

FISHERIES SCIENCE

Paper—II

Time : Three Hours

Full Marks : 300

*Candidates should attempt Question No. 1 from Section-A and Question No. 5 from Section-B which are compulsory, and any **THREE** of the remaining questions, selecting at least **ONE** from each Section.*

All questions carry equal marks.

SECTION—A

1. Answer any **THREE** of the following :—

- (a) Give an account of molecular diagnostic technique used in aquaculture health management. 20
- (b) Enumerate the nutritional and environmental diseases in culturable fin-fish and shell-fish. 20
- (c) Elaborately write the technique of cryopreservation in fish spermatozoa. 20

- (d) Describe the methods of estimating biogrowth parameters in aquaculture systems. 20
2.
 - (a) Describe the practice of duck-cum-fish culture. Add a note on its economics. 30
 - (b) Write an account of culture of air-breathing fishes. 30
3.
 - (a) Discuss the different types of aquaculture based on their management. Give example for each type. 20
 - (b) Describe induced breeding in Indian major carps. 20
 - (c) What is the present status of seaweed culture in India ? 20
4.
 - (a) Give an account of ecofriendly shrimp farming technology. 20
 - (b) Discuss the importance of water quality parameters in culture and breeding of ornamental fishes. 20
 - (c) Enumerate the methods of formulation and preparation of supplementary feeds and their management. 20

SECTION—B

5. Answer any **THREE** of the following :—
- (i) What is HACCP ? Discuss its principles with reference to HACCP application in preparation of canned Tuna in brine. 20
 - (ii) Discuss the post mortem changes in fish with respect to rigor mortis, autolytic and microbial changes. 20
 - (iii) Write a note on packaging developed for fresh and processed seafoods. 20
 - (iv) Classify the fishing gears operated in India and explain in brief the care and maintenance of the fishing gears used. 20
6. (i) Give an account of chemical and biological hazards encountered in fish and fishery products. 30
- (ii) Discuss the quality specifications for above hazards prescribed by EU, USA and Japan. 30
7. (i) Write on the fatty acid composition of fish lipids with emphasis on the n-3 fatty acids. 20
- (ii) Explain the kinds of defects and spoilages encountered in canned seafoods. 20
- (iii) What do you mean by constant and falling rate of drying ? Describe briefly the modern and traditional methods of fish drying. 20

8. (i) What is freezing of fish ? Describe the fish/prawn freezing methods employed for achieving quick freezing. 20
- (ii) Write on the quality and biochemical changes associated with storage of frozen fishery products. 20
- (iii) Give an account of fat and water soluble vitamins. 20