

2011

M.Sc.

3rd Semester Examination

**AQUACULTURE MANAGEMENT & TECHNOLOGY**

**PAPER—AMT-304**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**(Immunology, Vaccination and  
Diagnostic equipments)**

1. Write in brief on any four of the following : 2×4
- (a) What do you mean by Epitope and Paratope?
  - (b) Write a note on Phagocytosis?
  - (c) What do you mean by Sanitizer? Mention name of any four such products used in West Bengal.

(Turn Over)

- (d) Mention the organs and their functions in relation to teleostean fish immunity.
- (e) Enlist two Gram-positive and two Gram-negative probiotic bacteria used in aquaculture.
- (f) Write down the principle of RIA.
- (g) Mention the location and functions of hinge region of a  $I_g$  molecule.
- (h) Write down the important difference between light microscope and electron microscope.

2. Answer any *four* of the following : 4×4

- (a) Discuss about the protective barrier of fish against infection.
- (b) Write down the technique used in paper chromatography for qualitative and quantitative analysis of protein.
- (c) Enumerate the fish disease in relation to human health.
- (d) Discuss about different types of ELISA with diagram.
- (e) Add a note on the chemicals used in aquaculture and its impact on environment.

- (f) Write the principle of PCR and its application in aquaculture.
- (g) Briefly discuss about traditional medicines used in aquaculture.
- (h) Describe about the fish health certification and its necessity.

3. Answer any two of the following 8×2

- (a) (i) What do you mean by Oxygenerator? Enlist the different oxygenerators used in aquaculture with brand name and effective dosages.
- (ii) Briefly describe the benefits and doses of following chemicals used in aquaculture — Toximar, Agrimin, Hitek powder, Biocurb, Ex-Am.
- 3+5
- (b) (i) What do you mean by Live-attenuated Vaccines?
- (ii) Write down the advantage and disadvantages of Killed Vaccines.
- (iii) Add a note on mode of action of water and gut probiotics in fish.

2+2+4

- (c) (i) What do you mean by Immunostimulant?
- (ii) Enlist the immunostimulant commercially available for shrimp farming in India, with brand name and effective dosages.
- (iii) Add a note on the impact of antibiotics used in Shrimp farming pond.
- 1823008  
 $1\frac{1}{2}+2\frac{1}{2}+4$
- (d) (i) "All immunogens are antigen but some antigens are not immunogen" — Explain.
- (ii) Distinguish between immunogen and haptan.
- (iii) Discuss the cell mediated immunity in fish.

2+2+4

---