



College of Agriculture, Fisheries and Forestry

School of Veterinary Science, Animal Husbandry and Fisheries

Department of Fisheries

Bachelor of Science in Fisheries

FCU 503 – Freshwater Aquaculture

Semester 1 – 2018

Final Examination Paper

Sections	Category	Marks
Part I	Objective Type Questions	50%
A	True/False	15
B	Short Answer	20
C	Labeling	15
Part II	Subjective Type Questions	50%
A	Long Answer	30
B	Essay	20

Duration: 3 Hours & 10 minutes reading time

Total Pages: 9 PAGES

Instructions to the Students

1. You are allowed 10 minutes reading time during which you are not to write.
2. Begin each section on a fresh page and use both sides of the sheet.
3. Write your candidate number at top of each attached sheet.
4. For all sheets of paper on which rough/ draft work has been done, cross it through and must attach it to your answer scripts.
5. Write clearly the numbers attempted on the top of each sheet.

Part I Objective Type Questions

(50 marks)

Answer ALL questions from Sections A & B.

Section A- Multiple choices

(15 marks)

1. The term aquaculture is used widely to denote culture of aquatic animals and plants from:
 - a. Freshwater environment.
 - b. Brackish water.
 - c. Marine environments.
 - d. All of the above

2. Which one from the following is cultural and socio-economic basis of aquaculture?
 - a. Aquaculture is relatively efficient means of producing protein.
 - b. Aquatic animals have higher growth rates when compared to terrestrial animals.
 - c. New fisheries laws to protect the natural resources increased the demand for favored species.
 - d. Aquaculture can always restock the environment in return for whatever it has taken from it.

3. What is the name of hormone used during artificial propagation of carp?
 - a. gonadotropin hormone
 - b. Luteinizing hormone
 - c. Adrenocortic hormone
 - d. Thyroid hormone

4. Which one from the following doesn't represent the role of aquaculture in fishery management?
 - a. It is helping ease the fishing pressure of the intensively fished foreshore areas.
 - b. Aquaculture creates conflict between capture and culture fishery sector.
 - c. Helps poor fisherman by giving them a reliable and sustainable source of income.
 - d. None of the above.

5. What role does a hatchery play in aquaculture?
 - a. Produces the seed or young fish used to stock growing facilities.
 - b. Changes the form aquaculture products into something more desirable to consumers.
 - c. Facilities that produce crops from the seed.
 - d. Gathers or captures aquaculture products for marketing.

6. *Macrobrachium rosenbergii* reach sexual maturity at about 15–35 g within:
- 5 to 8 months.
 - 9 to 10 months.
 - 2 to 3 months.
 - 4 to 6 months.
7. Which species of carp are cultured in Fiji?
- Ctenopharyngodon idellus*
 - Hypophthalmichthys molitrix*
 - Aristichthys nobilis*
 - All of the above
8. What is the scientific name for locally cultured freshwater prawn?
- Macrobrachium lar*
 - Pinctada margaritifera*
 - Macrobrachium rosenbergii*
 - Litopenaeus vannamei*
9. How many parts per million (ppm) of formalin is required during the treatment of berried female prawns?
- 50-60 ppm
 - 20–30 ppm
 - 60-70 ppm
 - 80-90 ppm
10. Which one from the following is responsible for producing half pearls?
- Pinctada margaritifera*
 - Pteria penguin*
 - Penaeus monodon*
 - Litopenaeus stylirostris*
11. Which one from the following best represents a closed aquaculture systems?
- Silos, ponds, raceways and tanks.
 - Circular tanks, Sea-cage, Silos and ponds.
 - Raceways, tanks, racks and cages.
 - None of the above.

12. How many parts per million (ppm) of copper sulphate is required during treatment of berried female prawn?
- a. 0.2–0.3 ppm
 - b. 0.4-0.6 ppm
 - c. 0.5-0.7 ppm
 - d. 0.7-0.9 ppm
13. is characterized by very limited input from the culturist.
- a. Intensive aquaculture
 - b. Semi-intensive aquaculture
 - c. Concentrated aquaculture
 - d. Extensive aquaculture
14. What's the name of commonly used screen filter in a recirculating aquaculture system (RAS)?
- a. Drum filter
 - b. Granular media filter
 - c. Rotating Biological Contactor
 - d. Trickling filter
15. Approximately how many cubic meters of water are used to produce one kilogram of fish in extensive aquaculture system?
- a. 10 – 20 cubic meter
 - b. 50 – 100 cubic meter
 - c. 20 – 40 cubic meter
 - d. 90 – 120 cubic meter

Section B- Short Answer

(20 marks)

Answer ALL Questions.

