ICAR AIEEA PG 2025 Entomology and Nematology Question Paper With Solutions

Time Allowed :120 Minutes	**Maximum Marks :**480	**Total questions :**120

General Instructions

Read the following general instructions carefully and adhere to them strictly:

1. **Duration of the Exam:** The total duration of the examination is 2 hours and 30 minutes.
2. **Total Marks:** The question paper carries a total of 480 marks.
3. **Number of Questions:** The paper contains 120 multiple-choice questions (MCQs)
4. **Question Paper Format:**
   - All questions are compulsory unless otherwise instructed.
   - Each question has four options, out of which only one is correct.
5. **Mode of Examination:** The examination is conducted in online mode (Computer-Based Test).
6. **Marking Scheme:**
   - Each correct answer carries 4 marks.
   - 1 mark will be deducted for each incorrect answer.
   - No marks will be awarded or deducted for unattempted questions.
7. **Medium of Paper:** The question paper will be bilingual (English and Hindi), except for the language section (if applicable).
8. **Electronic Devices:** Use of calculators, mobile phones, smartwatches or any electronic gadgets is strictly prohibited.

1. Which of the following is the vector of the rice tungro virus?

(A) Nilaparvata lugens

(B) Nephotettix virescens

(C) Sogatella furcifera

(D) Laodelphax striatellus

Correct Answer: (B) Nephotettix virescens

Solution:

Rice tungro disease is a significant viral disease affecting rice crops in Asia. It is caused by a combination of two viruses: Rice tungro bacilliform virus (RTBV) and Rice tungro spherical virus (RTSV). The green leafhopper, *Nephotettix virescens*, is the primary vector transmitting these viruses. The insect acquires the virus by feeding on infected plants and then transmits it to healthy plants during subsequent feedings.

Quick Tip

Remember: *Nephotettix virescens* = Green leafhopper = Rice tungro virus vector.

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2. The term 'hypermetamorphosis' refers to:

(A) Complete metamorphosis with similar larval stages

(B) Incomplete metamorphosis with aquatic nymphs

(C) Complete metamorphosis with dissimilar larval stages

(D) Direct development without metamorphosis

Correct Answer: (C) Complete metamorphosis with dissimilar larval stages

Solution:

Hypermetamorphosis is a type of complete metamorphosis where the insect undergoes several larval stages that differ significantly in form and function. This phenomenon is observed in certain beetles, such as those in the family Meloidae (blister beetles). The first instar larva, called a triungulin, is active and mobile, while subsequent larval stages are typically grub-like and sedentary.

Quick Tip

Hypermetamorphosis = Multiple distinct larval forms in complete metamorphosis.

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3. Which nematode is known for causing 'root-knot' disease in plants?

(A) Heterodera avenae

(B) Meloidogyne incognita

(C) Pratylenchus penetrans

(D) Ditylenchus dipsaci

Correct Answer: (B) Meloidogyne incognita

Solution:

Meloidogyne incognita, commonly known as the root-knot nematode, is a plant-parasitic nematode that induces the formation of characteristic galls or "knots" on the roots of infected plants. These galls interfere with the plant's ability to absorb water and nutrients, leading to stunted growth and yield losses. Management includes crop rotation, resistant varieties, and nematicides.

Quick Tip

Root-knot nematode = *Meloidogyne incognita*.

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4. The 'sterile insect technique' (SIT) is primarily used for:

(A) Enhancing pollination efficiency

(B) Biological control of weeds

(C) Controlling insect pest populations

(D) Improving insecticide resistance

Correct Answer: (C) Controlling insect pest populations

Solution:

The sterile insect technique involves mass-rearing and sterilizing male insects, typically through irradiation, and releasing them into the wild. When these sterile males mate with

wild females, no offspring are produced, leading to a gradual decline in the pest population. SIT has been successfully used against pests like the Mediterranean fruit fly and screwworm fly.

Quick Tip

SIT = Release of sterile males to reduce pest populations.

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5. Which of the following is a characteristic feature of entomopathogenic nematodes?

(A) They are obligate plant parasites

(B) They have a symbiotic relationship with bacteria

(C) They reproduce only in aquatic environments

(D) They are vectors of plant viruses

Correct Answer: (B) They have a symbiotic relationship with bacteria

Solution:

Entomopathogenic nematodes (EPNs), such as those in the genera *Steinernema* and *Heterorhabditis*, are known for their symbiotic relationship with specific bacteria (*Xenorhabdus* and *Photorhabdus*, respectively). These nematodes infect insect hosts and release their symbiotic bacteria, which kill the host and create a suitable environment for nematode reproduction.

Quick Tip

EPNs + Symbiotic bacteria = Effective biological insect control.

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6. Which insect order is characterized by the presence of halteres?

(A) Lepidoptera

(B) Coleoptera

(C) Diptera

(D) Hymenoptera

Correct Answer: (C) Diptera

Solution:

Dipterans, commonly known as true flies, possess a single pair of functional wings. The second pair of wings is modified into small, club-like structures called halteres. These halteres act as gyroscopic organs, helping the insect maintain balance and stability during flight.

Quick Tip

Diptera = One pair of wings + Halteres for balance.

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7. The term 'quiescence' in insects refers to:

(A) A genetically programmed dormancy period

(B) A temporary halt in development due to unfavorable conditions

(C) A period of increased metabolic activity

(D) The pupal stage in holometabolous insects

Correct Answer: (B) A temporary halt in development due to unfavorable conditions

Solution:

Quiescence is a state where insect development is temporarily halted due to immediate unfavorable environmental conditions, such as extreme temperatures or lack of food. Unlike diapause, quiescence is not hormonally controlled and resumes once favorable conditions return.

Quick Tip

Quiescence = Immediate response to stress; development resumes with favorable conditions.

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8. Which of the following nematodes is known to cause 'yellow ear rot' in wheat?

(A) Anguina tritici

(B) Heterodera avenae

(C) Pratylenchus thornei

(D) Ditylenchus dipsaci

Correct Answer: (A) Anguina tritici

Solution:

Anguina tritici, also known as the wheat seed gall nematode, infects wheat ears, leading to the formation of galls that replace normal grains. This results in the 'yellow ear rot' disease, characterized by discolored and deformed ears, leading to significant yield losses.

Quick Tip

Anguina tritici = Wheat seed gall nematode = Yellow ear rot in wheat.
