

SEMESTER – VI

Paper-I : Aquaculture and Pest Management-I

External Marks : 40

Internal Assessment: 10

Time allowed : 3 Hours

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.5 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight, four questions are to be set from each section A & B, possibly splitting them in parts. Candidates are required to attempt four questions, two from each section.

SECTION-A

1. **Introduction to world fisheries:** Production, utilization and demand.
2. **Fresh Water fishes of India:** River system, reservoir, pond, tank fisheries; captive and culture fisheries, cold water fisheries.
3. Fishing crafts and gears.
4. Fin fishes, Crustaceans, Molluscs and their culture.

SECTION-B

Study of important insect pests of crops and vegetables:

5. **Sugercane:**
 - (a) Sugercane leaf-hopper (*Pyrrilla perpusilla*)
 - (b) Sugercane Whitefly (*Aleurolobus barodensis*)
 - (c) Sugercane top borer (*Sciropophaga nivella*)
 - (d) Sugercane root borer (*Emmalocera depresella*)
 - (e) Gurdaspur borer (*Bissetia steniellus*)

With their systematic position, habits and nature of damage cause. Life cycle and control of *Pyrrilla perpusilla* only.

6. **Cotton:**
 - (a) Pink bollworm (*Pestiphora gossypifolia*)
 - (b) Red cotton bug (*Dysdercus Cingulatus*)
 - (c) Cotton grey weevil (*Mylocerus undecimpustulatus*)
 - (d) Cotton Jassid (*Amrasca devastans*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pectinophore gossypiella*.

7. **Wheat:**

Wheat stem borer (*Sesamia inferens*) with its systematics position, habits, nature of damage caused. Life cycle and control.

8. **Paddy:**

- (a) Gundhi bug (*Leptocorisa acuta*)
- (b) Rice grasshopper (*Hieroglyphus banian*)
- (c) Rice stem borer (*Scirpophaga incertulus*)
- (d) Rice Hispa (*Diceladisa armigera*)

With their systematic position, habits and nature of damage caused. Life cycle and control of *Loptocorisa acuta*.

9. **Vegetables:**

- (a) *Raphidopalpa faveicollis* – The Red pumpkin beetle.
- (b) *Dacus cucurbitas* – The pumpkin fruit fly.
- (c) *Tetranychus tecarius* – The vegetable mite.
- (d) *Epilachna* – The Hadda beetle

Their systematics position, habits and nature of damage caused. Life cycle and control of *Aulacophora faveicollis*.

SEMESTER – VI

Paper-II : Aquaculture and Pest Management-II

External Marks : 40

Internal Assessment: 10

Time allowed : 3 Hours

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1. Question 1 is compulsory consisting of 10 parts (1.5 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight, four questions are to be set from each section A & B, possibly splitting them in parts. Candidates are required to attempt four questions, two from each section.

SECTION-A

1. **Seed production:** Natural seed resources – its assessment, collection, Hatchery production
2. **Nutrition:** Sources of food (Natural, Artificial) and feed composition (Calorie and Chemical ingredients).
3. **Field Culture:** Ponds-running water, recycled water, cage, culture; poly culture.
4. **Culture technology:** Biotechnology, gene manipulation and cryopreservation of gametes.

SECTION-B

5. **Stored grains:**
 - (a) Pulse beetle (*Callosobruchus maculatus*)
 - (b) Rice weevil (*Sitophilus oryzae*)
 - (c) Wheat weevil (*Trogoderma granarium*)
 - (d) Rust Red Flour beetles (*Tribolium castaneum*)
 - (e) Lesser grain borer (*Rhizopertha dominica*)
 - (f) Grain & Flour moth (*Sitotroga cerealella*)

Their systematic position, habits and nature of damage caused. Life cycle and control of *Trogoderma granarium*.

6. **Insect control:** Biological control, its history, requirement and precautions and feasibility of biological agents for control.
7. **Chemical control:** History, Categories of pesticides. Important pesticides from each category to pests against which they can be used. Insect repellants and attractants.
8. Integrated pest management.
9. Important bird and rodent pests of agriculture & their management.

B.Sc. Part-III

Paper-III : PRACTICAL

Max. Marks : 100
Time allowed : 6 Hours
(2 Session M&E)

1. External morphology, identification marks, nature of damage and host of the following pests:-
 - (i) **Sugarcane** : Sugarcane leaf-hopper, Sugarcane whitefly, Sugarcane top borer, Sugarcane root borer, Gurdaspur borer (any two).
 - (ii) **Cotton**: Red Cotton bug
 - (iii) **Wheat** : Wheat stem borer
 - (iv) **Paddy** : Gundhi bug, Rice grasshopper, Rice stem borer, Rice hispa (any one).
 - (v) **Vegetables**: *Aulocophora faveicollis*, *Dacus cucurbitas*, *Tetranychus tecarius*, *Epilachna* (any three).
 - (vi) **Pests of stored grains**: Pulse beetle, Rice weevil, Grain & Flour moth, Rust-red flour beetle, lessergrain borer (any three).
2. Stages of life history of silk moth and honey bee.
3. Identification of *Catle*, *Labeo rohita*, *L. calbasu*, *Cirrhius*, *mrigala* *Puntius sarana*, *Channa punctatus*, *C. marulius*, *C. stariatus*, *Trichogaster fasciata*, *Mystus seenghala*, *M. cavasius*, *M. tengra*, *Callichrous pabola*, *C. bimaculatus*, *Wallago attu*, *Prawns*, *Crabs*, *Lobsters*, *Calms*, *Mussels & Oysters*.
4. Chemical analysis of pond water and soil for pH, dissolved oxygen, free CO₂ nitrates, phosphates and chlorides.
5. A study of the slides of fish parasites.
6. A study of the different types of nets, e.g., cast net, gill net, drift net and drag net.
7. A visit to lake/reservoir/fish breeding centre.
8. Adaptative modifications in feet and breaks of birds.
9. Preparation of permanent/temporary slides of developmental stages of frog/mosquito.
10. Study of permanent slides of WM of chick embryo (13-18h, 24-36h, 36-48h, 48-72h).
11. Window preparation and identification of stages of development in chick egg.
12. **Histology**: Preparation of permanent histological slides of testis, ovary, kidney, intestine, live of rat (H and E staining).

