THE UNIVERSITY OF ZAMBIA

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POST GRADUATE SCHOOL OF VETERINARY MEDICINE 2020/21

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

ECOSYSTEMS HEALTH: HUMAN & ANIMALS (EPH 7300)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ANY FIVE (5)** 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) What are differences between the following concepts in the understanding of ecosystem health that embraces the holistic approach of ecological public health: **(5 marks)**
   i. Ecology?
   ii. Ecosystems?
   iii. Ecosystem Health?

b) Provide explanations on the **four (4)** main characteristics of the human ecosystem and how human ecological factors influence geographical distribution of disease prevalence and environmental pollution? **(10 marks)**

c) Give examples of five (5) zoonotic diseases influenced by the human intrusion into the ecological cycles of environment? **(5 marks)**

QUESTION 2

a) What are the main contextual features of ecosystem? **(4 marks)**

b) Give **one (1)** example of a disease that reflects its biodiversity and disease risk to humans? **(6 marks)**

c) What would you suggest are the possible causes and solutions to this ecosystem disease problem stated in (a)? **(10 marks)**

QUESTION 3

a) Describe the Composition of ecosystems services? **(10 marks)**

b) For what reasons the World Health Organization (WHO) has transformed the term ecosystem services to be "Ecosystem Goods and Services for Health"? **(5 marks)**

c) What is the purpose of introducing the field of "ecosystems health" in the context of public health? **(5 marks)**

QUESTION 4

a) Define complex ecosystems for health? What constitutes complex ecosystems for health? **(5 marks)**
b) Why is the concept of "healthy livelihood" marked as a central debate for human sustainability? **(10 marks)**
c) In what ways these health concepts of complex ecosystems can influence sustainable livelihood? **(5 marks)**

QUESTION 5

In understanding the complexity scope of ecological factors and disease prevalence, the concept of medical anthropology and behavioural studies have marked central to the field of ecological public health.

a) Describe the roles of culture, behavioural research and ecology in shaping disease and health outcome of humans and animals? **(4 marks)**
b) What are **two (2)** important purposes of medical anthropology in ecological public health? **(4 marks)**
c) Describe the four differential sources embracing the roots of medical anthropology? **(12 marks)**

QUESTION 6

a) Define behavioural research and its important roles in ecological public health? **(5 marks)**
b) What is the rationale for using behavioural change theories or models? **(5 marks)**
c) Provide an explanation on **one (1)** type of behavioural change models or theories reflecting its purposes on the value of disease screening and perceived components that may influence better understanding of disease control and prevention in Human populations? **(10 marks)**

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR AUGUST/SEPTEMBER EXAMINATIONS – 2020/21 ACADEMIC YEAR

APPLIED FOOD MICROBIOLOGY AND NUTRITIONAL TOXICOLOGY (FSR 7120)

DURATION: 3 HOURS

INSTRUCTIONS:

1. Please read all the instructions and each question carefully.
2. Answer **ALL three (3)** questions in **Section A**, and any **two (2)** in **Section B**.
3. **ALL** questions carry equal marks.
4. Write in a legible handwriting

SECTION A

QUESTION 1

a. Discuss how microorganism may manifest their presence in food. **(10 marks)**

b. Discuss how food contamination may occur from producers, manufacturers and consumers. In your discussion, highlight areas that are critical to contamination. **(10 marks)**

20 marks

QUESTION 2

There are basically three parameters that affect the growth of microorganisms in food products. Giving examples, explain the three parameters.

20 marks

QUESTION 3

Describe the microbial spoilage of the following foods:

a. Fish
b. Vegetables
c. Milk
d. Meat

20 marks

SECTION B

QUESTION 4

People are capable of swallowing a great variety and often large amounts of substances including food stuffs, nutrients, food additives and contaminants, drugs, inhaled particles and drugs. This exposes the gastrointestinal tract to potentially toxic substances.

a) List symptoms that are characteristic of upper alimentary tract toxicosis. (**5 marks**).
b) Discuss some features of toxicological damage to the upper alimentary tract. (**5 marks**).
c) Briefly discuss treatment and management of a case of upper alimentary tract toxicosis pointing out any contraindications (**10 marks**).

20 marks

QUESTION 5

Clearly, discuss the reasons for the ubiquitous environmental occurrence of Bisphenol A (BPA), its metabolism and in-vitro toxicity.

20 marks

QUESTION 6

Food allergy is a condition where an individual has generated an immune response to a food, and a subsequent encounter with the same food provokes an adverse (allergic) reaction.

a. List eight (8) major foods or food groups that are associated with the vast majority of allergic reactions according to the Food and Agriculture Organization (FAO)- World Health Organization (WHO) consultation on food allergies of 1995. (**8 Marks**)

b. Name the three (3) most common food allergies present in children. (**3 Marks**)

c. Immunoglobulin E (IgE) mediated allergies are easily detected by standard blood or skin tests and laboratory detection methods. An allergy focused history, physical examination is also very important. Describe the skin prick test (SPT). (**9 Marks**)

20 marks

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER MEXAMINATIOBER -2020/21 ACADEMIC YEAR

FOOD SAFETY RISK MANAGEMENT (FSR 7130)

Duration: 3 hours

INSTRUCTIONS:

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

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

QUESTION ONE

Part III of the Food Safety Act of 2019 of the Laws of Zambia highlights general provisions that the food industry must adhere to comply with the Act. Under Section Ten (10), a person shall not label, package, sell or advertise any food in a false, misleading or deceptive manner regarding its character, nature, value, substance, quality, composition, merit or safety or contravention of this Act.

Discuss deception in relation to the following:

a) Labelling **(5 marks)**
b) Packaging **(5 marks)**
c) Selling (**5 marks)**
d) Advertising **(5 marks)**

QUESTION TWO

A Quality Management System (QMS) is defined as "a set of coordinated activities to direct and control an organization to improve the effectiveness and efficiency of its performance continually. The ISO 9000 series of QMS standards are the most known and recognized QMS standards around the world. They provide a gold standard of QMS and are based on 7 key principles.

a) Identify and briefly explain any 5 of these principles. **(10 Marks)**

b) The most popular tool used in QMS is the Shewhart (PDCA) Cycle, developed by Dr. W. Edwards Deming. Briefly describe the PDCA cycle in relation to food safety management. **(10 Marks)**

QUESTION THREE

You have recently been hired as the Food Safety Manager of a Meat Processing plant manufacturing sausages and other meat cuts. One of the objectives assigned to you is to help the enterprise get their food safety management system in place within the first year of your employment. Write a report to Top Management on how this objective can be achieved focusing on the implementation of HACCP as your immediate target **(20 marks).**

SECTION B

QUESTION FOUR

The standard, ISO/IEC 17000, Conformity Assessment - Vocabulary and general principles, defines Conformity Assessment as 'the demonstration that specified requirements of a product, process, system, person, or body are fulfilled'.

a) List and define the elements of conformity assessment. **(6 marks)**
b) By way of a diagram, illustrate the conformity assessment hierarchy. **(2 marks)**
c) Describe the 'Functional Approach' to conformity assessment as set out in ISO/IEC 17000. **(12 Marks)**

QUESTION FIVE

You have been appointed as a Lead Auditor in one of your assignments at an Auditing Firm you are working for. You will be auditing a honey producing company seeking to get certification in HACCP.

a) Outline tasks you will be preparing for before, during and after the audit. **(10 marks)**
b) What qualities and characteristics will you be looking at in selecting your Audit Team to ensure that you have a successful audit? **(10 marks)**

QUESTION SIX

Discuss in details the elements of the national food safety control system **(20 marks).**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

FOOD SAFETY RISK ANALYSIS (FSR 7160)

Duration: 3 hours

INSTRUCTIONS:

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

SECTION A

QUESTION 1

a) Define Microbiological Risk Assessment and describe at least two (2) microbiological risk assessment methodology requirements **(6 marks)**

b) Give two (2) examples of how Food Safety Microbiological Risk Analysis can and/or is used and two (2) benefits of using Microbiological Risk Analysis **(6 marks)**

c) Write a very brief summary on the factors that you would consider during hazard identification and hazard characterization of *Listeria monocytogenes* in a refrigerated ready to eat fermented meat product **(8 marks)**

QUESTION 2

The Codex Alimentarius Commission defines exposure assessment as 'the qualitative and/or quantitative evaluation of the likely intake of biological, chemical, and physical agents via food as well as exposures from other sources if relevant.'

a) From this definition, identify and define the two major components of exposure assessment. **(5 marks)**

b) Describe any three (3) methods for food intake data to collect when conducting an exposure assessment. **(15 marks)**

QUESTION 3

Earlier this year, the manufacturer of Ceres recalled their apple juice products from the market, citing high levels of Patulin above the allowed 50 micrograms per litre. The Zambian Government has consulted you to conduct a food safety risk assessment of the exposure to Paulin through apple juice. Explain how you would go about conducting a risk assessment **(20 marks)**

.....SECTION B.....

QUESTION 4

Imagine that your country's National Food Safety Authority is trying to decide whether to ban the importation of fresh fish from a neighbouring country due to the suspicion of the product being contaminated with mercury. The economic stakes are high, with human health impacts quite uncertain. As an expert in chemical food safety risk analysis, discuss your approach to this situation in guiding the National Authority? **(20 marks)**

QUESTION 5

a) When conducting an exposure assessment, it is advisable to describe the food pathway, from farm to table or sections relevant to the individual exposure assessment (food pathway). Explain, with relevant examples, the factors you would take into account when describing a food pathway in an exposure assessment. **(10 marks)**

b) Exposure patterns over time may be plotted and illustrated graphically. Illustrate and describe any two exposure patterns. **(10 marks)**

QUESTION 6

The table below shows data collected when conducting a quantitative release assessment of the introduction of Peste Des Petits Ruminants (PPR) disease into Northern Zambia from Tanzania via an annual live goat trade. The input parameters of the likelihood of PPR virus release was based on: the annual volume of trade, probability of pre-export quarantine missing an infected goat, prevalence of infection, probability of PPR virus to survive in transit and probability of pre-export c-ELISA screening missing an infected goat.

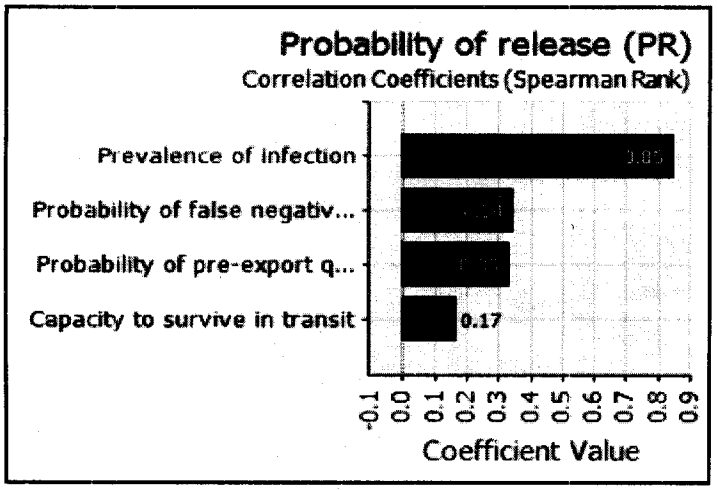
Release assessment of Peste Des Petits Ruminants (PPR) introduction into Northern Zambia from Tanzania via live goat consignment					
Probability of release	Minimum value	Most likely value	Maximum value	Estimates	Probability Distribution
Prevalence of infection	0.31	0.45	0.88	0.67	
Annual volume of trade	215		4612	2425	
Probability of pre-export quarantine missing an infected goat	0.045	0.066	0.072	0.052	
Probability of pre-export c-ELISA screening missing an infected goat (false negatives)	0.046	0.066	0.076	0.054	
Capacity PPR virus to survive in transit	0.8	0.9	1	0.9	

a) Name the probability distribution that you would use for each input parameter to arrive at the estimate. **(5 marks)**

b) Calculate the probability of release given the above estimates. **(4 marks)**

c) Come up with the equation that can help you calculate the number of infected animals likely to be released in the Northern part of Zambia. Provide the key and explanation for the letters and/or numbers used in the equation. **(5 marks)**

d) The sensitivity analysis of the release assessment was conducted as shown by the Tornado graph below. State the importance of the sensitivity analysis and interpret the results **(6 marks)**



Tornado chart showing the sensitivity analysis of the release assessment

QUESTION 7

Risk communication, in Risk Analysis, aims to provide meaningful, relevant and accurate information, in clear and understandable terms, targeted to a specific audience

a) List the guiding principles of risk communication as recognised by the Codex Alimentarius Commission. **(8 marks)**

b) Risk communication must consider both dimensions of risk perception because both influences how people make risk judgments. Identify and describe, with relevant examples, the two (2) major perceptions of risk. **(6 marks)**

c) List any six (6) barriers to effective risk communication **(6 marks)**

QUESTION 8

a) Discuss the key principles in the TBT agreements **(10 marks)**
b) Explain the organizational structure, objectives, functions, principles of the WTO **(10 marks)**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS-2021 ACADEMIC YEAR

ADVANCED DIAGNOSTIC CLINICAL PATHOLOGY AND FORENSIC SCIENCE (OHD 7110)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer all the **FIVE (5)** questions only
3. **ALL** questions carry equal marks (20 marks)
4. Write in a legible handwriting

QUESTION 1

Cervical cancer may develop from precursor lesions known as cervical intraepithelial lesions. Briefly describe how such lesions are graded in diagnostic cytology (**20 marks**)

QUESTION 2

An evidence suspected to be human semen was collected at the crime scene and brought to your Forensic science laboratory for analysis.

