FACULTY	HEALTH SCIENCES AND VETERINARY MEDICINE		
SCHOOL	VETERINARY MEDICINE		
DEPARTMENT	PARA-CLINICIAL STUDIES		
PROGRAMME	VETERINARY MEDICINE		
MODULE	VETERINARY PUBLIC HEALTH I		
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DURATION	**3 hours**	**Marks**	150

1st Examination papers

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This question paper consists of 11 (eleven) pages including this front page

Instructions

Read the questions carefully
Answer all questions
Write clearly and concisely
Hand in this question paper together with the answer booklet

Part 1:

Multiple Choice questions (Food Safety System):

Tick the correct answer (1 (one) or 2 (two) answers might be possible)
(1 mark for each correct answer) (Total marks 30)

1.	**1. With reference to the HACCP system: The periodical checking of the temperature in a chilled storage room by means of thermometer is falling under the:** a.) Monitoring action b.) Corrective action c.) Company action d.) Auditing for prerequisites e.) Competent authority check **2. At the end of the inspection, if non-compliances related to the implementation of HACCP plan were detected, the official veterinarian shall:** a.) Write a report indicating possible solutions that must be adopted. b.) Write a report on the parts of the plan in which non compliances were detected, without indicating possible solutions. c.) Prepare a draft of a new HACCP plan, together with the Food Business Operator. d.) Arrange a meeting with the comany and discuss possible solutions. **3. Which of the following statements are/is false about thermometers and their calibration?** a.) A thermometer must be available at all times in a food service establishment. b.) A thermometer must be regularly undergoing in-house calibration to ensure that it is accurate. c.) A thermometer must be calibrated every 2 years. d.) A thermometer must be accurate to 1°C. e.) A thermometer must have a valid calibration certificate. **4. A chiller used for chilling warm carcasses must be cabable of providing uninterupted cooling to reduce the inner core temperature of the carcass to below:** a.) 7^0C b.) 10^0C c.) 8^0C d.) 4^0C e.) 2^0C	30 marks

5. Verifying of animal welfare procedures before and during slaughtering is a crucial part of your duties at an export abattoir. The time between cattle stunning and killing:

a.) must be less than 120 sec

b.) must be less than 20 sec

c.) must be less than 60 sec

d.) must be less than 15 sec

e.) depends on the availability of the equipment.

6. The organism that can lead to Guillian Barre's Syndrome is:

a.) Campylobacter jejuni

b.) Escherichia coli O157:H7

c.) Listeria monocytogens

d.) *Campylobacter coli*

7. Name the bacteria that can be obtained from undercooked or raw hamburger

a.) Listeria monocytogenes

b.) Escherichia coli O157:H7

c.) Campylobacter jejuni

d.) Shigella spp.

e.) Leptospira spp.

8. Name the foodborne illness that can result in abortion in women.

a) Vibriosis

b) Leptospirosis

c) Listeriosis

d) Toxoplasmosis

9. Transmission of foodborne pathogens occurs via the oral route. How those pathogens contaminate food can vary based on the organism, and its reservoir. Which of the pathogens below does not have humans as reservoirs?

a.) Norwalk-like virus

b.) E. coli 0157:H7

c.) Shigella

d.) Listeria

10. Which bacteria can multiply in cheese at refrigeration temperature (4°C)?

a) *Staphylococcus aureus*

b) *Escherichia coli* O157:H7

c) *Brucella abortus*

d) *Listeria monocytogenes*

e) *Coxiella burnetii*

11. Which microorganism has been associated with waterborne diseases and is resistant to chlorination treatment?

a.) Campylobacter

b.) Vibrio cholera

c.) Giardia spp.

d.) *Shigella* spp.

