



Chhatrapati Shahu Ji Maharaj  
University, Kanpur

**Answer Script Details**  
**Barcode** 7884895

**Roll No.** 22031000195  
**Total Mark** 41/50.00

**Exam** BACHELOR OF SCIENCE (AG)\_DEC-2023  
**Subject** AG3011 - FUNDAMENTALS OF ENTOMOLOGYII (NEW)

**Question wise Mark Summary**

**Q.No Mark Q.No Mark Q.No Mark Q.No Mark**

1A 4/5

1B 4/5

1C 4/5

1D 4/5

1E 4/5

1F 4/5

2 NA/10

3 NA/10

4 9/10

5 NA/10

6 8/10

7 NA/10

8 NA/10

9 NA/10

# Chhatrapati Shahu Ji Maharaj University Kanpur, Uttar Pradesh

PART-I

Date of Exam: 23/01/24 Shift: II (A-L) Roll No.: 55  
 Paper Code: AG-3011 Subject: Fundamentals of Entomology - II 3<sup>rd</sup>  
 Name of Candidate: Kumar Vaibhav  
 Roll No.: 22031000195

Signature of Candidate: *[Signature]*  
 Signature of Investigator: *[Signature]*  
 COE Facsimile: *[Signature]*

**PART-II**

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
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(b)										
(c)										
(d)										
(e)										
(f)										
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(i)										
(j)										
Total										
Total Marks in Figures						Max. Marks				
Total Marks in Words										



AG3011  
Paper Code

Signature of Evaluator

Course: BSc (Ag) 3<sup>rd</sup> Sem  
 Session: 23-24 Year/Semester: 3<sup>rd</sup>  
 Subject Name: Fundamentals of Entomology - II  
 Medium: English  Hindi   
 Paper Code: AG3011  
 Exam Date: 23/01/2024  
 Name of Candidate: KUMARVAIBHAV  
 Father's Name: VINDOKUMARVERMA

कॉलेज का कोड  
College Code

एग्जाम सेंटर का कोड  
Exam Centre Code

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एग्जाम का प्रकार  
Type of Exam

Regular  
 Private  
 Open School Ex-Student  
 Back Paper Exam

ANSWER BOOKLET NO.

7884895

AG3011  
Paper Code

Enrollment Number: CSJMA22000040712  
 Candidate's Roll Number: 22031000195  
 Paper Code: AG3011

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Signature of Candidate: *[Signature]*

Signature of Investigator: *[Signature]*

C S Facsimile

COE Facsimile: *[Signature]*

नोट- 1. परीक्षार्थी को निर्दिष्ट किया जाता है कि आवरण वाले को पूरा भंग पर उचित सभी निर्देशों को सावधानीपूर्वक पढ़ें।  
 2. कोडिंग में भ्रम होने वाली प्रतिलिपि सभी ताल से शुद्ध की जाये। 3. गोली को जाने या गोले खोलने से भ्रम जाये।

### INSTRUCTION TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

### INSTRUCTION TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below, blacken the circles completely.



4. Make no Stray marks on this sheet.

**5. DO NOT WRITE OR MARK ON THE BAR CODE.**

### IN ORDER TO AVOD UFM ( UNFAIR MEANS ) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/electronic/digital/ watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

### अनुचित साधन से बचने हेतु :

1. उत्तर पुस्तिका के निर्दिष्ट स्थान को खोलकर अनुक्रमिक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखें तथा कोई भी चिह्न न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बायकोड अथवा उत्तर पुस्तिका संख्या पर छेद छद् करने पर अनुचित साधन प्रयोग माना जाएगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए प्रश्नपत्र के टुकड़े, मोबाइल, डिजिटल डायरी, डिजिटल वॉच, कांपी, प्लम्बक या कभी कालुं जो अनुचित साधन के अन्तर्गत आते हैं। केवल संश्लिख प्रश्नपत्र में ही वैयक्ती लेख साइडिफिक कंप्यूटरीटर ले जाने की अनुमति होगी।
4. उत्तर पुस्तिकाओं में रूपरे न लसे न ही उत्तर पुस्तिका में चिह्नबर्दी। ऐसा करण अनुचित साधन प्रयोग की परिधि में आता है।

