(Theory Paper)

Paper Code : ZOO 402 (F)

(Fish Diversity And Aquatic Resources)

Full Marks – 80

Time – Three hours

The figures in the margin indicate full marks for the questions.

Attempt *all* questions.

1. Answer the following multiple choice questions : 1×6=6

(i) _____ is generally used by fish biologist as an indication of the health of a fish population.

(a) Hepatosomatic index

(b) Gonodosomatic index

(c) Condition factor

(d) Lenght weight relationship

(ii) Which one of the following is a meristic trait count in fish ?

(a) Pharyngeal teeth

(b) Branchiostegal rays

(c) Lateral line scales

(d) All of the above

(iii) Fish shoal because it

(a) increases swimming speed

(b) increased efficiency of food finding

(c) decreased reproductive success

(d) increased risk of predation

(iv) Which of the following is false about elasmobranchs ?

(a) Placoid scales

(b) Five to seven gill openings

(c) Lower jaw attached with either amphitylic or holostylic suspension

(d) None of the above

(v) Which of the following fish body part is used for the formation of isinglass ?

(a) Collagen of air bladder

(b) Scales

(c) Fat of liver

(d) Fins

(vi) Which of the following statement is true ?

(a) Lipophilic compounds are rarely taken up from the water via the gills in animals

(b) Bioaccumulation of lipophilic compounds does not depend on the temperature presence of humic acids and pH

(c) The lipophilicity of a compound has no affects whatsoever on its probability of bioaccumulation / bioconcentration

(d) The speed of uptake of hydrophilic toxicants is independent of the availability and affinity of carriers transporting the toxicant across the lipid barriers.

2. Answer the following very short type questions : 2×5=10

(a) What is meant by bundh breeding ?

(b) Differentiate between ostracoderms and placoderms.

(c) What are the main reasons for migration in fish ? How can the detrimental effects of dams on fish migration be mitigated ?

(d) Differentiate between curyphagous and stenophagous feeding habits in fish ?

(e) Define LD_{50} of a contaminant. What is its significance ?

3. Answer any *six* of the following questions : 5×6=30

(a) Describe the different meristic traits used in fish taxonomy.

(b) What are lungfishes ? Write the important characteristic features of lungfishes. 2+3=5

(c) Explain the different types of prey capture methods found in fish.

(d) Give the location and function of the following :

Gill rakers, Pharyngeal teeth, Soft fin rays, branchiostegal rays and otolith.

(e) Describe the various methods for determining age and growth in fish.

(f) What do you understand by the primary productivity of a pond ? How is the productivity of a pond measured ? 2+3=5

(g) Write short notes on bioindicators and biomarkers.

(h) What do you mean by shoaling behaviour of fish ? How are actinopterygians different form Sarcopterygians ? Give examples. 2+3=5

(i) How does the lipophilicity of a compound affect its probability of bioaccumulation / bioconcentration ?

4. Answer any *two* of the following long answer type questions : 10×2=20

(a) Differentiate between synergistic and additive interaction between toxins. Explain the different mechanisms by which agonism is achieved. 4+6=10

(b) What is meant by fishery by-products ? Describe in detail the different types of useful products from fish and their processing waste. 2+8=10

(c) What is the difference between isometric and allometric growth in fish ? What factors influence the growth of fish ? Describe in detail the length-weight relationship in fish. 3+3+4=10

5. Answer any *one* of the following very long type questions : 14×1=14

(a) Define acute toxicity. Explain the meaning of toxicokinetics. Describe in detail the process of the toxicokinetics of harmful chemicals by fish. 2+2+10=14

(b) Describe cold water fisheries in India mentioning the important cold-water resources and fish species both endemic and exotic to India.