

*Subject: Aquatic Feed and Feeding*

*Class: Third*

*Time: 2 hour*

*Salahaddin University - Erbil*

*College of Agricultural Engineering Sciences*

*Fish Resources and Aquatic Animals Department*

 Final Examination / First Semester - First Trial / 2022-2023

**(20 Marks)**

**Q1. Complete the following sentences.**

1. Plants and animals also have an effect on their environment such as ---------------------, ------------------,----------------------- and ----------------------- .
2. Based on the type of input made to provide more food, pond aquaculture can be classified as follows ----------------------, --------------------------- and -------------------------.
3. Natural food abundance greatly depends on ----------------, ---------------- and --------------.
4. Three main groups of plankton which have an important role in fish production in ponds ---------------, ------------------------- and -------------------------.
5. Gelatin by product is used in diet formulations as a ---------------- and -----------------.
6. Rotifer contain protein ranges from **----------** and lipid **---------** carbohydrate **----------** of the dry weight, and carbohydrate composed of 61-80% **----------**, 9-18% **----------** and 0.8–7.0% **-------------**.
7. The main factors controlling Cyanobacteria abundance as a problem are ----------------, ------------------, ------------------------- and ----------------------------.
8. Biochemical composition of phytoplankton consist of protein ---------------------lipid -------------------- and carbohydrates ------------------------- of dry weight.
9. Feed Ingredients for fish diets are chosen for a number of reasons including --------------, --------------, ----------------------- and ------------------------.
10. Animal by-product as source of protein are good sources of ----------- but poor sources of --------------- and ---------------------.
11. There are three different species of Rotifers ------------------ , ------------------ and ---------------------- .
12. There are two main types of zooplankton ---------------------- and --------------------.

**Q2.** Give short answers to the following: **(Five Only)**

**(20 Marks)**

1. Numerate important types of phytoplankton?
2. List and describe the plankton according to the size groups?
3. What is the difference between corn gluten feed and corn gluten meal?
4. Make a diagram of the trophic level of an organism in a food chain?
5. List biochemical composition of microalgae that make them suitable as a food sources?
6. Write groups of protein supplements with an example for each groups?

**Q3\** Complete **Five** of the following information?

**(20 Marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Supplementation** | **Protein content %** | **Crude fat %** |
| 1 | Meat and bone Meal |  |  |
| 2 | Poultry By-Product |  |  |
| 3 | Fish Meal |  |  |
| 4 | Soybean Meal |  |  |
| 5 | Corn gluten feed |  |  |
| 6 | Krill Meal |  |  |

 **Q4**\ **Indicate False or True for the sentences; Correct the False sentence**  **(20 Marks**)

1. The essential amino acid composition of animal by-products meal is similar to that of whole-egg protein.
2. In any food web, energy is lost each time when one organism eats another organism.
3. Protein level is thought to increase more with blue than white light.
4. Wet fish product is acid-preserved before hydrolysis; it is called fish hydrolyzate. When it is hydrolyzed and then acidified for preservation, it is called fish silage.
5. Most of the lipids in rotifers are phospholipids and triacylglycerol.
6. Energy feedstuffs are those that contain more than 20% crude protein.
7. Four main groups have an important role among the plankton in the pond for fish production.
8. Animal by-product meals are good sources of lysine but poor sources of methionine and cysteine.
9. Green algae develop mainly in the winter.
10. The phytoplankton production can be 10-15% higher in unfertilized than fertilized ponds.

**Q5\** Make a diet for fish from two ingredients (Soybean meal (45% Crude Protein) and Maize (10% Protein) to obtain a total of 20% Crude Protein in the diet.

 **(20 Marks**)

***All the best***

***Assist. Prof. Dr. Rebin Aswad Mirza***