

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Sc. (Hons.) Agriculture

Semester : II (New)	Term : II	Academic Year : 2017-18
Course No. : ENTO 121	Title : Fundamentals of Entomology	
Credits : 2 (1+1)		
Day & Date : Thursday, 03.05.2018	Time : 09.00 to 11.00	Total Marks : 40

- Note :**
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 Explain in brief reasons of dominance of insects in animal kingdom.
- Q.2 Describe insect integument with figure.
- Q.3 Draw well labeled diagram of insect head capsule and enlist segments of head region.
- Q.4 Explain mouthparts of honey bee.
- Q.5 Define metamorphosis. State its significance and explain types of metamorphosis.
- Q.6 Explain with diagram male reproductive system of cockroach.
- Q.7 Define taxonomy. Enlist important characters of class Insecta.
- Q.8 State important characters of order Hemiptera.
- Q.9 Describe central nervous system of insects.
- Q.10 Write short notes (Any Two).
- a) Modifications of wings b) Structure of typical leg
- c) Binomial Nomenclature

SECTION "B"

- Q.11 Do as directed.
- 1) Give full form of - CIB and RC.
 - 2) Ommatidium is concerned with compound eyes. (State True or False)
 - 3) Which type of antenna is present in mango stem borer?
 - 4) What do you mean by apodous larva?
- Q.12 State the function of following.
- 1) Spiracle 2) Juvenile hormone
 - 3) Johnston's organ 4) Gizzard



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SEMESTER END THEORY EXAMINATION

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MODEL ANSWER SET

SECTION 'A'

Q. 1	Explain in brief reasons of dominance of insects in animal kingdom.	Marks
Ans.	Explanation on any eight points from the following points 1. Exoskeleton 2. Small size 3. Quicker speciation 4. Hexapod locomotion 5. Functional wings 6. Differentiation of body 7. Developmental characteristics 8. Chemical communication 9. Physiological adaptations	4
Q. 2	Describe insect integument with figure.	
Ans.	Figure with labels. Description on the following parts: 1. Cuticle : procuticle, exocuticle and endocuticle 2. Epidermis / hypodermis 3. Basement membrane.	1 3
Q. 3	Draw well labeled diagram of insect head capsule and enlist segments of head region.	
Ans.	Well labeled diagram of insect head capsule. Segments of head: Pre-antennary, Antennary, Intercalary, Mandibular, Maxillary, Labial segment	2 2
Q. 4	Explain mouth parts of honey bee with figure.	
Ans.	Well labeled figure of mouthparts of honey bee. Explanation regarding modifications, structures and functions of 1. Labrum 2. Mandibles 3. Maxillae 4. Labium	2 2
Q. 5	Define metamorphosis. State its significance and explain types of metamorphosis.	
	Definition: Metamorphosis is the conspicuous change in growth and development an insect undergoes during its life cycle from birth to maturity	1
	Significance: Reduces competition. Helps to overcome unfavourable climatic conditions.	1
	Types and its explanation in short: Ametabola, Hemimetabola (Incomplete metamorphosis), Holometabola (Complete metamorphosis), Hypermetamorphosis	2
Q. 6	Explain with diagram male reproductive system of cockroach.	
Ans.	Well labeled diagram of reproductive system of male cockroach. Explanation on structure and functions of - Testes, Vas efference, Vas difference, Seminal vesicle, Median ejaculatory duct, Accessory glands, etc.	1 3
Q. 7	Define taxonomy. Enlist important characters of class Insecta.	
Ans	Taxonomy: Science of classification. Placing organisms or forms in order. Theoretical study of classification including basis, principles, procedures and rules. Taxonomy includes nomenclature and classification. Characters of Class Insecta: . 1. Body divisions. 2. Head bears pair of antennae and a pair of compound eyes 3. Thorax- centre of locomotion with 3 pairs of legs and 2 pairs of wings. 4. Excretion mainly through malpighian tubules 5. Tracheal system for respiration is well developed. 6. Juvenile (immature stages) undergoes metamorphosis	1 3

Q. 8	State important characters of order Hemiptera.	
	Any eight characters of Hemiptera from following: 1. Head position: Opisthognathous. 2. Piercing and sucking type of mouthparts. 3. Mandibles and maxillae modified into stylets. 4. Antennae 5 segmented or less than that. 5. Ocelli: 2-3. 6. Thorax- well developed. 7. Some cases, Pronotum- triangular. 8. Fore wings: Hemelytra = Heteroptera ; Uniform consistency= Homoptera 9. Abdomen: soft, terminal end tapering / bulging (11 segmented) 10. Some cases 1 st or 2 nd segments of abdomen modified for sound production e.g. Cicada 11. Cerci absent 12. Metamorphosis = Incomplete (Egg, nymph and adult)	4
Q. 9	Describe central nervous system of insect.	
Ans.	Generalized figure of CNS. Description on structure and functions of sub-esophageal ganglion, supra-esophageal ganglion (brain) and ventral nerve cord.	1 3
Q. 10	Write short notes. (Any two)	
	a) Modifications of wings 1. Tegmina e.g. cockroach, mantid, grasshopper. 2. Elytra e.g. fore wings of beetle and weevils. 3. Hemelytra e.g. forewings of heteropteran bugs. 4. Halteres e.g. true flies, mosquito, male scale insect. 5. Fringed wings : e.g. thrips. 6. Scaly wings : e.g. butterfly and moths 7. Membranous wing: e.g. fore wings of true flies, hind wings of beetles, cockroach, grasshopper, both fore and hind wings of wasp, bees, dragon fly	4
	b) Structure of typical leg . Figure and description on following parts 1. Coxa 2. Trochanter 3. Femur 4. Tibia 5. Tarsus 6. Pretarsus	4
	c) Binomial Nomenclature Described by Carolus Linnaeus in 1758 in his book "Systema Naturae". The scientific name of a organism consists - first one is genus and second one is species. This system is called as binomial nomenclature and used worldwide, which gives accurate information Rules of Binomial Nomenclature :- 1. The first letter of generic name should be capital letter. 2. The first letter of species name should be smaller letter. 3. All the words are Latinized and written in Italics. It should be written and underlined separately other than Italics. 4. Authority name is written after the species name. It starts with capital letter. 5. The author name is put in bracket if the taxa has been reclassified.	4

SECTION 'B'

Q. 11	Do as directed .	
i) 1)	Spell out the abbreviation CIB & RC. Ans- Central Insecticide Board and Registration Committee.	1
ii) 2)	Ommatidium is concerned with compound eyes. (State true or false) Ans- True	1
iii) 3)	Which type of antenna is present in mango stem borer? Ans- Serrate.	1
iv) 4)	What do you mean by apodous larva? Ans- Legless larva / absence of legs.	1

Q. 12	State the function(s) of following	
	i. Spiracle: Ans- Organ of respiration.	1
	ii. Juvenile hormone Ans- Govern / control the metamorphosis.	1
	iii. Johnston's organ : Ans- Auditory/hearing organ (detects sound waves).	1
	iv. Gizzard: Ans- Breaking / grinding solid food particles.	1
