle (5 marks)
- b) Describe in detail the mechanism of smooth muscle contraction (15 marks)

#### QUESTION 5

- a) **List** four (4) supporting cells of the nervous system (2 marks)
- b) Using sketch diagrams, outline the classification of neurons based on the number of processes that emanate from the cell body (4 marks)
- c) Describe any two (2) types of nerve fibres (4 marks)
- d) Muscle cells and neurons are examples of excitable cells. What do you understand by the term "excitable cell"? (2 marks)
- e) Describe in detail the properties of skeletal muscle (8 marks)

#### QUESTION 6

Muscle fibres are excitable cells. Their cell membrane (sarcolemma) contains the ion channels and pumps necessary to maintain a very negative resting membrane potential and the voltage gated ion channels necessary for generation of an action potential.

- a) Define resting membrane potential (2 mark)
- b) Outline the three (3) classification of muscle tissue (6 marks)
- c) With the aid of a well labelled diagram describe in detail the generation and propagation of Cardiac muscle action potential (8 marks)
- d) Using a table format, mention the important differences in the sequence of events that occur in the contraction mechanisms of skeletal muscle and cardiac muscle (4 marks)

#### QUESTION 7

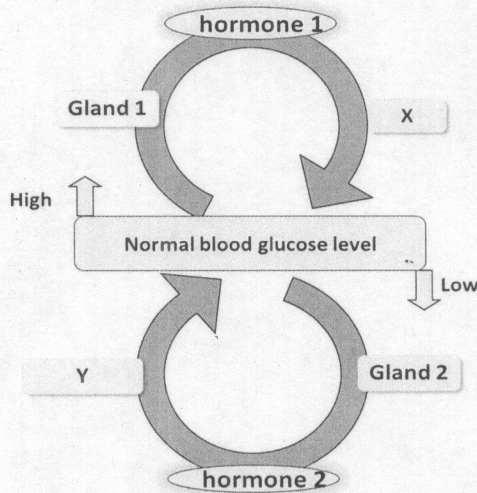
Give brief explanatory notes on each of the following: (20 marks)

- a) Functions of the cell membrane
- b) Cytoskeleton
- c) Transport Mechanisms across cellular membranes
- d) Functions of plasma membrane proteins

**QUESTION 8**

In healthy animals, the body's internal environment remains stable despite variations in the external environment and the animal's activity. This steady state condition is referred to as homeostasis.

- a) Name **any four (4)** organ systems of the body and briefly describe their role in maintaining homeostasis. **(6 marks)**
- b) Describe how the body uses negative and positive feedback circuits to respond to stimuli. **(4 marks)**



- c) Use the figure above to explain the regulation of glucose levels in the body. In your description, provide the names of gland 1, 2; hormone 1, 2 and include the effects of the hormones, represented by X and Y on blood glucose levels. **(10 marks)**

.....END OF EXAMINATION.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE**

**FINAL-YEAR DECEMBER EXAMINATIONS - 2019/20 ACADEMIC YEAR**

**ANIMAL PRODUCTION AND NUTRITION (VMB 2500)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Answer a total of **five (5)** questions only
2. ALL questions carry equal marks of 20 each
3. Write in legible handwriting

**SECTION A: [Answer QUESTION 1 and ANY OTHER 2 questions from this section]**

**QUESTION 1.** Discuss in Detail the characteristics, origin, function and temperament of the following breeds of cattle.

- a) Friesians
- b) Brown Swiss
- c) Jersey
- d) Tonga
- e) Angoni
- f) Brahman
- g) Hereford
- h) Charolais
- i) Sussex
- j) Afrikander

**QUESTION 2.** Discuss in detail a typical lactation curve of a dairy cow, mentioning all stages in the curve and the management required in each stage.

**QUESTION 3.** Culling of dairy animals is an unavoidable activity in all commercial dairy enterprises. Please discuss in detail citing percentage of each of the reasons of culling dairy animals.

**QUESTION 4.**

- a) Draw a sketch diagram of a plunge dip tank and show movement of cattle in and out of the facility.
- b) Mention all the advantages of using dip tank in the process of disease control.

**SECTION B: [Answer the one question in this section]**

**QUESTION 5.** Define the term vitamin. Discuss the sources, structural forms and functions of vitamin E. What are the deficiency symptoms of Vitamin E in poultry.

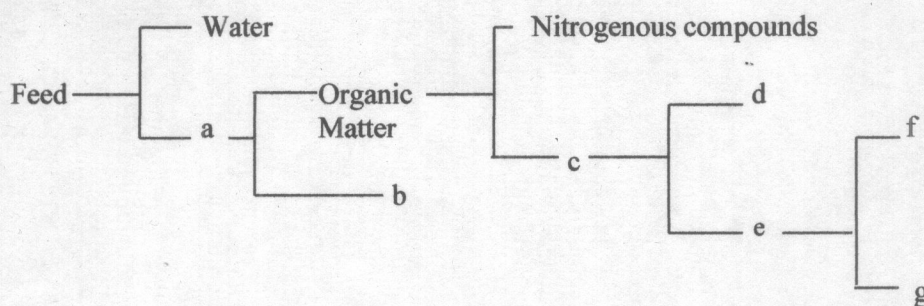
[20 marks]

**SECTION C: [Answer ONLY ONE question in this section]**

**QUESTION 6.**

- a) The proximate analysis of a sample of maize (corn) indicates the following figures (in % of FM): moisture 14% ashes 1% crude protein 9%  
ether extract 4% crude fiber 2% nitrogen-free-extract 70%
- i) What is the percentage of DM of this maize?  
ii) What is the percentage of OM?  
iii) What is the percentage of carbohydrates?  
iv) How many grammes of crude protein (CP) are there in 1 kg of maize?  
v) How many grammes of DM are there in 1kg of maize?  
vii) What is the composition of the maize in the Dry-Matter in percentages? (13 marks)

- b) Fill in the missing spaces a, b c, d, e, f and g (7 Marks)



**QUESTION 7.**

- a) Formulate 100 kg of Broiler Finisher using the following feedstuffs Maize, Soyabean meal (Full fat), Dicalcium phosphate, Limestone flour, Salt and Premix. (17 marks).
- b) Why are the following feedstuffs restricted when formulating rations for poultry and pigs?  
i). cottonseed cake ii) sunflower cake iii) sorghum (3 marks)

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**END OF EXAMINATION**

**NOTE ON THIS EXAMINATION:** New instructions were given. There were to be no compulsory questions and students could answer ANY five (5) questions from the 3 sections. Instructions given under each Section were to be disregarded.

**Table 1. Common Feed Ingredients Available in Zambia and Their General Nutritional Characteristics**

| FEED STUFF              | ME (Mcal/kg) | CP % | CF % | LYS % | M+C % | MET % | Ca %  | P %  | Moist % |
|-------------------------|--------------|------|------|-------|-------|-------|-------|------|---------|
| Maize                   | 3.34         | 8.7  | 2.2  | 0.22  | 0.35  | 0.2   | 0.04  | 0.30 | 13.1    |
| Sorghum                 | 3.26         | 10.0 | 2.8  | 0.23  | 0.35  | 0.16  | 0.03  | 0.30 | 12.6    |
| Cassava                 | 3.09         | 2.0  | 3.7  | 0.07  | 0.05  | 0.03  | 0.15  | 0.10 | 12.5    |
| Maize bran              | 2.74         | 11.0 | 12.3 | 0.36  | 0.36  | 0.17  | 0.10  | 0.50 | 12.5    |
| Soyabean meal(full fat) | 4.00         | 40.0 | 6.7  | 2.27  | 1.03  | 0.51  | 0.23  | 0.52 | 11.5    |
| Soya bean meal low fat  | 2.18         | 43.5 | 6.7  | 2.65  | 1.26  | 0.61  | 0.31  | 0.65 | 12.0    |
| Sunflower seed meal     | 1.37         | 28.5 | 27.9 | 0.97  | 1.11  | 0.63  | 0.33  | 1.08 | 11.7    |
| Sunflower seed cake     | 1.51         | 29.1 | 28.0 | 0.99  | 1.13  | 0.64  | 0.36  | 1.16 | 9.5     |
| Cotton seed meal        | 1.51         | 36.6 | 10.6 | 1.39  | 1.21  | 0.59  | 0.20  | 1.03 | 10.1    |
| Cottonseed cake         | 1.84         | 37.1 | 11.2 | 1.41  | 1.22  | 0.59  | 0.24  | 1.09 | 8.0     |
| Blood meal              | 3.02         | 87.5 | 0.5  | 8.4   | 2.27  | 1.14  | 0.17  | 0.17 | 9.4     |
| Bone meal               | 1.5          | 40.7 | 2.3  | 1.83  | 0.77  | 0.45  | 16.04 | 7.42 | 9.5     |
| Meat meal               | 3.09         | 58.2 | 1.7  | 3.26  | 1.4   | 0.87  | 6.0   | 2.9  | 5.2     |
| Fish meal               | 3.32         | 65.9 | 1.2  | 5.07  | 2.44  | 1.85  | 3.5   | 2.6  | 8.3     |
| Soya oil                | 9.3          | -    | -    | -     | -     | -     | -     | -    | 0.5     |
| Animal fat              | 8.5          | -    | -    | -     | -     | -     | -     | -    | 0.5     |
| Dicalcium Phosphate     | -            | -    | -    | -     | -     | -     | 24.0  | 18.0 | 1.0     |
| Limestone               | -            | -    | -    | -     | -     | -     | 38.0  | -    | 1.0     |
| Salt(NaC)               | -            | -    | -    | -     | -     | -     | -     | -    | -       |

**Table 2: Nutritional Requirements of Poultry (Expressed per kg of diet) – Standard**

| FEED            | ME<br>(Mcal/kg) | CP%  | MAXIMUM |     | Lys<br>% | Meth<br>% | M+C<br>% | Ca<br>% | P<br>% |
|-----------------|-----------------|------|---------|-----|----------|-----------|----------|---------|--------|
|                 |                 |      | EE<br>% | CF% |          |           |          |         |        |
| Chick Mash      | 2.8             | 20   | 5       | 5   | 1.0      | 0.45      | 0.8      | 1.0     | 0.7    |
| Growers Mash    | 2.8             | 16   | 5       | 5   | 0.80     | 0.32      | 0.7      | 1.0     | 0.6    |
| <u>LAYERS</u>   |                 |      |         |     |          |           |          |         |        |
| Complete        | 2.8             | 16.5 | 6       | 5   | 0.70     | 0.28      | 0.6      | 3.5     | 0.6    |
| High Energy     | 2.85            | 17   | 5       | 5   | 0.75     | 0.30      | 0.65     | 3.5     | 0.6    |
| <u>BROILERS</u> |                 |      |         |     |          |           |          |         |        |
| Starter         | 3.1             | 22   | 9       | 3.5 | 1.2      | 0.50      | 0.9      | 1.0     | 0.8    |
| Grower          | 3.1             | 21   | 9       | 3.5 | 1.1      | 0.5       | 0.8      | 1.0     | 0.7    |
| Finisher        | 3.2             | 20   | 10      | 3.5 | 1.0      | 0.45      | 0.8      | 1.0     | 0.7    |
| Parent Stock    | 2.7             | 16   | 5       | 6   | 0.7      | 0.28      | 0.6      | 3.0     | 0.7    |

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**DEFERRED/SUPPLEMENTARY EXAMINATIONS-2019/20 ACADEMIC YEAR**

**ANIMAL WELFARE AND BEHAVIOUR (VMB 2511)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully.
  2. Answer any **FIVE (5)** questions .
  3. Write the answers to **QUESTION 1 ONLY** in a separate examination answer book.
  4. **ALL** questions carry equal marks.
- .....

**QUESTION 1**

Horses may have been domesticated about 6000 years ago probably initially as a food source and later as a working animal.

- a) Outline the traits that made the horse a good candidate for domestication. **(4 marks)**.
- b) Briefly discuss the consequences of the domestication of horses. **(4 marks)**
- c) Write short notes for each of the following horse behaviours. **(2 marks each)**
  - i. Allelomimetic behaviour
  - ii. Epimeletic behaviour
- d) List and outline **three (3)** stereotypic behaviours of horses that may be harmful to humans or to the animal's health. **(2 marks each)**
- e) Outline the body language of a nervous horse. **(4 marks)**

**QUESTION 2**

Compare and contrast the welfare concerns/issues found in wildlife kept in zoos and those in national parks. **(20 marks)**

### **QUESTION 3**

Write short notes on how each of the following may affect welfare of an animal:

**(5 marks each)**

- a. Environmental enrichment
- b. Ability to perform natural behaviour
- c. disease
- d. Water

### **QUESTION 4**

Write short notes on the following:

- a. The five (5) freedoms of Animal Welfare (10 marks)
- b. Welfare inputs and welfare outputs (10 marks)

### **QUESTION 5**

Write short notes on the following:

- c. Qualities of an ideal euthanasia method. (10 marks)
- d. One acceptable euthanasia method for each of the following: (10 marks)
  - i. Pig
  - ii. goat
  - iii. Cat
  - iv. Crocodile
  - v. Cow

**QUESTION 6**

Write short notes on the common welfare issues found in the following:

**(5 marks each)**

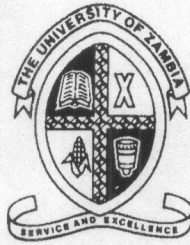
- a) Broiler chickens
- b) Aquarium fish
- c) Piglets
- d) Dogs

**QUESTION 7**

Give a detailed description of how you would carry out a welfare audit of a commercial slaughter house.

**(20 marks)**

**END OF EXAMINATION**



THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
FINAL EXAMINATIONS-2019/20 ACADEMIC YEAR

VETERINARY PHYSIOLOGY (VMB 3311)

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **FIVE (5)** questions only
  3. **ALL** questions carry equal marks
  4. Write in a legible handwriting
  5. Answer each question in a separate booklet
- 

**QUESTION 1**

The gastric pits are glands of the stomach that consist of several types of cells whose collective secretions are referred to as gastric juice.

- a) List the cells that make up the gastric pits. **5 marks**
- b) Name the secretions produced by each of the cells listed above and state their role in the digestion of food. **10 marks**
- c) List **three (3)** substances that stimulate secretions by the glandular cells of the gastric pits **5 marks**

**QUESTION 2**

Describe how proteins and the carbohydrates glucose and fructose, are transported across the wall of the small intestine. **20 marks**

**QUESTION 3**

You are presented with a dog with a history of weakness, weight loss, increased pulse rate and increased skin pigmentation. Your lab analysis reveals reduced serum sodium ions ( $\text{Na}^+$ ), reduced osmolarity, increased serum potassium ions ( $\text{K}^+$ ) and arteriole blood gases consistent with metabolic acidosis.

- a) What is your diagnosis? **2 marks**

b) In detail, give a concise discussion of how the above observations could have come about? **18 marks**

**QUESTION 4**

a) Give a detailed description of the renin-angiotensin-aldosterone system of Na<sup>+</sup> regulation. **16 marks**

b) Outline the second messenger system of hormone action. **4 marks**

**QUESTION 5**

a) Using a sketch diagram, describe the four phases of the bovine estrus cycle including the corresponding hormonal interactions. **10 marks**

b) Discuss in detail the factors affecting spermatogenesis in domestic animals. **10 marks**

**QUESTION 6**

a) Discuss in detail the endocrinological aspects of parturition in the cow. **10 marks**

b) Describe the maternal recognition of pregnancy in the sow. **5 marks**

c) Discuss the mechanisms of milk secretion control in dairy cattle. **5 marks**

**QUESTION 7**

a) Outline the classification of respiratory centers depending on their location in the brain stem. **5 marks**

b) Discuss the carbon dioxide transport in blood. **5 marks**

c) Describe the factors affecting the movement of oxygen and carbon dioxide across the respiratory membrane **5 marks**

d) Briefly describe the chemical control of respiration. **5 marks**

.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE**

**FINAL-YEAR EXAMINATIONS-2019/20 ACADEMIC YEAR**

**NOVEMBER 2020**

**VETERINARY PHARMACOLOGY - VMB 3600**

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**INSTRUCTIONS:**

1. **Duration:** 3 hours
2. Answer ALL questions from Section A and two (2) questions from Section B.
3. ALL questions are 20 marks each
4. Write in LEGIBLE handwriting
5. Write questions 1, 2, 5 and 6 in answer books separate from questions 3, 4, 7 and 8.