1. Give names of two types of caudal fins found on fishes (1 mark)
2. State the two major body types of fish and discuss how each affects its culture facility. (2 marks)
3. Define the following terms and give an example of each.
 - a. Neuston (1 mark)
 - b. Psammon (1 mark)
 - c. Nektons (1 mark)
 - d. Planktons (1 mark)
 - e. Detrivores (1 mark)
4. What is a seine net and how is it used? (2 marks)
5. Define the following :
 - a. Larvae ($\frac{1}{2}$ mark)
 - b. Post Larvae ($\frac{1}{2}$ mark)
 - c. Fry ($\frac{1}{2}$ mark)
 - d. Fingerlings ($\frac{1}{2}$ mark)
6. State four methods of collecting fish seed from the wild. (2 marks)
7. What is recirculating aquaculture system (RAS)? (1 mark)
8. Complete the following table by filling in the taxonomic classification of *Macrobrachium rosenbergii*. (5 mark)

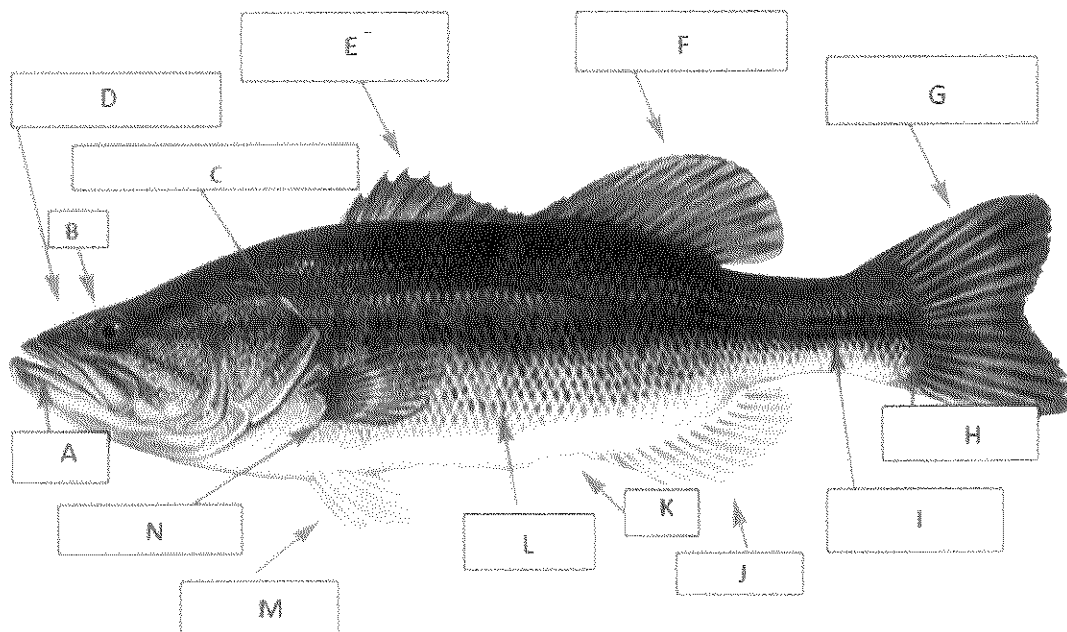
Kingdom	A.
Phylum	Arthropoda
Subphylum	B.
Class	C.
Order	D.
Sub-order	E.
Infraorder	F.
Superfamily	G.
Family	H.
Subfamily	I.
Genus	J.
Species	<i>Macrobrachium rosenbergii</i>

Section C – Labeling

(20 marks)

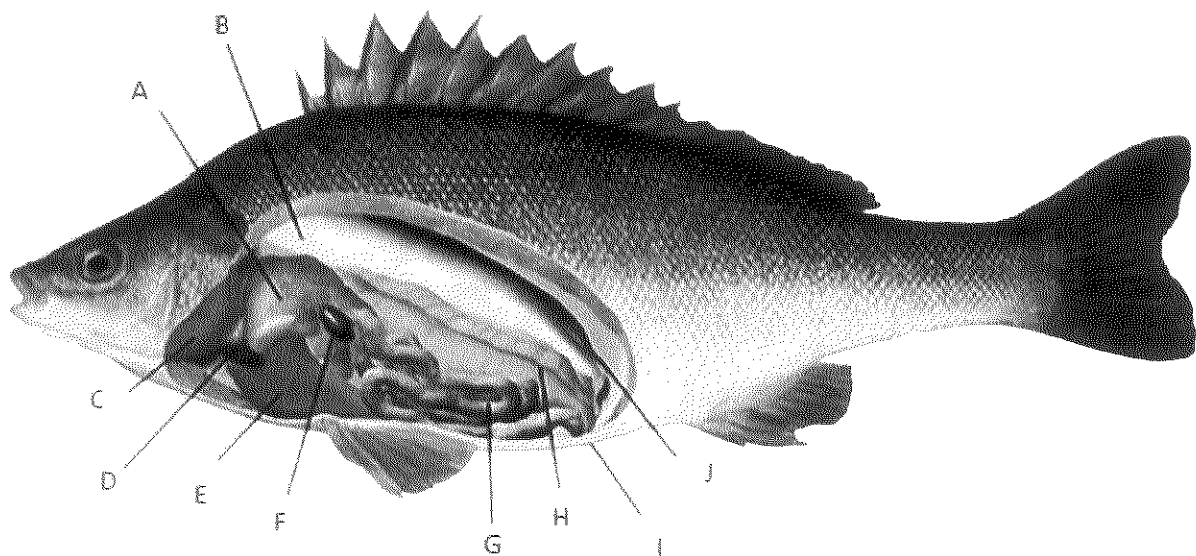
Answer ALL Questions.