### उत्तरपुस्तिकाओं को भिन्न लिखें

1. प्रश्नपत्र एवं उत्तर पुस्तिका पर दिने चर्ने निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दृश्यी लक्ष कुक न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनो लक्ष लिखें।
4. प्रश्नपत्र पर अपने अनुक्रमांक के अधिलिख कुक न लिखें।
5. प्रश्नपत्र कोड एवं प्रश्नपत्र ID सारकानी पूरक लिखें।
6. अपनी तिथि स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ ( 1-24) से कम है या चटे हुए है, तो शुरु होने के पूर्व दृश्यी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र को विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उत्तर ले पीछे होने से 20 मिनट के अन्दर उस त्रुटिका को सारकाल सुचित की, उसके बाद विषयविशालय द्वारा कोई चर्ने की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न कीं।
10. कौी कौी का अधिलिख चर्क नहीं लिख जायेगा।

### INSTRUCTION TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages ( 1-24) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Name, and Question of the Question Paper during first THIRTY MINUTES of commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in status as Carry Over. Those appearing as Ex- Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

### INSTRUCTION TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numerals in  Boxes.
2. Use blue or black ball point pen for filling the circles.

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4	4	4	4	4	●	4	4	4	4	4
5	5	5	5	●	5	5	5	5	5	5
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Note- If your Roll No. is of 10 digits. Please leave first three columns .



Paper Code

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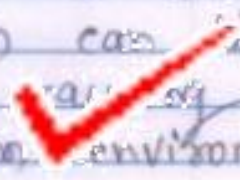
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-: Section - A :-

-: Ans-1 :-

-: Ans-1(A) :-

According to National Academy of Science (N.A.S.) :-

"Integrated pest control and pest management is pest management in which all necessary and available techniques should be consolidated in a unified programme so that pest population can be managed below the level which <sup>avoid the</sup> ~~causes~~ economic injury & <sup>adverse</sup> effect on environment." 

should be



## -! Ang-2(B) :-

Classification of Insects according to food or Nutritional Requirement :-

### 1- Omnivorous :-

Insects which feed on both plants as well as animals. eg - Ant, mollusca, flies etc.

### 2- Carnivorous :-

Insects which feed on only animals. eg - NFE (predator)  
• Seven spot lady bird beetle (*Coccinella septempunctata*)

### 3- Herbivorous :-

Which feed on plants.

They

are categorized :-

#### 1- Polyphagous :-

Insects which feed wide range of cultivated and wild species of plants. eg -

Cotton bollworm (*Helioverpa armigera*), Termite, Grasshopper, Root hairy caterpillar (*Amorcanth albistriga*)  
Bihar hairy caterpillar (*Spilosoma obliqua*)



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### ii. Oligophagous :-

Insects which feed on only "one botanical family" plants. eg -

Diamond back moth (*Plutella maculipennis*) and cabbage butterfly (*Pieris brassicae*) on brassicae family.

### iii. Monophagous :-

Insects which feed on only plants of one species. eg -

Rice stem borer (*Scirpophaga incertulas*), Mango leaf hopper (*Amirtoduy coliksoni*).

### :- Ang-L(C) :-

### Symbiosis :-

It is a type of mutual relationship in which both the insects are benefitted by their interaction, the organisms involved in symbiosis, is called symbionts.

But sometimes it can be negative symbiosis too.

- It can be intraspecific relationship between individuals of same species) eg -



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relation of 2 sexes, worker, soldier, 'parental care' in termite colony. and also can be interspecific (relation between different species organisms). eg-

Trichonympha sp. in mycetocyte cells of termites.

### Commensalism :-

It is the relationship of individuals of different species (interspecific) where one organism is benefitted (to the ~~benefit~~ <sup>advantage</sup> of another organism is harmed) without leaving any harmful effect on another organism. is called commensalism.

The organism/insect com. inside the insect on the insect body. They lived on waste material etc of hosts.

When the commensal used their host for the purpose of transportation, the phenomenon is called phoresy.



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Q. Any - 1 (0) :-

**Damage Boundary (D.B.) :-**

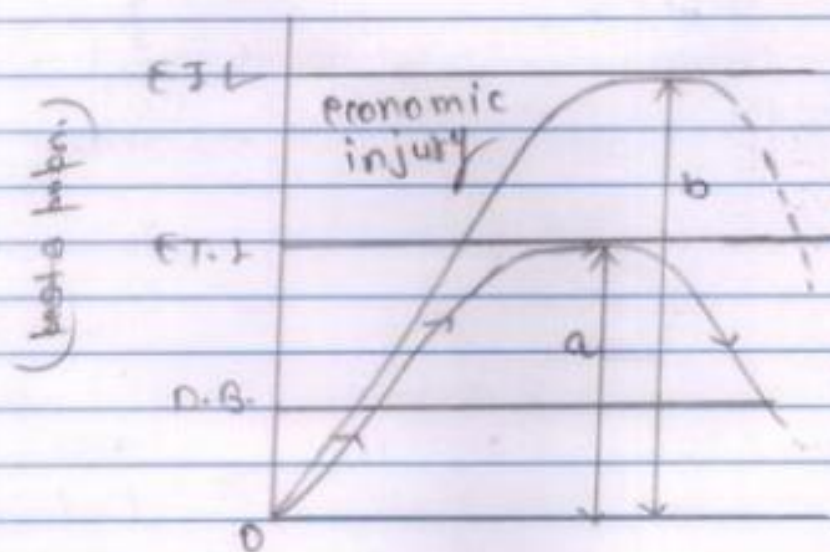
Lowest population of insect-pest level where damage can be measured is called damage boundary.

