



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES**

**DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES SCIENCES**

<b>QUALIFICATION: BACHELOR OF AGRICULTURE</b>	
<b>QUALIFICATION CODE: 07BAGR</b>	<b>LEVEL: 7</b>
<b>COURSE CODE: ANH620S</b>	<b>COURSE NAME: ANIMAL HEALTH</b>
<b>SESSION: JANUARY 2020</b>	<b>PAPER: THEORY</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS: 100</b>

**SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER**

<b>EXAMINER(S)</b>	PROF. T. WASSENAAR
<b>MODERATOR:</b>	DR. A. SAMKANGE

**INSTRUCTIONS**

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

**PERMISSIBLE MATERIALS**

1. All written work MUST be done in blue or black ink
2. No books, notes and other additional aids are allowed

**THIS QUESTION PAPER CONSISTS OF 3 PAGES (excluding this front page)**

**Question 1 Immunity and vaccinations, causes of disease, their transmission and spread 36 marks**

- 1.1 List the main properties of the innate immune system 5 marks
- 1.2 a) What are adjuvants? (1 mark) 4 marks  
b) How do they work? (3 marks)
- 1.3 Discuss the white cells of both the innate and acquired immune systems. Include their names, where they are produced, what immune system they are part of, where they are found in the body and what they do. 12 marks
- 1.4 Discuss three microbial infectious causes of disease, indicating the main characteristics of each type of microbe. Include an example of a disease caused by each, where relevant. 9 marks
- 1.5 Draw an organogram to explain the different types of adaptive/acquired immunity, including the types of immunizations (0.5 marks for each component) 6 marks

**Question 2. Notifiable diseases, the law and veterinary services 6 marks**

- 2.1 List four animal diseases in Namibia that are notifiable according to the Animal Health Act of 2011 4 marks
- 2.2 Name two of the important legislations that mandates the control of animal health in Namibia. 2 marks

**Question 3 Infectious and non-infectious diseases 26 marks**

- 3.1 Below is a table containing some basic information about four infectious diseases, with some missing information numbered a - f. Provide the missing information. 6 marks

Disease	Type of pathogen	Affected species (= "susceptible host")	Most important symptom
Bluetongue	Virus	(a)	(b)
(c)	Virus	Domesticated ruminants: lambs extremely susceptible (70-100% die), sheep and calves highly susceptible (60-70% die); wild ruminants; humans	Fever, abortion storm, sudden death or weakness; mucus and pus discharge from nose; bloody diarrhoea, small haemorrhages in mucous membranes, yellow mucous membranes
(d)	Bacterium	In Namibia, sheep are most susceptible, but it can affect cattle too	In sheep: abortions, few in year 1 with abortion storm in subsequent lambing seasons. Cattle: can cause late-term abortions
Bovine brucellosis	(e)	(f)	Cows: abortion, stillbirths, weak calves, retained placenta, drop in milk Bulls: epididymitis, orchitis Infertility, arthritis

3.2	List two common infectious causes of abortion in cattle	2 marks
3.3	Write short notes on the following: (i) What would make you suspect African Swine Fever in a piggery (4 marks) (ii) The causes and treatment of bumblefoot in chickens (4 marks)	8 marks
3.4	Read the example below that deals with rabies, then write sentences that describe the following aspects of the disease <b>rabies</b> : <ul style="list-style-type: none"> <li>- The course of the disease (is it peracute, acute or chronic) (0.5 mark)</li> <li>- What is the cause (0.5 mark)</li> <li>- Which organ system is mostly affected (0.5 mark)</li> <li>- How is it transmitted (0.5 mark)</li> <li>- Which species are affected (0.5 mark)</li> <li>- Most important symptoms (0.5 mark)</li> <li>- Most important pathological signs (0.5 mark)</li> <li>- How is it controlled (0.5 mark)</li> </ul> <p><i>Example: Bluetongue is a peracute to chronic viral disease transmitted by biting midges. The virus damages the walls of blood vessels resulting in swelling and blue discoloration of the tongue, salivation and nasal discharges, fever, redness of face, groin and coronary bands and abortions. It affects many ruminant species, with sheep being the most severely affected. The main post-mortem findings are haemorrhages, oedema, necrotic lesions in many muscles, redness and swellings. There are no effective treatments, hence control relies on movement control, vector control, limiting exposure to areas close to water, and vaccinations.</i></p>	4 marks
3.5	(i) Define “zoonosis” (1 mark) (ii) Name five zoonotic diseases. (5 marks)	6 marks

<b>Question 4 Animal Health Management, Animal Welfare</b>	<b>32 marks</b>
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4.1	A farmer is complaining that his young cattle are dying. Describe the entire investigative approach you will take in order to arrive at a tentative diagnosis of the cause(s) of mortalities in his herd. For each procedure in the investigation, explain why you are asking a specific question or doing a specific examination (10 marks)	10 marks
4.2	Explain how you could increase host resistance against disease.	6 marks
4.3	Explain the concept of biosecurity and how this might apply to a farm by applying the three main principles of segregation, cleaning and disinfection	4 marks
4.4	(a) Discuss the philosophy behind animal welfare and its relationship with the principle of humane treatment. (b) Are there any instances where humane treatment of sentient non-human species is not applicable?	4 marks
4.5	With the aid of a flow-diagram, explain the different types and uses of antimicrobial drugs.	5 marks
4.6	(i) With reference to antibiotics, what do the terms broad-spectrum and narrow-spectrum refer to? (ii) How will you apply your knowledge of broad-spectrum and narrow-spectrum to treat an animal with a bacterial infection?	3 marks