

CSM – 29 / 15**Fisheries Science****Paper – II***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 **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) Write about the disease development process in fishes.
 - (b) What are the principles of aquaculture ? Discuss about different types of culture practices with their production target.
 - (c) Describe in detail the nutrient management in a fish pond with diagram.
 - (d) What do you mean by induced breeding of fishes ? Discuss about different inducing agents used in the fish breeding.

2. (a) Write down the advantages and disadvantages of the following : 20
- (i) Organic fertilizer
 - (ii) Liming of pond
 - (iii) Dissolved Oxygen
 - (iv) Inorganic fertilizer
- (b) Write down the brief notes on the following : 20
- (i) Design and setting of aquaria for ornamental fishes.
 - (ii) Integrated fish based farming system.
 - (iii) Types of problem soil and their management of fish culture.
 - (iv) Biotechnological tools and techniques in fisheries.
- (c) Write about the feeding habits and nutritional requirement of cultivable fin fishes. Discuss about different feed ingredients used in fish feed preparation. 20
3. (a) Describe the major parasitic diseases of cultivable fishes and their remedial measures. 20

- (b) What do you mean by defense mechanism ?
Discuss detail about the defence mechanism of fishes. 20
- (c) What do you mean by probiotics ? Write about the vaccines and immunostimulants in aquaculture. 20
4. (a) Write about the soil and water quality criteria for freshwater aquaculture and their management strategies. 20
- (b) What do you mean by the nutritional diseases of fishes ? Discuss in detail the nutritional diseases of fishes and their remedial measures. 20
- (c) Write about the seed production and hatchery management of Indian major carps. 20

Section – B

5. Answer any **three** of the following : $20 \times 3 = 60$
- (a) Write about the care and preservation fishing gear.
- (b) What is fish spoilage ? Give an account of 'post-mortem' changes and 'rigor-mortis'.

- (c) What is preservation ? Why is it required ?
Give an account of principle of fish preservation and discuss about freezing and freeze drying.
- (d) Write about the food poisoning microbes in fishery products.
6. (a) What is fish oil ? Give the composition, source, extraction and economic importance of fish oils. 20
- (b) What is salting ? Why salting is required ? Describe the use of salt in various fish preservation technique. 20
- (c) Discuss the nutritive value of biochemical composition of fish flesh. Give an account of smoking of fish. 20
7. (a) Give an account of the following : 20
- (i) Fish protein concentrate
 - (ii) HACCP
 - (iii) Packaging materials used for fishery products
 - (iv) Care and maintenance of boats

- (b) Write about different modern commercial fishing methods. 20
- (c) Discuss about the yarn numbering system. Write about the natural and synthetic materials used in fishing gears. 20
8. (a) What do you mean by a gear ? Write about the active and passive fishing gears with diagram. 20
- (b) Write brief notes on the following : 20
- (i) Fishing effort of a gear
 - (ii) Fishing accessories and deck equipments
 - (iii) Handling and transportation of fresh fish
 - (iv) Value added fishery products
- (c) What is canning ? What are the containers used in canning ? Write about the steps of canning. 20

