

18/11/13

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B.E./ B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOVEMBER 2013

AGRICULTURAL ENGINEERING BRANCH

FIFTH SEMESTER

AI 9304 – AQUACULTURE ENGINEERING

(REGULATIONS 2008)

11

Time: 3 hr

Answer All Questions

Part – A (10 x 2 = 20 marks)

Max Mark: 100

1. List the water and land based systems of aquaculture
2. Is it possible to construct aquaculture farm with areas with layers of organic soil over 0.60m. Write suitable reasons for your answer
3. If DO level in fish pond drops below 2mg/L what are the indications do you observe
4. While using feeding trays how do you avoid soil deterioration?
5. What are the characteristics of ideal bio filter media? The concentration of suspended solids entering the filter is 30mg/L. After the filter the concentration is measured as 10mg/L. Find the effectiveness of the filter
6. Write about wing walls
7. The fish size is 1500g, the water temperature is 25°C and the specific oxygen consumption is 3.5mgO₂/min/Kg fish. The oxygen concentration in fully saturated water is 10.8mg/L. The acceptable concentration in outlet is 7.0 mg/L. Calculate Q_{in}.
8. Write brief notes on gas bubble trauma in fish farming
9. In fish farm how do you improve farm productivity
10. Calculate the actual quantity of poison required for the pond (if length = 200m, breath = 75m, width = 3 m, depth = 3.5m, dose = 3ppm)

Part – B (5 x 16 = 80 marks)

11. Write elaborate notes on various sources of finance and insurance coverage in aquaculture enterprise. Explain the activities to be covered by the insured for risk management in aquaculture (16)
12. a. Why nitrogen is to be removed from fish ponds? Explain the various method by which nitrogen is removed from fish ponds (16)

OR

- b.i) Explain the need for aeration in aquaculture farms? Write notes on RAS? (8)
 - ii) The success of an aquaculture enterprise depends on selection of suitable site. Explain how it is possible. (8)

13. a. i) Write elaborate notes on pond management in fish culture (10)

ii) Explain the post harvest operations in fishing enterprise (6)

OR

b. From the given data calculate the profit, rate of return on initial cost, rate of return on operating cost, production, payback period, breakeven price and breakeven production

| 1. Initial cost | | | | |
|--------------------------|-------------------------------|---------------|----------------------|-------------------------|
| Item | Cost (Rs) | Economic life | Salvage value | Annual depreciation(Rs) |
| Pond construction | 1,00000 | - | - | - |
| Water supply systems | 40,000 | 10 | 0 | 4000 |
| Storage, workshop | 10,000 | 5 | 0 | 2000 |
| Nets | 2000 | 5 | 0 | 400 |
| Pumps | 5000 | 5 | 0 | 1000 |
| Others | 5000 | 5 | 0 | 1000 |
| 2. Annual Operation cost | | | | |
| Item | Quantity | Unit price | Total cost(Rs) | |
| Fry | 20,000 | 100 per 1000 | 2000 | |
| Feed | | 5 | 10,000 | |
| Electricity | | | 2000 | |
| Hired labour | 2 man-month | 10000 per man | 20,000 | |
| Others | | | 2000 | |
| 3. Fixed cost(Rs) | Land lease, maintenance etc., | | 45600 | |
| 4. Profit | Production - 20000 kg | Unit price 50 | Income(Rs) - 1,00000 | |

14. a. Explain the water quality requirements for catfish hatcheries and how the quality is being managed

OR

b.i) If sea water is the only source for the aquaculture system explain the possible ways by which the water is being drawn for growing fish (8)

ii) A 10cm sea water well is to be placed in a sand spit. The static level of the sea water in the ground is at above Mean Sea Level (MSL) and there is no fresh water present. The sand layer is believed to extend at least 50m below MSL. A maximum drawdown of 5m, the radius of influence of 25m and a tested soil hydraulic conductivity

of 10m/day are believed to be reasonable for the site. Calculate the maximum sustainable flow rate from the sea water well. (8)

15. a. Write notes on the construction of dike, water control structures and canals in aquaculture system. How do you calculate the design height of main, primary and secondary dikes?

OR

b.i) Write the differences between poly culture and integrated aquaculture system. Explain the benefits of integrated system over conventional system (10)

ii) Write notes on the need for using feeding trays and any five problems encountered while using feeding trays and suitable solutions (6)