a) Name two presumptive tests you can use to determine this evidence as semen (**2 marks**)
b) Discuss the principle of the tests you have mentioned above (**12 marks**)
c) State one advantage and two weaknesses for each of the tests you have mentioned above (**6 marks**)

QUESTION 3

The diagnostic evaluation of a patient with a suspected haemostatic disorder starts with patient signalment (age, sex, breed in case of animals), history and physical examination. Clues obtained from the patient can and should guide diagnostic testing and test interpretation.

a. In the signalment, list five (5) questions that you should ask to help you with a diagnosis of a bleeding disorder. (**5 Marks**)

b. Give two (2) reasons why it is important to conduct a physical examination of a patient suspected to have a bleeding disorder. (**2 Marks**)

c. Why is a complete haemogram indicated in screening patients with bleeding disorders? (**2 Marks**)

d. List five (5) screening coagulation assays that are used to diagnose disseminated intravascular coagulation (DIC). (**5 Marks**)

e. List four (4) specialized tests that can help you diagnose secondary haemostatic disorders. (**4 Marks**)

f. Name two (2) global haemostatic tests that can measure multiple haemostatic pathways simultaneously, including the contribution of cells such as platelets and erythrocytes. (**2 Marks**)

QUESTION 4

Urine analysis is one of the most important and common tests carried out when evaluating a patient.

a. List Four (4) methods you would use for the physical examination of urine. (**4 marks**)
b. What would the following indicate after a chemical examination of a urine sample.
    i. High levels of proteinuria
    ii. Glucosuria
    iii. Crystalluria
    iv. Haemoglobinuria
    v. Hairs in a urine sample
    vi. Parasitic ova in a urine sample
c. What method would you use to distinguish haematuria from haemoglobinuria (**5 marks**)
d. Urine output is one on the methods used to evaluate a patient. What do the following terms mean related to urine output? (**3 marks**)
    i. Polyuria
    ii. Anuria
    iii. Oliguria
e. Wen examining a urine sample, what TWO (2) causes are suspected when you see a cloudy urine sample in a human being? (**2 marks**)

QUESTION 5

a. When examining the Erythron, you can either find an increase or a decrease in the total RBC count.

    i. What are the names given to (i) an increase in RBCs and (ii) a decrease in RBCs? (**2 marks**)

ii. Name the two (2) general causes of acute decreases in the RBC counts and briefly describe what each is?(**6 marks**)

iii. Which of the decreases in RBC counts are always chronic? **(2 marks)**

b. A WBC count consists of both granulocytes and agranulocytes.

iv. List all the granulocytes and then the agranulocytes. **(5 marks)**

v. Briefly explain what differentiates each of these cells. **(5 marks)**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
DEPARTMENT OF PARACLINICALS

END OF YEAR NOVEMBER/DECEMBER UNIVERSITY EXAMINATIONS
2020/21 ACADEMIC YEAR

CLINICAL BIOCHEMISTRY AND LABORATORY MANAGEMENT (OHD 7150)

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

QUESTION 1

a) Name two common parameters representing each of the following tests:-**(10 Marks)**

i) Cardiac markers

ii) Kidney function

iii) Liver function

iv) Minerals

v) Blood disorders

b) Laboratory data is usually interpreted with respect to reference intervals

i) Name the two ways of determining reference intervals. **(2 Marks)**

ii) Is it possible to find that a normal health animal's parameter is outside a "reference Interval", Explain? **(3 Marks)**

c) Describe how you would collect and preserve each of the following samples? **(5 Marks)**

i) Blood for blood smears

ii) Faeces for parasite egg determination

iii) Milk for bacteriological examination

iv) Skin for fungal infection diagnosis

v) Nasal discharges for viral infections

QUESTION 2

a) Describe a three point perception for the establishment of standards in laboratory automation and hence describe fully the envisaged results of the identification of initial standards development. **(11 Marks)**

b) Describe, fully, the automated instrument configurations commonly used in laboratory automation. **(9 Marks)**

QUESTION 3

Write short notes on the following:-

a) measurement of enzymes using the coupled assay. **(5 Marks)**

b) Gamma glutamyltransferase. **(5 Marks)**

c) Isoenzymes. **(5 Marks)**

d) Role of biomolecules in the body. **(5 Marks)**

QUESTION 4

Describe the difference between the role of a of leader and manager, and how each role is important to laboratory functions. **(20 Marks)**

QUESTION 5

Quality Systems Essentials (QSE) constitute the laboratory manager's "procedure manual". Discuss how you would apply QSE in the clinical biochemistry laboratory's path of workflow. **(20 Marks)**

QUESTION 6

Describe the importance of laboratory design and safety aspects. **(20 Marks)**

QUESTION 7

Discuss the components of a laboratory budget and ways of monitoring laboratory expenses. **(20 Marks)**

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

University of Zambia
School of Veterinary Medicine

End of Year University Examinations
Academic Year: 2020/2021

MSc Tropical Infectious Diseases and Zoonoses: Year I

Immunology of Infectious Diseases: TDZ 7311

Friday, November 19, 2021 **09:00-12:00**

Instructions

1. This paper contains two sections, A and B. You are required to answer FOUR (4) questions from Section A and THREE (3) questions from Section B. Please read the instructions for each question carefully.
2. Each question MUST be answered in a SEPARATE answer booklet. Ask for additional booklets, if required.
3. You must indicate your Student Number, the Section, and the Question you have attempted on the cover of the relevant answer booklet.
4. At the end of the examination, all answer booklets will be collected BEFORE you leave your seat.
5. Time allowed: 3 hours

[Please Turn Over

Section A: This section contains 5 short-answer questions. Attempt only FOUR (4) questions. Each question MUST be answered in a SEPARATE answer booklet.

1. a) What are pathogen-associated molecular patterns (PAMPs)? **(4 marks)**
   b) Using a specific pathogen, explain the interactions between the named pathogen PAMP and its toll-like-receptor ligand and the downstream immunological response. **(6 marks)**

2. How do the following cells of the T cell lineage exert their immune response against viral infections?
   a) Cytotoxic T cells. **(5 marks)**
   b) Natural Killer cells. **(5 marks)**

3. Write short notes on:
   a) ELISPOT assay. **(5 marks)**
   b) Cytotoxic T Lymphocyte (CTL) Assay. **(5 marks)**

4. Explain the benefits of inflammatory responses against infection. Using COVID-19 as an example, briefly discuss mechanisms of tissue and organ injury resulting from inflammation. **(10 marks)**

5. Compare and contrast cytometry bead array and the Luminex xMAP technology. **(10 marks)**

[Please Turn Over

Section B: This section contains 5 essay-type questions. Attempt only THREE (3) questions. Each question MUST be answered in a SEPARATE answer booklet.

1. Protozoan parasites cause economically important diseases in sub-Saharan Africa. Using examples and illustrations, discuss the innate and adaptive immune responses against a named infectious protozoan parasite. Further, outline how that protozoon evades host immune killing to perpetuate infections. **(20 marks)**

2. With the evolution of modern diagnostic and research techniques, host-pathogen interactions are being studied in greater detail. The immune system and immune responses are also being understood up to a molecular level. Answer any **FOUR** of the following **(5 marks each)**:
   a) Write short notes on the relationship between a host and its microbiome.
   b) Define the following terms: Dysbiosis, Holobiont, Microbiome, Microbiota, and Pathobionts.
   c) List diseases that are associated with a dysregulated gut microbiome and concisely discuss how the dysregulation leads to disease in one of them.
   d) Write short notes on Heat Shock Proteins (HSPs) and their role in immunology and disease pathogenesis.
   e) Write short notes on how the different mechanisms that antimicrobial proteins use to kill microbes.
   f) List FIVE antimicrobial proteins and concisely discuss one of them.

3. Outline the main features of live attenuated vaccines. Discuss the different approaches to vaccine development that have been applied to the development of the different COVID-19 vaccines. **(20 marks)**

4. Tuberculosis is truly an immunological delayed hypersensitivity reaction rather than a disease. It has two main outcomes, active or latent infection. Explain fully how these outcomes come about, including their ultimate results. **(20 marks)**

5. Briefly discuss the current approaches and technologies used for understanding the immunogenetics of infectious diseases. **(20 marks)**

End of Examination

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/21 ACADEMIC YEAR

BIOETHICS AND ANIMAL WELFARE (TDZ 7402)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ANY FIVE (5)** 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

Discuss the concept of justice with respect to research ethics. **(20 marks)**

QUESTION 2

Write short notes on the following: **(5 marks each)**

a) The Belmont Report
b) Informed consent
c) The 3Rs
d) Vulnerable populations as it applies in research ethics

QUESTION 3

You have a project to assess factors affecting acceptability of COVID-19 vaccination in Lusaka District. The project will involve interviewing participants using a semi-structured questionnaire for data collection. Discuss how you would ethically implement your project, outlining the ethical issues that are likely to arise and how you would address them. **(20 marks)**

QUESTION 4

Write short notes on the following **(5 marks each)**

a. Relationship between genetics and animal welfare
b. Effect of keeping an animal in a barren cage.
c. Effect of farming systems and production on the welfare of an animal
d. Assessment of stress in animals being used for research.

QUESTION 5

Discuss in detail how the welfare of animals being housed for research may be assessed.

(20 marks)

QUESTION 6

Discuss how the three Rs may be applied during animal research to ensure the welfare of animals. **(20 marks)**

QUESTION 7

Outline the common welfare issues which may be found on a farm in the following species: (**5 marks each**)

a. Farmed breams
b. Pigs
c. Cows
d. Meat chickens or broilers

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

PRINCIPLES OF PUBLIC HEALTH AND POLICIES (TDZ 7411)

Duration: 3 hours

INSTRUCTIONS:

1. Read instructions before attempting to answer the questions
2. Questions are organized in One Section
3. Answer **ANY FIVE (5)** questions
4. Write your computer number (ID) and Question Number on each answer sheet
5. Answer each question on a separate page
6. Insert Question numbers on all answer sheet pages

QUESTION 1

The contemporary Public Health had in the past passed through a series of contextual transformation. One of such transformation is the term "preventive medicine."

a) What was the main purpose of preventive medicine? Provide **four (4)** major components that transformed and broadened the scope of preventive medicine? **(5 Marks)**
b) The cornerstone of preventive medicine is "Primary Health Care" (PHC), briefly describe the phases or levels of preventive medicine? **(10 Marks)**
c) To what extent have these phases or levels of "prevention" mitigated the health risks of the humans in your respective countries? **(5 Marks).**

QUESTION 2

a) Define Primary Health Care (PHC) and State the **eight (8)** essential principle elements of PHC as declared at the Alma-Ata Conference in Russia in 1978 for the Universal Coverage of "Health for All"? **(10 Marks).**
b) Give **four (4)** major principles of Primary Health Care, with explanations, as adapted by the World Health Organization? **(6 Marks)**
c) How has the concept of Primary Health Care contributed to the health of the people in your respective countries? **(4 Marks)**

QUESTION 3

a) Provide an explanation on how the inter-linked **three (3)** disciplines classified as: a) basic sciences, b) clinical sciences, and c) public health or population medicine contribute to the knowledge about human health and disease? **(10 Marks)**
b) Give an example of an infectious disease that provides a good illustration of these three different approaches to the same disease as indicated in (a) above? **(10 Marks)**

QUESTION 4

Describe the **four (4)** historical distinct phases of public health evolution demarcated on the need to improve the health of people globally and contributed to shaping modern public health? **(20 Marks)**

QUESTION 5

a) What is the difference between a law and a policy? **(5 Marks)**
b) List six (6) core public health characteristics or attributes which depend entirely on the basis of the law? **(10 Marks)**
c) What is the main purpose of a public health policy? Give examples of actions that can be undertaken by those in authority to promote health of the people at risk? **(5 Marks**

QUESTION 6

Give accounts on **two (2)** from the following types of public health legislative measures:

a) Public Health and Primary Care Acts **(10 Marks)**
b) Constitutional Basis for Public Health Law **(10 Marks)**
c) Public Health Law Tools **(10 Marks)**
d) Public Health Surveillance Act **(10 Marks)**

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR AUGUST/SEPTEMBER EXAMINATIONS – 2020/21 ACADEMIC YEAR

TDZ ~~7210~~ 7502 INFECTIOUS DISEASES AND ZOONOSES (TDZ 7210)

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

QUESTION 1

Bacteria organisms are an important player in disease causation. Discuss the mechanisms of disease production and provide examples of some of the key elements involved in disease and how they can be used in diagnosis.

20 marks

QUESTION 2

With reference to Onchocerciasis, discuss in detail the lifecycle of the causative agent as well as clinical presentation and treatment.