1. Provided below is image of a fish showing its external features. Label from A - N. ($\frac{1}{2}$ mark each))



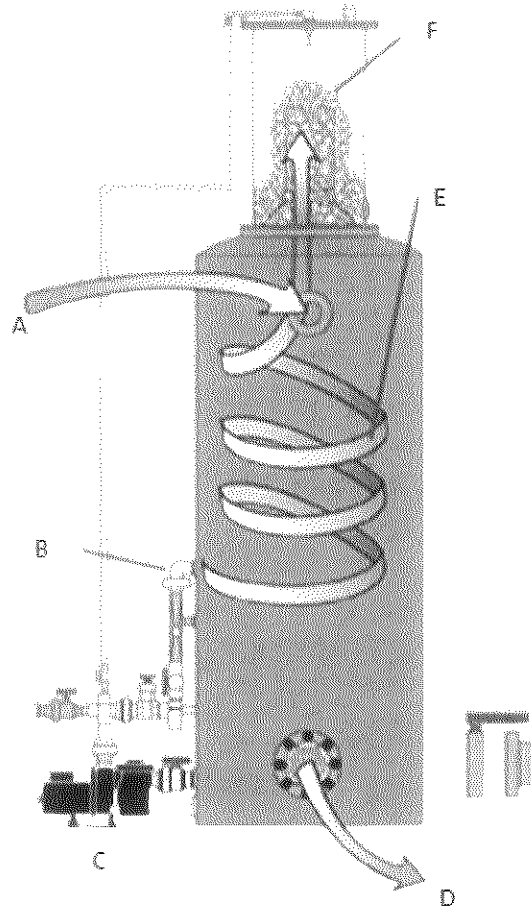
2. Provided below is image of a dissected fish showing its internal organs. Label from A - J.

($\frac{1}{2}$ mark each)



3. Provided below is image of a protein skimmer. Label from A – F.

($\frac{1}{2}$ mark each)



Part II Subjective Type Questions

(50 Marks)

Answer questions from Sections A-B.

Section A- Long answer

(30 marks)

Answer ALL Questions.

1. Draw labeled diagram of a fish pond showing its 4 major components and explain how would the pond be aligned with the wind direction? (3 marks)
2. Explain why aquatic animals have higher growth rates when compared to terrestrial animals? (3 marks)
3. Several methods exist for propagating the common carp. They are all based on its reproduction biology. Discuss the differences between the following three categories.
 - Natural propagation
 - Semi-artificial propagation
 - Artificial propagation(3 marks)
4. Discuss 5 important features that need to be considered at potential aquaculture site during initial site surveys. (5 marks)
5. The giant river prawn, *Macrobrachium rosenbergii*, is one of the most cultivated freshwater prawns in the world. *M. rosenbergii* is considered a freshwater species but the larval stage of the animal depends on brackish water. With the aid of diagram explain the life cycle of giant river prawn. (4 marks)
6. Say for example you have a pond which has 50 meter length, 20 meter width and average 1.5 depths.
 - a. Calculate the total water volume required in your pond. (1 mark)
 - b. Calculate how many seconds would it take to fill the pond. (1 mark)
 - c. Calculate the flow rate in m³/sec. (1 mark)
 - d. Calculate the diameter (inches) of pipe to be used to fill the pond in 4 hours if the velocity of water is 30 m/sec. (2 marks)

7. Calculate the flow rate of fluid if it is moving with the velocity of 20 m/s through a pipe of diameter 0.03 m

(2 marks)

8. The primary use for piscicides is to eliminate a dominant species of fish in a body of water, as the first step in attempting to populate the body of water with a different fish. Discuss five requirements of suitable piscicides.

(5 marks)

Section B: Essay

(20 marks)

Choose TWO question from the THREE given and write an essay of approximately 250 words.

1. Write an essay explaining the pre-stocking management steps for a drainable pond undrainable pond. Thoroughly explain the method and purpose of each step.

(10 marks)

2. Draw diagram of a recirculating aquaculture system and discuss how the system operates. Discuss in detail what happens at every filtration stage.

(10 marks)

3. Write an essay discussing steps taken during site survey for a potential aquaculture farm site. Discuss methods and purpose for every step.

(10 marks)

...THE END...