**SECTION A: [Answer ALL questions in this section]**

**QUESTION 1**

What do you understand by the terms drug absorption, bioavailability, elimination half-life, volume of distribution and first order kinetics. Outline the factors that may affect the gastrointestinal absorption of drugs in domestic animals.

**QUESTION 2**

- a) Barbiturates may be grouped into four classes based on their duration of action. List these classes giving one example of a barbiturate in each class. [4 marks]
- b) Discuss the pharmacological effects of barbiturate anaesthetic agents. [10 marks]
- c) Compare and contrast the elimination from the body of a thiobarbiturate and an oxybarbiturate in a lean Greyhound and an obese Labrador. [6 marks]

**QUESTION 3**

Discuss in detail properties, mode of action and five (5) susceptible organisms of the each of the following groups of drugs:

- 1) Cephalosporines
- 2) Tetracyclines

#### QUESTION 4

Mention two (2) drugs of choice that can be used to treat diseases related to the following agents  
[1 mark each]:

|                                |   |   |
|--------------------------------|---|---|
| i. <i>Trypanosoma vivax</i>    | v. <i>Trichomonas fetus</i>             | xiii. <i>Ehrlichia ruminantium</i>            |
| ii. <i>Babesia bovis</i>       | vi. <i>Taenia solium</i>                | xiv. <i>Emeria tenella</i>                    |
| iii. <i>Moniezia expansa</i>   | vii. <i>Fasciola hepatica</i>           | xv. <i>Entamoeba dysenteriae</i>              |
| iv. <i>Anaplasma marginale</i> | viii. <i>Mange mites</i>                | xvi. <i>Theileria parva</i>                   |
|                                | ix. <i>Rhipicephalus appendiculatus</i> | xvii. <i>Gastrophilus intestinalis larvae</i> |
|                                | x. <i>Bunostomum phlebotomum</i>        | xviii. <i>Demodex phylloides</i>              |
|                                | xi. <i>Trichostrongylus axei</i>        | xix. <i>Histomonas meleagridis</i>            |
|                                | xii. <i>Mycoplasma mycoides</i>         | xx. <i>Heartworm</i>                          |

#### SECTION B: [Answer TWO (2) questions in this section]

#### QUESTION 5

|  |                      |                     |
|--|----------------------|---------------------|
| Name the mode of action and one disease that can be treated by each one of the following drugs<br>[1 mark each]: | v. Monensin          | xiii. Imidocarb     |
| i. Isometamidium   | vi. Benzylpenicillin | xiv. Chlorpyrifos   |
| ii. Parvaquone   | vii. Deltamethrin    | xv. Ivermectin      |
| iii. Fluconazole   | viii. Levamisole     | xvi. Niclosamide    |
| iv. Amprolium  | ix. Mebendazole      | xvii. Metronidazole |
|  | x. Vincristine       | xviii. Cymiazole    |
|  | xi. Praziquantel     | xix. Ciprofloxacin  |
|  | xii. Lasalocid       | xx. Closantel       |

#### QUESTION 6

Drugs such as captopril, enalapril or lisinopril are very effective in the treatment of heart failure or hypertension. With the aid of an illustration, give an explanation of how they work.

#### QUESTION 7

Discuss the mode of action and pharmacological effects of acepromazine.

(20 marks)

#### QUESTION 8

Discuss the mode of action, pharmacological effects, and clinical uses of pethidine in the horse.

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END OF EXAMINATION

THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE

FINAL YEAR EXAMINATIONS - 2019/20 ACADEMIC YEAR

NOVEMBER 2020

VETERINARY TOXICOLOGY (VMB 4611)

Duration: 3 hours

**INSTRUCTIONS:**

1. Answer ALL questions from Section A and two (2) questions from Section B.
2. ALL questions are 20 marks each
3. Write in legible handwriting

**SECTION A: [Answer ALL questions in this section]**

**QUESTION 1.**

Explain the following terms in toxicology:-

- a) Therapeutic Index
- b) Idiosyncratic reactions
- c) Synergistic interaction
- d) Pharmacological antagonism (give specific example)

**QUESTION 2.**

The anticoagulant rodenticides are derivatives of 4-hydroxycoumarin or indane 1,3-dione.

- a) Briefly discuss the sources and the possible ways that pets, livestock, and wildlife may be exposed to these rodenticides.
- b) What is the mechanism of toxicological damage of the anticoagulant rodenticides?
- c) Describe the clinical signs and lesions associated with anticoagulant rodenticides.
- d) Discuss treatment options in case of accidental poisoning with anticoagulant rodenticides.

**QUESTION 3.**

Minamata disease was officially discovered in 1956 in Minamata City, Japan. The cause was attributed to methyl mercury poisoning.

- a) What are the clinical signs or symptoms of Minamata disease?
- b) Discuss the geochemical cycling of mercury in the environment.

**QUESTION 4.**

A Labrador retriever is brought to the veterinary clinic with severe signs of toxicosis. It is established that the cat has been exposed to Diquat. Discuss the following:-

- a) Mechanism of toxicological damage of Diquat
- b) Clinical signs
- c) Therapeutic approach

**SECTION B: [Answer TWO (2) questions in this section]**

**QUESTION 5.**

A veterinarian is presented with a case of adult cattle with suspected organophosphate poisoning. Clinical signs include vomiting, diarrhea, sweating, salivation, labored breathing with a few deaths.

- a) Describe the mechanism of action of organophosphate compounds used in the control of ectoparasites in cattle.
- b) Discuss how you would treat organophosphate poisoning?
- c) Explain the meaning of the term 'Organophosphate Induced Delayed Neuropathy (OPIDN)'. Give an example of a drug eliciting this condition.

**QUESTION 6.**

(a) Describe in detail factors favouring plant-related toxicosis and the general approach to diagnosing and treating plant toxicosis.

(b) Discuss the presenting clinical signs and how you would treat cattle poisoned by the following;

- i) *Solanum kwebense*
- ii) *Thevetia peruviana*
- iii) *Nerium oleander*
- iv) *Fusarium graminearum*
- v) *Aspergillus flavus*

**QUESTION 7.**

A farmer reports that two (2) cows have died after short illness. Close examination of both cases reviews that they all cows had the following clinical signs: increased heart rate dyspnoea, cyanosis, diarrhoea and death. However, postmortem signs were petechial hemorrhages with reddish brown blood for cow 1 and petechial haemorrhages with normal coloured blood for cow 2.

- a) Name eight (8) plant species and the toxic compound(s) that could be the cause of this type of poisoning.
- b) Describe the mechanism of toxicity and treatment options for this type of toxicity.

**QUESTION 8.**

A 2-month old male puppy is presented to the veterinary clinic as an emergency case. From the history and evidence of the source of the poison, you establish that it is possibly a case of pyrethroid poisoning.

- a) Discuss the clinical signs that you may have observed. (8 marks)
- b) How would you go about treating this puppy? (8 marks)
- c) What is the mechanism of toxicologic damage of the suspected poison? (4 marks)

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**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**PROPAEDEUTICS TO CLINICAL VETERINARY MEDICINE (VMC 4101)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer any **SIX** questions
  3. Write the answer to each question in a separate answer booklet
  4. **ALL** questions carry equal marks
  5. Write in a legible handwriting
- .....

**QUESTION 1**

Sheep are timid animals and do not seem to enjoy being stroked or petted. Their usual response is to flee when frightened and may seriously injure themselves in their effort to escape. Although similar to sheep in size, goats are entirely different in temperament and behavior. Goats are gregarious and seem to enjoy the company of other species of animals

- a) Briefly, discuss **three (3)** ways you can use to restrain an adult sheep? **(6 marks)**
- b) Discuss ways you can use to cast adult goats or sheep. **(10 marks)**
- c) Outline why animal faeces are examined as part of the overall clinical examination. **(4 marks)**

**QUESTION 2**

A 1-year-old Pug presents with abnormal behaviour. According to the owner the dog is "falling around" a bit, and is crying out in pain. This behaviour started suddenly about 3 days prior to presentation after suspected trauma to the back legs.

- a) Which system(s) do you suspect are involved? Justify your answer. **(4 marks)**
- b) Describe in detail how you would go about examining this case to identify the cause of the "falling around". **(10 marks)**
- c) List any **three (3)** specific tests you may perform and the abnormal responses/reflexes you may get to aid the process in (b) above. **(6 marks)**

### QUESTION 3

In veterinary practice, a thorough clinical examination of a patient is an essential part of evaluating a presenting problem to arrive at a diagnosis. Write short notes on any **four (4)** of the following:  
**(5 marks each)**

- a) Clinical examination of joints in horses.
- b) Clinical examination of muscles in a stallion.
- c) Clinical examination of the oral cavity in large animal species.
- d) Auscultation of gut sounds (borborygmis) in a horse.
- e) Rectal examination of the equine gastrointestinal tract.

### QUESTION 4

A number of times, cattle will exhibit signs of pain which may be due to hardware, abomasal ulcers, distention of the small intestine with gas or abomasal displacement.

- a) Outline how you would examine a cow with a suspected abomasal displacement.  
**(6 marks)**
- b) Describe **three (3)** tests you would employ in a case of pain due to hardware.  
**(10 marks)**
- c) Briefly, outline why history taking is an important component in farm animal practice.  
**(4 Marks)**

### QUESTION 5

Cardiovascular disease is very common in both dogs and cats.

- a) Give a detailed description of a cardiac murmur in a dog or cat. **(12 marks)**
- b) Briefly describe the significance of each of the following in the cardiovascular system physical examination in dogs and cats. **(2 marks each)**
  - i. Mucous membranes
  - ii. Palpation
  - iii. Jugular vein assessment
  - iv. Percussion

### QUESTION 6

Ear diseases are common in small animal practice and are associated with several predisposing factors and primary causes. A thorough investigation is therefore essential for the successful management of these patients.

- a) Describe in detail how you would examine a 3-month old cat presented with head shaking and ear scratching of two weeks duration. **(12 marks)**
- b) List four (4) clinical signs associated with Horner's syndrome. **(4 marks)**
- c) List four (4) clinical signs associated with vestibular syndrome. **(4 marks)**

### QUESTION 7

Eye problems are commonly encountered during day-to-day consultations in veterinary clinics.

- a) Describe how you would go about carrying out the following on a dog presented with "red eye". (Your colleague has already carried out the general clinical examination).
  - i. Specific physical exam **(10 marks)**
  - ii. Ancillary tests on a red eye in a dog **(5 marks)**
- b) Briefly outline important findings that may be found by observing a dog with an eye problem from a distance. **(5 marks)**

### QUESTION 8

Correctly documenting veterinary clinical information is very important. The problem oriented veterinary medical report (POVMR) is a format that has been described for documenting clinical information arising from a valid veterinary surgeon-client-patient interaction.

- a) Concisely discuss the importance of POVMR in veterinary anaesthesia and surgery. **(4 marks)**
- b) List the four (4) basic components of the POVMR. **(4 marks)**
- c) In a POVMR, what does the acronym SOAP stand for? Comprehensively discuss the SOAP process in the context of the following: **(12 marks)**
  - i. a small animal, out-patient presented to a veterinary practice with a medical condition
  - ii. an in-patient that has been admitted for one week and is undergoing long term therapy.

.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
END OF YEAR EXAMINATIONS-2019/20 ACADEMIC YEAR**

**PRINCIPLES AND INTRODUCTION TO VETERINARY SURGERY AND  
DIAGNOSTIC IMAGING (VMC 4200)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
2. Answer **ANY SIX** questions
3. Write the answer to each question in a separate answer booklet
4. **ALL** questions carry equal marks
5. Write in a legible handwriting

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**QUESTION 1**

Fluid therapy and local analgesia form an important part of equine practice.

- a) Briefly outline how you would determine the amount of fluid required by an 8% dehydrated adult horse and how you would administer it. **(4 marks)**
- b) Dehydration in a horse is usually accompanied by electrolyte and acid-base imbalances. Discuss how you would determine and correct these imbalances. **(6 marks)**
- c) Describe the indications and procedure for the following local analgesic techniques in horses. **(2 marks each)**
  - i. Mandibular nerve block
  - ii. Supraorbital nerve block
  - iii. Epidural nerve block
- d) Briefly outline how you would carry out the following. **(4 marks each)**
  - i. Complete desensitization of the manus of a gelding.
  - ii. A local analgesic technique for castrating a colt.

**QUESTION 2**

Surgical procedures in food animals are performed for various reasons.

- a) What is the difference between a rumenotomy and rumenostomy? **(2 Marks)**
- b) List two (2) indications for a rumenotomy in cattle. **(2 Marks)**
- c) Describe how you would perform a rumenostomy on a 450kg intact Bull. Include pre-surgical consideration, patient preparation, anaesthetic protocol, surgical procedure and post-operative care. **(16 Marks)**

### QUESTION 3

A 3-year-old German Shepherd has been in a motor vehicle accident. He presents with respiratory distress. Upon thoracic auscultation, there are muffled heart and lung sounds as well as borborygmus.

- a) Give a tentative diagnosis? (2 marks)
- b) How would you confirm your diagnosis in a) above? Justify your answer with possible findings. (6 marks)
- c) Describe in full how you would successfully manage the condition (include pre-operative considerations, anesthesia and postoperative care) (12 marks)

### QUESTION 4

Write short notes of **any four (4)** of the following: (5 marks each)

- a) The use of barbiturates in veterinary anaesthesia.
- b) List ten (10) properties of an ideal suture material.
- c) In a tabular format, discuss the advantages and disadvantages of inhalation anaesthesia over intravenous anaesthesia.
- d) With the aid of a sketch or line drawings, discuss the Mapelson alphabet breathing circuits.
- e) Discuss surgical catgut as a suture material in veterinary surgery.
- f) With the aid of a sketch or line drawings, discuss the criteria used for the comprehensive description of a surgical needle.
- g) Write short notes on the Pin Index system on an anaesthetic machine.

### QUESTION 5

Wounds are a large proportion of cases presented to small animal clinics.

- a) Describe **two (2)** types of wound drains and state their use(s). (5 marks)
- b) Differentiate between primary wound healing and delayed primary wound healing. (5 marks)
- c) Discuss in brief how patients presented with dog bites are assessed and the rationale of not managing them using first intention. (5 marks)
- d) Indicate what you would use to assess the age of a wound. Justify your answer. (5 marks)

### QUESTION 6

Write short notes on any **four (4)** of the following:

**(5 marks each)**

- a) Types/categories of shock and their likely causes.
- b) Splenic torsion.
- c) Pathophysiology of shock.
- d) Advantages and disadvantages of routes of administration used in fluid therapy.
- e) Anaesthetic and general considerations in hepatic surgery.

### QUESTION 7

You are presented with a 3-year-old male dog for gastric surgery.

- a) Describe the aseptic preparation you would perform on the dog. **(5 marks)**
- b) Outline the anaesthetic protocol for this case. **(2 marks)**
- c) Name and describe the most appropriate celiotomy approach for this animal (including the closure). **(8 marks)**
- d) Describe the post-operative monitoring for this patient. **(5 marks)**

### QUESTION 8

Radiography is one of the most important diagnostic tools used in the practice of veterinary medicine.

- a) Describe the anatomy of the X-ray tube with the aid of a diagram. **(5 marks)**
- b) Describe the generation of x-radiation in the X-ray tube. **(4 marks)**
- c) Define the following terms: **(2 marks each)**
  - i. Radiographic contrast
  - ii. Radiolucent
  - iii. Radiopaque
  - iv. Radiographic artefact
  - v. Foreshortening

.....**END OF EXAMINATION**.....