20 marks

QUESTION 3

The figure below (Figure 1) shows a test you have performed for the diagnosis of Rabies in Lusaka.

i) Name the test and describe and interpret Lanes WM, 1, 2 and 3 in the Figure 1. **(10 marks)**

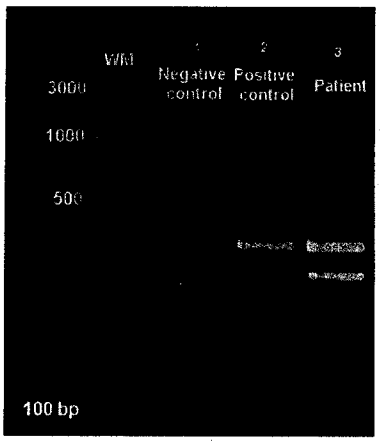

Figure 1

ii) The product shown in **Figure 1** was obtained from the sequence below (Figure 2). Using the sequence below (Figure 2), clearly demonstrate how you designed primers for the products shown in Figure 1 above **(10 marks)**

ORIGIN

1 gatcaaaatt aaaaacaaaa atgaaagggg tctgtgaagt gggggttcaa gcactcaaaa
61 agtgtgatgg ccaactcagc actgcacatg aggttgtgcc ctttgcagtg tttaagaact
121 caaagaaggt ttattttgat aagcttgacc tcaagactga ggagaatatg ctaccagact
181 catttgtctg cttcgagcat aaggggcagt ataaaggtac aatggactct ggtcagacta
241 agagggagct caaaagcttt gatatctctc agtgccccaa gattggagga catggtagta
301 agaagtgcac tggggacgca gcattttgct ctgcttatga gtgcactgct cagtacgcca
361 atgcctattg ttcacatgct aatgggtcag gggttgtgca gatacaagta tcaggggtct
421 ggaagaagcc tctatgtgtg gggtatgaga gagtggttgt gaagagagaa ctctctgcca
481 agcccatcca gagggttgag ccttgcacaa cttgtataac caaatgtgag cctcatggat
541 tggttgtccg atcaacaggg ttcaagatat catctgcagt tgcttgtgct agcggagttt
601 gcgt

Figure 2

20 marks

QUESTION 4

Explain the life cycle of *Tunga penetrans* and discuss its medical and veterinary importance. How can the condition caused by this parasite in its hosts be prevented?

20 marks

QUESTION 5

a) List 4 different immunodiagnostic techniques available for the detection of infectious diseases **(4)**

b) Briefly explain the basis of an Immunodiagnostic test **(4)**

c) Using diagrams and illustrations, describe the procedure for conducting an immunological test involving diffusion of test components through a semi-solid media and provide the different interpretations of the results depending on the various reactions you may get. **(12)**

20 marks

QUESTION 6

Describe the common metagenomic techniques and their applications to infectious disease research. (20 marks)

20 marks

QUESTION 7

Discuss the applications of nucleic acid techniques in the molecular epidemiology of infectious diseases. (20 marks)

20 marks

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SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

VETERINARY OPERATIVE SURGERY (VMC 5210)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ALL** questions in Section A and **THREE** 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

SECTION A

QUESTION 1

Small Animal Dentistry is an important component of small animal practice. A veterinarian's understanding of dental problems is therefore important to ensure that correct and appropriate client advice is provided.

a) Describe any **five** (**5**) malocclusions that you know that can occur in dogs outlining their effects in those affected. **(10 marks)**

b) Outline the factors that predispose small animals to periodontal diseases. **(5 marks)**

c) It is said that the oral cavity has its own natural defense mechanisms. Discuss this statement. **(5 marks)**

QUESTION 2

Lameness is a clinical sign of a more severe disorder that results in a disturbance in the gait and the ability to move the body about, typically in response to pain, injury or abnormal anatomy. Losses due to lameness in dairy cattle include reduced milk yield, weight loss, disposals, deaths, infertility, prolonged calving interval, veterinary expenses, drugs, and additional stockmen.

a) List any **three (3)** conditions of the hoof that can cause lameness in dairy cattle. **(3 Marks)**

b) List any **three (3)** indications for amputation of a bovine digit. **(3 Marks)**

c) List **two (2)** conditions that can be managed with a hoof block as part of the treatment regime. **(2 Marks)**

d) Describe the principle and process of hoof block application in cattle for one of the conditions listed in (c) above. **(12 Marks)**

QUESTION 3

Orthopaedics is defined as a speciality in medicine that involves management and treatment of injuries and diseases of the musculoskeletal system.

a) Comprehensively discuss the criteria for fracture classification. With each fracture criteria, also discuss the implications on fracture management/repair. **(15 marks)**

b) With the aid of line drawings or sketches, concisely discuss the difference between
   i) a chisel and an osteotome
   ii) cerclage wire and Kirschner wire. **(5 marks)**

SECTION B

QUESTION 4

Dehorning is an important activity for cattle practitioners that they need to master.

a) List the indications for dehorning cattle. **(4 marks)**
b) Describe in detail a technique that you would use to dehorn adult cattle. Include preoperative, technique and postoperative procedures. **(8 marks)**
c) Discuss the sequelae of dehorning adult cattle and how you would manage them. **(8 marks)**

QUESTION 5

Left recurrent laryngeal hemiplegia is a disease of horses which makes breathing more difficult and therefore impairs performance. During exercise, horses with left recurrent laryngeal hemiplegia make loud breathing noises that are described as "roaring" or "whistling.

a) Briefly outline how you would confirm a diagnosis of left recurrent laryngeal hemiplegia in a horse. **(2 marks)**
b) Outline a grading system for laryngeal function in a resting horse. **(4 marks)**
c) List the surgical techniques available in the correction of left recurrent laryngeal hemiplegia. **(4 marks)**
d) Discuss a technique or techniques you would use from (c) to correct laryngeal hemiplegia in a 14-year-old gelding (Include patient preparation, anaesthesia and post-operative care). **(10 marks)**

QUESTION 6

With the aid of line drawings or sketches, comprehensively discuss **TWO (2)** methods of preparing a teaser bull. **(20 marks)**

QUESTION 7

Orthopaedic conditions of the forelimb occur quite commonly. The conditions range from fractures caused by trauma to developmental anomalies.

a) Discuss the aetiopathogenesis of canine elbow dysplasia. **(6 marks)**

b) With the aid of line drawings or sketches, comprehensively discuss the pathogenesis and surgical management of *radius curvus* in a dog. **(14 marks)**

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

THE UNIVERSITY OF ZAMBIA

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END OF YEAR EXAMINATION NOVEMBER EXAMINATION

2020/2021 ACADEMIC YEAR

ADVANCED STATISTICAL METHODS IN EPIDEMIOLOGY (VMM 7512)

Time: Three (3) Hours

INSTRUCTIONS

Read the instructions and the questions carefully before attempting to answer any questions
Answer ANY Five (5) questions
State all assumptions used and show all calculations

QUESTION 1

The predictors of the number of awards earned by 200 students at one high school was analysed using a Poisson model. The number of awards (**num_awards**) is the outcome variable and indicates the number of awards earned by students at a high school in a year, **math** is a continuous predictor variable and represents students' scores on their math final exam, and **prog** is a categorical predictor variable with three levels indicating the type of program in which the students were enrolled. It is coded as 1 = "General", 2 = "Academic" and 3 = "Vocational".

The following output was obtained from the analysis of this data:

##	Estimate	Robust SE	Pr(>|z|)	LL	UL
## (Intercept)	-5.24712	0.64600	4.567e-16	-6.5133	-3.98097
## progAcademic	1.08386	0.32105	7.355e-04	0.4546	1.71311
## progVocational	0.36981	0.40042	3.557e-01	-0.4150	1.15463
## math	0.07015	0.01044	1.784e-11	0.0497	0.09061

a) Calculate the rate ratio for each level of the predictor variable and interpret the output of this analysis. Write the regression equation for this model. **(15 marks)**
b) Explain how you would check whether this model fitted the data? **(3 marks)**
c) What do you understand by the concept of proportional rates when used in Poisson regression? **(2 marks)**

QUESTION 2

a) Describe the three assumptions for linear regression. How do you check to ensure that these assumptions are not violated during your data analysis? **(6 marks)**

b) A study was carried out to determine the determinants of packed cell volume (PCV) in cattle in Zambia. The dependent variable was PCV. The independent variables were tick burden, Age, number of infections and body condition score. The number of infections was the number of co-infections that were diagnosed by PCR in an animal and was recorded as a continuous variable. Body condition score was treated as a continuous variable for the purpose of this analysis. Tick burden was the number of ticks observed on each animal and was recorded as "None seen"= no ticks on animal's body, "Few"= 1 to 20 ticks seen on an animal, "moderate" = 21 – 50 ticks and "abundant" = >50 ticks. Agecat was the age of cattle in months. It was categorized as 1 = "1 to 12 months", 2 = "13 to 24 months", 3 = "25 to 48 months" and 4 = ">48 months". The results of the analysis of this data are shown in the table below. Write the regression equation for this analysis and interpret the results **(10 marks)**

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	25.179	1.087	23.159	.000	23.043	27.315
[Tickburden=abundant]	-2.549	1.852	-1.376	.169	-6.186	1.089
[Tickburden=Few]	-.661	.501	-1.321	.187	-1.645	.322
[Tickburden=moderate]	-1.545	.661	-2.338	.020	-2.842	-.247
[Tickburden=None seen]	0[a]	.	.	.	.	.
[Agecat=1]	3.593	.651	5.517	.000	2.314	4.873
[Agecat=2]	1.738	.645	2.693	.007	.470	3.005
[Agecat=3]	1.231	.578	2.129	.034	.095	2.366
[Agecat=4]	0[a]	.	.	.	.	.
Numberofcoinfections	-.452	.155	-2.914	.004	-.757	-.147
Bodycondition	2.705	.313	8.640	.000	2.090	3.320

c) Describe the meaning of the analysis of variance (ANOVA) and t-test when used in multiple linear regression. **(4 marks)**

QUESTION 3

Meta-analysis is a systematic reproducible secondary study method that has become popular since the 1990s. Outline in detail the steps involved in performing a meta-analysis **(20 marks)**

QUESTION 4

Sixteen patients with advanced stomach carcinoma were randomized to receive one of two chemotherapies (Group A or Group B). The survival times from treatment (in weeks) are (+ denotes a censored observation): Group A: 63+, 59+, 57+, 40, 37, 33, 21+, 11

Group B: 57+, 51+, 44+, 32, 27, 27+, 10+, 6

a) Two reasons why an observation might be censored include: (i) administrative: study closes before patient dies; (ii) loss to follow-up during study due to patient leaving the area. State for each whether the assumption of statistical independence with survival time is plausible or not and the basis for your statement.
(4 marks)

b) Construct (arithmetically) and plot (very roughly) the Kaplan-Meier survival curve for Group B. **(6 marks)**

c) Construct the risk sets of patients still alive and on-study in each group at t = 32 weeks and show (arithmetically) the contribution to the observed and expected number of deaths in Group A at that time using the log-rank procedure.
(6 marks)

d) For each group, total observed and expected deaths were calculated using the log-rank procedure, with the following results:

	Group A	Group B
Observed deaths	4	3
Expected deaths	4.03	2.97

What is the null hypothesis H_0 under which the row of expected numbers of deaths is calculated? In particular, if $S_A(t)$ and $S_B(t)$ denote the survival probabilities in the two groups at time t, what is assumed about these probabilities under H_0? **(4 marks)**

QUESTION 5

a) Describe key differences between cox and Poisson regression **(4 marks)**

b) Describe how you carry out a likelihood ratio test and the meaning of its results when used in regression analysis **(8 marks)**

c) Describe the two approaches you can use to calculate the 95% confidence intervals for the most likely value **(8 marks**

QUESTION 6

a) Give three (3) reasons why linear regression is not appropriate for the analysis of categorical data. **(6 marks)**

b) Below is the analysis of data from a study that was carried out to determine the predictors of cattle being positive for Rift Valley fever (RVF) in Zambia. The response variable was RVF status which was recorded as either positive or negative. The predictor variables were cattle grazing in the national park, recorded as 1 = "No" and 0 = "Yes" , abortion occurs recorded as 1 = "Yes" and 0 = "No", grazing system recorded as 1 = "Local" and 0 = "Transhumance", cattle grazing in flood plains recorded as 1 = "No" and 0 = "Yes" and grazing with wildlife recorded as 1 = "No" and 0 = "Yes". All responses recorded as zero (0) were the reference categories. The model was run using the stepwise binary logistic regression method.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
razing_Wildlife(	1.431	.563	6.466	1	.011	4.185	1.388	12.61
port_Occur(1)	1.335	.560	5.682	1	.017	3.799	1.268	11.38
onstant	-1.311	.474	7.648	1	.006	.270		

i) Write the regression equation and interpret the output of this analysis **(10 marks)**

c) The results in the tables shown below were also obtained from the analysis in (b) above. Interpret these results and explain the relevance of the information in the two Tables. **(4 Marks)**

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	0	.
2	.396	2	.820

Contingency Table for Hosmer and Lemeshow Test

		RVF_Herd_Status = Positive		RVF_Herd_Status = Negative		Total
		Observed	Expected	Observed	Expected	
Step 1	1	20	20.000	8	8.000	28
	2	13	13.000	29	29.000	42
Step 2	1	16	16.541	5	4.459	21
	2	4	3.459	3	3.541	7
	3	9	8.459	9	9.541	18
	4	4	4.541	20	19.459	24

THE UNIVERSITY OF ZAMBIA
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DEPARTMENT OF DISEASE CONTROL

END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ZOONOTIC DISEASES AND INFECTIONS (VMM 7610)
EMERGING AND RE-EMERGING DISEASES (VMM 7601)
INFECTIOUS DISEASES AND ZOONOSES (TDZ 7210)

Duration: 3 hours

INSTRUCTIONS

1. Please read all the instructions and each question carefully
2. Answer **ALL FIVE** in **SEPARATE ANSWER BOOKLETS**
3. **ALL** questions carry equal marks

QUESTION 1

Answer **ANY TWO (2)** of the following;

a) Define zoonoses and describe the classification of zoonoses based on based on the usual reservoir host **(10 marks)**

b) With examples, differentiate between emerging and re-emerging infectious diseases. **(10 marks)**

c) Discuss reasons why some outbreaks of viral haemorrhagic fevers, like Ebola virus disease, become big and uncontrolled. **(10 marks)**

