



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2016/2017

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR
THE DEGREE OF BACHELOR OF SCIENCE IN
FISHERIES AND AQUACULTURE AND BACHELOR OF
SCIENCE IN AQUATIC RESOURCES CONSERVATION
AND DEVELOPMENT WITH INFORMATION
TECHNOLOGY**

MAIN CAMPUS

**AFN 315: FISH BREEDING AND HATCHERY
MANAGEMENT**

Date: 7th December, 2016

Time: 3.30 - 6.30pm

INSTRUCTIONS:

- Answer ALL Questions in Section A.
- Answer Question 9 (Compulsory) and any other THREE in Section B.

Section A: Answer ALL questions from this section (40 marks)

1. Highlight any FIVE guiding principles that have to be considered when setting up and positioning hapa nets within a water body (5 marks)
2. Highlight any THREE different types of hormones that can be used to induce reproduction during artificial reproduction Catfish (*Clarias gariepinus*) while giving one disadvantage of each (6 marks)
3. (a). Distinguish between wet fertilization and dry fertilization methods as applied in artificial Catfish (*C. gariepinus*) propagation (2 marks)
(b). Highlight the ideal conditions under which each of the above methods may be used (4 marks)
4. Outline the THREE methods which have commonly been used in preventing aggressive male Nile Tilapia (*Oreochromis niloticus*) from injuring unresponsive females during spawning (3 marks)
5. Highlight the FOUR main technologies that have been used to produce monosex (all-male) populations in Nile Tilapia (*O. niloticus*) breeding programs (5 marks)
6. Briefly describe the THREE main methods that are commonly used to preserve fish pituitaries in fingerling production facilities. (5 marks)
7. Highlight any FIVE disadvantages of using the hapa net system for fry and fingerling production (5 marks)
8. Outline the main criteria used in determining maturity and readiness for spawning in male and female catfish (*C. gariepinus*) broodfish (5 marks)

END OF SECTION A

**Section B: Answer Question 9 (Compulsory) any other THREE questions from this Section
(30marks)**

9. As a Fisheries consultant and hatchery operator, you have been contracted to supply 800,000 *Clarias gariepinus* fry for restocking a Government farm. Assuming that the average female brooder produces 6000 eggs per kilogram of body weight:
- Calculate how many eggs of this species you will require to produce the fry assuming that only 90% of eggs spawned are viable and of these, 86% will be successfully fertilized and out of these, only 78% would hatch and survive to the fry stage; transit mortality is at 5%. (4 marks)
 - The average weight of each female *C. gariepinus* as at the time of this contract was 3kg. Assuming the sex ratio of male to female to effect the breeding was 2:3, calculate the number of male and female brood stock to be maintained in order to produce the number of eggs above. (2 marks)
 - For proper management, at least twice the required brood stocks must be maintained in a brood stock pond at a density of 300 grams per square metre. Assuming each male weighed 2.5kg, calculate the number of ponds measuring 300m² each, that would be required to maintain the brooders that would ensure the above fry supply. (3 marks)
10. Discuss the major bio-security measures that should be put in place in order to prevent entry and spread of disease within hatchery facilities (7marks)
11. Soon after introducing a batch of catfish fry into a newly constructed concrete tank (having a smooth cement finish), a hatchery manager noticed that all the fry had died within a span of 12 hours even after applying proper feeding and aeration procedures.
- Explain what could have caused these mortalities and the steps that the manager could have taken to prevent this from happening (4 marks)
 - Highlight the main advantages and disadvantages of constructing rectangular and circular tanks in a hatchery facility (3 marks)
12. Discuss the major ancillary units that are commonly found in a typical commercial fish hatchery facility, with emphasis on their functions and relative positions within the facility (7 marks)
13. Describe the steps involved during packaging, transportation and stocking of fingerlings destined for grow-out facilities (7 marks)

END OF SECTION B

END OF PAPER