12. On how many principles is the Hazard Analysis Critical Control Point (HACCP) based?

a.) 4
b.) 7
c.) 9
d.) 12
e.) 10

13. In the European Union (EU) legislation, food safety systems or HACCP based systems with equivalent results are:

a) Required by law (based on import EU regulations).

b) On voluntary basis.

c) Prepared by the Competent Authority (CA) together with HACCP team in the establishment.

d) Approved by the Competent Authority.

e) Developed by the company and implemented by the Competent Authority.

f) Recommended by the Competent Authority.

14. Concerning the preparation of a food safety system, when should pre-requisite be in place?

a.) At the beginning, prior to the development of the HACCP analysis.
b.) After the development of the flow diagram.

c.) Before the food producing establishment is constructed.
d.) After determination of the Critical Control Points (CCPs).
e.) Before the establishment starts the production.
f.) After the food safety system is developed, but not implemented yet.

15. What is a Critical Control Point (CCP)?

a.) Each non-conformance detected during auditing activity.
b.) A procedure, a step, an operational phase that if not controlled properly can lead to an unacceptable risk.
c.) A target value.
d.) A point which is critical but possible to control.
e.) A point which indicates a microbiological sample point.
f.) One non-conformance detected during production.

16. In case that a critical limit, which is stipulated in the Food Safety system is exceeded:

a.) The food must be treated as a by-product.

b.) The HACCP plan shall be revised.

c.) A corrective action shall be adopted.

d.) A communication must be sent immediately to the Competent Authority.

e.) The production line must be stopped until the issue is solved.

f.) The product must be separated until further notice.

17. What needs to be done prior to the identification of a Critical Control Point (CCP)

a.) Identify corrective actions for every Critical Control Point.
b.) Check if pre-requisites are sufficient to control a possible identified hazard.
c.) Identify and set critical limits.
d.) Develop a flow diagram and do the HACCP analysis.
e.) Check if the records are kept.
f.) Identify the monitoring procedures.

18. What is "monitoring of a critical control point in the context of food safety"?

a.) Permanent visual check to be carried out in correspondence of a Control Point.
b.) Sporadic check of a Critical Point during production.

c.) Continuous but spontaneous verification of a Critical Control Point.

d.) End product sampling.

e.) Planned activity of sampling to assess whether a Critical Control Point is under control.

f.) Planned sequence of observations or measurements to assess whether a Critical Control Point is under control.

19. What is the role of the official state veterinarian working at a food processing company regarding food safety system failures:

a.) To provide the company with solutions to solve the problems.

b.) To make a deal with the company in order to find a solution in case of problems in HACCP.

c.) To set corrective actions.

d.) To verify if problems in the HACCP implemenation have been identified and corrected by the company.

e.) To cooperate with the company in order to find a solution in case of problems in HACCP.

f.) To stop the production until the problem is solved.

20. With reference to the Food safety system development, which ONE of the following is included in the 12 "steps" that can be used in the process of developing a Hazard Analysis Critical Control Point (HACCP) plan for food safety?

a) Use a master cleaning schedule.

b) Establish ante mortem procedures.

c) Construct a flow diagram.

d) Establish post mortem procedures.

e) Responsibilities of the official state veterinarian.

f) Documented checks on stunning and bleeding.

21. Which ones of the following principles are NOT part of the seven principles of HACCP?

a.) Conduct hazard analysis

b.) Identify the HACCP team

c.) Identify critical control points

d.) Identify critical limits

e.) Implement pre-requisite programmes

f.) Responsibilities of the official state veterinarian

22. Veterinary maturation as stipulated by the OIE is the process by which the FMD virus is inactivated when:

a.) Carcasses are chilled at a temperature > +2°C for a period of not less than 24 hours.

b.) Legs and head are removed.

c.) Decreasing muscle pH to less than 6.0

d.) Carcasses are frozen for 3 days at minus 12°C

e.) Carcasses are chilled at a temperature > 0°C for at least 48 hours.

f.) Meat is kept for 14 days before release for export

23. The purpose of the Veterinary Cordon Fence (VCF) in Namibia is:

a.) To prohibit movement of game species from the northern to the southern regions.