QUESTION 2

Intestinal disease associated with fresh produce and water contamination with parasites has become common in recent years especially in poor resource settings

a) List **five (5)** foodborne parasites that are associated with fresh produce. **(2.5 marks)**
b) From the listed parasites in (a) above, list **two** that can also be transmitted through ingestion of contaminated eater and outline the risk factors for transmission. **(6 marks)**
c) Discuss the effects of *Toxoplasma gondii* on the human host. **(5 marks)**
d) Outline the measures that should be employed to prevent infections with the parasites listed in (a) above. **(6.5 marks)**

QUESTION 3

a) Describe anthropogenic activities that would accelerate the emergence and re-emergence of infectious zoonotic pathogens? **(10 marks)**

b) Discuss how pathogen evolution influences disease emergence and sustenance looking at transmission and maintenance, establishment, and adaptation. You can use any bacterial infectious disease of your choice as an exemplary model. **(10 marks)**

QUESTION 4

Write brief notes on the following important virology concepts: including but not limited to description, significance, and application.

a) Virus neutralization test **(4 marks)**
b) Serotypes **(4 marks)**
c) Phylogeny **(4 marks)**
d) Hemagglutination inhibition **(4 marks)**
e) Molecular SNPs **(4 marks)**

QUESTION 5

You wish to draft a research proposal whose main objective is to determine the prevalence of hydatidosis in people living in a rural community in Western 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) Name the parasite that causes human hydatidosis in the proposed study area. **(2 marks)**
b) Outline the tools, including samples (if any), you would use to diagnose the condition in the intermediate and final host study subjects. **(4 marks)**
c) Briefly outline the life cycle of the parasite named in (a) above. **(4 marks)**
d) List the risk factors associated with hydatidosis infection in humans. **(4 marks)**
e) Describe control measures you would recommend aimed at reducing the incidence of hydatidosis in rural communities of endemic areas. **(6 marks)**

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

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END OF YEAR EXAMINATION NOVEMBER EXAMINATION

2020/2021 ACADEMIC YEAR

INFECTIOUS DISEASES MODELLING AND GIS (VMM7612)

Duration: Three (3) hours

INSTRUCTIONS

1. Read the instructions carefully before attempting to answer any question
2. Examination has **SIX (6)** Questions. Please answer **ANY FIVE (5)**
3. State all assumptions used and show all calculations
4. Answer **QUESTIONS 1 & 2, each** in a **separate booklet**

QUESTION 1

Describe at least ten habits of a systems thinker. **(20 marks)**

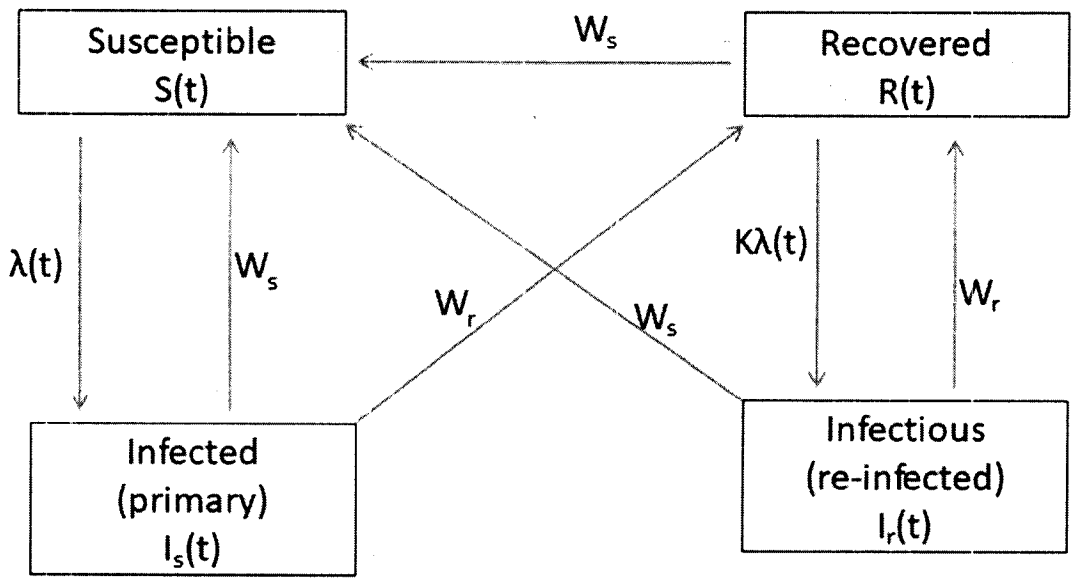
QUESTION 2

a) Give a description of the meaning or write short notes on each of the following terms or phrases
   i) Non-random or heterogeneous mixing **(2 marks)**
   ii) Infection doubling time **(2 marks)**
   iii) Net reproduction number **(2 marks)**
   iv) Epidemic curve **(2 marks)**
   v) Effective contact **(2 marks)**

b) Difference and differential equations are written using distinct notation. Compare the equations for the susceptible, pre-infectious, infectious, and recovered individual in difference and differential equations, giving descriptions for each notation used. **(10 marks)**

QUESTION 3

a) Figure shows structure of model describing transmission dynamics of respiratory syncytial virus (RSV). Individuals are stratified into those who are susceptible *(S(t))*, those who have been infected and are infectious for the first time *($I_s(t)$)*, those who have recovered from infection *(R(t))*, and those who have been re-infected and are infectious *($I_r(t)$)*. Rate at which recovered individuals are re-infected differs by a factor k from rate at which susceptible individuals are infected for first time. Rate at which infectious individuals recover to become partially immune to further re- infection *(w_r)* is assumed to be independent of whether they have experienced infection for first or subsequent time. Recovered and infectious individuals can become fully susceptible to infection again at a rate *(w_s)* which is identical for all individuals.



Write the equations for this model **(10 marks)**

b) Describe 'density-dependent' and 'frequency-dependent' transmission of an infectious disease and how β is affected in each when the population size changes.

QUESTION 4

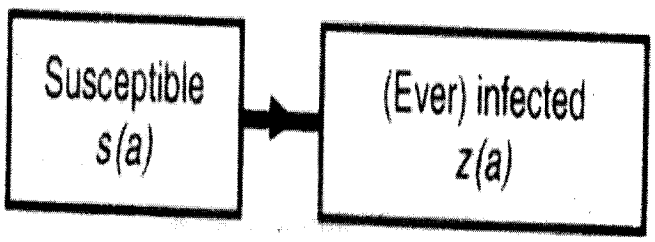
Giving examples, describe the steps you would follow in setting up a model **(20 marks)**

QUESTION 5

a) Give limitations and/ or advantages of equations for calculating R_0 that use growth rate **(6 marks)**

b) There are several key equations that relate the basic reproduction number to the proportion of individuals who have been infected by the end of the epidemic (epidemic size). Describe the challenges and advantages of using these equations to estimate the size of an epidemic? **(8 marks)**

c) The figure below shows a catalytic model that can be used to track individuals of a given age group from birth and uses the average annual force of infection for the rate at which susceptible individuals are infected.



Using this model, write expressions for.

i) The proportion of individuals that are susceptible at age a, s(a) **(3 marks)**

ii) The proportion of individuals who have ever been infected by age a, z(a) **(3 marks)**

QUESTION 6

Systems dynamics is a modelling method based on stocks (levels) and flows (rates), which can be used in a variety of fields.

a) Construct a schematic simple closed population, susceptible-diseased stock and flow diagram of a human disease spread through contact. There is no treatment for the disease and patients have the condition for the rest of their lives. Please clearly label your diagram. **(9 marks)**

b) What are the formulas for the stock(s) and flow(s) in the model above **(8 marks)**

c) What are the units for each of the components of the model above? **(3 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ONE HEALTH MEDICINE AND GLOBALIZATION (VMM 7701)

Duration: 3 hours

INSTRUCTIONS

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

QUESTION 1

a) What is the main rationale for ONE Health **(5 marks)**
b) State the main five (5) principles of One Health **(5 marks)**
c) Provide a description of the contextual issues warranting ONE Health approach in Africa? **(10 marks)**

QUESTION 2

a) There are determinants of health influencing health which lie both within the individuals and externally in societies, what are these health determinants? **(10 marks)**
b) How has 'One Health' been conceptualized in understanding the new philosophy of Health **(10 marks)**

QUESTION 3

a) Define One Health? **(5 marks)**
b) What approach would you use to solve a one health problem from **ONE** of the following disease conditions affecting both humans and animals: **(5 marks)**
   i. Malaria
   ii. Human African Trypanosomiasis (HAT)
   iii. Anthrax
   iv. Bovine Tuberculosis

c) How would you apply this approach to solve the selected problem identified in (b) above? **(10 marks)**

QUESTION 4

a) What are the three (3) health concepts of Complex systems? **(5 marks)**
b) In what ways these health concepts of complex ecosystems can influence sustainable livelihood? **(5 marks)**
c) State the differences between livelihood stresses and livelihood shocks? Give two (2) examples from each livelihood? **(10 marks)**

QUESTION 5

a) Define globalization? **(2 marks)**
b) State the three (3) distinct interrelated dynamics phenomena of globalization? **(8 marks)**
c) What are four (4) main Globalization effects linking to health outcomes? **(10 marks)**

QUESTION 6

a) Describe the effects of debt crises and structural adjustment program of developing country economies constrained investments in public health education, water and sanitation including neighbourhood improvements by Governments? **(10 marks)**

b) In what ways, with examples, have the globalization environmental damage and working conditions affect health and livelihood of local communities, natural habitats, and the ecosystems in developing countries? **(10 marks)**

QUESTION 7

What actions can be done by the national Governments to reduce the health risk of globalization in developing countries, particularly in Africa Region **(20 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ONE HEALTH RESEARCH METHODOLOGY (VMM 7901/8901/FSR8900)

Duration: 3 hours

INSTRUCTIONS

1. Please read the instructions and each question carefully
2. Answer **ALL** questions only
3. Total marks: **60 of the total score**
4. Write in a legible handwriting

QUESTION 1

a) State the Nature of Scientific Enquiry and provide a stepwise 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? **(12 marks)**

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. **(10 marks)**

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. **(10 marks)**

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? **(14 marks)**

QUESTION 5

a) Define Bibliography, generally and in relation to Scientific Writing. Briefly explain the main purpose of a bibliographic entry and state any other names or phrases used to refer to it.
b) Name and briefly describe types of bibliography.
c) There are four basic steps to making an effective oral presentation. Please name and briefly describe these steps.
d) Name and briefly describe the main purposes of presentations. **(14 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ETHICS IN FOOD SAFETY MANAGEMENT (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 (2)** 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

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

QUESTION 1

Carefully read the news item provided in ***Exam Question 1 supplement*** where at least a hundred people who ate a popular fast food known as *Shawarma* on the Copperbelt of Zambia recently reported food poisoning. Based on that story in the Zambia Daily Mail,

(a) Identify and list ethical issues arising from the article **(3 marks)**
(b) Briefly justify why you believe the issues in (a) above have ethical implications in food safety management? **(5 marks)**
(c) Discuss in detail how you could have addressed any of the major ethical issues in (a) above. **(6 marks)**
(d) Which food safety management system(s) would be appropriate to address the problem(s) cited above? Justify your answer. **(6 marks)**

QUESTION 2

Discuss in detail the following question and citing appropriate examples, where possible, in your write-up.

"Are genetically modified foods safe for human consumption? Discuss the motion *FOR* or *AGAINST* in terms of what is in it for consumers in terms of ethics and food safety?" **(20 marks)**

QUESTION 3

There are **three (3)** commonly known food safety management systems.

a) List the **three (3)** food safety management systems. **(3 marks)**
b) For each food safety management system listed in (a) above, indicate, in detail, how it relates to ethical practice of food safety? Justify your answers. **(9 marks)**
c) How can a food safety expert like yourself compare and contrast the three food safety management systems in achieving the best outcome for the farm-to-fork cycle? **(8 marks)**

SECTION B

QUESTION 4

In a field educational tour to Hartland Farm Snails Zambia located in Kabwe, you were informed of how the enterprise raises edible land snails, predominantly for human consumption or cosmetic use. The meat and snail eggs are a delicacy with the earlier containing high quantities of protein, magnesium, calcium, copper, zinc, and iodine. The later provide a high-end cuisine as caviar. The snail slime (or mucus) has medicinal properties with claims of treating some common health problems such as asthma and tuberculosis. Further, the secretions are employed in the cosmetic industry.

a) Write in detail what governs the Farm's food safety management **(4 marks)**
b) What is/are the ethics at play at the farm? **(2 marks)**
c) Describe how the ethics in (b) are interlinked and enhanced to provide food safety at the farm. **(6 marks)**
d) What are the major lessons that you learnt from this exotic farming experience that can make you fully explore the influence of culture, globalization and farming on ethics in food safety practice? **(8 marks)**

QUESTION 5

Ethics is a broad term that encompasses different frameworks and approaches.

a) Discuss in detail the components and steps involved in the *Framework for Ethical Decision Making.* **(10 marks)**
b) List and briefly describe the **five (5)** sources or approaches of ethical standards that are used to answer ethical issues. **(10 marks)**

QUESTION 6

Carefully read the news item provided in ***Exam Question 5 supplement*** explaining what happened to people that consumed foods a traditional event.