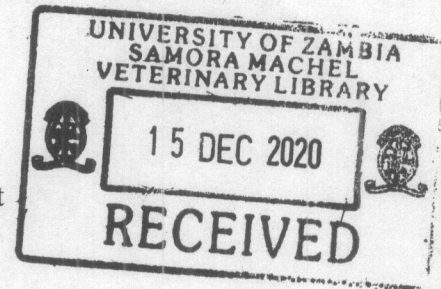
**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
FINAL EXAMINATIONS-2019/20ACADEMIC YEAR**

**INTRODUCTION TO VETERINARY REPRODUCTION AND OBSTETRICS  
(VMC 4309)**

**Duration:** Three (3) hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
2. Answer **ANY SIX** questions
3. Write the answer to each question in a separate answer booklet
4. **ALL** questions carry equal marks
5. Write in a legible handwriting



**QUESTION 1**

A farmer calls you to see one of his Holstein Friesian cows that calved one day prior and has a long band of tissue hanging from the vulva and almost scraping the floor. Upon examination the temperature is normal, a slight malodorous discharge from the vulva is seen, the cow is otherwise alert and eating.

- a) What is your tentative diagnosis? (4 marks)
- b) List two (2) differential diagnoses. (2 marks)
- c) Describe the aetiopathogenesis of the condition in (a) above. (6 marks)
- d) Discuss the management for the condition in (a) above. (6 marks)
- e) Outline the client education for the condition in (a) above. (2 marks)

**QUESTION 2**

Write short notes on any **four (4)** of the following: (5 marks each)

- a) Sequelae of termination of pregnancy in the cow
- b) Indications for induction of parturition in the cow.
- c) Postpartum return to ovarian cyclicity in the cow
- d) Hydrometra in the doe.
- e) Bovine Trophoblastic Protein-1

### **QUESTION 3**

Write brief notes on any **four (4)** of the following:

**(5 marks each)**

- a) Puberty in dogs
- b) Mating behaviour of cats
- c) Pregnancy diagnosis using radiography
- d) Pregnancy termination in dogs
- e) Proestrous in dogs
- f) Hormonal changes during the oestrous cycle in dogs
- g) Parturition in cats

### **QUESTION 4**

The mare is described as a seasonal polyoestrous breeder whose cyclicity is greatly influenced by day length, plane of nutrition and general body condition.

- a) Briefly discuss the term 'seasonal polyoestrous'. **(2 marks)**
- b) Describe how day length influences cyclicity in the mare. **(2 marks)**
- c) Discuss the endocrinology of pregnancy in the mare. **(6 marks)**
- d) Briefly outline the maternal recognition of pregnancy in the mare. **(4 marks)**
- e) Outline the findings of each of the following in establishing overt oestrus in a mare. **(2 marks each)**
  - i. Behaviour of the mare
  - ii. Rectal examination
  - iii. Vaginal examination

### **QUESTION 5**

Breeding soundness evaluation (BSE) of bulls is an easy, cheap, and an essential tool for the cow-calf operation. BSE reduces risk, improves, strategic bull usage, fertility of herd and economics.

- a) Outline the outstanding qualities you would consider when selecting breeding bulls during BSE. **(4 marks)**
- b) Mention **four (4)** pathological colours of semen that can be found when conducting BSE and what they signify. **(4 marks)**
- c) List **four (4)** breeding soundness evaluation components. **(2 marks)**
- d) Briefly describe each of the components mentioned in (c) above, stating clearly step by step how each process is carried out. **(10 marks)**

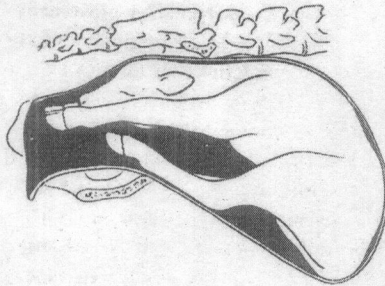
### **QUESTION 6**

Artificial Insemination (AI) is one of a group of technologies commonly known as “assisted reproduction technologies” (ART), whereby offspring are generated by facilitating the meeting of gametes (spermatozoa and oocytes).

- a) List **four (4)** disadvantages of AI. **(2 marks)**
- b) State **two (3)** reasons why you think AI in sheep is not commonly performed compared to AI in cattle. **(3 marks)**
- c) What animal health precaution (s) would you consider when performing A.I. **(5 marks)**
- d) Describe step by step the process of carrying out artificial insemination in cattle. **(10 marks)**

**QUESTION 7**

Closely examine the picture below and answer the questions that follow.



- a) Describe the orientation of the foetus. **(5 marks)**
- b) Discuss what could have led to the development of the condition shown in the image above. **(5 marks)**
- c) Describe in detail how you would manage the condition shown in the image above. **(10 marks)**

**QUESTION 8**

A farmer calls you to see one of his 5-year-old well-conditioned ewes that was last seen on heat and mated 143 days prior. On examination of the ewe you notice a large red/pinkish swelling around the perineal area.

- a) What is your tentative diagnosis? **(4 marks)**
- b) What would be your differential diagnoses? **(2 marks)**
- c) Discuss aetiopathogenesis of the condition in (a) above. **(6 marks)**
- d) Discuss how you would manage the condition in (a) above. **(6 marks)**
- e) Outline the client education for the condition in (a) above. **(2 marks)**

.....**End of Examination**.....

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**END OF YEAR EXAMINATION NOVEMBER EXAMINATION- 2019/2020**  
**ACADEMIC YEAR**

**EPIDEMIOLOGY (VMD 4201)**

**Duration: Three (3) Hours**

**Instructions**

1. Read the instructions before attempting to answer any questions
2. This Examination has **SIX (6)** Questions. Please answer **ANY FIVE**
3. State all assumptions used and show all calculations
4. Answer **each question** in a **separate booklet**

**Question 1**

**(a)**

- i. Define a study design? **(2 Marks)**
- ii. What should guide the choice of study design to use? **(2 Marks)**
- iii. What are advantages and disadvantages of a cases-control study **(4 Marks)**
- iv. What is the difference between the relative risk and odds ratio? **(2 Marks)**

**(b)** A final year veterinary student at the University of Zambia wanted to undertake a study to assess the association between eating food sold on the streets and developing diarrhoea. Answer the following question:

Assume now that the student has obtained the data presented below:

| <b>DIARRHOEA</b>            |            |           |              |
|-----------------------------|------------|-----------|--------------|
| <b>SOURCE OF FOOD</b>       | <b>Yes</b> | <b>No</b> | <b>Total</b> |
| <b>Street food (Yes) F+</b> | 37         | 17        | 54           |
| <b>Street food (No) F-</b>  | 13         | 53        | 66           |
| <b>Total</b>                | 50         | 70        | 120          |

- i. What study design would you recommend for such a study and why? **(2 Marks)**
- ii. What is the risk of developing diarrhoea among those who ate street foods?

- iii. (2 Marks)
- iv. What is the risk of developing diarrhoea among those who did not eat street foods (2 Marks)?
- v. Calculate the relative risk and give interpretation (4 Marks)

### Question 2

Write brief notes any 5 (five) on the following topics:

- a) Target population (4 marks)
- b) Gold standard (4 marks)
- c) Stratified random sampling (4 marks)
- d) False positives (4 marks)
- e) Census (4 marks)
- f) Parallel interpretation of diagnostic tests (4 marks)
- g) Principle of sampling

### Question 3

- a) Describe the following terms (10 Marks)
  - i. Epidemiology
  - ii. Population at risk
  - iii. Incidence risk
  - iv. Accuracy
  - v. Separated population
  
- b) You visit a farm on 20<sup>th</sup> January 2020. You find that the farmer has a flock of 70 pigs. You diagnose 10 of his pigs to be suffering from mange. You recommend treatment for the sick pigs. You visit the farm again a month later and find that there have been 8 new cases of mange. You also learn that the farmer has sold 12 apparently health pigs to Master Pork.  
From the information above, calculate:
  - i. The time at risk (4 marks)
  - ii. The incidence risk of mange (3 marks)
  - iii. The incidence rate of mange (3 Marks)

### Question 4

- a) Suppose you were a district veterinary officer, what would you do if a list A disease broke out in an area in your district? ?

- b) What is epidemiological surveillance and/or monitoring? Differentiate between epidemiological surveillance and epidemiological monitoring and state how they are related Epidemiological diagnosis.
- c) Briefly discuss considerations required when designing an epidemiological monitoring programme.
- d) What is EMPRES and what role does EMPRES play?
- e) Define Trans-boundary diseases and classify them according to EMPRESS. State which of these classes are regarded as most important and how they are important.

#### Question 5

Studies are generally conducted to identify causes of disease so that preventive measure can be formulated and implemented, and their effectiveness evaluated. In so doing, epidemiologists formulate hypotheses and follow certain rules and guidelines in order to relate causes with disease syndromes.

- a) When attempting to establish a causal association, what principles should be considered? **(10 marks)**
- b) State and explain the major methods that you would use to arrive at a hypothesis. **(10 marks).**

#### Question 6

- a) Distinguish cluster sampling from stratified random sampling **(10 Marks)**
- b) Diagnostic tests are important in the disease control activities both at individual and population level. Using appropriate illustrations, discuss how interpretation of diagnostic test results can be useful or detrimental to disease control efforts **(10 Marks).**

*End of Examination – Good lucky*

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**COMPANION ANIMAL MEDICINE (VMC 5149)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
2. Answer **ANY SIX (6)** questions.
3. Write the answer to each question in a separate answer booklet
4. **ALL** questions carry equal marks
5. Write in a legible handwriting

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**QUESTION 1**

A 12-year-old Great Dane with a history of lameness and coughing of 2 months duration, is presented to your small animal practice. Physical examination revealed the following abnormalities; largeswelling and pain in the region of the proximal humerus weight loss, and lethargy.

- a) What is your tentative diagnosis? (3 marks)
- b) List two (2) differential diagnosis. (6 marks)
- c) What radiographic findings would you expect in the condition in (a) above? (4 marks)
- d) What is the prognosis of this case? (1 mark)
- e) Outline the management options in this case in (a) above (6 marks)

## QUESTION 2

You are presented with a 16-year-old mare that the owner thinks is drinking excessive amounts of water. He is worried as it is his best performing horse and thinks there is something wrong with it. He has hence presented it to you to determine whether the horse is healthy or not.

- a) Describe in detail how you would carry out an investigation to arrive at the cause of the polydipsia (6 marks)
- b) List four (4) conditions that would cause polydipsia in the the horse. (4 marks)
- c) Describe tests, including their findings that you would carry out to conform or rule out the conditions listed in (b) above. (10 marks)

## QUESTION 3

A 2-year-old female mongrel is presented to you with severe lethargy and anorexia of three day's duration. On physical examination, you discover that the mucous membranes are very pale, the dog has numerous ticks and temperature is 40°C. Laboratory results show evidence of babesiosis. A few days following presentation the dog develops marked icterus and becomes even more depressed. A blood slide now shows marked autoagglutination. The dog is fully vaccinated and was recently dewormed.

- a) What is your tentative diagnosis? (2 marks)
- b) List two (2) differential diagnoses. (2 marks)
- c) Give a detailed description of the aetiopathogenesis of the condition in (a) above. (5 marks)
- d) Outline the ancillary tests that you would carry out in order to reach a definitive diagnosis. (2 marks)
- e) Outline the management of the condition in (a) above. (9 marks)

#### QUESTION 4

You are presented with a 24-year-old gelding with problems of lameness and progressive weight loss despite an increase in its appetite. The horse has also been observed to have increased water intake and a wavy long hair coat and sweats with minimal exercise. You examine the horse and apart from the long wavy hair coat you also find increased fat deposits on the neck, tail head and the supraorbital fossa. Assessment of the lameness shows that it is lame on all four limbs.

- a) What is your tentative diagnosis? **(4 marks)**
- b) Outline the laboratory investigation necessary to confirm the diagnosis in (a) above. **(4 marks)**
- c) Discuss how you would manage the case. **(8 marks)**
- d) Briefly, outline the prognosis of this case? **(4 marks)**

#### QUESTION 5

Anaemia occurs quite commonly in horses with the primary clinical sign being pallor of the mucous membranes.

- a) List the other clinical signs associated with anaemia in horses. **(4 marks)**
- b) List the pathophysiological mechanisms that anaemia in a horse can be classified into and for each class, state whether regenerative or non-regenerative. **(3 marks)**
- c) Outline the erythron parameters that make the interpretation of anaemia in horses more complicated compared to other animal species. **(4 marks)**
- d) For each of the classifications in (b) above, write short notes on each class giving an example of a condition that can lead to that type of anaemia in a horse. **(9 marks)**

#### QUESTION 6

A 3-year-old male mongrel is presented to you with lacrimation of a month's duration. On physical examination, you discover that the mucous membranes are hyperaemic, there is photophobia, corneal oedema and entropion. There is also evidence of neovascularisation of the cornea. The dog is fully vaccinated and was recently dewormed.

- a) What is your tentative diagnosis? **(2 marks)**
- b) List two (2) differential diagnoses. **(2 marks)**
- c) Give a detailed description of the pathophysiology of the condition in (a) above. **(6 marks)**
- d) Outline the ancillary tests that you would carry out in order to reach a definitive diagnosis. **(3 marks)**
- e) Outline the medical management of this case. **(7 marks)**

### **QUESTION 7**

Polyuria and polydipsia are common presenting problems caused by several conditions.

- a) What is the tentative diagnosis, expected urinalysis findings for **each** of the following cases:
- i. A 6-year-old dog with polydipsia, polyuria and weight loss. **(5 marks)**
  - ii. A 9-year old male dog with non-pruritic symmetrical alopecia, polydipsia and polyuria. **(5 marks)**
  - iii. A 14-year-old cat with polydipsia, polyuria, anaemia, anorexia and oral ulcerations **(5 marks)**
- b) Outline the management options for the condition in (a)(i) above. **(5 marks)**

### **QUESTION 8**

A 3-year-old male Doberman is presented to you with ataxia of all the limbs of a month's duration. The owner tells you that the limbs were progressively getting worse especially the hindlimbs where 'knuckling' was sometimes observed. Physical examination, reveals severe ataxia and delayed proprioception of the hindlimbs. The dog is fully vaccinated and was recently dewormed.

- a) What is your tentative diagnosis? **(2 marks)**
- b) List two (2) differential diagnoses. **(2 marks)**
- c) Give a detailed description of the pathophysiology of the condition in (a) above. **(6 marks)**
- d) Outline the radiographic findings of the condition in (a) above. **(5 marks)**
- e) Outline the medical management of this case. **(5 marks)**

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**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
END OF YEAR FINAL EXAMINATIONS-2019/20 ACADEMIC YEAR**

**VETERINARY OPERATIVE SURGERY (VMC 5210)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **ANY six (6)** questions
  3. Write the answer to each question in a separate answer booklet
  4. **ALL** questions carry equal marks
  5. Write in a legible handwriting
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**QUESTION 1**

Lameness is a clinical sign manifested by in a disturbance in the gait and the ability to move the body about, typically in response to pain, injury, or abnormal anatomy. Sudden lameness in dogs is mainly due to an injury to a joint, muscles or bones.

- a) List three (3) arthropathies commonly seen in dogs. **(3 marks)**
- b) List three (3) myopathies commonly seen in dogs. **(3 marks)**
- c) Outline the radiographic features of hip dysplasia and 'Grade 4' bilateral medial patella luxation in dogs. **(8 marks)**
- d) Outline the surgical management options available for hip dysplasia and 'grade 4' bilateral medial patella luxation in dogs. **(6 marks)**

**QUESTION 2**

Rectovaginal lacerations in the mare can be classified into first-, second- or third-degree lacerations. Correction of these lacerations requires surgical intervention.

