UNIT VII. ARTHROPODA - COCKROACH

		EXTERNAL FEATURES:
•	Phylum Arthropoda was established by	Body of the cockroach consists of three Tagmata
	- Von Siebold	are - Head, Thorax and Abdomen
•	Arthropoda means - Jointed-legged animals	• Cervicum connects - Head with thorax
•	About 80% of known animal species belongs to	• Embryo of cockroach formed of - 20 segments
	- Phylum Arthropoda	• Head is formed by first -6 Segments
•	The most successful animals among all the animal	• Thorax is formed by - Three segments
	groups belongs to Devium Arthropode	Abdominal segments in the embryonic stage
•	- r nyium Artifropoda	-Eleven segments
•	Dreatest adaptive radiation is exhibited by Phylum A rthropode	• The vestigial segment in the adult
	- I hyrum Ar thropoda In Arthropods the maintenance of the shape of the	-11 th abdominal segment
-	hody is due to - Chitinous Cuticle	HEAD :
•	In terrestrial Arthropods dehydration is prevented	• Head is with two enicranial plates on the
	due to - Waxy enjcuticle	Vertex (ten) of the head
•	The animals in which striated muscles made	- vertex (top) of the head
	appearance first time among the invertebrates	• Onparted plate present below the epicramum is
	- Phylum Arthropoda	The largest sclerite is Frons
•	In Arthropods the system which serves to bathe the	Below the frons Chypeus is Present
	tissues of all organs with blood	Check sclerites Check sclerites
	- Open type of blood vascular system	 Sclerites of head are immovable because of the
•	Arthropodization of Arthropoda is due to the pres-	absence of - Arthrodial membrane
	ence of	• Opening of the posterior part of head is
	- Exoskeleton, jointed legs and Haemocoel	- Occipital foramen
•	Ancesters of Arthropods are	• Vestigial ocelli or simple eyes of cockroach are
	- worm like organisms	- Fenestrae
•	Phylum Arthropoda is with	• Hypognathus means -Head is at right angles to
	- Heteronomous segmentation	the long axis of the body
•	Segments are grouped to form body regions called	APPENDAGES OF HEAD
	- Tagmata	 First and third head segments
•	Tagmata of inscects are	- Without any appendages
	-Head, Thorax and Abdomen	• Appendages of second segment are - Antennae
•	The regional differentiation of the body is called	• The first segment of antennae - Scape
	- Tagmosis	• The second segment of antenna - Pedicel
•	Largest Phylum - Arthropoda	• The multi - segmented distal part of Antenna
•	Largest class - Insecta or Hexapoda	- Flagellum
	(Porinlanota amoricana)	• Flagella are - Tactile and olfactory organ
		• Appendages of fourth segment are - Mandibles
IY	PES OF COCKROACHES	• Appendages of fifth segment are - Maxillae
•	Common Household cockroach is	Appendages of sixth segment are
	- Periplaneta americana	- Second maxillae or Labium
•	Number of genera of cockroaches in the world	• The appendages which are olfactory and tactile in
	- 2,600	function - Antennae
•	Peripianeta americana and Biatta orientalis are	MOUTH PARTS OF COCKROACH
•	- Inuian cockroacnes. Blattella germanica (German Cockroach) and Platte	• Mouth parts of cockroach are
-	Diaucita germanica (Oerman Cockioacii) and Blatta	- Biting and Chewing type
	ausu anasac are not frequentity present in - india	

