Advanced Aquaculture Science

Aquaculture · Practice Test · 10 Questions

1. What is the primary physiological mechanism by which 'Integrated Multi-Trophic Aquaculture' (IMTA) reduces nutrient loading in surrounding ecosystems?

A) The use of biological filters such as seaweed and filter-feeding bivalves to sequester excess nitrogen and phosphorus
B) The application of UV sterilization to neutralize nitrogenous waste products
C) The implementation of closed-loop ozone oxidation cycles
D) The chemical precipitation of phosphates using lanthanum-modified bentonite

2. In salmonid aquaculture, what is the 'FCR' (Feed Conversion Ratio) typically influenced by in terms of thermodynamic efficiency?

A) The species' metabolic rate adjusted for ambient water temperature and dissolved oxygen saturation
B) The rate of photosynthesis within the cage structure
C) The ratio of artificial light to natural photoperiods
D) The concentration of antibiotics in the feed formulation

3. Which phenomenon describes the genetic risk posed by the escape of domesticated aquaculture species into wild populations?

A) Outbreeding depression leading to reduced fitness of the wild genotype
B) Increased heterosis enhancing the resilience of the local population
C) A reduction in polyploidization rates
D) A shift in sex determination ratios due to endocrine disruptors

4. What is a primary environmental concern associated with the use of 'copper-based antifouling' nets in marine finfish aquaculture?

A) The accumulation of heavy metals in the localized benthic sediment and toxicity to non-target sessile organisms
B) The accelerated corrosion of structural steel support cables
C) The excessive promotion of macroalgal blooms due to copper fertilization
D) The risk of permanent coral bleaching via hyper-oxygenation

5. In the culture of Penaeid shrimp, what is 'Biofloc Technology' (BFT) primarily utilized for?

A) The in-situ conversion of toxic nitrogenous waste into microbial protein that serves as supplemental feed
B) The rapid removal of carbon dioxide via hyper-aeration
C) The selective breeding of disease-resistant crustacean strains
D) The chemical stabilization of water pH during high-density stocking

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6. Which physiological condition is often triggered by 'super-saturation' of dissolved gases in aquaculture water supplies?

A) Gas Bubble Disease (GBD) leading to embolisms in fish gills and tissues
B) Chronic Hypoxia leading to metabolic acidosis
C) Osmotic shock due to sudden salinity fluctuations
D) Hyper-calcemia due to mineral precipitation in the scales

7. What defines the 'carrying capacity' of a coastal site used for open-net pen aquaculture?

A) The maximum biomass that can be supported without exceeding the environmental threshold for sediment organic enrichment
B) The total square footage of the leasing area permitted by maritime law
C) The maximum number of individual fish that can be harvested per annum regardless of size
D) The limit of feed distribution efficiency per unit of surface area

8. Why are 'triploid' oysters (Crassostrea gigas) preferred in many commercial aquaculture operations?

A) Because their sterility diverts energy from gametogenesis to somatic growth, increasing meat yield
B) Because they are immune to all known strains of Ostreid herpesvirus
C) Because they possess enhanced shell pigmentation for market differentiation
D) Because they grow slower, resulting in a denser and higher-quality shell

9. What is the role of 'corticosteroids' in the context of fish stress response in aquaculture?

A) They are the primary endocrine indicators of acute and chronic environmental stress in teleost fish
B) They act as growth stimulants when administered in low concentrations
C) They prevent the synthesis of cortisol in the adrenal glands
D) They are used to induce spawning in captive fish populations

10. How does high-density aquaculture contribute to 'eutrophication' in freshwater lakes?

A) Through the discharge of uneaten protein-rich feed and fish excretions containing reactive phosphorus and nitrogen
B) By depleting the lake's supply of dissolved oxygen through excessive fish respiration
C) By increasing the water turbidity which blocks sunlight from reaching benthic macrophytes
D) By altering the pH level of the water column through carbonic acid secretion

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