

(d) Mention the principles of composite fish culture. Describe the composite fish culture of Indian and exotic carps.

2+8=10

(e) Write an essay on parental care in fishes.

(f) Discuss the fisheries laws and regulations in India.

(g) Elucidate in brief the induced breeding technique practised in Indian major carp.

(h) Give an account on different types of protozoan diseases found in fishes.

Total number of printed pages-12

3 (Sem-6/CBCS) ZOO HE 1/2

2022

## ZOOLOGY

(Honours Elective)

Answer the Questions from any one Option.

### OPTION-A

(Biology of Insecta)

Paper : ZOO-HE-6016

### OPTION-B

(Fish and Fisheries)

Paper : ZOO-HE-6026

Full Marks : 60

Time : Three hours

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

Contd.

**OPTION-A**

**(Biology of Insecta)**

Paper : ZOO-HE-6016

1. Choose the correct option : (Answer **any seven** questions)  $1 \times 7 = 7$

(i) Which of the following is not a characteristic of insects ?

- (a) Presence of ventral nerve cord.
- (b) Three pairs of jointed legs.
- (c) Body divisible into cephalothorax and abdomen.
- (d) Excretion by Malpighian tubules.

(ii) Moniliform antennae is found in

- (a) Termites
- (b) Ants
- (c) Grasshoppers
- (d) Dragonflies

(iii) The units of compound eyes in insects are

- (a) Ocelli
- (b) Ommatidia
- (c) Rhabdoms
- (d) Crystalline cones

(iv) The presence of two wings only is the characteristic of

- (a) Dipterans
- (b) Orthopterans
- (c) Hemipterans
- (d) Hymenopterans

(v) Crop is completely separated as a lateral diverticulum in the alimentary canal of

- (a) Cockroach
- (b) Beetle
- (c) Housefly
- (d) Termite

(vi) The primitive type of mouthpart from which other types developed in insects is

- (a) Biting and chewing type
- (b) Piercing and sucking type
- (c) Siphoning type
- (d) Chewing-lapping type

(vii) Spermatheca is found in

- (a) Male reproductive system
- (b) Female reproductive system
- (c) Spermatophores
- (d) Colleterial glands

(viii) Which of the following represents holometabolous metamorphosis ?

- (a) Egg → larva → adult
- (b) Egg → pupa → larva → adult
- (c) Egg → larva → pupa → adult
- (d) Egg → larva → pupa

(ix) Waggle dance for communication is performed by —

- (a) Alate termites
- (b) Drone honeybees
- (c) Queen honeybee
- (d) Forager worker honeybees

(x) Which of the following acts as vector for dengue fever ?

- (a) *Culex Pipiens*
- (b) *Aedes aegypti*
- (c) *Anopheles spp*
- (d) *Culex tarsalis*

2. Answer the following questions : **(any four)**

2×4=8

(i) Why is epicranial suture known as ecdysial cleavage line ?

(ii) Mention *any two* differences between aristate and stylate antennae.

(iii) Name the parts which are modified to form stylets in 'Piercing and sucking' type of mouthparts.

(iv) What is plastron in insects ? Mention its function.

(v) What are nephrocytes ? Mention their function.

(vi) What is hemimetamorphosis ? Give *one* example.

(vii) Name the hormone produced by prothoracic glands of insects and mention its one function.

(viii) What is procuticle ?

3. Answer the following questions : **(any three)**

5×3=15

(i) How do phytophagous insects select host plants ?

(ii) Describe the 'chewing and lapping' type of mouthparts in insects.

(iii) Write the functions of haemolymph in insects.

(iv) Describe briefly the mechanism of excretion in insects.

(v) Write briefly about the structure of wings in insects with a labelled diagram.

(vi) Why are mosquitoes considered as important insect-vectors ? Explain.

(vii) How does digestion of carbohydrates take place in insects ?

(viii) Give a detailed structure of an ommatidium with a labelled diagram.

4. Answer the following questions : **(any three)**

10×3=30

(i) Describe the male reproductive system of any insect with a labelled diagram. Mention the role of different parts in the system. 7+3=10

(ii) Describe the anatomy of various parts of the alimentary canal of insects with labelled diagrams.

(iii) Give an account of different types of legs in insects with their modification and adaptations.

(iv) Describe the social characteristics of insects with special reference to honeybees.

(v) What do you mean by open circulatory system ? Describe the structure and function of circulatory system in insects. 1+9=10

(vi) Describe the role of allelochemicals in insects-host plant mediation or interaction.

(vii) Give an account of central nervous system of insects with labelled diagrams.

(viii) Describe the structure and function of tracheal system of insects.

## OPTION-B

### (Fish and Fisheries)

Paper : ZOO-HE-6026

1. Fill in the blanks : **(any seven)**  $1 \times 7 = 7$
- In fishes fins are supported by fin rays or \_\_\_\_\_.
  - \_\_\_\_\_ scales are commonly found in elasmobranchs.
  - A vascular network called \_\_\_\_\_ is present under each gas gland.
  - A classic example of semelparous fish is \_\_\_\_\_.
  - The migratory fishes confined to the freshwater done are called \_\_\_\_\_.
  - The number of eggs ripened by a female fish during a spawning season is called as \_\_\_\_\_.
  - The Indian Exclusive Economic Zone (EEZ) is about \_\_\_\_\_ million sq.km. long in the sea.
  - The scientific name of grass carp is \_\_\_\_\_.
  - Biological filters are used in aquarium to remove \_\_\_\_\_.

(j) The infection dropsy disease in fishes is caused by \_\_\_\_\_.

2. Answer the following questions : **(any four)**  
 $2 \times 4 = 8$

(a) "Air bladder acts as hydrostatic organ"  
— Justify it.

(b) What are the specialized cells of the gills of fishes ?

(c) Write the functions of paired and unpaired fins.

(d) Give a brief note on hermaphroditism in fishes.

(e) Write the differences between extensive and intensive fish farming.

(f) Write a note on Isinglass.

(g) Give the reasons for spoilage of fishes.

(h) What strategies are adopted for gene transfer in transgenic fishes ?

3. Answer the following questions : **(any three)**  
 $5 \times 3 = 15$

(a) Give an account on Modern lung fishes.

(b) Describe briefly the mechano reception in fishes.

(c) Write a note on the fishing gears and crafts used in marine fisheries.

(d) Explain osmoregulation in elasmobranch.

(e) Describe briefly age determination in fishes.

(f) Write the biological significance of bioluminescence in fishes.

(g) What is remote sensing ? Mention its application in fisheries and aquaculture.  
 $1 + 4 = 5$

(h) Write the advantages and disadvantages of pen culture.  
 $2\frac{1}{2} + 2\frac{1}{2} = 5$

4. Answer the following questions : **(any three)**  
 $10 \times 3 = 30$

(a) Classify the fishes based on their feeding habit.

(b) Describe the mechanism of gill respiration in teleosts fishes with suitable diagram.

(c) Define migration. Explain anadromous and catadromous migration with suitable examples.  
 $2 + 8 = 10$