- a) Briefly outline the three classes of rectovaginal lacerations in mares. **(4 marks)**
- b) Discuss the pre-surgical considerations in the surgical management of rectovaginal lacerations in the mare. **(4 marks)**
- c) List the surgical technique(s) you can use to correct a third degree laceration. **(2 marks)**
- d) Describe in detail **one (1)** of the techniques listed in (c) above (include anaesthesia and post-operative care). **(10 marks)**

### QUESTION 3

You are presented with a Labrador with a swollen ear pinnae. You have been treating this dog for otitis externa intermittently for the past year and was recently noticed to be head shaking vigorously. On examination of the pinnae, the swelling is fluctuant.

- a) Give a tentative diagnosis. (2 marks)
- b) What diagnostic tests would be useful for arriving at a definitive diagnosis? (2 marks)
- c) Describe the procedure to correct the problem with the pinnae. (6 marks)
- d) List two procedures you would consider if the otitis externa continues to be problematic. (2 marks)
- e) Describe one of the procedures listed in (d) above. (8 marks)

### QUESTION 4

Write short notes on any **four (4)** of the following: (5 marks each)

- a) Surgical and general considerations in a case of ulcerated mammary tumours affecting an entire mammary chain in a bitch.
- b) Clinical signs associated with the various stages of periodontal disease in a cat.
- c) Anaesthetic and preoperative considerations in a case of closed pyometra in a 2-year-old mongrel.
- d) Indications and technique for performing an episiotomy in a boerboel.
- e) Indications for radiography of the oral cavity in a dog.

### QUESTION 5

You are a recent graduate from the University of Zambia, School of Veterinary Medicine and currently working at UNZA Veterinary Clinics. A client presents to you an 11-year-old crossbreed dog with halitosis, excessive salivation and inappetance. The owner tells you that the dog appears to be in pain and refuses to eat. You decide to carry out a thorough oral examination and confirm the above-mentioned signs. Additionally, the right maxillary canine tooth has a crack.

- a) You decide to manage the case surgically by extracting the fractured canine tooth. Discuss in detail how you would surgically manage this case (include pre-operative assessment, anaesthesia and postoperative care and possible complications). (15 marks)
- b) Outline the natural defense mechanisms of the oral cavity. (5 marks)

### QUESTION 6

Disorders of the urinary tract in small animals are rare but when they occur they may necessitate surgical intervention.

- (a) Where may ectopic ureters terminate in the male? (3 marks)
- (b) Name the other abnormality/abnormalities most commonly associated with ureteral ectopia. (3 marks)
- (c) List four (4) indications for performing a urethrostomy in the dog. (4 marks)
- (d) Describe in full the scrotal urethrostomy (exclude anesthesia) (10 marks)

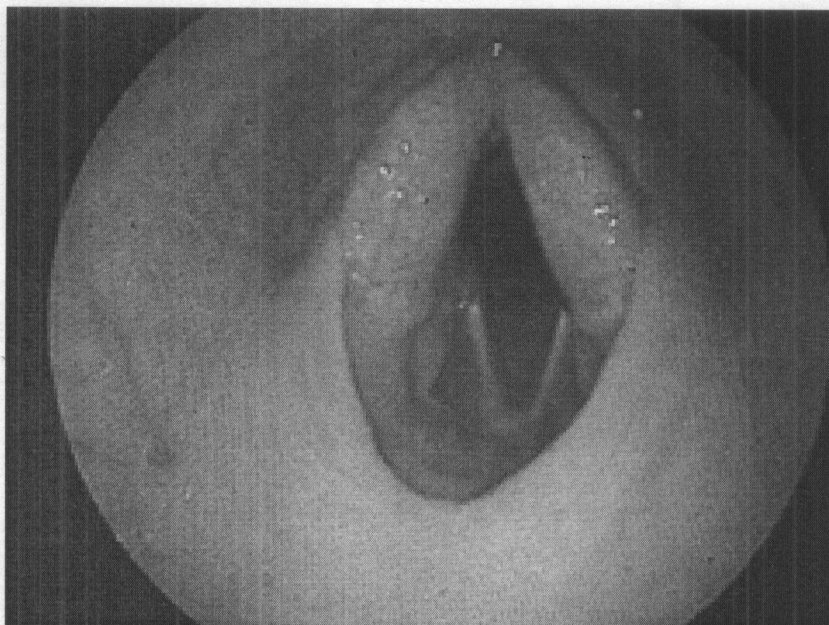
### QUESTION 7

In bovine practice it may be necessary to remove the eye.

- (a) List five (5) indications for eye enucleation in the bovine. (5 marks)
- (b) Describe in detail the procedure for extirpation in the bovine. (Include in your description preoperative preparations, surgical technique and postoperative care). (15 marks)

### QUESTION 8

You are presented with a 14-year-old gelding with a gurgling respiratory noise produced during exercise and has become exercise intolerant. The noise is especially heard when the horse exhales. Occasionally, it is observed struggling to breath. You carry out a physical examination and all parameters are within normal range. The endoscopic findings are shown in the picture below:



- a) Briefly outline the abnormality/abnormalities revealed in the endoscopic picture: (2 marks)
- b) What is your diagnosis? (2 marks)
- c) List the surgical techniques you can use to correct the diagnosis in (b) above. (2 marks)
- d) List the approaches available to the site of the condition in (b) above. (4 marks)
- e) Describe in detail **one (1)** technique from (c) above (include patient preparation, anaesthesia and post-operative care). (10 marks)

.....THE END.....

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**FINAL EXAMINATIONS-2019/20 ACADEMIC YEAR**  
**VETERINARY REPRODUCTION AND GYNAECOLOGY (VMC 5319)**

**Duration:** Three (3) hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **ANY SIX** questions
  3. Write the answer to each question in a separate answer booklet
  4. **ALL** questions carry equal marks
  5. Write in a legible handwriting
- .....

**QUESTION 1**

A farmer invites you to examine one of his dairy cows that is not showing signs of heat. On physical examination you notice that there is pus coming from the vulva and palpation per rectum of the reproductive tract reveals a symmetrically enlarged uterus and presence of an active corpus luteum on the right ovary.

- a) What is your tentative diagnosis? **(4 marks)**
- b) Give **one (1)** differential diagnosis. **(2 marks)**
- c) Describe the aetiopathogenesis of the condition in (a) above. **(5 marks)**
- d) Describe the management for the condition in (a) above. Include in your description the mechanism of action of the agents used. **(7 marks)**
- e) Outline the appropriate client education for the condition in (a) above. **(2 marks)**

**QUESTION 2**

You are on break and join a conversation where your classmates are debating two diseases as it relates to their effects on pig reproduction. The diseases being discussed are porcine leptospirosis and Swine erysipelas.

- a) Compare and contrast the two diseases as to their effect on reproduction in pigs. **(8 marks)**
- b) Describe the clinical manifestation of porcine leptospirosis as observed in different age groups. **(6 marks)**
- c) Compare and contrast the management and control of these two diseases. **(6 marks)**

### QUESTION 3

You are presented with a mare that was mated 10 days prior to a newly acquired stallion and has since developed a profuse grey to yellow vulval discharge. Speculum examination of the reproductive tract reveals vaginitis, cervicitis and endometritis.

- a) What is your tentative diagnosis? (4 marks)
- b) State the aetiology of the condition in (a) above and how it is transmitted. (2 marks)
- c) List two (2) differential diagnoses for the condition in (a) above. (2 marks)
- d) Discuss in detail how you would manage the condition in (a) above. (10 marks)
- e) Briefly outline your client education in terms of reproductive outlook of his mare and the control of the condition on his premises. (2 marks)

### QUESTION 4

You are requested to carry out a breeding soundness examination of a 7-year-old stallion as part of a pre-purchase examination. Your client would like to purchase the stallion for his horse breeding establishment to replace an aging stallion. Your only notable finding during the examination of the external genitalia was presence of vesicles and pustules on the shaft of the penis. Some of the lesions have ulcerated and healed leaving scars. There is also oedema of the prepuce and sheath.

- a) What is your tentative diagnosis? (4 marks)
- b) State the aetiology of the condition in (a) above and how is it transmitted? (2 marks)
- c) Outline the effect(s) your diagnosis in (a) above has on the reproductive potential of the stallion. (4 marks)
- d) Discuss how the condition in (a) above can be managed? (8 marks)
- e) Outline the control measures for the condition in (a) above. (2 marks)

### QUESTION 5

You are consultant veterinarian presented with four healthy queens. The history is that between four and six weeks previously, the queens were placed with the same tomcat for a period of three days each while they were on heat. Since then all the queens have been observed carefully but none of them has come into heat again and no signs of pregnancy have been observed. The owners are worried about this state of affairs. You carry out an ultrasound examination on each queen and none of them are pregnant. The tomcat is healthy and has palpably normal external genitalia.

- a) What is the most likely cause of the absence of oestrus in the queens during the past few weeks? Justify your answer. **(5 marks)**
- b) How would you confirm the condition in a) above? **(5 marks)**
- c) What is the essential next step in your examination of this case? **(2 marks)**
- d) Outline the management of the case. **(8 marks)**

### QUESTION 6

An adult Boxer dog is presented with only the left testis, which is small and soft, in the scrotum. The other testis cannot be palpated. The dog suffers bilaterally symmetrical, non-pruritic alopecia, with enlarged, dark, firm nipples and a dark, firm scrotum. A smear from the urine sediment (obtained by means of cystocentesis) reveals many large, polygonal epithelial cells that are anuclear or have pyknotic nuclei.

- a) List **three (3)** abnormalities that the Boxer has. **(3 marks)**
- b) What is your tentative diagnosis? **(3 marks)**
- c) What is your opinion of the fertility of the dog, should it be used for breeding now? **(4 marks)**
- d) Describe in detail the best treatment for this dog? **(8 marks)**
- e) Justify your answer in d) above. **(2 marks)**

### QUESTION 7

A five-year-old Holstein Friesian cow, weighing 450 kg, is referred to your clinic with a slimy chocolate-coloured vaginal discharge. The owner of the cow noted that she had been inseminated 196 days prior. Using transrectal ultrasonography, you visualize bone fragments directly related to the foetus with no foetal fluid in the uterus. On vaginal examination, the cervix is open such that a small amount of uterine discharge could pass through to the vagina.

- a) List two (2) conditions you suspect? **(3 marks)**
- b) What do you think is the cause of this case? **(3 marks)**
- c) What will be your drug of choice in the management of the condition (s) you are suspecting in (a) above, justify your answer? **(2 marks)**
- d) What will be your alternative drug (s) of choice and other management procedures you would consider in managing this case? **(8 marks)**
- e) What will be your client education in terms of the cows reproduction status? **(4 marks)**

### QUESTION 8

One of the common causes of infertility on beef and dairy farms in Zambia is anestrus. It can lead to prolonged inter-calving interval and increased veterinary costs.

- a) List the various causes of anestrus on beef and dairy farms. **(6 marks)**
- b) For **three (3)** of the listed causes in (a) above describe the aetiopathogenesis pathogenesis leading to anestrus. **(6 marks)**
- c) Describe how you would manage anestrus due to the **three (3)** causes listed in (b) above. **(6 marks)**
- d) Outline the client education for a farmer having **anoestrous** problems on his beef farm during the long dry season in Zambia. **(2 marks)**

.....**End of Examination**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
END OF YEAR EXAMINATIONS-2019/20 ACADEMIC YEAR**

**VETERINARY CLINICAL PATHOLOGY (VMD 4102)**

**Duration: 3 hours**

**INSTRUCTIONS:**

1. Please read each question carefully
  2. Answer ALL questions
  3. ALL questions carry equal marks
  4. Write in a readable handwriting
- 

**Question 1:**

Haematology is the study of blood and its clotting factors. It may also include the study of other non-blood fluids.

- a. Blood smear examination is one of the most important diagnostic techniques during blood sample examination.
  - I. When you prepare a blood smear, name the three (3) parts of the smear that you have to consider before examining it. **(3 Marks)**
  - II. Which of these parts do you examine? **(1 Mark)**
  - III. List three (3) labels you would write as part of proper labelling of a blood slide. **(3 Marks)**
  - IV. To examine blood samples, name the anticoagulants that you would find in a Red, Green and Blue top tube. **(3 Marks)**
- b. Give five (5) reasons why you would carry out a blood examination. **(5 Marks)**
- c. During examination of White blood cells (WBCs), some of the cells are identified as Granulocytes while others are Agranulocytes.
  - I. Which of the cells are called Granulocytes and why **(3 Marks)**
  - II. Among all the white blood cell types which cell is the largest and which one is the smallest on blood smear examination **(2 Marks)**?

## Question 2:

A 3-month-old female intact Irish wolfhound presents for stunted growth and episodes of intermittent lethargy and disorientation. A serum biochemistry panel is performed, with the results shown below.

The fasted ammonia concentration is 175  $\mu$ /dL (normal range, 0–50  $\mu$ /dL).

Preprandial and postprandial (2-hour) bile acids are 40  $\mu$ mol/L (normal, 0–8  $\mu$ mol/L) and 102  $\mu$ mol/L (normal, 0–30  $\mu$ mol/L), respectively.

### Serum Biochemistry Results

| Analyte         | Value    | Normal Range  |
|-----------------|----------|---------------|
| BUN             | 3mg/dL   | 7 - 27mg/dL   |
| Total Protein   | 5g/dL    | 5.2 - 8.2g/dL |
| Albumin         | 2g/dL    | 2.4 - 4g/dL   |
| Glucose         | 118mg/dL | 74 - 140mg/dL |
| ALT             | 50U/L    | 10 - 130U/L   |
| AST             | 15U/L    | 10 - 34U/L    |
| ALP             | 180U/L   | 24 - 147U/L   |
| GGT             | <10U/L   | 0 - 25U/L     |
| Total Bilirubin | 0.1mg/dL | 0 - 0.8mg/dL  |

- Interpret the results. (10 Marks)
- What is your diagnosis? (5 Marks)
- What further test(s)/examination(s) would you carry out to confirm your diagnosis? (5 Marks)

## Question 3:

Urine chemistry test strips have multiple pads impregnated with reagents that change color when the substance of interest is present. The degree of color change corresponds to the approximate amount of the substance present. Because color changes can be subtle, results may be considerably varied between individuals reading the test.

- List 10 (ten) causes of proteinuria. (10 Marks)
- List 10 (ten) causes of hematuria. (10 Marks)

## Question 4

UNZAVET clinic is presented with a referral case of suspected hypothyroidism in a German shepherd. The dog is suspected to be exhibiting signs of hypothyroidism. As the UNZAVET Head of the Laboratory of Clinical Pathology clearly outline the algorithm that you would implement to establish the nature of the condition of the dog (20 marks).

### **Question 5**

Write short notes on any four (4) of the following topics

- a. Cortisol (5 marks)
- b. Troponin (5 marks)
- c. Functional biomarker (5 marks)
- d. Trypsinogen (5 marks)
- e. BNP (5 marks)

**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**VETERINARY INFECTIOUS DISEASES (VMD 5300)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions in **SEPARATE ANSWER BOOKLETS**
3. **ALL** questions carry equal marks
4. Write in a legible handwriting
5. Five minutes perusal time.

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**QUESTION 1**

Discuss enzootic bovine leukosis (EBL) using the following subheadings: (20 marks)

- a) Aetiology and pathogen transmission
- b) Phases of infection
- c) Economic impact of infection
- d) Prevention and control

**20 MARKS**

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**QUESTION 2**

- a) Discuss how infectious diseases emerge and re-emerge (10 marks)
- b) In your opinion, what factors could be driving the emergence of arboviruses (10 marks)

**20 MARKS**

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### QUESTION 3

- i. Discuss clinical and diagnostic features Bovine Theileriosis
- ii. What is the economic significance of Bovine Theileriosis in Zambia?
- iii. What would be your recommendations for prevention, control of the disease in Zambia?