(a) List the ethical issues in the said supplement and justify why you have identified them as such. **(4 marks)**

(b) From the issues in (a) above, are there are any that can lead to ethical dilemmas if they must be addressed? If *Yes*, what would prompt such ethical dilemmas? **(4 marks)**

(c) Indicate in detail the factors that can influence the ethical decision-making process in this case. **(4 marks)**

(d) Discuss in detail the constraints of employing any food safety management systems in this traditional event. **(8 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

ECOSYSTEMS HEALTH: HUMAN & ANIMALS (EPH 7300)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ANY FIVE (5)** 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) What are differences between the following concepts in the understanding of ecosystem health that embraces the holistic approach of ecological public health: **(5 marks)**
   i. Ecology?
   ii. Ecosystems?
   iii. Ecosystem Health?

b) Provide explanations on the **four (4)** main characteristics of the human ecosystem and how human ecological factors influence geographical distribution of disease prevalence and environmental pollution? **(10 marks)**

c) Give examples of five (5) zoonotic diseases influenced by the human intrusion into the ecological cycles of environment? **(5 marks)**

QUESTION 2

a) What are the main contextual features of ecosystem? **(4 marks)**

b) Give **one (1)** example of a disease that reflects its biodiversity and disease risk to humans? **(6 marks)**

c) What would you suggest are the possible causes and solutions to this ecosystem disease problem stated in (a)? **(10 marks)**

QUESTION 3

a) Describe the Composition of ecosystems services? **(10 marks)**

b) For what reasons the World Health Organization (WHO) has transformed the term ecosystem services to be "Ecosystem Goods and Services for Health"? **(5 marks)**

c) What is the purpose of introducing the field of "ecosystems health" in the context of public health? **(5 marks)**

QUESTION 4

a) Define complex ecosystems for health? What constitutes complex ecosystems for health? **(5 marks)**
b) Why is the concept of "healthy livelihood" marked as a central debate for human sustainability? **(10 marks)**
c) In what ways these health concepts of complex ecosystems can influence sustainable livelihood? **(5 marks)**

QUESTION 5

In understanding the complexity scope of ecological factors and disease prevalence, the concept of medical anthropology and behavioural studies have marked central to the field of ecological public health.

a) Describe the roles of culture, behavioural research and ecology in shaping disease and health outcome of humans and animals? **(4 marks)**
b) What are **two (2)** important purposes of medical anthropology in ecological public health? **(4 marks)**
c) Describe the four differential sources embracing the roots of medical anthropology? **(12 marks)**

QUESTION 6

a) Define behavioural research and its important roles in ecological public health? **(5 marks)**
b) What is the rationale for using behavioural change theories or models? **(5 marks)**
c) Provide an explanation on **one (1)** type of behavioural change models or theories reflecting its purposes on the value of disease screening and perceived components that may influence better understanding of disease control and prevention in Human populations? **(10 marks)**

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR AUGUST/SEPTEMBER EXAMINATIONS – 2020/21 ACADEMIC YEAR

APPLIED FOOD MICROBIOLOGY AND NUTRITIONAL TOXICOLOGY (FSR 7120)

DURATION: 3 HOURS

INSTRUCTIONS:

1. Please read all the instructions and each question carefully.
2. Answer **ALL three (3)** questions in **Section A**, and any **two (2)** in **Section B**.
3. **ALL** questions carry equal marks.
4. Write in a legible handwriting

SECTION A

QUESTION 1

a. Discuss how microorganism may manifest their presence in food. **(10 marks)**

b. Discuss how food contamination may occur from producers, manufacturers and consumers. In your discussion, highlight areas that are critical to contamination. **(10 marks)**

20 marks

QUESTION 2

There are basically three parameters that affect the growth of microorganisms in food products. Giving examples, explain the three parameters.

20 marks

QUESTION 3

Describe the microbial spoilage of the following foods:

a. Fish
b. Vegetables
c. Milk
d. Meat

20 marks

SECTION B

QUESTION 4

People are capable of swallowing a great variety and often large amounts of substances including food stuffs, nutrients, food additives and contaminants, drugs, inhaled particles and drugs. This exposes the gastrointestinal tract to potentially toxic substances.

a) List symptoms that are characteristic of upper alimentary tract toxicosis. (**5 marks**).
b) Discuss some features of toxicological damage to the upper alimentary tract. (**5 marks**).
c) Briefly discuss treatment and management of a case of upper alimentary tract toxicosis pointing out any contraindications (**10 marks**).

20 marks

QUESTION 5

Clearly, discuss the reasons for the ubiquitous environmental occurrence of Bisphenol A (BPA), its metabolism and in-vitro toxicity.

20 marks

QUESTION 6

Food allergy is a condition where an individual has generated an immune response to a food, and a subsequent encounter with the same food provokes an adverse (allergic) reaction.

a. List eight (8) major foods or food groups that are associated with the vast majority of allergic reactions according to the Food and Agriculture Organization (FAO)- World Health Organization (WHO) consultation on food allergies of 1995. (**8 Marks**)

b. Name the three (3) most common food allergies present in children. (**3 Marks**)

c. Immunoglobulin E (IgE) mediated allergies are easily detected by standard blood or skin tests and laboratory detection methods. An allergy focused history, physical examination is also very important. Describe the skin prick test (SPT). (**9 Marks**)

20 marks

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER MEXAMINATIOBER -2020/21 ACADEMIC YEAR

FOOD SAFETY RISK MANAGEMENT (FSR 7130)

Duration: 3 hours

INSTRUCTIONS:

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

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

QUESTION ONE

Part III of the Food Safety Act of 2019 of the Laws of Zambia highlights general provisions that the food industry must adhere to comply with the Act. Under Section Ten (10), a person shall not label, package, sell or advertise any food in a false, misleading or deceptive manner regarding its character, nature, value, substance, quality, composition, merit or safety or contravention of this Act.

Discuss deception in relation to the following:

a) Labelling **(5 marks)**
b) Packaging **(5 marks)**
c) Selling (**5 marks)**
d) Advertising **(5 marks)**

QUESTION TWO

A Quality Management System (QMS) is defined as "a set of coordinated activities to direct and control an organization to improve the effectiveness and efficiency of its performance continually. The ISO 9000 series of QMS standards are the most known and recognized QMS standards around the world. They provide a gold standard of QMS and are based on 7 key principles.

a) Identify and briefly explain any 5 of these principles. **(10 Marks)**

b) The most popular tool used in QMS is the Shewhart (PDCA) Cycle, developed by Dr. W. Edwards Deming. Briefly describe the PDCA cycle in relation to food safety management. **(10 Marks)**

QUESTION THREE

You have recently been hired as the Food Safety Manager of a Meat Processing plant manufacturing sausages and other meat cuts. One of the objectives assigned to you is to help the enterprise get their food safety management system in place within the first year of your employment. Write a report to Top Management on how this objective can be achieved focusing on the implementation of HACCP as your immediate target **(20 marks).**

SECTION B

QUESTION FOUR

The standard, ISO/IEC 17000, Conformity Assessment - Vocabulary and general principles, defines Conformity Assessment as 'the demonstration that specified requirements of a product, process, system, person, or body are fulfilled'.

a) List and define the elements of conformity assessment. **(6 marks)**
b) By way of a diagram, illustrate the conformity assessment hierarchy. **(2 marks)**
c) Describe the 'Functional Approach' to conformity assessment as set out in ISO/IEC 17000. **(12 Marks)**

QUESTION FIVE

You have been appointed as a Lead Auditor in one of your assignments at an Auditing Firm you are working for. You will be auditing a honey producing company seeking to get certification in HACCP.

a) Outline tasks you will be preparing for before, during and after the audit. **(10 marks)**
b) What qualities and characteristics will you be looking at in selecting your Audit Team to ensure that you have a successful audit? **(10 marks)**

QUESTION SIX

Discuss in details the elements of the national food safety control system **(20 marks).**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

FOOD SAFETY RISK ANALYSIS (FSR 7160)

Duration: 3 hours

INSTRUCTIONS:

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

SECTION A

QUESTION 1

a) Define Microbiological Risk Assessment and describe at least two (2) microbiological risk assessment methodology requirements **(6 marks)**

b) Give two (2) examples of how Food Safety Microbiological Risk Analysis can and/or is used and two (2) benefits of using Microbiological Risk Analysis **(6 marks)**

c) Write a very brief summary on the factors that you would consider during hazard identification and hazard characterization of *Listeria monocytogenes* in a refrigerated ready to eat fermented meat product **(8 marks)**

QUESTION 2

The Codex Alimentarius Commission defines exposure assessment as 'the qualitative and/or quantitative evaluation of the likely intake of biological, chemical, and physical agents via food as well as exposures from other sources if relevant.'

a) From this definition, identify and define the two major components of exposure assessment. **(5 marks)**

b) Describe any three (3) methods for food intake data to collect when conducting an exposure assessment. **(15 marks)**

QUESTION 3

Earlier this year, the manufacturer of Ceres recalled their apple juice products from the market, citing high levels of Patulin above the allowed 50 micrograms per litre. The Zambian Government has consulted you to conduct a food safety risk assessment of the exposure to Paulin through apple juice. Explain how you would go about conducting a risk assessment **(20 marks)**

.....SECTION B.....

QUESTION 4

Imagine that your country's National Food Safety Authority is trying to decide whether to ban the importation of fresh fish from a neighbouring country due to the suspicion of the product being contaminated with mercury. The economic stakes are high, with human health impacts quite uncertain. As an expert in chemical food safety risk analysis, discuss your approach to this situation in guiding the National Authority? **(20 marks)**

QUESTION 5

a) When conducting an exposure assessment, it is advisable to describe the food pathway, from farm to table or sections relevant to the individual exposure assessment (food pathway). Explain, with relevant examples, the factors you would take into account when describing a food pathway in an exposure assessment. **(10 marks)**

b) Exposure patterns over time may be plotted and illustrated graphically. Illustrate and describe any two exposure patterns. **(10 marks)**

QUESTION 6

The table below shows data collected when conducting a quantitative release assessment of the introduction of Peste Des Petits Ruminants (PPR) disease into Northern Zambia from Tanzania via an annual live goat trade. The input parameters of the likelihood of PPR virus release was based on: the annual volume of trade, probability of pre-export quarantine missing an infected goat, prevalence of infection, probability of PPR virus to survive in transit and probability of pre-export c-ELISA screening missing an infected goat.

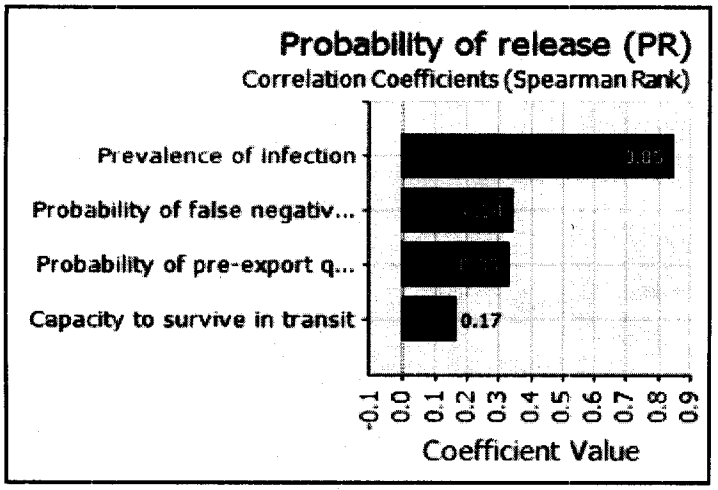
Release assessment of Peste Des Petits Ruminants (PPR) introduction into Northern Zambia from Tanzania via live goat consignment					
Probability of release	Minimum value	Most likely value	Maximum value	Estimates	Probability Distribution
Prevalence of infection	0.31	0.45	0.88	0.67	
Annual volume of trade	215		4612	2425	
Probability of pre-export quarantine missing an infected goat	0.045	0.066	0.072	0.052	
Probability of pre-export c-ELISA screening missing an infected goat (false negatives)	0.046	0.066	0.076	0.054	
Capacity PPR virus to survive in transit	0.8	0.9	1	0.9	

a) Name the probability distribution that you would use for each input parameter to arrive at the estimate. **(5 marks)**

b) Calculate the probability of release given the above estimates. **(4 marks)**

c) Come up with the equation that can help you calculate the number of infected animals likely to be released in the Northern part of Zambia. Provide the key and explanation for the letters and/or numbers used in the equation. **(5 marks)**

d) The sensitivity analysis of the release assessment was conducted as shown by the Tornado graph below. State the importance of the sensitivity analysis and interpret the results **(6 marks)**



Tornado chart showing the sensitivity analysis of the release assessment

QUESTION 7

Risk communication, in Risk Analysis, aims to provide meaningful, relevant and accurate information, in clear and understandable terms, targeted to a specific audience

a) List the guiding principles of risk communication as recognised by the Codex Alimentarius Commission. **(8 marks)**

b) Risk communication must consider both dimensions of risk perception because both influences how people make risk judgments. Identify and describe, with relevant examples, the two (2) major perceptions of risk. **(6 marks)**

c) List any six (6) barriers to effective risk communication **(6 marks)**

QUESTION 8

a) Discuss the key principles in the TBT agreements **(10 marks)**
b) Explain the organizational structure, objectives, functions, principles of the WTO **(10 marks)**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS-2021 ACADEMIC YEAR

ADVANCED DIAGNOSTIC CLINICAL PATHOLOGY AND FORENSIC SCIENCE (OHD 7110)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer all the **FIVE (5)** questions only
3. **ALL** questions carry equal marks (20 marks)
4. Write in a legible handwriting

QUESTION 1

Cervical cancer may develop from precursor lesions known as cervical intraepithelial lesions. Briefly describe how such lesions are graded in diagnostic cytology (**20 marks**)

QUESTION 2

An evidence suspected to be human semen was collected at the crime scene and brought to your Forensic science laboratory for analysis.

a) Name two presumptive tests you can use to determine this evidence as semen (**2 marks**)
b) Discuss the principle of the tests you have mentioned above (**12 marks**)
c) State one advantage and two weaknesses for each of the tests you have mentioned above (**6 marks**)

QUESTION 3

The diagnostic evaluation of a patient with a suspected haemostatic disorder starts with patient signalment (age, sex, breed in case of animals), history and physical examination. Clues obtained from the patient can and should guide diagnostic testing and test interpretation.

