



**THE COPPERBELT UNIVERSITY
SCHOOL OF NATURAL RESOURCES
DEPARTMENT OF AGRICULTURE AND AQUATIC SCIENCES**

2024 SESSIONAL EXAMINATION

[FA 420]

[FISH POST-HARVEST TECHNOLOGY]

[DATE: 24 OCTOBER 2024]

[TIME: 9:00-12:00 Hrs]

Instructions:

1. There are seven questions in total.
2. Answer a Compulsory Question (CQ) in **Section A**.
3. Answer any **four (4) questions from Section B**.
4. There are 100 marks allocated to this paper.
5. Each question carries **20 marks**.
6. Where possible, illustrate your answers.
7. Time allowed: **Three (3) hours**.
8. When answering follow further instructions in the answer book.

[FISH POST-HARVEST TECHNOLOGY]

SECTION A:

COMPULSORY QUESTION (CQ)

Question One

- a) What is the importance of marketing of fish and fishery products? [4 Marks]**
- b) What is quality assurance of fish and fishery Products? [3 Marks]**
- c) Mention and explain two major hazards found in fish and fishery products, providing examples for each. [6 Marks]**
- d) List the main elements of the Hazard Analysis Critical Control Point (HACCP). [4 Marks]**
- e) What are the merits and demerits of the Hazard Analysis Critical Control Point (HACCP) system? [3 Marks]**

SECTION B: ANSWER ANY FOUR (4) QUESTIONS FROM THIS SECTION

Question Two

- a) State and explain two things to consider during the transportation of live fish to the market. [3 Marks]**

- b) Explain the structure of fish muscle, including its key components and their functions. [7 Marks]**
- c) Careful handling of fish during harvesting and after harvesting reduces post-harvest losses. State what you should consider when handling fish during harvesting and transportation. [5 Marks]**
- d) State and explain any five (5) factors affecting or contributing to fish spoilage. [5 Marks]**

Question Three

- a) After harvesting, if you notice that your fish has begun to spoil, what are the fundamental mechanisms responsible for fish spoilage? [3 Marks]**
- b) Describe one mechanism that leads to fish spoilage and provide examples to support your explanation. [7 Marks]**
- c) What are the key characteristics of fresh fish? [5 Marks]**
- d) Describe a method used to assess the quality and freshness of fish, and explain its advantages and disadvantages. [5 Marks]**

Question Four

- a) List the methods of fish preservation you know. [3 Marks]**
- b) As a catfish farmer, you have received an order from the Democratic Republic of Congo to supply 45,000 pieces of catfish for sale in local rural markets. Describe the most effective preservation method you would use to process this fish in preparation for delivery. [10 Marks]**

- c) What is the significance of fish preservation in fisheries and aquaculture?
[4 Marks]
- d) Why is important to transport live fish to the market? **[3 marks]**

Question Five

- a) When preserving fish through drying, two distinct phases of the drying process occur. What are these phases, and can you briefly explain each?
[3 Marks].
- b) What are the reasons for using food additives during fish processing? How are these additives classified, and what are the advantages of their use?
[7 Marks]
- c) Fish are often processed into various products. Based on your knowledge, list and explain three (3) types of fish and fishery products. **[5 Marks]**
- d) Fish and fishery products serve various purposes. List and explain three (3) ways in which fish and fishery by-products are utilized. **[5 Marks]**

Question Six

- a) As a graduate trainee at Yalelo, assigned as a supervisor in the tilapia packaging section, what is the aim of this department based on the knowledge gained from your post-harvest technology course at CBU? **[5 Marks]**
- b) Mr. Tombwe, the extension officer, is teaching small-scale farmers about fish marketing. Identify and explain five (5) marketing skills he should

encourage farmers to adopt for effectively marketing fish and fishery products. **[5 Marks]**

- c) Mr. Polopela is planning to start a fish farming venture in Chinsali but is uncertain about the market potential for his fish. Identify and briefly explain five (5) market-driving factors for fish products that he should consider in his analysis. **[5 Marks]**
- d) A group of small-scale fish farmers in Kalabo District are struggling to sell their fish. List and explain five (5) challenges they may be facing in marketing their fish products. **[5 Marks]**

Question Seven

- a) What three effects does the preservation of fish by smoking combine? **[3 Marks]**
- b) What role does AI play in enhancing fish post-harvest technology? **[5 Marks]**
- c) Give a brief description of the Aquaculture Value Chain and its relevance in the aquaculture industry. **[6 Marks]**
- d) How does post-harvest technology contribute to food and nutrition security? **[6 Marks]**