**20 MARKS**

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### QUESTION 4

A 2-year-old female mongrel is presented to you with severe weightloss and bilateral epistaxis of three day's duration. On physical examination, you discover that the mucous membranes are very pale and there is evidence of petechial and ecchymotic haemorrhages on the buccal mucosae, the dog has numerous ticks and temperature is 40°C. The dog is fully vaccinated and was recently dewormed with a pyrantel/praziquantel combination.

- a) What is your tentative diagnosis? **(2 marks)**
- b) List two (2) differential diagnoses. **(2 marks)**
- c) Give a detailed description of the aetiopathogenesis of the condition in (a) above. **(7 marks)**
- d) Outline the ancillary tests that you would carry out in order to reach a definitive diagnosis. **(2 marks)**
- e) Outline the management of this case. **(7 marks)**

**20 MARKS**

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### QUESTION 5

a) Give an overview of African horse sickness including the most susceptible hosts. Discuss the clinical manifestations of African horse sickness.

b) Give an overview of Rift Valley Fever and its possible distribution in your country.

How would you recognize an outbreak of RFV? State the most pathognomonic lesions in all or most cases

**20 MARKS**

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## **QUESTION 6**

- a) Apart from being called Lumpy skin disease (LSD) which other names is this disease often referred to as? Provide a very brief history of the occurrence of LSD – i.e. where and when was it first identified?
- b) State the most pathognomonic lesion in LSD, in which host species and briefly describe its pathogenesis. Explain the economic importance of LSD. Does this disease cause illness in man?

**20 MARKS**

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## **QUESTION 7**

A 6-year-old intact male Domestic Short-Haired cat is presented due to weight loss of a month's duration. On physical examination intractable gingivitis/stomatitis, rhinitis, diarrhoea, skin disease and uveitis are evident. Further tests following faecal culture reveal that the diarrhoea is due to salmonellosis. It is an out-door cat and is vaccinated against rabies, feline influenza and FeLV.

- a) What is your tentative diagnosis? **(2 marks)**
- b) List two (2) differential diagnoses. **(2 marks)**
- c) Briefly outline the pathogenesis of the condition in (a) above. **(4 marks)**
- d) Outline **two (2)** ancillary tests that you would carry out in order to reach a definitive diagnosis. **(2 marks)**
- e) State and justify your prognosis **(2 mark)**
- f) Outline the management of this case in (a) above. **(5 marks)**
- g) Describe briefly prevention of this disease **(3 Marks)**

**20 MARKS**

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**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**END OF YEAR EXAMINATIONS – 2019/2020 ACADEMIC YEAR**

**DISEASES OF WILDLIFE, FISH AND EPICULTURE (VMD 5302)**

**Duration: 3 hours**

**INSTRUCTIONS**

1. Please read the instructions and each question carefully
  2. **Answer ALL questions**
  3. Write the answer to each question in a separate answer booklet where applicable)
  4. Write in a legible handwriting
- 

**QUESTION 1**

1. Outline five (5) properties of a good immobilization drug for wildlife. **(4 marks)**
2. Most of Zambia's National Parks are "buffered" by zones. What are these buffer zones called? Briefly, but with necessary detail, describe the types of buffer zones surrounding National Parks in Zambia **(4 marks)**
3. Compare and contrast Boma Capture Vs. Drop nets capture methods. **(4 marks)**
4. During Game capture preparation, outline four (4) important factors that should be put in place prior to a capture operation. **(4 marks)**
5. Outline four (4) principles behind a successful game capture operation. **(4 marks)**

**QUESTION 2**

- a) Briefly, but with necessary detail, outline the rabies in a Yellow mongoose **(5 marks)**
- b) How does a rabid Jackal present itself? **(3 marks)**
- c) How does a rabid Jackal differ from a domestic rabid dog? **(3 marks)**
- d) In Crocodiles, the gout disease is an important occurrence. What are the risk factors of its occurrence? **(2 marks)**
- e) In Ostriches, Obstipation is mainly caused by what? **(2 marks)**
- f) Anthrax is a major disease in wildlife. Which wildlife species are mostly affected and outline the disease presentation in wildlife. **(5 marks)**

### QUESTION 3

- a) Briefly discuss water transparency as an indicator of water fertility
- b) In order to achieve high fish production, regular maintenance and monitoring of the pond is necessary. Briefly explain how this is done.
- c) Briefly discuss the structural and functional anatomy of the fish's gill apparatus
- d) Briefly explain the significance of the air/ swim bladder in fish and give an example of a fish species in which this organ is highly developed and the reasons for this.

**15 marks**

### QUESTION 4

- a) There are some basic rules which must be observed if outbreaks of disease in the fish pond are to be prevented or, if they occur, to be controlled. Briefly outline these rules
- b) Compare and contrast between EUS and Enteric Septicemia of catfish in terms of the nature of the causative agent(s), host fish species, symptomatology and treatment (if any)
- c) Discuss the different treatment methods in fish management.
- d) Briefly discuss how you would investigate a disease outbreak in the fish pond.

**20 marks**

### QUESTION 5

- a) Briefly outline the importance of the honey bee to animals, man and other insects and, name the most important honey bee in Africa. Explain why it is called "honey bee" and how it differs from other insects.
- b) Briefly outline the structural and functional anatomy of the honey bee's respiratory and circulatory systems. Briefly describe how the honey bee's crop functions. What other names is this organelle known by?
- c) A healthy honey bee colony has three distinct individuals. Name these individuals and briefly outline their roles and functions in the colony. How can one differentiate amongst these individual members of the colony?
- d) Briefly outline the stage wise development process of the honey bee, describing the appearance and pattern of each normal stage. What is the common name for all these developmental stages? Why is it necessary to know the normal appearance and patterns of these stages?

**20 marks**

### **QUESTION 6**

- a) Compare and contrast between American foulbrood (AFB) and European foulbrood (EFB) in terms of aetiology, transmission, symptomatology, pathogenicity, prevention and/ or treatment.
- b) Describe the varroa parasitosis in terms of the causative agent, its destructive nature and capacity to transmit other diseases giving examples.
- c) Compare and contrast between Aethinosis and Galleriosis.
- d) Outline and briefly discuss human activities that negatively affect the honey bee health. Also outline any five measures that can be applied to prevent the spreading of honey bee diseases.

**20 marks**

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**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**VETERINARY PUBLIC HEALTH (VMD 5400)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions
3. **ALL** questions carry equal marks
4. Write in a legible handwriting
5. Five minutes perusal time.

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**QUESTION 1**

Some helminths are known to cause parasitic zoonoses with great burden on affected communities. Many of these are of major economic and public health importance in developing countries like Zambia and their control is urgently needed.

- a) Briefly outline the public health significance for each one of the following zoonotic helminths:
  - i. *Taenia solium* (2 marks each)
  - ii. *Taenia saginata* (2 marks each)
  - iii. *Echinococcus granulosus* (2 marks each)
  - iv. *Trichinella spiralis* (2 marks each)
  
- b) Diseases caused by *Taenia solium* is described as potentially eradicable by the World Health Organisation, outline the factors that make these diseases potentially eradicable. (6 marks)
  
- c) *Hymenolepis nana* or the dwarf tapeworm is described as the smallest tapeworm infecting man and is found worldwide. Outline its life cycle and its pathogenesis in humans. (4 marks)
  
- d) Outline a control programme for *Echinococcus granulosus* in an endemic rural community. (2 marks)

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**20 MARKS**

## QUESTION 2

- a) List eight (8) roles of a veterinarian in the prevention and control of zoonoses
- b) Define the following: Saprozoonoses, anthroozoonoses, zooanthroponoses, amphixenoses
- c) Define the following: disinfection and decontamination
- d) List the four steps of a microbiological risk assessment
- e) List four food borne zoonoses
- f) Briefly discuss the prevention and control of two (2) food borne diseases listed in (e) above
- g) Name the three forms of anthrax in humans and name the three forms of anthrax in animals
- h) Discuss the diagnosis, prevention and control of anthrax in wildlife and livestock
- i) Briefly outline the anthrax reporting system in Zambia

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**20 MARKS**

## QUESTION 3

- a. Define the following
  - i. Milk. (1 mark)
  - ii. Milk hygiene. (1 mark)
- b. List the milk contamination sources and contaminants of milk (give examples). (4 marks)
- c. Discuss the control of hazards in milk at both the animal level and in the milking parlour. (10 marks)
- d. Define the term Pasteurization and list three (3) methods of Pasteurization that are commonly used. (4 marks)

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**20 MARKS**

#### **QUESTION 4**

1. Briefly, outline the simple basic steps/protocols of cleaning and/or disinfecting the abattoir environment. **(5 marks)**
2. In any slaughter operation, there are considerations that one need to consider before the actual slaughtering processing of any food animal is undertaken. With necessary detail, outline actual slaughter (intra-slaughter) considerations and explain their importance. **(5 marks)**
3. At the abattoir, animals can be evaluated based on live animal composition and based on carcass quality. Describe the methods available to a meat inspector to evaluate live animal composition as well as carcass composition. **(5 marks)**
4. How can you differentiate a carcass that has jaundice due to physiological causes to that one that is due to pathological causes at an abattoir during meat inspection? **(5 marks)**

**20 MARKS**

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#### **QUESTION 5**

1. Briefly, but with necessary detail, outline what “Meat Inspection” really encompasses **(3 marks)**
2. Compare and contrast food risk from hazard. **(3 marks)**
3. Briefly describe the conditions desirable for food safety and hygiene at an abattoir. **(3 marks)**
4. Briefly describe how “cold shortening” can prevent spoilage of red meat. **(3 marks)**
5. Differentiate between “Dirty” and “Clean” areas in an abattoir **(3 marks)**
6. Briefly, outline an ideal “siting” of an abattoir. **(2 marks)**
8. Elaborate on the three types of “slaughter facilities” found in Zambia African region. **(3 marks)**

**20 MARKS**

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**QUESTION 6**

1. What action plan(s) can you undertake in a Beef establishment in relation to design and maintenance as a meat inspector? (4 Marks)
2. Define the food safety term HACCP (2 Marks).
3. List the 7 principles involved in HACCP (8 Marks).
4. List the factors that affect the quality grade of a beef carcass. (3 Marks)
5. List the factors that affect the yield grade of a beef carcass. (3 Marks)

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**20 Marks**

**QUESTION 7**

Choose one Zoonotic Diseases you learnt in class. For your chosen disease, describe what it is, its causative agent, how it is transmitted and present itself in humans. What control and preemptive measures can you advise the Zambian government in terms of preparedness for the same disease?

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**20 Marks**

.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**AVIAN MEDICINE (VMD 6401)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. *Please read all the instructions and each question carefully*
  2. *Answer ANY FIVE questions*
  3. *ALL questions carry equal marks*
  4. *Write in a legible handwriting*
  5. *Five minutes perusal time.*
- 

**QUESTION 1**

- a. Describe the gross and histopathological lesions of Inclusion body hepatitis (IBH)/Hydropericardium syndrome (HPS) in chickens (**5 marks**).
- b. Fowl pox, also commonly referred to as avian diphtheria, is a highly contagious, slow spreading viral infection of chickens, turkeys and other birds. Describe the pathology of the different forms of the disease in chickens (**5 marks**)
- c. Outline the clinical presentation of egg drop syndrome in layers (**5 marks**)
- d. Infectious bursal disease is a highly contagious, viral infection of chickens. Discuss the pathology of the disease (**5 marks**)

**20 MARKS**

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## QUESTION 2

You have been consulted to conduct vaccination against Fowl Pox, Infectious Coryza and Newcastle/infectious bronchitis at a layer poultry farm. Describe how you would go about conducting the vaccinations.

**20 MARKS**

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## QUESTION 3

Infectious bronchitis, infectious laryngotracheitis and avian influenza are important respiratory diseases in the poultry industry globally. Compare and contrast these three diseases in chickens under the following headings:

- a) Age affected
- b) Incubation period
- c) Morbidity and mortality rates
- d) Impact on egg production and/or quality
- e) Organs or organ systems affected

**20 MARKS**

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## QUESTION 4

The demand for chicken meat is on the increase in Africa. This has resulted into increasing the production of day old chicks. As a manager of an upcoming hatchery, discuss disease management in a hatchery with emphasis on:

- a) Prevention of disease transmission (Biosecurity) **(8 marks)**
- b) Problems of chicks after hatching **(5 Marks)**
- c) Significance of nutrition and maternal antibodies in the production of quality chicks. **(7**

**Marks)**

**20 MARKS**

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## QUESTION 5

As a Veterinarian, discuss the importance of your involvement in the poultry industry consisting of Breeding companies, Broiler hatcheries and farms, Meat inspection, Layers Hatcheries and farms, and Feed and pharmaceutical companies.

**20 MARKS**

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**QUESTION 6**

- a) Discuss the consequences of the errors that could be made when vaccinating chickens using the subcutaneous (SC) neck injection
  
- b) Briefly discuss how poultry vaccines should be handled and stored:
  - i) For all vaccines arriving from the manufacturer or distributor;
  - ii) For Live Vaccines during transportation to a farm and at the farm;
  - iii) For Inactivated Vaccines before, during and after transportation to the farm;
  
  - iv) Inactivated vaccines are especially susceptible to temperature extremes or poor handling, describe how one could determine the suitability for use, the contents in certain bottles of the vaccine.
  
- c) Describe the semi-free-range village poultry production system and outline its advantages over the commercial and free-range systems in the village setting. Can this system be used for commercial production?
  
- d) What are the advantages of rearing village chicken vs commercial?

**20 MARKS**

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.....**END OF EXAMINATION**.....

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR  
PREVENTIVE VETERINARY MEDICINE (VMD 6501)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
  2. Answer **ANY FIVE** questions in **SEPARATE ANSWER BOOKLETS**
  3. **ALL** questions carry equal marks
  4. Write in a legible handwriting
  5. Five minutes perusal time.
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**QUESTION 1**

- a) One of the fundamental requirements of a successful herd health programme is a simple, reliable system of recording animal health events and production performance. What are the fundamental requirements of such a system?
- b) What is the main objective of a herd health programme in the dairy and how can it be achieved? What are the methods for achieving optimum reproductive efficiency in the dairy and what reasons can you provide for such methods?
- c) Briefly how would you assess the mastitis status of the dairy herd?
- d) What is the major objective of a beef cattle herd health programme? Name the parameters that determine the profitability of a beef cattle production programme.

**20 MARKS**

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## QUESTION 2

- a) What is the primary objective of a herd health programme in the feedlot?
- b) What are the major causes of production and reproductive inefficiency in the swineherd?
- c) Briefly discuss how you would investigate a disease outbreak in a fish pond.
- d) Internal parasites are one of the biggest disease issues for small ruminants. Discuss how you would control this type of parasitism in your health programme.

**20 MARKS**

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## QUESTION 3

- i. There is a notification for the Ministry of Fisheries and livestock of a suspected novel viral disease affecting mainly cattle. As the head of the prevention unit in your department. You are presented with the following issues that you are expected to present to the Nhon. Minister. Kindly address the following and give reasons for every decision you make:
- ii. What immediate measure would you institute to contain the disease **(5 marks)**
- iii. What kind of test would you set up to enable identification of the causative agent **(2 marks)**
- iv. Outline the steps you would take to establish a diagnostic tool for this novel virus **(10 marks)**
- v. If the causative agent is confirmed to be a virus, name any treatment you would institute and state the reason for your choice **(3 marks)**

**20 MARKS**

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## QUESTION 4

Rift valley fever (RVF) is an important zoonosis that mainly affects domestic animals and occasionally humans. Discuss how you would implement the strategic vector control explaining the various measures you would put in place in your approach to controlling RFV **(20 marks)**.

**20 MARKS**

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### **QUESTION 5**

The WHO is the world body under which nations of the world cooperate in dealing human health matters. Similarly, there is another organization under which nations in the world cooperate in animal health matters.