a. In the signalment, list five (5) questions that you should ask to help you with a diagnosis of a bleeding disorder. (**5 Marks**)

b. Give two (2) reasons why it is important to conduct a physical examination of a patient suspected to have a bleeding disorder. (**2 Marks**)

c. Why is a complete haemogram indicated in screening patients with bleeding disorders? (**2 Marks**)

d. List five (5) screening coagulation assays that are used to diagnose disseminated intravascular coagulation (DIC). (**5 Marks**)

e. List four (4) specialized tests that can help you diagnose secondary haemostatic disorders. (**4 Marks**)

f. Name two (2) global haemostatic tests that can measure multiple haemostatic pathways simultaneously, including the contribution of cells such as platelets and erythrocytes. (**2 Marks**)

QUESTION 4

Urine analysis is one of the most important and common tests carried out when evaluating a patient.

a. List Four (4) methods you would use for the physical examination of urine. (**4 marks**)
b. What would the following indicate after a chemical examination of a urine sample.
    i. High levels of proteinuria
    ii. Glucosuria
    iii. Crystalluria
    iv. Haemoglobinuria
    v. Hairs in a urine sample
    vi. Parasitic ova in a urine sample
c. What method would you use to distinguish haematuria from haemoglobinuria (**5 marks**)
d. Urine output is one on the methods used to evaluate a patient. What do the following terms mean related to urine output? (**3 marks**)
    i. Polyuria
    ii. Anuria
    iii. Oliguria
e. Wen examining a urine sample, what TWO (2) causes are suspected when you see a cloudy urine sample in a human being? (**2 marks**)

QUESTION 5

a. When examining the Erythron, you can either find an increase or a decrease in the total RBC count.

    i. What are the names given to (i) an increase in RBCs and (ii) a decrease in RBCs? (**2 marks**)

ii. Name the two (2) general causes of acute decreases in the RBC counts and briefly describe what each is?(**6 marks**)

iii. Which of the decreases in RBC counts are always chronic? **(2 marks)**

b. A WBC count consists of both granulocytes and agranulocytes.

iv. List all the granulocytes and then the agranulocytes. **(5 marks)**

v. Briefly explain what differentiates each of these cells. **(5 marks)**

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

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
DEPARTMENT OF PARACLINICALS

END OF YEAR NOVEMBER/DECEMBER UNIVERSITY EXAMINATIONS
2020/21 ACADEMIC YEAR

CLINICAL BIOCHEMISTRY AND LABORATORY MANAGEMENT (OHD 7150)

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

QUESTION 1

a) Name two common parameters representing each of the following tests:-**(10 Marks)**

i) Cardiac markers

ii) Kidney function

iii) Liver function

iv) Minerals

v) Blood disorders

b) Laboratory data is usually interpreted with respect to reference intervals

i) Name the two ways of determining reference intervals. **(2 Marks)**

ii) Is it possible to find that a normal health animal's parameter is outside a "reference Interval", Explain? **(3 Marks)**

c) Describe how you would collect and preserve each of the following samples? **(5 Marks)**

i) Blood for blood smears

ii) Faeces for parasite egg determination

iii) Milk for bacteriological examination

iv) Skin for fungal infection diagnosis

v) Nasal discharges for viral infections

QUESTION 2

a) Describe a three point perception for the establishment of standards in laboratory automation and hence describe fully the envisaged results of the identification of initial standards development. **(11 Marks)**

b) Describe, fully, the automated instrument configurations commonly used in laboratory automation. **(9 Marks)**

QUESTION 3

Write short notes on the following:-

a) measurement of enzymes using the coupled assay. **(5 Marks)**

b) Gamma glutamyltransferase. **(5 Marks)**

c) Isoenzymes. **(5 Marks)**

d) Role of biomolecules in the body. **(5 Marks)**

QUESTION 4

Describe the difference between the role of a of leader and manager, and how each role is important to laboratory functions. **(20 Marks)**

QUESTION 5

Quality Systems Essentials (QSE) constitute the laboratory manager's "procedure manual". Discuss how you would apply QSE in the clinical biochemistry laboratory's path of workflow. **(20 Marks)**

QUESTION 6

Describe the importance of laboratory design and safety aspects. **(20 Marks)**

QUESTION 7

Discuss the components of a laboratory budget and ways of monitoring laboratory expenses. **(20 Marks)**

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

University of Zambia
School of Veterinary Medicine

End of Year University Examinations
Academic Year: 2020/2021

MSc Tropical Infectious Diseases and Zoonoses: Year I

Immunology of Infectious Diseases: TDZ 7311

Friday, November 19, 2021 **09:00-12:00**

Instructions

1. This paper contains two sections, A and B. You are required to answer FOUR (4) questions from Section A and THREE (3) questions from Section B. Please read the instructions for each question carefully.
2. Each question MUST be answered in a SEPARATE answer booklet. Ask for additional booklets, if required.
3. You must indicate your Student Number, the Section, and the Question you have attempted on the cover of the relevant answer booklet.
4. At the end of the examination, all answer booklets will be collected BEFORE you leave your seat.
5. Time allowed: 3 hours

[Please Turn Over

Section A: This section contains 5 short-answer questions. Attempt only FOUR (4) questions. Each question MUST be answered in a SEPARATE answer booklet.

1. a) What are pathogen-associated molecular patterns (PAMPs)? **(4 marks)**
   b) Using a specific pathogen, explain the interactions between the named pathogen PAMP and its toll-like-receptor ligand and the downstream immunological response. **(6 marks)**

2. How do the following cells of the T cell lineage exert their immune response against viral infections?
   a) Cytotoxic T cells. **(5 marks)**
   b) Natural Killer cells. **(5 marks)**

3. Write short notes on:
   a) ELISPOT assay. **(5 marks)**
   b) Cytotoxic T Lymphocyte (CTL) Assay. **(5 marks)**

4. Explain the benefits of inflammatory responses against infection. Using COVID-19 as an example, briefly discuss mechanisms of tissue and organ injury resulting from inflammation. **(10 marks)**

5. Compare and contrast cytometry bead array and the Luminex xMAP technology. **(10 marks)**

[Please Turn Over

Section B: This section contains 5 essay-type questions. Attempt only THREE (3) questions. Each question MUST be answered in a SEPARATE answer booklet.

1. Protozoan parasites cause economically important diseases in sub-Saharan Africa. Using examples and illustrations, discuss the innate and adaptive immune responses against a named infectious protozoan parasite. Further, outline how that protozoon evades host immune killing to perpetuate infections. **(20 marks)**

2. With the evolution of modern diagnostic and research techniques, host-pathogen interactions are being studied in greater detail. The immune system and immune responses are also being understood up to a molecular level. Answer any **FOUR** of the following **(5 marks each)**:
   a) Write short notes on the relationship between a host and its microbiome.
   b) Define the following terms: Dysbiosis, Holobiont, Microbiome, Microbiota, and Pathobionts.
   c) List diseases that are associated with a dysregulated gut microbiome and concisely discuss how the dysregulation leads to disease in one of them.
   d) Write short notes on Heat Shock Proteins (HSPs) and their role in immunology and disease pathogenesis.
   e) Write short notes on how the different mechanisms that antimicrobial proteins use to kill microbes.
   f) List FIVE antimicrobial proteins and concisely discuss one of them.

3. Outline the main features of live attenuated vaccines. Discuss the different approaches to vaccine development that have been applied to the development of the different COVID-19 vaccines. **(20 marks)**

4. Tuberculosis is truly an immunological delayed hypersensitivity reaction rather than a disease. It has two main outcomes, active or latent infection. Explain fully how these outcomes come about, including their ultimate results. **(20 marks)**

5. Briefly discuss the current approaches and technologies used for understanding the immunogenetics of infectious diseases. **(20 marks)**

End of Examination

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/21 ACADEMIC YEAR

BIOETHICS AND ANIMAL WELFARE (TDZ 7402)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ANY FIVE (5)** 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

Discuss the concept of justice with respect to research ethics. **(20 marks)**

QUESTION 2

Write short notes on the following: **(5 marks each)**

a) The Belmont Report
b) Informed consent
c) The 3Rs
d) Vulnerable populations as it applies in research ethics

QUESTION 3

You have a project to assess factors affecting acceptability of COVID-19 vaccination in Lusaka District. The project will involve interviewing participants using a semi-structured questionnaire for data collection. Discuss how you would ethically implement your project, outlining the ethical issues that are likely to arise and how you would address them. **(20 marks)**

QUESTION 4

Write short notes on the following **(5 marks each)**

a. Relationship between genetics and animal welfare
b. Effect of keeping an animal in a barren cage.
c. Effect of farming systems and production on the welfare of an animal
d. Assessment of stress in animals being used for research.

QUESTION 5

Discuss in detail how the welfare of animals being housed for research may be assessed.

(20 marks)

QUESTION 6

Discuss how the three Rs may be applied during animal research to ensure the welfare of animals. **(20 marks)**

QUESTION 7

Outline the common welfare issues which may be found on a farm in the following species: (**5 marks each**)

a. Farmed breams
b. Pigs
c. Cows
d. Meat chickens or broilers

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE

END OF YEAR NOVEMBER/DECEMBER EXAMINATION
2020/21 ACADEMIC YEAR

PRINCIPLES OF PUBLIC HEALTH AND POLICIES (TDZ 7411)

Duration: 3 hours

INSTRUCTIONS:

1. Read instructions before attempting to answer the questions
2. Questions are organized in One Section
3. Answer **ANY FIVE (5)** questions
4. Write your computer number (ID) and Question Number on each answer sheet
5. Answer each question on a separate page
6. Insert Question numbers on all answer sheet pages

QUESTION 1

The contemporary Public Health had in the past passed through a series of contextual transformation. One of such transformation is the term "preventive medicine."

a) What was the main purpose of preventive medicine? Provide **four (4)** major components that transformed and broadened the scope of preventive medicine? **(5 Marks)**
b) The cornerstone of preventive medicine is "Primary Health Care" (PHC), briefly describe the phases or levels of preventive medicine? **(10 Marks)**
c) To what extent have these phases or levels of "prevention" mitigated the health risks of the humans in your respective countries? **(5 Marks).**

QUESTION 2

a) Define Primary Health Care (PHC) and State the **eight (8)** essential principle elements of PHC as declared at the Alma-Ata Conference in Russia in 1978 for the Universal Coverage of "Health for All"? **(10 Marks).**
b) Give **four (4)** major principles of Primary Health Care, with explanations, as adapted by the World Health Organization? **(6 Marks)**
c) How has the concept of Primary Health Care contributed to the health of the people in your respective countries? **(4 Marks)**

QUESTION 3

a) Provide an explanation on how the inter-linked **three (3)** disciplines classified as: a) basic sciences, b) clinical sciences, and c) public health or population medicine contribute to the knowledge about human health and disease? **(10 Marks)**
b) Give an example of an infectious disease that provides a good illustration of these three different approaches to the same disease as indicated in (a) above? **(10 Marks)**

QUESTION 4

Describe the **four (4)** historical distinct phases of public health evolution demarcated on the need to improve the health of people globally and contributed to shaping modern public health? **(20 Marks)**

QUESTION 5

a) What is the difference between a law and a policy? **(5 Marks)**
b) List six (6) core public health characteristics or attributes which depend entirely on the basis of the law? **(10 Marks)**
c) What is the main purpose of a public health policy? Give examples of actions that can be undertaken by those in authority to promote health of the people at risk? **(5 Marks**

QUESTION 6

Give accounts on **two (2)** from the following types of public health legislative measures:

a) Public Health and Primary Care Acts **(10 Marks)**
b) Constitutional Basis for Public Health Law **(10 Marks)**
c) Public Health Law Tools **(10 Marks)**
d) Public Health Surveillance Act **(10 Marks)**

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR AUGUST/SEPTEMBER EXAMINATIONS – 2020/21 ACADEMIC YEAR

TDZ ~~7210~~ 7502 INFECTIOUS DISEASES AND ZOONOSES (TDZ 7210)

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

QUESTION 1

Bacteria organisms are an important player in disease causation. Discuss the mechanisms of disease production and provide examples of some of the key elements involved in disease and how they can be used in diagnosis.

20 marks

QUESTION 2

With reference to Onchocerciasis, discuss in detail the lifecycle of the causative agent as well as clinical presentation and treatment.

20 marks

QUESTION 3

The figure below (Figure 1) shows a test you have performed for the diagnosis of Rabies in Lusaka.

i) Name the test and describe and interpret Lanes WM, 1, 2 and 3 in the Figure 1. **(10 marks)**

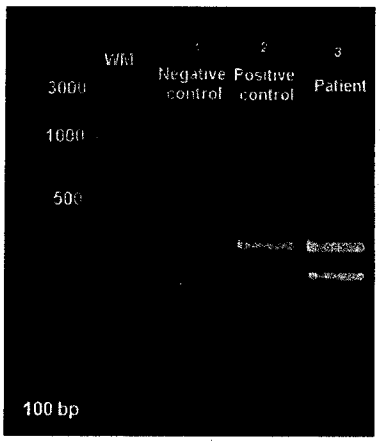

Figure 1

ii) The product shown in **Figure 1** was obtained from the sequence below (Figure 2). Using the sequence below (Figure 2), clearly demonstrate how you designed primers for the products shown in Figure 1 above **(10 marks)**

ORIGIN

1 gatcaaaatt aaaaacaaaa atgaaagggg tctgtgaagt gggggttcaa gcactcaaaa
61 agtgtgatgg ccaactcagc actgcacatg aggttgtgcc ctttgcagtg tttaagaact
121 caaagaaggt ttattttgat aagcttgacc tcaagactga ggagaatatg ctaccagact
181 catttgtctg cttcgagcat aaggggcagt ataaaggtac aatggactct ggtcagacta
241 agagggagct caaaagcttt gatatctctc agtgccccaa gattggagga catggtagta
301 agaagtgcac tggggacgca gcattttgct ctgcttatga gtgcactgct cagtacgcca
361 atgcctattg ttcacatgct aatgggtcag gggttgtgca gatacaagta tcaggggtct
421 ggaagaagcc tctatgtgtg gggtatgaga gagtggttgt gaagagagaa ctctctgcca
481 agcccatcca gagggttgag ccttgcacaa cttgtataac caaatgtgag cctcatggat
541 tggttgtccg atcaacaggg ttcaagatat catctgcagt tgcttgtgct agcggagttt
601 gcgt

Figure 2

20 marks

QUESTION 4

Explain the life cycle of *Tunga penetrans* and discuss its medical and veterinary importance. How can the condition caused by this parasite in its hosts be prevented?