THE END



THE COPPERBELT UNIVERSITY

KAPASA MAKASA UNIVERSITY

CHINSALI, MUCHINGA PROVINCE

BACHELOR OF SCIENCE IN FISHERIES AND AQUACULTURE

FISHERIES ECONOMICS AND ENTREPRENEURSHIP – FA 410

END OF YEAR FINAL SESSIONAL EXAMINATION

15TH OCTOBER 2024

INSTRUCTIONS TO CANDIDATES

1. Time allowed is **THREE (3) HOURS**
2. Remember to write your student identity number (SIN) on the provided answer sheets
3. All questions carry equal marks (**20 Marks**)
4. Question one is **COMPULSORY**
5. Attempt a total of **FIVE** questions. One compulsory question and two questions from each section.
6. This paper consists of **THREE SECTIONS**:
 - A. **SECTION A:** Compulsory question
 - B. **SECTION B:** Fisheries Economics
 - C. **SECTION C:** Entrepreneurship
7. Do **NOT** write in pencil (except for graphs and diagrams).
8. The marks shown against the requirement(s) for each question should be taken as an indication of the expected length and depth of the answer.
9. All workings must be done in the answer booklet.
10. Present legible and tidy work.

CELLPHONES AND OTHER RELATED GAGETS ARE NOT ALLOWED IN THE EXAMINATION ROOM

DO NOT TURN THIS PAGE UNTIL YOU HAVE BEEN TOLD TO DO SO BY THE CHIEF INVIGILATOR

SECTION A (COMPULSORY)

QUESTION ONE. (PLEASE USE DIFFERENT ANSWER BOOKLETS FOR PART A AND B)

QUESTION ONE

1.

A. Consider the following information about an open economy:

Autonomous consumption = 7500; Disposable income (Y_d) = $Y - T$; Taxes (T) = $0.3Y$; Marginal Propensity to consume = $0.2Y_d$, Government spending (G) = 2500; Investment (I) = 2000; Exports (X) = 3000; and Imports (M) = $750 + 0.2Y$.

- i. Find the aggregate demand (AD) function. **[5 Marks]**
- ii. Determine the equilibrium income (Y) for this economy. **[3 Marks]**
- iii. By how much will equilibrium income change if the government spending more to K5000 **[2 Marks]**

[Total: 10 Marks]

B. The Rochdale Co-operative Principles form the basic philosophical foundation which guides the development and operation of co-operative societies all over the world. Prepare a write up on these principles since you will have to include them in your draft Business Plan for your new cooperative. **(10 marks)**

SECTION B: ECONOMICS

PLEASE CHOOSE ANY TWO QUESTIONS FROM THIS SECTION AND ALL QUESTIONS CARRY EQUAL MARKS (20 MARKS).

QUESTION TWO

2. John Banda was a Civil Servant who opted to retire early to start his own business named Banda's Cookie Bakery. Banda buys flour, sugar, flavourings, and other cookie ingredients. He also buys the mixers and ovens and hires workers to run this equipment. A worker costs K100 per day and his business pays K500 for his land rates every year. He sells his cookies to consumers at K20 each. The relationship between the number of workers and output in a day is as follows:

Number of workers	Output (Quantity)	Marginal Product	Total Cost	Average Total Cost	Marginal Cost	Total Revenue	Marginal revenue	Profit or loss
0	0							
1	20							
2	50							
3	90							
4	120							
5	140							
6	150							
7	155							

Required:

- A. Fill in the missing columns **[16 Marks]**
- B. Compare the column for marginal product and the column for marginal cost and explain the relationship **[3 Marks]**
- C. Compare the column for average total cost and the column for marginal cost and explain the relationship **[3 Marks]**

QUESTION THREE

3. On 27th October 2024, The Minister of Finance presented a total budget of 217 billion kwacha. In Paragraph 11, he said “On inflation Madam Speaker, the country has experienced pressure over the past year, registering 15.6% in September 2023. The main drivers are linked to the drought which resulted in increased food prices. To moderate inflationary pressure, the Bank of Zambia tightened its monetary policy. The government of Zambia has been using monetary policy to influence the economy.
 - A. Explain how the Bank of Zambia uses each of the following monetary policy tools to reduce liquidity or money supply in the Zambian economy
 - i. Open Market Operations **[3 Marks]**
 - ii. Required Reserve Ratio policy **[3 Marks]**
 - iii. Discount Rate policy **[2 Marks]**
 - B.
 - i. Explain any four (4) effects of a rise in inflation rates in an economy. **[4 Marks]**
 - ii. Explain briefly the effects of a high inflation rate on the functions of money. **[5 Marks]**
 - C. State three (3) effects of unemployment. **[3 Marks]**