- a) What is the name (full name and abbreviation) of the organization under which nations in the world cooperate in animal health matters? **(2 marks)**
- b) Where is the headquarters of the WHO? **(2 mark)**
- c) By which process does the animal health organization referred to above assess the effectiveness and level of compliance of countries to international standards? **(2 marks)**
- d) In which document are international animal welfare standards published? **(2 marks)**
- e) Within the international animal health organization referred to above, under which commission are scientific matters related animal health considered? **(2 marks)**
- f) Which chapter of the animal health international standards document are veterinary legislation matters principally considered? **(2 marks)**
- g) Which are the four principal stages of the animal health risk analysis process? **(8 marks, for each stage)**

**20 MARKS**

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### **QUESTION 6**

Foot Mouth Disease (FMD) is an important disease of livestock that requires drastic measures if the disease outbreak is to be adequately managed. One such a measure is test-slaughter of affected populations. Express your views regarding this proposition of the test and slaughter in the management of FMD in cattle in Zambia **(20 marks)**.

**20 MARKS**

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### **QUESTION 7**

Zambia desires to export livestock and livestock products to a number of countries within and outside Africa. The department of veterinary services is aware of the fact that for such exports to take place, a number of the potential importing countries will demand compliance with the an international agreement signed by most countries in the world under the umbrella of an international organization.

- a) Which agreement is being referred to in the above paragraph? **(2 marks)**
- b) Under which organization (full name, not abbreviation) does the agreement fall? **(2 marks)**
- c) Before the international organization referred to above was created, under what arrangement (give the full name) was trade between nations being carried out? **(2 marks)**
- d) Give seven principles that the agreement which governs the application of health measures in trade in food and agricultural commodities stipulates **(14 marks)**

**20 MARKS**

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THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL

END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR

PROFESSIONAL JURISPRUDENCE, ETHICS, EXTENSION AND RURAL  
SOCIOLOGY  
(VMD 6601)

Duration: 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions
3. **ALL** questions carry equal marks
4. Write in a legible handwriting
5. Five minutes perusal time.

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**QUESTION 1**

What are the dissemination routes (or channels) for livestock husbandry and health information?  
Describe how you would ensure that communication is 'inclusive'.

**20 MARKS**

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**QUESTION 2**

Describe the following:

- a. Key informant
- b. Semi-structured interview
- c. Focus group discussion
- d. Multi-way communication
- e. Informal knowledge

**20 MARKS**

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### **QUESTION 3**

What are the qualities of an extension worker? Write the important criteria you should keep in mind when selecting an extension agent to work in a rural area (sub-area of a district) of western Zambia.

**20 MARKS**

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### **QUESTION 4**

- a. What is euthanasia? Under what circumstances you will present the different options for an animal to be euthanized and which document you will need from the rightful owner? (12)
- b. Write characteristics of ideal euthanasia substances. (4)
- c. Write briefly offenses against animals and name the law that protects them in Zambia (4)

**20 MARKS**

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### **QUESTION 5**

- a. Name the different laws of Zambia affecting veterinarians, livestock owners and agro-vet-dealers (12)
- b. What is difference amongst Veterinary surgeon, veterinary officer and veterinary inspector in Zambia and their one single important duty (4)
- a. What are differences between an act and statutory instrument (SI) explain giving examples (4)

**20 MARKS**

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### **QUESTION 6**

Write short notes on Following:

- i. Veterinary Council of Zambia and Veterinary Association of Zambia (4)
- ii. Professional Negligence and Malpractice (4)
- iii. Interrelationship between Rural Sociology and Agricultural Extension (4)
- iv. Forensic Examination of meat and Soundness Certificate (4)
- v. Professional ethics among veterinarians (4)

**20 MARKS**

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.....**END OF EXAMINATION**.....

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR AUGUST/SEPTEMBER EXAMINATIONS – 2019/2020 ACADEMIC YEAR

APPLIED FOOD MICROBIOLOGY AND NUTRITIONAL TOXICOLOGY

(VMM 7120/FSR 7120)

DURATION: 3 HOURS

INSTRUCTIONS:

1. Please read all the instructions and each question carefully.
2. Answer **ONLY FIVE (5)** questions.
3. **ALL** questions carry equal marks.
4. Write in a legible handwriting.
5. Answer each question in a separate answer Booklet.

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**QUESTION 1**

- a. Describe the characteristics of food types that include milk, eggs, meat, fish and plant products indicating important features that are significant in food microbiology. In your description, highlight the properties that drive microbial growth and association.

**20 marks**

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**QUESTION 2**

Discuss the microbial production of the following foods and outline how they can be commercialised

- i. Munkoyo

- ii. Kachasu made from Masau

**20 marks**

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### **QUESTION 3**

Discuss the parameters that may affect the growth of microorganisms in processed and raw food products. In your discussion, elaborate the factors involved in each parameter.

**20 marks**

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### **QUESTION 4**

In the toxicology of the gastrointestinal tract

- a) Some substances or drugs may cause direct toxicosis or indirect toxicosis. State two substances or drugs in each case. **(4 marks)**.
- b) Describe and explain the difference between LD<sub>50</sub> and ED<sub>50</sub>. **(4 marks)**.
- c) A patient is brought into the hospital with a case of acute gastric toxicosis
- Describe the clinical signs you are most likely to see in this patient. **(4 marks)**.
  - Discuss the approach to therapy and management of this case. **(4 marks)**.
  - Discuss situations in which induction of vomiting should not be prevented in general cases of acute gastric toxicosis. **(4 marks)**.

**20 marks**

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### **QUESTION 5**

- a) Mono Sodium Glutamate (MSG) is widely used as a food additive. State the reasons for use of MSG as a food additive and hence explain clearly how MSG may lead to Obesity. **(10 marks)**
- b) State the three benefits of using nitrates/nitrites as food additives and hence clearly explain how the nitrate/nitrites bring about such benefits? **(6 marks)**

- c) Give clear scientific explanation of the likely benefit(s) of consuming process meat with a glass of wine? **(4 marks)**

**20 marks**

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**QUESTION 6**

- a. Discuss the significance of food borne diseases. **(5 marks)**
- b. Discuss and differentiate intoxication and infection in food microbiology. **(5 marks)**
- c. The Incubation period as an indicator or determinant on the type of the food pathogen involved. **(5 marks)**
- d. What is spoilage and elaborate its effect on protein foods. **(5 marks)**

**20 marks**

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THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS-2019/2020  
ACADEMIC YEAR

**FOOD SAFETY MANAGEMENT (VMM 7310/FRS 7130)**

**QUESTION TWO**

- a) Precisely and concisely define any five of the following:
- i. Official Control (2 Marks)
  - ii. Competent Authority (2 Marks)
  - iii. Lot (2 Marks)
  - iv. Traceability (2 Marks)
  - v. Critical Control Point (2 Marks)
  - vi. Sampling (2 Marks)
- b) Write brief notes on any four of the following:
- i. Concept of Food Safety (2.5 Marks)
  - ii. One Health in Food Safety (2.5 Marks)
  - iii. Key Objectives of a Food Safety (2.5 Marks)
  - iv. Food Safety Concerns (2.5 Marks)

**QUESTION FIVE**

Write brief notes on any four of the following:

- a) Criteria for Good governance in National food safety System (4 marks)
- b) Main principles of Official Control Policy (4 Marks)
- c) Characteristics of risk-based official control (4 Marks)
- d) Describe the types of sampling methods (4 Marks)
- e) Rationale for sampling (5 Marks)
- f) Basic principles in sample selection (4 Marks) ✓

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**VMM 7610 ZOO NOTIC DISEASES AND INFECTIONS [ONE HEALTH FOOD  
SAFETY]**

**VMM 7601 EMERGING AND RE-EMERGING DISEASES [ ONE HEALTH  
ANALYTICAL EPIDEMIOLOGY]**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions in **SEPARATE ANSWER BOOKLETS**
3. **ALL** questions carry equal marks
4. Write in a legible handwriting
5. Five minutes perusal time.

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**QUESTION 1**

Zoonotic infections are currently receiving attention among various stakeholders due to the impact they have on human health.

- a) Compare and contrast the transmission pathways of *Cryptosporidium* parvum and *Toxoplasma gondii* (**8 marks**)
- b) Discuss the different ways in which *Cryptosporidium* spp. can be identified in the laboratory (**4 marks**)
- c) With regard to cryptosporidiosis, discuss the prevention and control measures that can be employed to reduce environmental contamination as well as reduce transmission in animals and humans. (**8 marks**)

## QUESTION 2

You wish to draft a research proposal whose main objective is to determine the prevalence and burden of *Taenia solium* in a rural community in Eastern province of Zambia. As this is a neglected tropical disease, you hope to acquire data that will lead to policy change with regards how health authorities view this important zoonotic infection.

- a) Outline the public health significance of *T. solium*. **(2 marks)**
- b) Briefly outline the life cycle of *T. solium*. **(4 marks)**
- c) Outline the tools, including samples (if any), you would use to diagnose *T. solium* infections in its hosts. **(4 marks)**
- d) Propose a study you would carry out to highlight the burden that *T. solium* has on local people in affected communities. **(4 marks)**
- e) Design a health education tool you would use during your community sensitization meetings in the affected communities on *T. solium* control. **(6 marks)**

## QUESTION 3

As the head of the Laboratory and surveillance unit, you receive a report of a surge in the number of cases of a common viral disease. Your ELISA and RT-PCR laboratory protocols have over time detected less and less of a common viral infection in your locality. This has prompted media house and social media platforms to hail your Ministry of the complete eradication of the disease in the country. In contrast there has been an increase ~~in the number~~ in the number of cases being reported despite regular vaccination programmes being implemented. The Minister responsible for Viral infections, emerging and reemerging diseases summons you to her office for an explanation over the happening in your locality.

- i) What would be your initial thoughts about the happening? **(2 marks)**
- ii) What are the pitfalls in your laboratory that have resulted in the apparent eradication of the disease in your area? **(4 marks)**
- iii) Explain the high rate of clinical presentation amidst regular vaccination? **(4 marks)**

- iv) Name a test (s) you would use and describe the logical outflow of laboratory protocol(s) you would set up that would ensure that the next vaccine to be procured will be effective against the infection **(7 marks)**
- v) State and briefly describe the 3 possible ways in which the situation described above would likely come about regarding viral infections **(3 marks)**

#### **QUESTION 4**

Emerging and re-emerging diseases are driven by various kinds of factors both extrinsic and intrinsic. State and briefly discuss the various underlying causes of this phenomena giving an example of the infection/disease that best suits the driver you have stated. *NB. A condition or diseases cannot be cited more than once* **(20 marks)**

#### **QUESTION 5**

Bacterial diseases transmitted from animals and environment to humans and vice versa usually occur as recurrent events from time to time in the human existence. In some cases, man is caught unaware of such re-emergence. Examples of such diseases may include Cholera, Anthrax and Plague. As a zoonosis disease expert, what are the possible drivers of such diseases and explain the possible control measures of one of the diseases that should be put in place to continuously reduce the impact of such a disease to the affected communities. **(20 marks)**

#### **QUESTION 6**

Currently, 70% of all known infectious diseases in humans are of zoonotic origin. Of these, Bacteria zoonoses are of major concern.

- a) Discuss an emerging foodborne infectious zoonoses of YOUR choice that is transmitted through contaminated food and form part of the human ecosystem. In your discussion, indicate how emergency and transmission play a role in its emergence. **(7 marks)**
- b) Discuss a zoonoses that is part of the symbiotic relationship between communities and environment that has been amplified as a result of the inevitable proximity of humans and animals

in its transmission. In your discussion, indicate how human and animal interactions lead to disease amplification and sustenance. **(7 marks)**

c) Describe a zoonotic disease that is influenced by human activities in its emergence and re-emergence. As you describe the zoonotic disease, emphasis must be focused on how human activities influence its emergence and re-emergence. **(6 marks)**

**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL**

**END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS  
2019/20 ACADEMIC YEAR**

**ONE HEALTH ECONOMICS, POLICY, MONITORING AND EVALUATION  
(VMM 7802)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read all the instructions and each question carefully
2. Answer **ANY FIVE** questions
3. **ALL** questions carry equal marks
4. Write in a legible handwriting

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**QUESTION 1**

- a. In general terms, what do you understand by the term “Health Economics”? **(2 Marks)**.
- b. What role does one health economics; policy, monitoring and evaluation play in the concept of “One Health”? **(2 Marks)**.
- c. What do you understand by the phrase, “economics is a science of scarcity”? **(2 Marks)**.
- e. Define opportunity cost and describe the role it plays in decision-making? **(2 Marks)**.
- f. Briefly describe the types of markets and their characteristics **(8 marks)**.
- g. What causes the markets you described in (f) to fail to allocate goods and services to their intended users? **(2 marks)**.
- h. How do you determine prices for goods and services in a perfectly competitive market? **(2 marks)**.

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**20 MARKS**

## QUESTION 2

You have been consulted as a One Health Economist to develop the National Health System for Chambia Republic, a newly formed country. The terms of reference for the consultancy are as follows:

- i. To develop the organization structure for the Chambia's National Health System
- ii. To provide the merits and demerits of the proposed National Health System on delivery of quality healthcare.
- iii. To develop methods of funding healthcare in Chambia Republic
- iv. To highlight economic factors that can cause markets for healthcare to fail.

Discuss the pertinent issues you will bring out in successfully executing this consultancy.

**20 MARKS**

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## QUESTION 3

- a. What is a policy and why is it important? (2 Marks).
- b. Briefly discuss the public policy development process? (5 Marks).
- c. What lessons did you learn from the nexus policy development class exercise on "Miriam's story" and the "Public negotiation meeting"? (5 Marks).
- d. What is the connection between systems thinking and nexus policy development? (3 Marks).
- e. You have been hired to develop a public policy on the removal of user fees for healthcare in Zambia. Describe how you would go about it using the Walt and Gilson Policy analysis triangle (3 Marks).

**20 MARKS**

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## QUESTION 4

A logical framework otherwise also referred to as logframe is one of the management tools used to improve the design of interventions more especially at the level of the project to see to it that project goals and objectives are achieved.

- a) In objective formulation, what questions should a well-constructed objective address?

- b) Objectives and goals should be constructed or formulated using the SMART philosophy. What do you understand by the SMART philosophy and how is this applied in project objective formulation?
- c) Identify and outline the elements of the logframe giving brief explanation on each of the elements so identified.

**20 MARKS**

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### **QUESTION 5**

Monitoring and Evaluation are two terminologies that are commonly used to assess the performance of projects, institutions and programmes set up by governments, international organisations and NGOs.

- a) How is project monitoring different from project evaluation?
- b) Outline with brief explanations on at least **Five (5) types** of monitoring that you know.
- c) List the **Five (5) types** of evaluations classified according to timing (evaluation timing).

**20 MARKS**

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### **QUESTION 6**

Using a Logical Framework, outline your monitoring and evaluation strategy for a project that aims to vaccinate against COVID-19 in Kafue District of Zambia. Show clearly your inputs, activities, outputs, outcomes, goal, and indicators for this particular project.

**20 MARKS**

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### **QUESTION 7**

You have been invited to make a presentation on decision-making tools in Animal Health Economics at The International Society for Economics and Social Sciences of Animal Health (ISESSAH). Briefly and concisely, discuss the content of pertinent issues in your presentation

**20 MARKS**

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.....**END OF EXAMINATION**.....