**E.T.L. :-**

E.T.L. stands for economic threshold level. The lowest population level of insect-pests where control measure should be initiated, is called E.T.L.

**E.I.L. :-**

E.I.L. is stand for economic injury level. The lowest population level of insect pest which cause economic injury. No need to start any control measure due to economic loss.



a = popn. reach E.T.L. so control measure should be initiated, not to become reach popn. at economic injury level.

Time →



b = Economic injury is above, no need to start del measure

### -o Ans-1 (E) :-

#### Formulation of Insecticide

##### 1- Solid :-

Formulation Name	Toxicity	Concentration	Example
Dust (Insecticide + inert matter)	0.15 - 25%	1 - 40 $\mu$	Endosulfan 10% D
Granules	2 - 10%	250 - 2400 $\mu$	phoxat, carbosulfon
Wettable Powder (WP) or is diluted with water	4 - 95%	-	Carbofuran

(Insecticide + inert matter)  $\rightarrow$  time  $\rightarrow$  flower etc  
 (Insecticide + inert matter + surfactants)  $\rightarrow$  (अवसाधक + अकारक + सफाईक)

##### 2- Liquid

Name	Toxicity	Example
EC (Emulsifiable concentration)	2.5 - 100%	Rimon 10 EC Endosulfan 10 EC




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- ii WDG (Water dispersible granule)
- iii Suspensible concentration (SC)
- iv Suspensible liquid (SL)
- v

∴ Ans-1 (F):-

Precaution should be adopted for safe use of (fungi) insecticide:-

- i We should use economic  household conc. of insecticide, that doesn't leave harmful effect on environment
- ii We should separate cloths, equipment for uses of insecticide.
- iii Spray solution should be mixed only at the time of spraying & not before.
- iv Insecticide should be stored at the place, reach out of children.
- v We don't use repeat application of one insecticide if pest is not controlled.
- vi We should use personal apparel (cloths, masks, socks etc.) for safe use.

Do Not Write anything in this Portion



Paper Code

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8

X



## Section - B :-

### Ans - 4 :-

Classification of Insecticides on the basis of mode of entry / Application.

Stomach poison	Contact Insecticide	Systemic Insecticide	Fumigants
<p>1. Arsenical Compound</p> <p>→ Sodium arsenate</p> <p>→ Lead arsenate</p> <p>→ Calcium arsenate</p> <p>→ Arsenic oxide</p>	<p>1. Organophosphates (non-systemic)</p> <p>→ TEPP</p> <p>→ DDVP</p> <p>→ Roachon etc</p> <p>2. Botanical Insecticide</p> <p>→ Nicotium glaucum (extracts from seed)</p> <p>→ Zingiber officinalis (Rhizome)</p> <p>→ Pyrethrum → from (chrysanthemum flower cinerifolium)</p> <p>→ Nicotine from (Nictiana tobacum)</p>	<p>1. Organophosphates (Systemic)</p> <p>→ Monocrotophos</p> <p>→ Chlorpyrifos</p> <p>→ Malathion</p> <p>→ Cyfluthrin</p> <p>→ Demeton-O methyl</p> <p>→ Dimethoate</p> <p>2. Carbamates (Systemic)</p> <p>→ Carbendazim</p> <p>→ Carbosulfen</p> <p>→ Aldicarb</p> <p>→ Triazophos</p> <p>→ Methidathion</p> <p>3. Cholinesterase Inhibitors</p> <p>→ DDT</p>	<p>→ Grain fumigant</p> <p>→ MB (methyl Bromide)</p> <p>→ Oxone deployed</p> <p>→ EDB (Ethylene dibromide)</p> <p>→ Carbofuran chlozole (CT)</p> <p>→ ED/CT (3:1) mixture</p> <p>→ Celphos (Aluminium phosphide)</p> <p>→ 9 gm tablet containing 1 gm phosphine gas release.</p>
<p>2. Fluorine Compound</p> <p>→ Sodium fluoride</p> <p>→ Sodium fluorosilicate</p> <p>→ Cryolite</p>	<p>3. Organo phosphates (non-systemic)</p> <p>→ TEPP</p> <p>→ Tetra ethyl</p>		



