

2018

**AQUACULTURE MANAGEMENT**

[ **Honours** ]

**PAPER –III**

*Full Marks : 90*

*Time : 4 hours*

*The figures in the right-hand margin indicate marks  
Candidates are required to give their answers in their  
own words as far as practicable*

*Illustrate the answers wherever necessary*

[ **NEW SYLLABUS** ]

1. Answer any *ten* questions from the following : 2 × 10
- (a) Define microbes.
  - (b) What is co-enzyme ? Give two examples.
  - (c) Classify bacteria on the basis of structure.
  - (d) What is feed attractant ? Give four examples which are used in fish feed.

( Turn Over )

- (e) Define antinutritional factor. Give two examples with their sources.
- (f) What is epitope and paratope ?
- (g) Mention the important properties of a good fish feed.
- (h) Define NPU %.
- (i) What do you mean by autotrophic and heterotrophic bacteria ?
- (j) Mention the composition of Bristols solution. State its uses.
- (k) State the uses of Laminar air flow.
- (l) What do you mean by essential amino acid ? List few of them.
- (m) State about infectious and non-infectious disease.
- (n) What is preservative ? Mention two such names used in aquafeed preservation.
- (o) State the role of vitamin C in fish immunity.

GROUP – A

2. Answer any *two* questions from the following :

(a) (i) Why artificial feed is required in Aquaculture ?  $10 \times 2$

(ii) State about different live feed available for fish in nature.

(iii) Write down the feed and feeding habit of *Macrobrachium rosenbergii*.

(iv) Add a note on feeding practices of *Ctenopharyngodon idella*.  $2 + 3 + 2 \frac{1}{2} + 2 \frac{1}{2}$

(b) (i) What do you mean by nutritional bioenergetics ?

(ii) Write down the energy partitioning in fish nutrition.

(iii) Add a note on the effect of processing on different nutrients in food.  $2 + 5 + 3$

(c) (i) Enlist four bacterial diseases and four fungal diseases of *Penaeus monodon*.

(ii) Discuss in detail the prophylactic measure and other treatment of viral diseases of fish.

(iii) Add a note on nutritional diseases of fish. 4 + 3 + 3

(d) (i) Discuss in details the disease diagnostic approaches when fish is sick.

(ii) State about the life cycle of *Argulus*.

(iii) Add a note on epidemiology. 5 + 3 + 2

3. Answer any *one* question from the following :

15 × 1

(a) (i) How to calculate the growth rate of fish ?

(ii) Explain that FCR and PER are inversely proportional.

(iii) Discuss about different feed additives which are used in aqua feed.

(iv) Enumerate the role of probiotics in aquaculture. 3 + 3 + 5 + 4

- (b) (i) What do you mean by ectoparasite and endoparasite of fish.
- (ii) Mention the symptoms and treatment method of monogenean Trematode affected fish.
- (iii) State about non-specific immune system in fish.
- (iv) Add a note on different disease of *Litopenaeus vannamei*. 2 + 4 + 6 + 3

GROUP – B

4. Answer any two questions from the following : 10 × 2
- (a) (i) Discuss different classification of carbohydrate.
- (ii) Give structural idea about arachidonic acid and cephalin.
- (iii) Add a note on non-protein nitrogen. 4 + 4 + 2
- (b) (i) Discuss different enzymes which are involved in protein digestion in fish.

(ii) Write down the role of pH and temperature on enzyme kinetics.

(iii) Add a note on ATP production in TCA cycle. 3 + 4 + 3

(c) (i) Classify different types of media used in microbial test.

(ii) Differentiate virus from bacteria.

(iii) Discuss the role of temperature on bacterial growth.

(iv) Add a note on composition of gram staining. 3 + 2 + 3 + 2

(d) (i) Write a note on enzyme specificity.

(ii) Discuss indices of fish spoilage in details.

(iii) Add a note on auto-oxidation. 4 + 4 + 2

5. Answer any *one* question from the following :

(a) (i) What is biogeochemical cycle ? 15 × 1

( 7 )

(ii) State the role of microbes in nitrogen recycling in aquatic food chain.

(iii) Add a note on plate count method for bacterial growth study.  $2 + 8 + 5$

(b) (i) What is antigen and immunogen ?

(ii) Enlist different immunoglobulin present in fish.

(iii) Discuss in detail the cell mediated immunity.

(iv) Add a note on macrophages.  $2 + 3 + 8 + 2$

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