20 marks

QUESTION 5

a) List 4 different immunodiagnostic techniques available for the detection of infectious diseases **(4)**

b) Briefly explain the basis of an Immunodiagnostic test **(4)**

c) Using diagrams and illustrations, describe the procedure for conducting an immunological test involving diffusion of test components through a semi-solid media and provide the different interpretations of the results depending on the various reactions you may get. **(12)**

20 marks

QUESTION 6

Describe the common metagenomic techniques and their applications to infectious disease research. (20 marks)

20 marks

QUESTION 7

Discuss the applications of nucleic acid techniques in the molecular epidemiology of infectious diseases. (20 marks)

20 marks

THE UNIVERSITY OF ZAMBIA
SCHOOL OF VETERINARY MEDICINE
END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

VETERINARY OPERATIVE SURGERY (VMC 5210)

Duration: 3 hours

INSTRUCTIONS:

1. Please read the instructions and each question carefully
2. Answer **ALL** questions in Section A and **THREE** 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

SECTION A

QUESTION 1

Small Animal Dentistry is an important component of small animal practice. A veterinarian's understanding of dental problems is therefore important to ensure that correct and appropriate client advice is provided.

a) Describe any **five** (**5**) malocclusions that you know that can occur in dogs outlining their effects in those affected. **(10 marks)**

b) Outline the factors that predispose small animals to periodontal diseases. **(5 marks)**

c) It is said that the oral cavity has its own natural defense mechanisms. Discuss this statement. **(5 marks)**

QUESTION 2

Lameness is a clinical sign of a more severe disorder that results in a disturbance in the gait and the ability to move the body about, typically in response to pain, injury or abnormal anatomy. Losses due to lameness in dairy cattle include reduced milk yield, weight loss, disposals, deaths, infertility, prolonged calving interval, veterinary expenses, drugs, and additional stockmen.

a) List any **three (3)** conditions of the hoof that can cause lameness in dairy cattle. **(3 Marks)**

b) List any **three (3)** indications for amputation of a bovine digit. **(3 Marks)**

c) List **two (2)** conditions that can be managed with a hoof block as part of the treatment regime. **(2 Marks)**

d) Describe the principle and process of hoof block application in cattle for one of the conditions listed in (c) above. **(12 Marks)**

QUESTION 3

Orthopaedics is defined as a speciality in medicine that involves management and treatment of injuries and diseases of the musculoskeletal system.

a) Comprehensively discuss the criteria for fracture classification. With each fracture criteria, also discuss the implications on fracture management/repair. **(15 marks)**

b) With the aid of line drawings or sketches, concisely discuss the difference between
   i) a chisel and an osteotome
   ii) cerclage wire and Kirschner wire. **(5 marks)**

SECTION B

QUESTION 4

Dehorning is an important activity for cattle practitioners that they need to master.

a) List the indications for dehorning cattle. **(4 marks)**
b) Describe in detail a technique that you would use to dehorn adult cattle. Include preoperative, technique and postoperative procedures. **(8 marks)**
c) Discuss the sequelae of dehorning adult cattle and how you would manage them. **(8 marks)**

QUESTION 5

Left recurrent laryngeal hemiplegia is a disease of horses which makes breathing more difficult and therefore impairs performance. During exercise, horses with left recurrent laryngeal hemiplegia make loud breathing noises that are described as "roaring" or "whistling.

a) Briefly outline how you would confirm a diagnosis of left recurrent laryngeal hemiplegia in a horse. **(2 marks)**
b) Outline a grading system for laryngeal function in a resting horse. **(4 marks)**
c) List the surgical techniques available in the correction of left recurrent laryngeal hemiplegia. **(4 marks)**
d) Discuss a technique or techniques you would use from (c) to correct laryngeal hemiplegia in a 14-year-old gelding (Include patient preparation, anaesthesia and post-operative care). **(10 marks)**

QUESTION 6

With the aid of line drawings or sketches, comprehensively discuss **TWO (2)** methods of preparing a teaser bull. **(20 marks)**

QUESTION 7

Orthopaedic conditions of the forelimb occur quite commonly. The conditions range from fractures caused by trauma to developmental anomalies.

a) Discuss the aetiopathogenesis of canine elbow dysplasia. **(6 marks)**

b) With the aid of line drawings or sketches, comprehensively discuss the pathogenesis and surgical management of *radius curvus* in a dog. **(14 marks)**

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

THE UNIVERSITY OF ZAMBIA

SCHOOL OF VETERINARY MEDICINE

END OF YEAR EXAMINATION NOVEMBER EXAMINATION

2020/2021 ACADEMIC YEAR

ADVANCED STATISTICAL METHODS IN EPIDEMIOLOGY (VMM 7512)

Time: Three (3) Hours

INSTRUCTIONS

Read the instructions and the questions carefully before attempting to answer any questions
Answer ANY Five (5) questions
State all assumptions used and show all calculations

QUESTION 1

The predictors of the number of awards earned by 200 students at one high school was analysed using a Poisson model. The number of awards (**num_awards**) is the outcome variable and indicates the number of awards earned by students at a high school in a year, **math** is a continuous predictor variable and represents students' scores on their math final exam, and **prog** is a categorical predictor variable with three levels indicating the type of program in which the students were enrolled. It is coded as 1 = "General", 2 = "Academic" and 3 = "Vocational".

The following output was obtained from the analysis of this data:

##	Estimate	Robust SE	Pr(>|z|)	LL	UL
## (Intercept)	-5.24712	0.64600	4.567e-16	-6.5133	-3.98097
## progAcademic	1.08386	0.32105	7.355e-04	0.4546	1.71311
## progVocational	0.36981	0.40042	3.557e-01	-0.4150	1.15463
## math	0.07015	0.01044	1.784e-11	0.0497	0.09061

a) Calculate the rate ratio for each level of the predictor variable and interpret the output of this analysis. Write the regression equation for this model. **(15 marks)**
b) Explain how you would check whether this model fitted the data? **(3 marks)**
c) What do you understand by the concept of proportional rates when used in Poisson regression? **(2 marks)**

QUESTION 2

a) Describe the three assumptions for linear regression. How do you check to ensure that these assumptions are not violated during your data analysis? **(6 marks)**

b) A study was carried out to determine the determinants of packed cell volume (PCV) in cattle in Zambia. The dependent variable was PCV. The independent variables were tick burden, Age, number of infections and body condition score. The number of infections was the number of co-infections that were diagnosed by PCR in an animal and was recorded as a continuous variable. Body condition score was treated as a continuous variable for the purpose of this analysis. Tick burden was the number of ticks observed on each animal and was recorded as "None seen"= no ticks on animal's body, "Few"= 1 to 20 ticks seen on an animal, "moderate" = 21 – 50 ticks and "abundant" = >50 ticks. Agecat was the age of cattle in months. It was categorized as 1 = "1 to 12 months", 2 = "13 to 24 months", 3 = "25 to 48 months" and 4 = ">48 months". The results of the analysis of this data are shown in the table below. Write the regression equation for this analysis and interpret the results **(10 marks)**

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	25.179	1.087	23.159	.000	23.043	27.315
[Tickburden=abundant]	-2.549	1.852	-1.376	.169	-6.186	1.089
[Tickburden=Few]	-.661	.501	-1.321	.187	-1.645	.322
[Tickburden=moderate]	-1.545	.661	-2.338	.020	-2.842	-.247
[Tickburden=None seen]	0[a]	.	.	.	.	.
[Agecat=1]	3.593	.651	5.517	.000	2.314	4.873
[Agecat=2]	1.738	.645	2.693	.007	.470	3.005
[Agecat=3]	1.231	.578	2.129	.034	.095	2.366
[Agecat=4]	0[a]	.	.	.	.	.
Numberofcoinfections	-.452	.155	-2.914	.004	-.757	-.147
Bodycondition	2.705	.313	8.640	.000	2.090	3.320

c) Describe the meaning of the analysis of variance (ANOVA) and t-test when used in multiple linear regression. **(4 marks)**

QUESTION 3

Meta-analysis is a systematic reproducible secondary study method that has become popular since the 1990s. Outline in detail the steps involved in performing a meta-analysis **(20 marks)**

QUESTION 4

Sixteen patients with advanced stomach carcinoma were randomized to receive one of two chemotherapies (Group A or Group B). The survival times from treatment (in weeks) are (+ denotes a censored observation): Group A: 63+, 59+, 57+, 40, 37, 33, 21+, 11

Group B: 57+, 51+, 44+, 32, 27, 27+, 10+, 6

a) Two reasons why an observation might be censored include: (i) administrative: study closes before patient dies; (ii) loss to follow-up during study due to patient leaving the area. State for each whether the assumption of statistical independence with survival time is plausible or not and the basis for your statement.
(4 marks)

b) Construct (arithmetically) and plot (very roughly) the Kaplan-Meier survival curve for Group B. **(6 marks)**

c) Construct the risk sets of patients still alive and on-study in each group at t = 32 weeks and show (arithmetically) the contribution to the observed and expected number of deaths in Group A at that time using the log-rank procedure.
(6 marks)

d) For each group, total observed and expected deaths were calculated using the log-rank procedure, with the following results:

	Group A	Group B
Observed deaths	4	3
Expected deaths	4.03	2.97

What is the null hypothesis H_0 under which the row of expected numbers of deaths is calculated? In particular, if $S_A(t)$ and $S_B(t)$ denote the survival probabilities in the two groups at time t, what is assumed about these probabilities under H_0? **(4 marks)**

QUESTION 5

a) Describe key differences between cox and Poisson regression **(4 marks)**

b) Describe how you carry out a likelihood ratio test and the meaning of its results when used in regression analysis **(8 marks)**

c) Describe the two approaches you can use to calculate the 95% confidence intervals for the most likely value **(8 marks**

QUESTION 6

a) Give three (3) reasons why linear regression is not appropriate for the analysis of categorical data. **(6 marks)**

b) Below is the analysis of data from a study that was carried out to determine the predictors of cattle being positive for Rift Valley fever (RVF) in Zambia. The response variable was RVF status which was recorded as either positive or negative. The predictor variables were cattle grazing in the national park, recorded as 1 = "No" and 0 = "Yes" , abortion occurs recorded as 1 = "Yes" and 0 = "No", grazing system recorded as 1 = "Local" and 0 = "Transhumance", cattle grazing in flood plains recorded as 1 = "No" and 0 = "Yes" and grazing with wildlife recorded as 1 = "No" and 0 = "Yes". All responses recorded as zero (0) were the reference categories. The model was run using the stepwise binary logistic regression method.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
razing_Wildlife(	1.431	.563	6.466	1	.011	4.185	1.388	12.61
port_Occur(1)	1.335	.560	5.682	1	.017	3.799	1.268	11.38
onstant	-1.311	.474	7.648	1	.006	.270		

i) Write the regression equation and interpret the output of this analysis **(10 marks)**

c) The results in the tables shown below were also obtained from the analysis in (b) above. Interpret these results and explain the relevance of the information in the two Tables. **(4 Marks)**

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	0	.
2	.396	2	.820

Contingency Table for Hosmer and Lemeshow Test

		RVF_Herd_Status = Positive		RVF_Herd_Status = Negative		Total
		Observed	Expected	Observed	Expected	
Step 1	1	20	20.000	8	8.000	28
	2	13	13.000	29	29.000	42
Step 2	1	16	16.541	5	4.459	21
	2	4	3.459	3	3.541	7
	3	9	8.459	9	9.541	18
	4	4	4.541	20	19.459	24

THE UNIVERSITY OF ZAMBIA
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DEPARTMENT OF DISEASE CONTROL

END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ZOONOTIC DISEASES AND INFECTIONS (VMM 7610)
EMERGING AND RE-EMERGING DISEASES (VMM 7601)
INFECTIOUS DISEASES AND ZOONOSES (TDZ 7210)

Duration: 3 hours

INSTRUCTIONS

1. Please read all the instructions and each question carefully
2. Answer **ALL FIVE** in **SEPARATE ANSWER BOOKLETS**
3. **ALL** questions carry equal marks

QUESTION 1

Answer **ANY TWO (2)** of the following;

a) Define zoonoses and describe the classification of zoonoses based on based on the usual reservoir host **(10 marks)**

b) With examples, differentiate between emerging and re-emerging infectious diseases. **(10 marks)**

c) Discuss reasons why some outbreaks of viral haemorrhagic fevers, like Ebola virus disease, become big and uncontrolled. **(10 marks)**