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→ DVP (Dimethyl Varyl phosphate)	→ Nornitren (Nicotino Sylvestris)	→ BHC (Benzene hexachloride)	→ Cyngay (Rat fumigant) → Contain HCN gas
→ methyl parathion	→ Rotenone (Derris elliptica) from roots		→ Para dichloro benz → Carbondisulphide (CS <sub>2</sub> )
→ Parathion			→ chloropicrin - (tear gas) (Nitrochloroform)
→ Clothion			
→ Phorate			
→ Chlorpyrifos	→ NSK 6 (Azadirachtin indica) from leaf		
→ Malathion			
→ Quinalphos			
<b>1. Carbamate (non- systemic)</b>	→ PTH (Inhibitor)		
→ <del>Carbaryl</del> Carbaryl	→ Ricinine (Ricinny communis) from seed		
→ Imidacloprid			
→ Azinphos ↓ (Baygon - used to kill household insect - mosquito, housefly, cockroach)	→ Quassin (Quassia arnata) from bark of tree		

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## According to Mode of Action :-

### 1. Physical poison :-

- Activated clay
- Petrolcum oil

### 2. Protoplasm poison :-

- Arsenical compound
    - Sodium arsenate
    - Calcium arsenate
    - Arsenious oxide
  - Fluorine compound
    - Cryolite
    - Sodium fluosilicate
  - mercuric chloride etc
- 

### 3. chitin synthesis inhibitor :-

- Diflubenzuron
- teflubenzuron
- Flufenoxuron
- Novaluron

### 4. Nerve poison :-

#### ↳ Axonic poison :-

- DDT & BHC
- Fipronil  
(Trade Name - Regent)

GABA receptor is the target site of fipronil

- Synthetic pyrethroids



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→ Fenitrothion

Synaptic poison :-

A. Organophosphates & Carbamate group of insecticides

B. Thiometoxam

C Imidacloprid → (to ✓ to bird) of

D Thiocloprid (Sucking pest - aphid against)

E - Methomyl (cause dizziness, nausea in insect pests)

F clothianidin

⇒ chitin synthesis inhibitor block the formation of chitin, disrupt the moulting

⇒ Nerve poison bind to the GABA protein & AChE, so transmission of information is stopped or hyperexcitation of neurons.



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Section - C :-

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Attractants :-

(Natural or synthetic) food, shelter and oviposition sites. Attractants are chemical compounds that attract insects.

मुख्यतः निम्न प्रकार के होते हैं -

- i. Pheromone
- ii. Bait trap
- iii. Oviposition lure
- iv. Feed lures

Pheromone :-

term coined by Pheromone is a mixture of chemicals produced by one sex of opposite gender to attract the opposite sex.

Classification of Pheromone :-

on the basis of sex →

Female Sex Pheromone :-

These are produced by the female to attract the same species male. The direction of it is toward the air currents.



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The range of female sex pheromone is wider than male sex pheromone.

The <sup>only</sup> attraction of male is depend upon the threshold concentration of released pheromone.

eg -

Bombycol - *Bombyx mori* (Mulberry silkworm)  
Gyphure - *Perithousa dispar* (Gypsy moth)  
Glossyplure - *Pectinophora gossypiella* (Pink bollworm)  
Terimidlure - *Spodoptera litura*  
Litlure - *Spodoptera litura*  
Cuelure - *Batocera cucurbitae*

Amplure - *Triplasia ni*.

## 2. Male Sex pheromone :-

eg - aphid → Terpene  
Ant → formic acid

## According to activity :-

1. Release pheromone → affect behaviour of insect. (tactile organ receives)
2. Beimer pheromone → affect physical activity of insect. (olfactory organ receive).
1. Trail pheromone → foraging ants & formic acid.



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5 Alarm pheromone →

to forewarn the  
another member of colony termites  
soldier produce methyl acetone.



6

Role of Pheromone :-

i ये कीले को आकर्षित करने के लिए  
प्रयोग किया जाता है।

ii यह इनका प्रयोग किया जाता है ताकि  
कीले को collect करके उन्हें

हटा सके या mechanical equipment  
से kill कर सकें।

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