

Time : 3 hours

Full Marks : 200

Instructions :

- (1) Answer all questions following the directions.
- (2) The figures in the right-hand margin indicate full marks for the questions.

SECTION—A

1. Give a brief account on the capture-based culture fisheries. 10

Or

Write about the prospects and challenges of species diversification in freshwater aquaculture in India.

2. Write short notes on the following (any five) : 2×5=10

- (a) Raceway aquaculture
- (b) Cage and pen culture
- (c) Recirculatory aquaculture system
- (d) Wastewater aquaculture
- (e) Biological filter
- (f) Cryopreservation
- (g) Osmoregulation in teleost

3. Write on any two of the following : 10×2=20

- (a) Prospects of cold-water fisheries in Arunachal Pradesh
- (b) Role of endocrine in gametogenesis in fish
- (c) Brief account of cold-water fish diseases and their preventive measures
- (d) Brood stock management of *Macrobrachium rosenbergii*

SECTION—B

(Fishery Biology)

4. Explain the countercurrent mechanism in teleost with proper diagram. 10

Or

What are different methods for age and growth determination of fish?

5. Write short notes on any *five* of the following : 2×5=10

- (a) Mangroves ecosystem
- (b) Pituitary gland
- (c) Reservoir fisheries management
- (d) Fly casting
- (e) Ornamental fishery resources of North-East India
- (f) MSY and MEY
- (g) Beel fisheries management

6. Answer any *two* of the following : 10×2=20

- (a) Write a brief note on *ex situ* and *in situ* conservation measures of fish germplasm.
- (b) Explain the digestive system of finfishes.
- (c) Explain the maturity stages of finfishes (both male and female).

SECTION—C

(Fishery Hydrography)

7. "Planktons are the basis of fish culture." Explain. 10

Or

Write a brief note on standard operating procedure for soil and water quality management in carp culture.

8. Write short notes on any *five* of the following : 2×5=10

(a) EIA

(b) Micronutrients role in aquaculture

(c) Biological productivity

(d) Harmful Algal Bloom (HAB)

(e) Methods of aquatic weed control

(f) Bioremediation

(g) Aquatic insects control

9. Define primary productivity. What are different methods used for estimation of primary productivity? Explain any one. 1+1+8=10

Or

Define ecosystem. What are different biotic and abiotic factors affecting the productivity of an ecosystem? Explain.

SECTION—D

(Fishery Technology)

10. Define radiation preservation. What are different advantages of this technology? 10
11. Write short notes on any *five* of the following : 2×5=10
- (a) IQF
 - (b) Mince-based fish products
 - (c) Smoked fish
 - (d) Canning
 - (e) Hook and lines
 - (f) Value addition
 - (g) Smoked fish preparation
12. Write different steps involved in postmortem changes in fish. 10

Or

Give a brief note on different traditional preservation techniques of fish prevailing in North-East India.

SECTION—E

(Fishery Economics and Management)

13. Write short notes on any *three* of the following : 5×3=15
- (a) Prevailing fish marketing system in India
 - (b) NFDB
 - (c) WTO
 - (d) Elasticity of demand and supply
 - (e) Capital budgeting