QUESTION 2

Intestinal disease associated with fresh produce and water contamination with parasites has become common in recent years especially in poor resource settings

a) List **five (5)** foodborne parasites that are associated with fresh produce. **(2.5 marks)**
b) From the listed parasites in (a) above, list **two** that can also be transmitted through ingestion of contaminated eater and outline the risk factors for transmission. **(6 marks)**
c) Discuss the effects of *Toxoplasma gondii* on the human host. **(5 marks)**
d) Outline the measures that should be employed to prevent infections with the parasites listed in (a) above. **(6.5 marks)**

QUESTION 3

a) Describe anthropogenic activities that would accelerate the emergence and re-emergence of infectious zoonotic pathogens? **(10 marks)**

b) Discuss how pathogen evolution influences disease emergence and sustenance looking at transmission and maintenance, establishment, and adaptation. You can use any bacterial infectious disease of your choice as an exemplary model. **(10 marks)**

QUESTION 4

Write brief notes on the following important virology concepts: including but not limited to description, significance, and application.

a) Virus neutralization test **(4 marks)**
b) Serotypes **(4 marks)**
c) Phylogeny **(4 marks)**
d) Hemagglutination inhibition **(4 marks)**
e) Molecular SNPs **(4 marks)**

QUESTION 5

You wish to draft a research proposal whose main objective is to determine the prevalence of hydatidosis in people living in a rural community in Western 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) Name the parasite that causes human hydatidosis in the proposed study area. **(2 marks)**
b) Outline the tools, including samples (if any), you would use to diagnose the condition in the intermediate and final host study subjects. **(4 marks)**
c) Briefly outline the life cycle of the parasite named in (a) above. **(4 marks)**
d) List the risk factors associated with hydatidosis infection in humans. **(4 marks)**
e) Describe control measures you would recommend aimed at reducing the incidence of hydatidosis in rural communities of endemic areas. **(6 marks)**

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

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END OF YEAR EXAMINATION NOVEMBER EXAMINATION

2020/2021 ACADEMIC YEAR

INFECTIOUS DISEASES MODELLING AND GIS (VMM7612)

Duration: Three (3) hours

INSTRUCTIONS

1. Read the instructions carefully before attempting to answer any question
2. Examination has **SIX (6)** Questions. Please answer **ANY FIVE (5)**
3. State all assumptions used and show all calculations
4. Answer **QUESTIONS 1 & 2, each** in a **separate booklet**

QUESTION 1

Describe at least ten habits of a systems thinker. **(20 marks)**

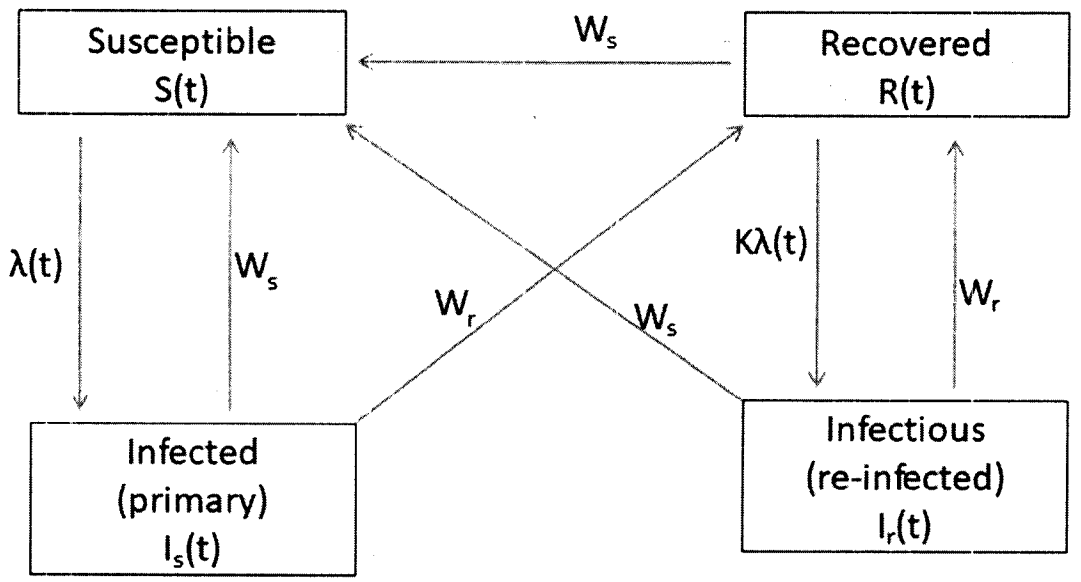
QUESTION 2

a) Give a description of the meaning or write short notes on each of the following terms or phrases
   i) Non-random or heterogeneous mixing **(2 marks)**
   ii) Infection doubling time **(2 marks)**
   iii) Net reproduction number **(2 marks)**
   iv) Epidemic curve **(2 marks)**
   v) Effective contact **(2 marks)**

b) Difference and differential equations are written using distinct notation. Compare the equations for the susceptible, pre-infectious, infectious, and recovered individual in difference and differential equations, giving descriptions for each notation used. **(10 marks)**

QUESTION 3

a) Figure shows structure of model describing transmission dynamics of respiratory syncytial virus (RSV). Individuals are stratified into those who are susceptible *(S(t))*, those who have been infected and are infectious for the first time *($I_s(t)$)*, those who have recovered from infection *(R(t))*, and those who have been re-infected and are infectious *($I_r(t)$)*. Rate at which recovered individuals are re-infected differs by a factor k from rate at which susceptible individuals are infected for first time. Rate at which infectious individuals recover to become partially immune to further re- infection *(w_r)* is assumed to be independent of whether they have experienced infection for first or subsequent time. Recovered and infectious individuals can become fully susceptible to infection again at a rate *(w_s)* which is identical for all individuals.



Write the equations for this model **(10 marks)**

b) Describe 'density-dependent' and 'frequency-dependent' transmission of an infectious disease and how β is affected in each when the population size changes.

QUESTION 4

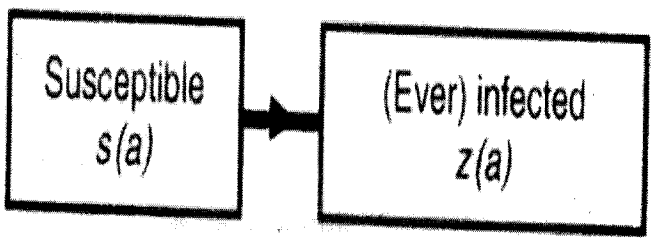
Giving examples, describe the steps you would follow in setting up a model **(20 marks)**

QUESTION 5

a) Give limitations and/ or advantages of equations for calculating R_0 that use growth rate **(6 marks)**

b) There are several key equations that relate the basic reproduction number to the proportion of individuals who have been infected by the end of the epidemic (epidemic size). Describe the challenges and advantages of using these equations to estimate the size of an epidemic? **(8 marks)**

c) The figure below shows a catalytic model that can be used to track individuals of a given age group from birth and uses the average annual force of infection for the rate at which susceptible individuals are infected.



Using this model, write expressions for.

i) The proportion of individuals that are susceptible at age a, s(a) **(3 marks)**

ii) The proportion of individuals who have ever been infected by age a, z(a) **(3 marks)**

QUESTION 6

Systems dynamics is a modelling method based on stocks (levels) and flows (rates), which can be used in a variety of fields.

a) Construct a schematic simple closed population, susceptible-diseased stock and flow diagram of a human disease spread through contact. There is no treatment for the disease and patients have the condition for the rest of their lives. Please clearly label your diagram. **(9 marks)**

b) What are the formulas for the stock(s) and flow(s) in the model above **(8 marks)**

c) What are the units for each of the components of the model above? **(3 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ONE HEALTH MEDICINE AND GLOBALIZATION (VMM 7701)

Duration: 3 hours

INSTRUCTIONS

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

QUESTION 1

a) What is the main rationale for ONE Health **(5 marks)**
b) State the main five (5) principles of One Health **(5 marks)**
c) Provide a description of the contextual issues warranting ONE Health approach in Africa? **(10 marks)**

QUESTION 2

a) There are determinants of health influencing health which lie both within the individuals and externally in societies, what are these health determinants? **(10 marks)**
b) How has 'One Health' been conceptualized in understanding the new philosophy of Health **(10 marks)**

QUESTION 3

a) Define One Health? **(5 marks)**
b) What approach would you use to solve a one health problem from **ONE** of the following disease conditions affecting both humans and animals: **(5 marks)**
   i. Malaria
   ii. Human African Trypanosomiasis (HAT)
   iii. Anthrax
   iv. Bovine Tuberculosis

c) How would you apply this approach to solve the selected problem identified in (b) above? **(10 marks)**

QUESTION 4

a) What are the three (3) health concepts of Complex systems? **(5 marks)**
b) In what ways these health concepts of complex ecosystems can influence sustainable livelihood? **(5 marks)**
c) State the differences between livelihood stresses and livelihood shocks? Give two (2) examples from each livelihood? **(10 marks)**

QUESTION 5

a) Define globalization? **(2 marks)**
b) State the three (3) distinct interrelated dynamics phenomena of globalization? **(8 marks)**
c) What are four (4) main Globalization effects linking to health outcomes? **(10 marks)**

QUESTION 6

a) Describe the effects of debt crises and structural adjustment program of developing country economies constrained investments in public health education, water and sanitation including neighbourhood improvements by Governments? **(10 marks)**

b) In what ways, with examples, have the globalization environmental damage and working conditions affect health and livelihood of local communities, natural habitats, and the ecosystems in developing countries? **(10 marks)**

QUESTION 7

What actions can be done by the national Governments to reduce the health risk of globalization in developing countries, particularly in Africa Region **(20 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ONE HEALTH RESEARCH METHODOLOGY (VMM 7901/8901/FSR8900)

Duration: 3 hours

INSTRUCTIONS

1. Please read the instructions and each question carefully
2. Answer **ALL** questions only
3. Total marks: **60 of the total score**
4. Write in a legible handwriting

QUESTION 1

a) State the Nature of Scientific Enquiry and provide a stepwise 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? **(12 marks)**

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. **(10 marks)**

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. **(10 marks)**

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? **(14 marks)**

QUESTION 5

a) Define Bibliography, generally and in relation to Scientific Writing. Briefly explain the main purpose of a bibliographic entry and state any other names or phrases used to refer to it.
b) Name and briefly describe types of bibliography.
c) There are four basic steps to making an effective oral presentation. Please name and briefly describe these steps.
d) Name and briefly describe the main purposes of presentations. **(14 marks)**

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

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END OF YEAR NOVEMBER/DECEMBER EXAMINATIONS
2020/2021 ACADEMIC YEAR

ETHICS IN FOOD SAFETY MANAGEMENT (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 (2)** 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

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

QUESTION 1

Carefully read the news item provided in ***Exam Question 1 supplement*** where at least a hundred people who ate a popular fast food known as *Shawarma* on the Copperbelt of Zambia recently reported food poisoning. Based on that story in the Zambia Daily Mail,

(a) Identify and list ethical issues arising from the article **(3 marks)**
(b) Briefly justify why you believe the issues in (a) above have ethical implications in food safety management? **(5 marks)**
(c) Discuss in detail how you could have addressed any of the major ethical issues in (a) above. **(6 marks)**
(d) Which food safety management system(s) would be appropriate to address the problem(s) cited above? Justify your answer. **(6 marks)**

QUESTION 2

Discuss in detail the following question and citing appropriate examples, where possible, in your write-up.

"Are genetically modified foods safe for human consumption? Discuss the motion *FOR* or *AGAINST* in terms of what is in it for consumers in terms of ethics and food safety?" **(20 marks)**

QUESTION 3

There are **three (3)** commonly known food safety management systems.

a) List the **three (3)** food safety management systems. **(3 marks)**
b) For each food safety management system listed in (a) above, indicate, in detail, how it relates to ethical practice of food safety? Justify your answers. **(9 marks)**
c) How can a food safety expert like yourself compare and contrast the three food safety management systems in achieving the best outcome for the farm-to-fork cycle? **(8 marks)**

SECTION B

QUESTION 4

In a field educational tour to Hartland Farm Snails Zambia located in Kabwe, you were informed of how the enterprise raises edible land snails, predominantly for human consumption or cosmetic use. The meat and snail eggs are a delicacy with the earlier containing high quantities of protein, magnesium, calcium, copper, zinc, and iodine. The later provide a high-end cuisine as caviar. The snail slime (or mucus) has medicinal properties with claims of treating some common health problems such as asthma and tuberculosis. Further, the secretions are employed in the cosmetic industry.

a) Write in detail what governs the Farm's food safety management **(4 marks)**
b) What is/are the ethics at play at the farm? **(2 marks)**
c) Describe how the ethics in (b) are interlinked and enhanced to provide food safety at the farm. **(6 marks)**
d) What are the major lessons that you learnt from this exotic farming experience that can make you fully explore the influence of culture, globalization and farming on ethics in food safety practice? **(8 marks)**

QUESTION 5

Ethics is a broad term that encompasses different frameworks and approaches.

a) Discuss in detail the components and steps involved in the *Framework for Ethical Decision Making.* **(10 marks)**
b) List and briefly describe the **five (5)** sources or approaches of ethical standards that are used to answer ethical issues. **(10 marks)**

QUESTION 6

Carefully read the news item provided in ***Exam Question 5 supplement*** explaining what happened to people that consumed foods a traditional event.

(a) List the ethical issues in the said supplement and justify why you have identified them as such. **(4 marks)**

(b) From the issues in (a) above, are there are any that can lead to ethical dilemmas if they must be addressed? If *Yes*, what would prompt such ethical dilemmas? **(4 marks)**

(c) Indicate in detail the factors that can influence the ethical decision-making process in this case. **(4 marks)**

(d) Discuss in detail the constraints of employing any food safety management systems in this traditional event. **(8 marks)**

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