QUESTION FOUR

4. Given the following demand and supply functions for firm X

$$Q_s = -7 + 8P$$

$$Q_d = 26 - 2P$$

- A. Calculate the Equilibrium Price (p) and Output (q) **[2 Marks]**
- B. Using the values of p and q above, illustrate using a diagram the demand and supply curves showing the equilibrium point. **[4 Marks]**
- C. Calculate the price elasticity of demand when price increases to K6 and Quantity reduces to 22 units. Interpret the value of the elasticity calculated. **[4 Marks]**
- D. In an analysis of the market for paint, an economist discovers the facts listed below. State whether each of these changes will affect supply or demand, and in what direction.
- i. There have recently been some important cost-saving inventions in the technology for making paint. **[3 Marks]**
 - ii. Paint is lasting longer, so that property owners need not repaint as often. **[1 mark]**
 - iii. Because of severe hailstorms, many people need to repaint now. **[3Marks]**
 - iv. The hailstorms damaged several factories that make paint, forcing them to close down for several months. **[3 Marks]**

SECTION C: ENTREPRENEURSHIP

PLEASE CHOOSE ANY TWO QUESTIONS FROM THIS SECTION AND ALL QUESTIONS CARRY EQUAL MARKS (20 MARKS)

QUESTION FIVE

5. "Whereas creativity and innovation are the citadel of entrepreneurship and lies at the heart of blue-chip companies, it is not without difficulties and challenges". Discuss in detail what could be done to overcome the challenges before crafting a business plan to launch the enterprise.

(20 marks)

QUESTION SIX

6. Kapasa Musonda is having challenges in selling her Japanese Quails on the local market. She has been advised to visit the Zambia Development Agency (ZDA) for business advisory services as she is considering entering the export market for her Japanese Quails.
- A. Discuss the role of ZDA in promoting entrepreneurs with regards to the export market. **(10 marks)**
 - B. How would Kapasa Musonda be assisted by the Citizens economic empowerment Commission (CEEC) in her intentions using empowerment pillar number four. **(5 marks)**
 - C. Discuss why it would be important for Kapasa Musonda to draft a business plan before entering the export market. **(5 marks)**

QUESTION SEVEN

7. Constituency Development Fund (CDF) is a government budget allocation mechanism that channels a specific portion of the national budget to the constituencies to finance development projects such as school facilities, health clinics and water supply systems and entrepreneurial development.
- A. Discuss the challenges of using CDF to promote entrepreneurial activities. **(10 marks)**
 - B. Discuss the concept of product life cycle management. **(5 marks)**
 - C. Explain any two of the four areas that financial management covers in entrepreneurship. **(5 marks)**

END OF EXAMINATION, BEST WISHES.



THE COPPERBELT UNIVERSITY

2024 SESSIONAL EXAMINATIONS

FISHERIES MANAGEMENT AND EXTENSION

FA 450

DATE: 01st NOVEMBER, 2024

09:00 – 12:00

INSTRUCTIONS

1. There are two sections in this question paper, **A** and **B**
2. Question 1 should be answered in the same booklet as any other TWO questions from section A
3. Question 2 should be answered in the same booklet as any other TWO questions from section B
4. Submit separate answer booklet for sections A and B
5. Clearly, write your Student Identity Number on the Answer Booklets provided
6. Write neatly and orderly to avoid loss of marks

SECTION A

QUESTION 1 (COMPULSORY)

Discuss annual fishing ban that runs from 1st December to 28th /29th February in Zambia

(10 marks)

QUESTION 2

I. What is co-management?

(5 marks)

II. Discuss five (5) advantages of fisheries co-management

(15 marks)

QUESTION 3

You work as Fisheries Research Officer for Lake Kariba. Give an account of four (4) primary considerations you should pay attention to in a bid to ensure sustainability.

(20 marks)

QUESTION 4

Write notes on the following:

a) Total Allowable Catch

(10 marks)

b) Fish licensing

(10 marks)

SECTION B

QUESTION 5 (compulsory)

Discuss Edgar Dale's Cone of Experience

(10 marks)

QUESTION 6

(a) Discuss various factors that should be considered for Selection of Extension Teaching Methods

(10 marks)

(b) In details discuss different types of leadership styles. Further, deduce their merits and demerits.

(10 Marks)

QUESTION 7

(a) Write few notes on the following

- i. Rapid Rural Appraisal
- ii. Philosophy of extension
- iii. Extension Education
- iv. Ethnocentrism
- v. Horizontal communication

(10 Marks)

(b) Teaching, in the context of extension and development, can be thought of as providing purposeful direction through learning process. Discuss step by step processes involved in extension teaching.

