Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Science

End Sem Examination Dec 2024

FS3EG03 Entomology

Programme: B.Sc. (Hons.) Branch/Specialisation: Forensic Science

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Forensic entomology is most useful in cases of: (a) Acute poisoning (b) Decomposed bodies (c) Heart attacks (d) Drowning	**1**	2	1	1	
	ii.	Which of the following insect orders includes species like flies and mosquitoes, which are used in forensic entomology? (a) Coleoptera (b) Lepidoptera (c) Diptera (d) Orthoptera	**1**	2	2	1	
	iii.	The exoskeleton of an insect is made of a substance called: (a) Collagen (b) Chitin (c) Keratin (d) Calcium carbonate	**1**	2	1	2	
	iv.	Beetles belong to the order: (a) Coleoptera (b) Diptera (c) Hymenoptera (d) Orthoptera	**1**	2	1	2	
	v.	In insects, which system is responsible for transporting hormones and nutrients throughout the body? (a) Circulatory system (b) Respiratory system (c) Excretory system (d) Nervous system	**1**	2	1	3	

vi.	Which of the following is a common type of asexual reproduction in insects? (a) Parthenogenesis (b) Fertilization (c) Mating (d) External fertilization	**1**	2	4	3
vii.	The presence of which insect larvae is commonly used to estimate the post-mortem interval (PMI)? (a) Butterfly larvae (b) Blowfly larvae (c) Moth larvae (d) Grasshopper nymphs	**1**	2	1	4
viii.	Which stage of decomposition leads to swelling of the body due to gas buildup? (a) Fresh stage (b) Bloated stage (c) Active decay stage (d) Dry remains stage	**1**	2	4	4
ix.	In forensic entomology, what is used to preserve insect specimens collected from a crime scene? (a) Alcohol (usually ethanol or isopropanol) (b) Freezing the specimens immediately (c) Air-drying them in the field (d) Storing them in a sealed plastic bag	**1**	2	2	5
x.	What is the main method used to identify insect species in the lab? (a) Listening to the insects' sounds (b) DNA analysis or morphological identification (c) Measuring their size (d) Analyzing their diet	**1**	1	2	5

Q.2	i.	Define the term "Forensic Entomology".	**2**	2	1	1
	ii.	Explain the significance of forensic entomology in criminal investigation.	**3**	2	5	1
	iii.	Write and explain classification of phylum Arthopoda upto class with examples.	**5**	1	3	1
OR	iv.	Write a detailed note on history of forensic entomology in India.	**5**	1	1	1

Q.3	i.	List the factors that can affect the growth of insects.	**2**	2	3	2
	ii.	Write the classification and identification characteristics of blow flies with a suitable diagram.	**8**	2	4	2
OR	iii.	What are the different types of insects that feed on the decaying corpse? Explain with the help of a suitable diagram.	**8**	2	3	2
Q.4	i.	Explain different types of pupae.	**3**	2	3	3
	ii.	Explain the mechanism and construction of reproductive system of insects.	**7**	2	2	3
OR	iii.	Explain the mechanism and construction of digestive system of insects.	**7**	2	3	3
Q.5	i.	What is the role of insects in decomposition and PMI estimation?	**4**	2	3	4
	ii.	Define the term death. Explain the mechanism of death.	**6**	2	4	4
OR	iii.	Explain the insect succession level on cadaver.	**6**	3	3	4
Q.6		Attempt any two:				
	i.	Write a note on- (a) Entomo-toxicology (b) Admissibility of insect evidences	**5**	2	1	5
	ii.	Explain the laboratory techniques for insect identification.	**5**	3	3	5
	iii.	Describe different collection and preservation techniques of insects.	**5**	2	2	5

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Marking Scheme
FS3EG03 (T) Entomology (T)

Q.1	i)	B) Decomposed bodies	**1**
	ii)	C) Diptera	**1**
	iii)	B) Chitin	**1**
	iv)	A) Coleoptera	**1**
	v)	A) Circulatory system	**1**
	vi)	A) Parthenogenesis	**1**
	vii)	B) Blowfly larvae	**1**
	viii)	B) Bloated stage	**1**
	ix)	A) Alcohol (usually ethanol or isopropanol)	**1**
	x)	B) DNA analysis or morphological identification	**1**

Q.2	i.	Define the term "Forensic Entomology". Definition -1 mark Example -1 mark	**2**
	ii.	Explain the significance of Forensic Entomology in criminal investigation. Importance -2 marks Case example -1 mark	**3**
	iii.	Write and explain classification of phylum Arthropoda upto class with examples. Explanation -1 mark Classification -3 marks Examples -1 mark	**5**
OR	iv.	Write a detailed history of Forensic Entomology in India. Contribution of scientists -5 marks	**5**

Q.3	i.	List the factors that can affect the growth of insects.	**2**
	ii.	Write classification and identification characteristics of blow flies with suitable diagram. Classification - 4 marks Identification characteristic -2 marks Diagram -2 marks	**8**
OR	iii.	What are the different types of insects that feed on the decaying corpse? Explain with the help of suitable diagram. Different types of insects feed on decaying corpse - 4 marks Diagram -2 marks	**8**

Q.4	i.	Explain different types of pupae. Exarate Pupa (1 Mark) Obtect Pupa (1 Mark) Coarctate Pupa (1 Mark)	**3**
	ii.	Explain the mechanism and construction of reproductive system of insects. Male Reproductive System (2.5 Marks) Female Reproductive System (2.5 Marks) Mechanism of Fertilization and Reproduction (2 Marks)	**7**
OR	iii.	Explain the mechanism and construction of digestive system of insects. Mouthparts (1 Mark) Foregut (1 Mark) Midgut (1.5 Marks) Hindgut (1 Mark) Accessory Glands (0.5 Mark) Mechanism of Digestion and Absorption (2 Marks):	**7**

Q.5	i.	What is the role of insects in decomposition and PMI estimation. Role of Insects in Decomposition (2 Marks) Role of Insects in PMI estimation. (2 Marks)	**4**
	ii.	Define the term Death. Explain the mechanism of death. Definition of death (2 marks) Mechanism of death (4 marks)	**6**

OR iii. Explain the insect succession level on cadaver. **6**
Fresh stage (1.5 marks)
Bloat stage (1 marks)
Active decay stage (1.5 marks)
Advanced decay stage (1 marks)
Skeletonized stage (1 marks)

Q.6 Attempt any two:

i. Write a note on **5**
(a) entomo-toxicology
Introduction (1.5 marks)
Application (1 mark)
(b) Admissibility of insect evidences
Scientific validly (1.5 marks)
Chain of custody (1 marks)

ii. Explain the laboratory techniques for insect identification. **5**
Molecular technique (1.5 marks)
Microscopical technique (1.5 marks)
Chemical technique (1.5 marks)
Significance (0.5 marks)

iii. Describe different collection and preservation techniques of insects. **5**

Collection of Insects (2 Marks):

- Hand Collection (0.5 Marks)
- Net Collection (0.5 Marks)
- Trapping (0.5 Mark)
- Collecting Larvae (0.5 Marks)

Preservation of Insects (2.5 Marks):

- Killing and Preserving in Alcohol (1.5 Marks)
- Drying and Mounting (1 Mark)
- Freezing (0.5 Marks)

Labelling and Documentation (0.5 Marks):

- Proper labelling of insect specimens (0.5 Marks).

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