b.) To assist the Namlits (Namibia Livestock Identification and Traceability) system in controlling livestock movement in all regions.

c.) To demarcate the OIE recognized Foot and Mouth Disease free zone from the rest of the country, which is not FMD free.

d.) To recognize the area south the VCF as free from Lumpy Skin Disease.

e.) To prevent Namibia from losing access to high value export markets that require specific FMD disease freedom

24. A main complication for zoonotic Listeriosis is:

a.) Chronic reactive arthritis
b.) Meningitis
c.) Hemolitic uremic syndrome
d.) Crohn's disease
e.) Guillain Barre syndrome

25. The main complication for zoonotic shiga toxin-producing *Escherichia coli* (STEC) is:

a.) Chronic reactive arthritis
b.) Meningitis
c.) Hemolitic uremic syndrome
d.) Crohn's disease
e.) Guillain Barre syndrome

Part 2: True/False questions:

If the answer is false, provide the correct information. Questions with false answers are awarded 3 marks whereas those with true answers are awarded 1 mark Total (20 marks).

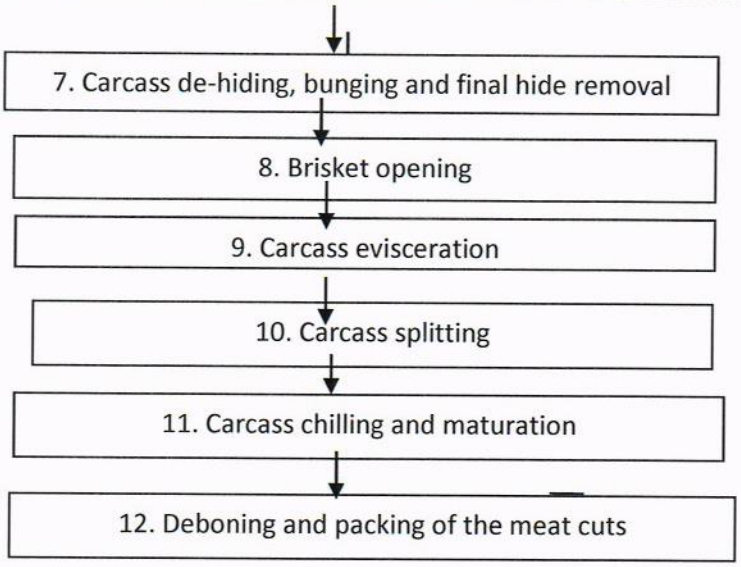
1.	Prerequisite programmes (PRP's) are food safety basic conditions and activities that are necessary to maintain a hygienic environment throughout the food chain suitable for the production, handling and provision of safe end products and safe food for human consumption.	True	False
2.	Verification with regards to food safety means obtaining evidence that the control measures managed by the HACCP plan and by the operational PRPs are capable of being effective.	True	False
3.	Critical control point (CCP) with regards to food safety means a step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level.	True	False
4.	Control measure/point ⟨food safety⟩ is an action or activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.	True	False
5.	Validation in food safety means confirmation, through the provision of objective evidence, that specified requirements/standards have been fulfilled.	True	False
6.	The term "adulterated" in the Food Safety context, means a state, condition, or occurrence which may lead to the contamination or adulteration of edible meat or poultry product when it is exposed, processed, handled, stored or packaged.	True	False
7.	Food chain means series of processes involved in the production, processing, distribution, storage and handling of an animal from primary production to consumption.	True	False
8.	The main responsibilities of a state veterinarian at an abattoir are ante mortem, post mortem, certification based on the respective export requirements and verification of the Food Safety system of the company.	True	False
9.	Pasteurization of milk is the destruction of pathogenic micro-organisms, and most spoilage organisms, by making noticeable changes to the taste and additions to the nutritional value, and so promote an increased shelf-life.	True	False
10.	Particular attention needs to be paid to temperature control, with temperatures of freshly slaughtered and dressed carcasses and other edible parts being reduced in approximately 6 hours after slaughtering to a temperature that minimise the growth of micro-organisms or the formation of toxins that could constitute a risk to human health.	True	False

