

CSM – 28/19
Fisheries Science
Paper – I

Time : 3 hours

Full Marks : 300

The figures in the right-hand margin indicate marks.

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and any **three** of the remaining questions, selecting at least **one** from each Section.*

SECTION – A

1. Answer any **three** of the following : $20 \times 3 = 60$
 - (a). What are the different types of migration in fish ? Discuss the various factors influencing migration of fish.
 - (b) What is binomial nomenclature ? Write the important identifying characters of different families of order Cypriniformes.

- (c) Discuss aquatic resource potential of India to promote fisheries and aquaculture.
- (d) Give an account of fisheries education and research in India.
2. (a) Discuss the different maturity stages of fish. 20
- (b) Write short notes on the following : 20
- (i) Commercially important crabs of Odisha
 - (ii) Cephalopods of India
 - (iii) Commonly available shrimps
 - (iv) Cladocerans and Calanoides as plankton
- (c) Give a brief account of biology of a typical fresh water prawn. 20
3. (a) Describe food and feeding habits of fin fish. 20
- (b) Write short notes on the following : 20
- (i) Vitamins
 - (ii) Enzymes
 - (iii) Procaryotic Cell
 - (iv) Nitrogen Cycle

- (c) Describe the role of fisheries and aquaculture in the context of fish for health and national economy of the country. 20
4. (a) Discuss fecundity of fish. Write the various factors influencing fecundity in fish. 20
- (b) Write short notes on the following : 20
- (i) Fish population models
 - (ii) Disaster awareness
 - (iii) Protein synthesis
 - (iv) Immunoglobulin
- (c) Discuss the concept of maximum sustainable yield and maximum economic yield. How remote sensing is useful to fisheries ? 20

SECTION – B

5. Answer any **three** of the following : $20 \times 3 = 60$
- (a) Classify reservoirs. Discuss the management measures needed to enhance fish production in reservoirs. –

- (b) Write short notes on the following :
- (i) Coral reefs
 - (ii) Food web
 - (iii) Benthos
 - (iv) El Nino
- (c) Discuss the status and potential of fisheries of flood plain wetlands and measures required to promote its fisheries.
- (d) Discuss, in brief, on bioaccumulation and biomagnifications.
6. (a) Write short notes on the following : 20
- (i) Mangroves
 - (ii) Fouling organisms
 - (iii) Organic pollutants
 - (iv) Tsunami
- (b) Discuss the various types of pollution in rivers.
How pollutants affect fishes ? 20
- (c) Give an account of different divisions in marine environment and topographic features of sea bottom. 20

7. (a) Write short notes on the following : 20
- (i) Principles of Fisheries Extension Education
 - (ii) Laws of Sea
 - (iii) Role of FFDA and BFDA
 - (iv) Reservoir Fisheries Policy of Odisha
- (b) Describe the status of Fisheries Cooperatives and measures required to develop it. 20
- (c) Give an account of the status of fisheries in EEZ of India and suggest management measures for developing its fisheries. 20
8. (a) Write short notes on the following : 20
- (i) Correlation
 - (ii) Design of experiment
 - (iii) Testing of hypothesis
 - (iv) Project planning
- (b) Discuss on status of inland and marine fish marketing in India and suggest measures for its development. 20
- (c) Write an essay on sewage treatment and effluent management. 20