# UNIVERSITY OF ZAMBIA EXAMINATIONS –2019/2020

## VMM 7901/ 8901: ONE HEALTH RESEARCH METHODOLOGY

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer ALL questions
  3. Write in a legible handwriting
- 

Question 1

- a) State the Nature of Scientific Enquiry and provide a step-wise explanation of the process of scientific inquiry.
- b) State the pattern, limitations, values and uses of the Scientific Method
- c) Briefly explain what a literature review is, what it is not as well as why it is vital in academia
- d) What is a thesis and why write one? **(20 points)**

Question 2

- a) Define hypothesis and state its functions
- b) Discuss critical reading of literature as opposed to passive reading of the same. What is scientific literature?
- c) Briefly explain the principles of conceptualization, operationalization and measurement. **(15 points)**

Question 3

- a) State and briefly discuss types of Research Proposals. How does a Research Project Proposal differ from a thesis?
- b) What is a study design? Name and compare among the major study design types.
- c) Define data collection giving reasons for its necessity. State and explain the likely components of a data collection plan. **(15 points)**

Question 4

- a) Define and classify Scientific Reviews
- b) State and briefly explain the general elements of a Scientific Review
- c) How does a Scientific Review differ from a Journal Publication?
- d) Define data management and Data analysis and provide reasons why there is need to be skilled in both. What is a database? **(25 points)**

Question 5

- a) Define Bibliography, generally and in relation to Scientific Writing. Also, in this regard, briefly explain the main purpose of a bibliographic entry and state any other names or phrases used to refer to it.
  - b) There are four basic steps to making an effective oral presentation. Name and briefly describe these steps.
  - c) Name and briefly describe the main purposes of presentations **(25 points)**
- 

**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL  
END OF YEAR EXAMINATIONS NOVEMBER/DECEMBER 2019/20 ACADEMIC  
YEAR**

**SURVEILLANCE AND RISK ANALYSIS (VMM8201/ 7201)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer any FIVE questions
  3. All questions carry equal marks
  4. Write in a legible handwriting
- 

**QUESTION ONE**

- a) Precisely and concisely define any five of the following:
- i. Surveillance (**2 marks**)
  - ii. Monitoring (**2 marks**)
  - iii. Data (**2 marks**)
  - iv. Risk (**2 marks**)
  - v. Risk analysis (**2 marks**)
  - vi. Outbreak (**2 marks**)
- b) Answer any four the following questions:
- i. Compare and contrast qualitative and quantitative risk assessment (**2.5 marks**)
  - ii. A common-source-point source and continuous common-source outbreak (**2.5 marks**)
  - iii. Discuss the benefits of undertaking a risk analysis (**2.5 marks**)
  - iv. Outline the risk management questions that one should ask in a risk analysis (**2.5 marks**)
  - v. Mooring and surveillance (**2.5 marks**)

**QUESTION TWO**

Entry assessment is one of the steps in conducting an import risk assessment. It consists of describing the biological pathways necessary for an importation activity to introduce pathogenic agents into a particular environment, and estimating the probability of that complete process occurring, either qualitatively (in words) or quantitatively (as a numerical estimate). The entry assessment describes the probability of the 'entry' of each of the hazards (the pathogenic agents) under each specified set of conditions with respect to amounts and timing, and how these might change as a result of various actions, events or measures. Discuss the factors that would aid you derive inputs for an entry assessment. (**20Marks**)

### **QUESTION THREE**

There are suspected cases of patulin contamination in apple juice that is imported from Chambia Republic. The local food authority has requested his scientific committee to carry out a Risk Assessment in order to determine the risks linked to the presence of patulin in apple juice. You have been given a consultancy to carry out a risk assessment and advise as to whether they should ban or not ban the importation of this apple juice from Chambia Republic. Discuss how you would go about conducting this risk assessment? **(20 marks)**.

### **QUESTION FOUR**

Following an event that took place, a case of food poisoning was reported that resulted in a number of attendees being admitted to the hospital. A follow up on these patients revealed that all of them had eaten fried rice, potato salad with mayonnaise and cheese/ham sandwich.

- a) List the pathogens that are associated with the three different foods consumed? **(2 marks)**
- b) Outline the major steps taken in this food poisoning investigation? **(2 marks)**
- c) Describe the role and the importance of the laboratory in this investigation? **(4 marks)**
- d) What do you understand by the term “Danger zone” in the control of food-borne pathogens? **(2 marks)**
- e) List the top ten (10) causes of foodborne pathogens? **(4 marks)**
- f) What are the six (6) factors that affect bacterial growth? **(2 marks)**
- g) List five (5) chemicals used in food preservation and for each of them, write two (2) advantages and two (2) disadvantages? **(4 marks)**

### **QUESTION FIVE**

An epidemic curve is a graphical depiction of the number of cases of illness by the date of illness onset.

- a) How can an epidemic curve help in an outbreak investigation? **(3 marks)**
- b) What are outbreak outliers? **(2 marks)**
- c) What information can an epidemic curve provide on the characteristics of an outbreak? **(4 marks)**
- d) How would you describe an outbreak in terms of person, place and time associations **(6 marks)**
- e) Outline the steps of an outbreak investigation. **(5 marks)**

## **QUESTION SIX**

A few days ago, an outbreak of gastrointestinal disturbances such as diarrhoea was reported among Kalingalinga residents of Lusaka. Most of the residents reported to Kalingalinga Healthcare facility and were admitted and commenced on treatment. Residents reported that the source of the disease was an old borehole where they fetch water for drinking and domestic use. An investigation by the Ministry of Health found no infectious microorganisms from the suspected drinking water. However, some residents reported that there was a possibility that the source of the disease could be due to contamination of council water with poultry waste from a businessman who rears chicken layers and broilers. The businessman drains his poultry wastes into the drainage where it finds entry into broken council water pipes. Using this scenario, answer the following questions.

- a) List four (4) microorganisms that can be isolated from poultry wastes **(2 marks)**
- b) List three (3) ways of recognizing an outbreak **(3 marks)**
- c) Investigate this disease outbreak by using all necessary steps and an illustration (sketch) of the disease source and cases in Kalingalinga **(15 marks)**

## **QUESTION SEVEN**

You were recently appointed to be on the team of foodborne and infectious disease surveillance in Zambia. A foodborne disease outbreak due to infectious agents was reported in Ndola. The disease was reported to be as a result of consuming milk supplied by one commercial farmer. Using your experience and acquired knowledge during your training, answer the following questions.

- a) List and explain the steps involved in carrying out disease surveillance **(4 marks)**
- b) List and explain the components of an effective disease surveillance system **(5 marks)**
- c) Explain how an attributable (two class) sampling plan can be used in making a decision on the samples of milk collected from the reported commercial farmer **(2 marks)**
- d) How can you increase the effectiveness of a two class sampling plan? **(1 mark)**
- e) Explain any three (3) roles of public health and regulatory agencies in foodborne disease surveillance **(3 marks)**
- f) During the period of a foodborne disease outbreak, a rabies disease outbreak was also reported. This called for an emergency preparedness and response. Using a diagram, illustrate the Framework for emergency preparedness and response. **(4 marks)**

## **QUESTION EIGHT**

Discuss in details the different types of surveillance methods **(20 marks)**

.....**END OF EXAMINATION**.....

**UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
DEPARTMENT OF DISEASE CONTROL  
END OF YEAR EXAMINATIONS 2019/2020 ACADEMIC YEAR**

**HEALTH PROMOTION AND EDUCATION (VMM 8711)**

**Duration: 09 -12 hours**

**Instructions to candidates**

1. Read instructions on this page carefully.
  2. Do not turn this page until you are told to do so.
  3. Use the answer booklet provided to answer your questions
  4. Write your computer number on the answer booklets
  5. The paper has **two (2)** sections.
  6. Answer all questions in section A.
  7. Section **B** has **FOUR (4)** questions; choose **THREE (3)**
- 

**SECTION A**

**SHORT ANSWER QUESTIONS. ATTEMPT ALL QUESTIONS IN THIS SECTION**

**QUESTION 1**

One of the principles of the Ottawa Charter is to “create supportive environments”.

Considering the problem of anti-microbial resistance in the country, explain how this problem can be tackled using this principle?

**5 marks**

**QUESTION 2**

What is implied by healthy public policy and explain how it relates to the control of food borne diseases?

**5 marks**

**QUESTION 3**

Explain how the following factors may influence the distribution of zoonotic diseases?

- a) Education,
- b) Income
- c) Culture
- d) Gender roles

**5 marks each**

**QUESTION 4**

What are social inequalities? How can social inequalities affect food -borne illnesses and outcomes? **5 marks**

**QUESTION 5**

You have been asked to prepare health education messages for the control of African swine fever that has broken out in Choma District. Briefly state five (5) principles that you will observe when disseminating your health education messages? **5 marks?**

**QUESTION 6**

How does social marketing influence people's food consumption behaviors? **5 marks**

---

**SECTION B**

**ANSWER THREE QUESTIONS ONLY**

**QUESTION 1**

Porcine cysticercosis is among the neglected tropical diseases that commonly occurs among marginalized populations that may lead to tapeworm infestations in humans.

- a. Using the following social factors, explain how each one contributes to the propagation of the disease between pigs and humans.
  - i. Cultural norms **3 marks**
  - ii. Sanitation **2 marks**
  - iii. Food consumption practices **2 marks**
  
- b. Explain how you will involve the community in the control of tapeworm infestations? **5 marks**
  
- c. How will you ensure cultural competence in your control interventions? **6 marks**
- d. Discuss the factors you will consider in selecting and designing your health education messages for your community? **7 marks**

## QUESTION 2

Anti-microbial resistance is becoming a problem of concern in Zambia due to the misuse of antibiotics in food animals.

- a. Using real life examples, explain how government can tackle this problem using the following health promotion strategies?
- i. Fiscal measures 5 marks
  - ii. Healthy public policy 5 marks
  - iii. Legislation 5 marks
- b. Discuss how you can use media communication to resolve the problem? 10 marks

## QUESTION 3

People's lifestyles have been regarded as the cause of many modern diseases. Therefore, understanding how people can be helped to adopt healthy behaviors is key. There is an outbreak of rabies in your community and you want dog owners to have their dogs vaccinated.

- a. Explain how community members will accept rabies vaccination using variables of the Health Belief Model namely:
- i. perceived susceptibility
  - ii. perceived severity
  - iii. perceived benefits
  - iv. perceived efficacy 5 marks each
- b. What interventions (cues to action) will you put in place to modify individual behaviors? 5 marks

*under message*

## QUESTION 4

You have a pending outbreak of Foot and Mouth disease in your district. You are the Director of livestock services. You have been asked by your permanent secretary to come up with a strategic control plan using one of the four approaches to health Promotion.

- a. Discuss how you will use each of the following approaches to mitigate the spread of the disease?
- i. Disease prevention approach
  - ii. ecological approach
  - iii. empowerment approach
  - iv. educational approach 3 marks each
- b. Mention two limitations of each approach 8 marks
- c. Compare and contrast between Health Promotion and Public Health 5 marks

**END OF EXAM**

THE UNIVERSITY OF ZAMBIA  
SCHOOL OF VETERINARY MEDICINE  
MID-YEAR EXAMINATIONS  
2019/20 ACADEMIC YEAR  
NOVEMBER 2020

ETHICS IN FOOD SAFETY PRACTICE (VMM 8911)

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
2. Answer **ALL** questions in Section A and any **TWO** questions in Section B
3. Write the answers to each question in a separate answer booklet
4. **ALL** questions carry equal marks
5. Write in a legible handwriting
6. Any additional illustrative material used in the examination (photographs, excerpts) must be returned undamaged to the invigilator at the end of the examination.

.....SECTION A.....

**QUESTION 1**

Refer to the *Exam supplement for Question 1* that was a media statement on the effect of covid-19 pandemic on the supply chain for meat products and impact on the workforce in the meat processing plants.

- (a) What are the key messages that are being reported in the supplement? **(4 marks)**
- (b) How would you definitely confirm that a One Health approach could have been used in addressing the covid-19 impact? **(6 marks)**
- (c) Describe the ethical considerations interrogated by the business owners before embarking on any actions they performed. Cite them and discuss the context in which they were addressed? **(10 marks)**

**QUESTION 2**

Read carefully the news item provided in *Exam supplement for Question 2* and answer the following questions. It is a story of an intestinal illness arising from the consumption of bagged salads sold over a large geographical area in the USA. The source of infection was identified to be a named company. Suspected contaminated water was used to irrigate the vegetables.

- a) What are the **two (2)** broad types of ethics that are being described in this case? **(2 marks)**
- b) List the ethical issues in the said supplement and justify why you have identified them as such. **(4 marks)**

- c) From the issues in (a) above, are there any that can lead to ethical dilemmas if they have to be addressed? If Yes, what would prompt such ethical dilemmas? **(4 marks)**
- d) Indicate in detail the factors that can influence the ethical decision making process in this case. **(4 marks)**
- e) Discuss how a One Health approach could have been effectively used in addressing the cyclosporiasis problem? **(6 marks)**

### **QUESTION 3**

As an expert in food safety, you are invited to a popular live radio phone-in program. This program handles questions from listeners. One of the anonymous callers poses the following question:

*I am working for a local restaurant and I usually noticed that the head chef (who also happens to be the owner of the restaurant) uses ingredients that are not "fresh". I fear that using such ingredients could possibly cause the customers to get sick. Now, how do I go about dealing with this? Do I confront the owner? Do I call the health authorities? What would be the best way to go about this issue quietly without bringing negative attention to the restaurant?*

- (a) Highlight the possible ethical issues in the question **(5 marks)**
- (b) Identify the key ethical dilemmas that the caller faces **(4 marks)**
- (c) Discuss the considerations that should be taken into account in b) above to arrive at the best solution. **(6 marks)**
- (d) Describe in detail the advice you can give in reaching the best resolution of the matter? **(6 marks)**

### .....SECTION B.....

### **QUESTION 4**

There are many legal instruments in Zambia that govern how matters to do with food safety and related issues are handled and governed.

- (a) List any **three (3)** key legal frameworks that exist in Zambia on food safety? **(6 marks)**
- (b) Indicate clearly the role(s) of the general legal framework in the practice of One Health Food Safety agenda. **(6 marks)**
- (c) Of **one (1)** legal framework outlined in a) above, explain in detail what the piece of legislation does specifically and why its understanding is useful for food safety and practice of ethics. **(8 marks)**

### **QUESTION 5**

There are at least three (3) food safety management systems used in ensuring food safety worldwide.

- (a) Define the term *food safety* and describe what it constitutes of? **(4 marks)**
- (b) Who are the players responsible for food safety practice? Justify your answer. **(3 marks)**
- (c) List **three (3)** food safety management systems widely used today. **(3 marks)**
- (d) For any **one (1)** of the systems listed in (c) above, discuss in detail what governs food safety management and how such a system responds to ethical practice of food safety? **(10 marks)**

### **QUESTION 6**

There are many aspects that do not define what *ethics* is.

- (a) Describe in detail the term *Ethics*. **(4 marks)**
- (b) From the description in a) justify why ethics in food safety practice must be studied. **(6 marks)**
- (c) Compare and contrast the framework of ethical decision making in environmental and business ethics. **(10 marks)**

.....**END OF EXAMINATION**.....

## Chicken Plants – and the Food Supply – Take Center Stage in Delaware’s COVID-19 Fight

By Steve Sternberg, Assistant Managing Editor, Health Initiatives May 5, 2020

More than half of the 300 workers tested in just one county plant last week were found to be positive for the virus, says Dr. Gary Siegelman, senior vice president and chief medical officer of Dover-based Bayhealth Medical Center, which ran the testing site.

The county accounts for the majority of the roughly 270 million broiler chickens produced annually in Delaware. Sussex County chickens fill freezer cases throughout the mid-Atlantic region, including in Philadelphia, Washington, D.C., and Baltimore.

Teams of health workers from the state, hospitals and poultry companies are staffing testing sites; identifying infected workers; counseling workers and their families; offering to test contacts of workers who have been exposed to the virus; and making sure that people who are sick get the care they need.

Plant managers and wellness clinic staff have arranged for infected workers to self-isolate in hotels at state expense or at home, sometimes along with their entire family, Siegelman says.

"They're trying to balance caring for their workers with keeping the business going," he says.

Plant closures or work slowdowns drive up prices, reduce inventory on grocery shelves and threaten to strike an even bigger blow to the nation's economy. Already, grocery giants Costco and Kroger have begun rationing meat supplies for customers.

In a full-page advertisement published late last month in The New York Times, the chairman of Tyson Foods Inc., John Tyson, warned that the "food supply chain is breaking" due to the coronavirus. Tyson alone stopped operations at multiple meat plants because of cases linked to the facilities. Smithfield Foods, Cargill Inc., and JBS USA also have enacted closures.