Part 3: Short and long answer questions

1.	**All food processing establishments must use water that is fit for human consumption.** **a.) Explain which microbiological tests are required to guarantee that the water is safe for food production (5 marks).** **b.) State the minimum frequency between sample collections and explain, which steps are taken if the results are positive?** **(5 marks)**	10 marks
2.	**It is the function and responsibility of the food processing company to implement an approved food-safety system and to validate the effectiveness of this system on a continuous basis. It is the responsibility of the official Veterinarian to verify that an approved food-safety system is indeed in place and that the pre-requisite programs (PRP) and associated monitoring systems reflect the accurate representation of the system and procedures implemented at the establishment.** **a) List the most important prerequisite programs (PRPs) (9 marks)**	9 marks
3.	**In the food industry, chemicals are routinely used to sanitize and disinfect product contact surfaces. These chemicals provide a necessary and required step to ensure that the foods produced and consumed are as free as possible from microorganisms that can cause foodborne illness. In the context of the above, answer the questions below.** **a) Give the definition of the term disinfection. (4 marks)** **b) Explain the difference between Disinfecting and Sanitizing (4 marks)** **c) Elaborate on the principles of disinfection in a cleaning programme. (4 marks)**	12 marks
4.	**Contamination by foodborne pathogens can occur at several points along the milk production chain.** **a) Explain the most important points where contamination might occur along the milk production chain. (6 marks)** **b) Give one example of foodborne pathogen per identified contamination point above. (6 marks)**	12 marks
5.	**Briefly describe the basic procedures applicable for the ante and post mortem inspection. (7 marks)**	7 marks
6.	**Food Safety of Products of animal origin applying the HACCP based principles provides direction on the obligations and responsibilities of the Food Business Operator and the Veterinarian with regards to the implementation and maintenance of a HACCP system in food business**	13 marks

	establishments. a) Give the definition of HACCP and the basic requirements which are necessary to develop a fully functioning Food Safety system. (9 marks) b) Illustrate in the form of a diagram the main components of a food safety system within a quality management programme. (4 marks)	

7.	**Use the beef slaughter flow diagram as a model and explain the two (2) most common potential food safety hazards that you could judge reasonably likely to occur.** **For *each* hazard that is determined to be reasonably likely to occur, you should identify critical control points (CCP's) and corresponding critical limits that are measurable or observable.** **Identify these hazards and analyze them in the format given below (justification/reason; preventative measures in place; are these measures effective? If not, what should be recommended to get the hazard under control)** **a) Process Step where hazard is identified. (1 mark for each example)** **b) Group the hazard and explain why you choose step as a CCP. (2 marks for each example)** **c) Describe the established critical limit for this CCP. (2 marks for each example)** **d) Which monitoring procedures will you recommend? f) (2 marks for each example)** **e) Which corrective actions will you establish if the critical limits for this CCP is exceeded? (2 marks for each example)** **(Total 18 marks)** **BEEF SLAUGHTER FLOW DIAGRAM** 1. Cattle offloading and Resting overnight in lairages ↓ 2. Cattle taken from lairage through races to abattoir ↓ 3. Stunning and Shackling/hoisting ↓ 4. Halaal Slaughtering & bleeding ↓ 5. Head removal and rodding ↓ 6. Front/hind shanks removal and Hind quarter de-hiding	18 marks

		
8.	**a) Define the term "Veterinary Public Health" as stipulated by the World Health Organization (WHO) (4 marks)** **b) Develop a diagram covering the principle steps of a complete "food chain" (9 marks)**	13 marks
9.	**Elaborate in detail the terms insanitary and adulterated, with an example for each of the terms. (6 marks)**	6 marks
	END OF EXAMINATION PAPER	