(10 marks)

QUESTION 8

(a) In extension and innovation transfer there is a common and important proverb "*The best way to peoples' heart is through their stomach, but the best way to their brain is through their eyes and ears*". In details, explain the meaning of this proverb

(6 marks)

(b) The livestock and fisheries sector in Zambia has made strides aiming at improving production mainly through the promotion of various technologies among the rural people. However, the adoption rates of such technologies are still low. Discuss various factors that affect the transfer of technologies.

(14 marks)



THE COPPERBELT UNIVERSITY
KAPASA MAKASA UNIVERSITY
CHINSALI, MUCHINGA PROVINCE
AQUACULTURE MANAGEMENT – FA 400
END OF YEAR FINAL SESSIONAL EXAMINATION

5TH NOVEMBER 2024

INSTRUCTIONS TO CANDIDATES

1. Time allowed is **THREE (3) HOURS**
2. Remember to write your student identity number (SIN) on the provided answer sheets
3. All questions carry equal marks (**20 Marks**)
4. Question one is **COMPULSORY**
5. Attempt a total of **FIVE** questions

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QUESTION ONE

1.

A. Outline clearly some of the roles of aquaculture in a developing country like Zambia.

(10 marks)

B. In aquaculture, stocking density and the sex ratio of broodstock are crucial factors that influence hatchery operations and productivity. As a graduate of The Copperbelt University, you have learned the significance of maintaining specific stocking densities and sex ratios in pond aquaculture, particularly in tilapia breeding. Select a sex ratio (e.g., 1:1, 1:2, 1:3....., 1:6) that you believe is most appropriate for broodstock management in tilapia pond aquaculture. Justify your choice of sex ratio over the others, explaining how it benefits hatchery operations. Please provide a clear explanation. You may illustrate your explanation with a figure or graph (note: no need to draw to scale). (10 marks)

QUESTION TWO

2. Study careful the table below (Table 3.1) and after understanding the table proceed to answer the following questions.

Table 3.1 The time interval between fertilization and hatching of catfish eggs in relation to water temperature

WATER TEMPERATURE (°C)	TIME BETWEEN FERETILIZATION & HATCHING (HOURS)
20	57
25	27
28	22
30	20

* Please bear in mind that temperature is the independent or predictor variable.

A. Plot a general graph showing the relationship between temperature and the time interval from fertilisation to hatching of catfish eggs, and briefly explain the role of temperature in this process.

(10 marks)

B. Explain what you think would happen if:

- i. Lowered to 15 (°C) and further to 10 (°C) (5 marks)
- ii. Increased to 35 (°C) and further to 40 (°C) (5 marks)

QUESTION THREE

3. Following the interview you had, you have been hired by the company. Your first task is to do community engagement to explain the following terms as a way of sensitizing them:
- A. Ecological Carrying Capacity (5 Marks)
 - B. Aquaculture Zoning. (5 Marks)
 - C. Social Carrying Capacity (5 Marks)
 - D. Production Carrying Capacity (5 Marks)

NB: Feel free to use hypothetical examples.

QUESTION FOUR

- 4.
- A. Write short notes on the use of pituitary extracts in fish species which are known be 'difficult to breed' in captivity such as *Clarias gariepinus*, *Cyprinus carpio* and *Heterobranchus longifilis* to mention a few. (10 marks)
 - B. Discuss one form of integrated agriculture aquaculture system of your choice. Given the advantages and disadvantages of integrated agriculture aquaculture. (10 marks)

QUESTION FIVE

- 5.
- A. What do you understand by the terms Oxygenation and aeration? (4 marks)
 - B. Briefly explain why any two environmental factors that influence growth rate in aquaculture. (4 marks)
 - C. Explain how you would prepare and administer a sex reversal hormone to a suitable tilapia species of your choice. (12 marks)

QUESTION SIX

6. Reproduction is a costly investment and as such, fishes have evolved to adapt breeding to the environmental conditions that ensure maximum fertilization and larval survival. Discuss in detail **at least four (4)** factors that affect spawning in fish. **(20 marks)**

QUESTION SEVEN

7. The concept 'before you farm fish, farm the water' highlights the importance of maintaining good water quality in aquaculture. As a graduate of the Copperbelt University with a Bachelor of Science (BSc) in Fisheries and Aquaculture, you have been employed as a farm manager at Kapasa Makasa University. In your first meeting with the farm workers, you decided to emphasize the significance of maintaining good water quality. Discuss any five water quality parameters that affect fish growth and health. **(20 marks)**

THE END

WISHING YOU ALL THE SUCCESS!!!!!!