The staff shortages have a huge impact on production, because processing chickens is a highly mechanized business. The birds must be a standard size to fit into the assembly-line equipment that readies them for market. If they can't be processed on schedule, they grow too large to fit into the machinery and must be destroyed.

"Animals are backing up on the farms," Brown says. "We're euthanizing chickens, we're euthanizing hogs. None of that is what farmers in this country want to be doing."

In April, Delaware poultry processor Allen Harim Foods reportedly had to destroy some 2 million chickens because staffing shortages tied to the coronavirus meant it couldn't keep up with the birds headed to its facilities from local farms.

## VMM 8911 Exam supplement for Question 2: 2020

### Intestinal Illness Spurs Recall of Bagged Salads Sold at Walmart, Aldi

June 29, 2020

**BY ROBERT PREIDT**, *HealthDay Reporter*

Bagged salad mixes sold at Walmart and other stores are linked with an outbreak of intestinal illness in eight Midwestern states, the U.S. Centers for Disease Control and Prevention (CDC) reports.

More than 200 people in Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and Wisconsin who reported eating the salad mix have come down with cyclosporiasis, an illness caused by a microscopic parasite. At least 23 people have been hospitalized, the CDC said Monday. No deaths have been reported.

The salads contain iceberg lettuce, carrots and red cabbage, and were produced by Illinois-based Fresh Express. Besides Walmart, the recalled salads were sold at Aldi, Hy-Vee and Jewel-Osco in the Midwest.

People who were sickened range from 16 to 92 years old. They started becoming ill between May 11 and June 17. Donald Schaffner, a food microbiologist at Rutgers University in New Brunswick, N.J., told the *New York Times* that the outbreak is likely due to the water used to irrigate the produce.

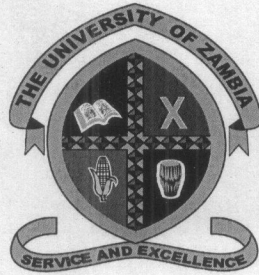
"It probably has something to do with human fecal contamination of that water, but of course there's a whole lot of unknowns," Schaffner said. "Very often with these fresh produce outbreaks, we never learn the definitive cause."

The CDC said consumers and retailers in Arkansas, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota and Wisconsin should not eat, sell or serve the recalled bagged salad mixes. Consumers should check their homes for the salads and throw out any remaining salad, even if some has been eaten and no one has gotten sick, the CDC advised.

People in Arkansas, Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Minnesota, Nebraska, North Dakota, South Dakota and Wisconsin who don't know if bagged salad mixes in their home are among the recalled salads should throw them away.

Antibiotics can treat the illness, but most healthy people recover on their own, according to the agency. Symptoms of cyclosporiasis begin an average of seven days after swallowing the infective form of the parasite, and usually include watery diarrhea. Also common are loss of appetite, weight loss, cramping, bloating, increased gas, nausea and fatigue. Some people may vomit or develop a low-grade fever, according to the CDC.

Without treatment, symptoms can last several weeks to a month. Diarrhea can return. Some symptoms such as fatigue may continue after the gastrointestinal symptoms have gone away.



**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**DEPARTMENT OF PARACLINICAL STUDIES**  
**VMP 3100 VETERINARY PATHOLOGY EXAMINATION**

**Date:** Nov/Dec 2020      **Time:** 09:00-12:00 hrs      **Duration:** 3 hours      **Venue:** VLT

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **ALL** questions
  3. Write the answer to each question in a separate answer book
  4. **ALL** questions carry equal marks
- .....

## QUESTION 1

Write short notes on any four (4) of the following: (20 marks total)

- (a) Define pathology and list its types
- (b) Define and briefly discuss etiology
- (c) Describe the causes and pathology of dietetic liver dystrophy disease.
- (d) Discuss the causes of atrophy in detail
- (e) Outline the results of necrosis
- (f) Describe focal bacterial necrosis of the liver and its pathology
- (g) Discuss the types of calcification in detail
- (h) List the various types of necrosis

## QUESTION 2

Write short notes on any four (4) of the following: (20 marks total)

- (i) Discuss the pathology of guttural pouch mycosis in horses (5 marks).
- (j) Outline the developmental stages of bronchopneumonia (5 marks).
- (k) Describe the pathways involved in metastasis of tumours (5 marks)
- (l) Briefly discuss the causes of jaundice/icterus in domestic animals (5 marks)
- (m) Briefly outline the distinguishing features of benign and malignant tumours (5 marks).
- (n) Describe the types of bronchiectasis based on anatomical appearance (5 marks).
- (o) Briefly describe the pathology and sequel of interstitial emphysema (5 marks).
- (p) Describe the causes and consequences of bronchiolitis (5 marks)

### QUESTION 3

Write short notes on any four (4) of the following: (20 marks total)

- a) Briefly describe the inflammation you see in a case of Johne's disease (paratuberculosis) (5 marks)
- b) Briefly describe the pathophysiology or pathogenesis of inflammation (5 marks)
- c) Compare and contrast the neutrophils vs macrophages (5 marks)
- d) Briefly describe the reaction of astrocytes to sub-lethal injury (5 marks)
- e) Give examples of viral infections associated with congenital defects of the CNS and then briefly describe cerebellar aplasia/hypoplasia (5 marks)
- f) Describe the pathology of rabies in the CNS (5 marks)
- g) Compare and contrast the features of acute vs chronic inflammation (5 marks)
- h) Briefly describe the purulent exudate and pathogenesis of abscess formation (5 marks)

### QUESTION 4

Write short notes on any four (4) of the following: (20 marks total)

- a) Briefly describe the pathological hydronephrosis (5 marks)
- b) Briefly describe the extra-renal lesions in chronic renal failure (5 marks)
- c) Briefly describe the pathological features of cryptorchidism (5 marks)
- d) Briefly describe the effects of a functional pituitary adenoma on the uterus (5 marks)
- e) Name the testicular tumor that causes feminization syndrome in dogs and briefly describe its pathological features (5 marks)
- f) Briefly describe the pathological features of Transmissible venereal tumor (TVT) in female dogs (5 marks)
- g) Briefly describe the pathological features of prostate carcinoma in dogs (5 marks)
- h) Briefly describe cystic endometrial hyperplasia in dogs (5 marks)

### **QUESTION 5**

**Write short notes on any four (4) of the following: (20 marks total)**

- a) Briefly describe the pathogenesis of thrombosis (5 marks)
- b) Explain the fate of haemorrhage (5 marks)
- c) Briefly describe disseminated intravascular coagulation (DIC) (5 marks)
- d) Briefly describe Acral lick dermatitis (5 marks)
- e) Briefly describe Acanthosis (5 marks)
- f) Briefly describe the pathogenesis of Dermatophilosis (5 marks)
- g) Briefly discuss suppurative pericarditis in cattle (5 marks)
- h) Briefly discuss congestive heart failure (5 marks)

### **QUESTION 6**

**Write short notes on any four (4) of the following: (20 marks total)**

- a) Briefly describe intussusception (5 marks)
- b) Briefly describe maldigestion and malabsorption (5 marks)
- c) Briefly describe proliferative/granulomatous inflammation of the intestines (5 marks)
- d) Briefly describe Primary hyper-function of an endocrine gland (5 marks)
- e) Briefly describe Hyperparathyroidism of malignancy (5 marks)
- f) Briefly describe Absolute polycythaemia (5 marks)
- g) Briefly describe Myeloid (bone marrow) hyperplasia (5 marks)
- h) Briefly describe Acute lymphadenitis (5 marks)

**END OF EXAMINATION**

**THE UNIVERSITY OF ZAMBIA**  
**UNIVERSITY FIRST SEMESTER EXAMINATION 2019-2020**  
**VETERINARY MICROBIOLOGY AND IMMUNOLOGY (VMP 3300)**

**TIME: 3 HOURS**

**ANSWER ONLY FIVE (5) QUESTIONS OF YOUR CHOICE**

**EACH QUESTION MUST BE ANSWERED IN A SEPARATE ANSWER BOOKLET**

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**SECTION I: IMMUNOLOGY**

Q1. Write brief and informative comments on **ANY FOUR (4)** of the following:

- a) IgM (5)
- b) Adjuvant (5)
- c) MHC Class II (5)
- d) Macrophages (5)
- e) Immunity against worms (5)
- f) Primary lymphoid organs (5)

Q2. Fetal and neonatal domestic animals succumb rapidly to organisms that present little threat to adult animals. Discuss immunity in the fetal/neonatal calf under the following headings (20):

- a) Sources and forms of fetal/neonatal "Immunological assistance"
- b) Role of IgA and IgG in fetal/neonatal immunity
- c) Reasons for failure of passive transfer
- d) Treatment of the failure of passive transfer

**SECTION II: BACTERIOLOGY**

Q3. Bacteria are prokaryotic cells of microscopic size which are normally capable of independent life. With the aid of a diagram, list the important structures of a bacteria cell and discuss the principal components of the gram positive and gram negative bacteria cell wall. (20)

Q4. Discuss the process of infection and disease production by bacteria under the following headings:

- a) Entrance and establishment of bacteria within the host (10)
- b) Mechanisms of disease production (10)

Q5. Write brief and informative comments on ANY FOUR (4) of the following:

- a) List 10 different genera that come under Enterobacteriaceae family (5)
- b) Significance of plasmids in Veterinary science (5)
- c) Types of infections caused by bacteria (5)
- d) Isolation and identification of *Salmonella gallinarum* from an infected poultry flock (5)
- e) The division of *Clostridium* species based on their disease producing mechanism (5)

Q6. Write informative notes on ANY FOUR (4) of the following:

- a) Ziehl Neelsen staining (5)
- b) *Corynebacterium pseudotuberculosis* (5)
- c) Characteristic features of *Streptococcus pyogenes* (5)
- d) Pathogenicity features of *Staphylococcal* species (5)
- e) Why *Mycoplasmas* are considered to be bacteria (5)
- f) CAMP test (5)

### SECTION III: VIROLOGY

Q7. Draw the Sketch outlining the one step growth cycle of a virus of your choice, and give concise description of the cycle. (20)

Q8. Write brief notes on any four (4) of the following:

- a) Rhabdoviridae (5)
- b) Recombination (5)
- c) Hemagglutination inhibition (5)
- d) Reverse transcriptase (5)
- e) Foot and Mouth Disease (5)

### SECTION IV: MYCOLOGY

Q9. Briefly and concisely comment on ANY FOUR (4) of the following:

- a) Fungal isolation from clinical materials (5)
- b) Phycomycetes (5)
- c) *Microsporum canis* (5)
- d) Ascomycotina (5)
- e) *Aspergillus fumigatus* (5)
- f) Sporangiospore (5)

Q10. Fungi show a much more diverse pathogenic activity compared to viruses and bacteria.

- a) Discuss three (3) main ways fungi cause disease. (10)
- b) Describe Mycotic abortion taking into consideration the route of inhalation as a main pathway. (10)

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF VETERINARY MEDICINE**  
**2019/20 ACADEMIC YEAR EXAMINATIONS**

**VETERINARY PARASITOLOGY (VMP 3400)**

**Duration:** 3 hours

**INSTRUCTIONS:**

1. Please read the instructions and each question carefully
  2. Answer **ALL** questions
  3. **EACH SECTION** must be answered in a **separate answer booklet**
  4. **ALL** questions carry equal marks
  5. Write in a legible handwriting
- 

**SECTION A: PROTOZOOLOGY**

**QUESTION 1**

Write **BRIEF** and **INFORMATIVE NOTES** on **ANY FOUR (4)** of the following topics:

- a) Basic classification of protozoan parasites (**5 marks**)
- b) Clinical manifestations of Theileriosis in domestic animals (clinical signs) (**5 marks**)
- c) The life cycle of African Animal Trypanosomes (**5 marks**)
- d) Binary fission; and mention one protozoan parasite that reproduces by this process (**5 marks**)
- e) Predilection site for *Ehrlichia ruminantium* in the animal host; and why it is called heart water (**5marks**)
- f) Saprozoic feeding by protozoan parasites (**5 marks**)
- g) Diagnostic methods you would employ to demonstrate the presence of Babesiosis in domestic animals (**5 marks**)
- h) Clinical manifestations of *Eimeria* spp (coccidiosis) in birds (**5 marks**)

**PLEASE TURN OVER TO NEXT PAGE**

## **QUESTION 2**

Write **SHORT NOTES** on **ANY FOUR (4)** of the following topics:

- a) Morphological differences between *Trypanosoma congolense* and *Trypanosoma brucei brucei* (5 marks)
- b) Salivaria type of transmission (5 marks)
- c) Stercolaria type of transmission (5 marks)
- d) Major differences between *Eimeria* spp sporulated oocysts and *Isospora* spp sporulated oocysts (5 marks)
- e) Holozoic feeding in protozoan parasites (5 marks)
- f) How you would differentiate *Babesia bigemina* piroplasm from *Babesia divergens* piroplasm on a giemsa stained slide (5 marks)
- g) Modes of reproduction in protozoan parasites (5 marks)
- h) Major differences between Eukaryotic and Prokaryotic cells (5 marks)

**PLEASE TURN OVER TO NEXT PAGE**

## **SECTION B: HELMINTHOLOGY**

### **QUESTION 3**

Write **SHORT NOTES** on **ANY FOUR (4)** of the following topics:

- a) Fascioliasis in sheep **(5 Marks)**.
- b) Thelaziosis in cattle **(5 marks)**
- c) The Baermann technique **(5 marks)**
- d) Parasitic stages of trematodes **(5 marks)**
- e) Classical morphology of tapeworms **(5 marks)**
- f) The equine ascarid **(5 Marks)**.
- g) Hypobiosis and its initiating factors **(5 Marks)**.
- h) Bovine schistosomiasis **(5 marks)**

### **QUESTION 4**

Write **SHORT NOTES** on **ANY FOUR (4)** of the following topics:

- a) The gapeworm of birds **(5 marks)**.
- b) The life cycle of *Schistosoma mansoni* **(5 Marks)**.
- c) Abdominal cysticercosis of small ruminants **(5 marks)**.
- d) Morphological features used to identify the lancet fluke **(5 Marks)**.
- e) Types of hosts in parasitology **(5 marks)**.
- f) The "cucumber worm" **(5 marks)**.
- g) The simple test tube flotation technique used in faecal examination **(5 marks)**.
- h) Heterakiasis **(5 marks)**.

**PLEASE TURN OVER TO NEXT PAGE**

## **SECTION C: ENTOMOLOGY**

### **QUESTION 5**

Write **SHORT NOTES** on **ANY FOUR (4)** of the following:

- a) Functions of an insect exoskeleton (**5 marks**).
- b) Metamorphosis and growth in insects (**5 marks**).
- c) Functions of Malpighian tubules in insects (**5 marks**).
- d) Biological transmission of disease pathogens by insects to vertebrates (**5 marks**).
- e) Classification of Phylum Arthropoda (**5 marks**).
- f) Pheromone system of insects (**5 marks**).
- g) Oviparous and viviparous insects (**5 marks**).
- h) Direct effects of arthropods on vertebrate hosts (**5 marks**).

### **QUESTION 6**

**DISCUSS BRIEFLY** on **ANY FOUR (4)** of the following topics:

- a) Life cycle of *Rhipicephalus appendiculatus* (**5 marks**).
- b) Mange (**5 marks**).
- c) Myiasis and state any four families of arthropods that cause myiasis (**5 marks**).
- d) Life cycle of arthropods in the family Hippoboscidae (**5 marks**).
- e) The veterinary/medical importance of the Oriental rat flea (**5 marks**).
- f) Classification of arthropod vector of river blindness (**5 marks**).
- g) The differences between sucking lice and chewing lice (**5 marks**).
- h) Identification features of arthropods in the family Glossinidae (**5 marks**).

**END OF EXAMINATION**