•	Labrum or upperlip attached to	• Largest sclerite on the body of cockroach
	- Ventral edge of the clypeus	- Pronotum
•	Labrum is with - Gustatory sensillae	• Thorax is with - 3 pairs of legs
•	Triangular, hard, unjointed chitinised mouth parts are	• Each leg is with -5 segments or Podomeres
	- Mandibles	• Podomeres of leg from base to tip are
•	Teeth of mandibles are - Masticatory in function	- Coxa; Trochanter; Femur ; Tibia; Tarsus
•	Adductor and abductor muscles helps in	• Tarsus is with - 5 Tarsomeres
	 Opposite movements of mandibles 	• last tarsomere is called - Pretarsus
•	Sensory lobe of mandible -Prostheca	• Pretarsus is with
•	First maxillae are with two dorsal segments	- A pair of claws and pulvillus or arolium
	- Cardo and stipes	• Plantulae are minute pads present in between
•	By means of cardo, maxilla attaches to - Head	- Tarsomeres
•	Stipes is attached to - Cardo	• Arolium and plantulae help in locomotion on
•	Stipes is with five segmented - Maxillary palp	- Smooth surfaces
•	Maxillary palp of maxilla is present on - Palpifer	• On the mesothorax - First pair of wings
•	Stipes has two chitinous lobes called	On the metathorax - second pair of wings
	L acinia and galea	 First pair of wings are called - Tegmina
•	Two Pincer like terminal denticles present in	Hind wings are useful for Flight
•	I wor meet nike terminar dentieles present in	Wings supported by selerotised tubes called
	Galea is blunt bood like and covers I aginia	Voins or porvuros
•	Maxillanu nalma and used for algoning the	- venis of new mass have
•	Maximary paips are used for cleaning the	• Arrangement of hervures have
	- Antennae and front legs	- Taxonomic importance
•	Second pair of maxillae are fused and form	• Wings are moved by - lergosternal muscles
	- Labium	& Longitudinal muscles
•	Labium is with	ABDOMEN
	- Postmentum, and Prementum	• Abdomen of embryo has eleven segments but in
•	The basal segment of labium - Post mentum	adult - Ten segments only
•	Post mentum represents - 2 fused cardos	• Anus is present -between the triangular podicel
•	Prementum is - Fused stipes	plates called - paraprocts
•	Labium is with palpiger on the - Mentum	• Paraprocts represent - 11th sternum
•	Palpiger bears - 3 segmented labial palp	• Analcerci are - Fifteen segmented appendages
•	Labial palps are with - Gustatory sensillae	• Analcerci present between - 9 th and 10 th segments
•	Prementum is with paraglossae which reprents -	Analcerci are
	Galeae	Phonorecentors or auditory sensille
•	Between para glossae two glossae are present	• Appendages of Vestigial eleventh abdominal seg
	which indicate - Laciniae	Appendages of vestigiar eleventif abdominar seg-
•	Glossae and paraglossae constitute - Ligula	
•	Hypopharynx is called as - Lingua or tongue	
•	Hypopharynx divides the preoral cavity into	• Genital pouch or brood pouch of female is formed
	- anterior cibarium and posterior salivarium	by - Sternum of 7 th , 8 th and 9 th abdominal seg-
•	The rectangular segment of post mentum is	ments
	- Submentum	• Sternum of seventh abdominal segemnt of female
•	The triangular segment of labium is	bears - Gynovalvular plates
	Dromontum is formed due to fusion of Stings	• Gynovalvular plates form the
-	• Supes	- Floor of genital pouch
ΤH	URAX	• 8 th sternum of female forms
•	Second Tagma of cockroach is - Thorax	- Anterior wall of genital pouch
•	3 segments of thorax	• Female genital aperture is present on the middle of
	- Prothorax Mesothorax and Metathorax	- 8 th sternum
	- I Tothor any microthor an and micrathor an	
•	Dorsal Sclerites of Thorax	• 9 th sternum of female forms
•	Dorsal Sclerites of Thorax - Pronotum, Mesonotum and Metanotum	• 9 th sternum of female forms - Roof of genital pouch

• • •	Anterior part of genital pouch is- GynatriumPosterior part is- Oothecal chamberFertilization takes place in- GynatriumCocoon formation occurs in- Oothecal chamberGonapophyses of female are- Three pairs	•	 b) Trichogen cells - forms spines or bristles and associated with - neurosensory cells c) Tormogen cells - forms the sockets of bristles d) Oenocytes - Secrete wax layer of epicuticle. A trichogen cell, neuro sensory cells and a tormogen
•	One pair on -8 th sternum		cell constitute a - Sensillum
•	Two pairs on - 9 th sternum	•	Innermost layer of body wall is
•	Gonapophyses help in- Copulation, formation of		- Basement membrane
	ootheca and oviposition (deposition of eggs)	•	The invaginations of sclerotised cuticle are referred
•	Gonapophyses of the male are called		as -Apodemes
	- Phallomeres	•	The rigid surface for the attachment of muscles is
•	Phallomeres are formed from - 9 th sternum		provided by - Apodemes
•	Three phallomeres are present	•	Apodemes of the head are fused to form an inter-
	- One on ventral side and one on left and right		nal protective structure called Tentorium
	sides	•	Stink glands are present in between
•	Male genital aperture is present at the base of		- 5 th and 6 th abdominal terga
	- Ventral phallomere	•	Body cavity is filled by - Haemolymph
•	Left phallomere is with three segments	•	Original schizocoelom is restricted to
	- Pseudopenis, titillator and an asperate lobe		- Reproductive organs.
•	Right phallomere has two segments called	•	The perivisceral cavity contains many large sized
	- Hook and a serrate lobe		- Corpora adiposa / Fat bodies
•	9 th sternum of male is with	•	Haemocoel is divided into
	- A pair of unjointed needle like anal styles		- 3 Sinuses by two diaphragms
•	Anal styles are	•	The dorsal sinus is
	- Secondary sexual characters of male		-Pericardial sinus that encloses heart
	BODY WALL OF COCKROACH		The middle sinus is
•	Body wall is with- Chitinous cuticle, Epidermis		- Largest perivisceral sinus that surrounding
	and Basement membrane		alimentary canal
•	Cuticle is with	•	The ventral smallest sinus is
	- Epicuticle Exocuticle and Endocuticle		- Perineural sinus encloses nerve cords
•	Epicuticle consists of	•	Schizocoelom is restricted to
	- Outer lipoprotein cement layer		- Spaces around the reproductive organs
	- Middle waxy layer	•	Fat bodies have lobules containing - 4 kinds of cells
	- inner layer of polyphenol	•	The cells which store food in the form of glycogen
•	Regidness of the sclerites is due to		tat and proteins are -trophocytes.
	- Polymerisation of chitin and cross linking of	•	I he cells which contain symbiotic bacteria that syn-
	proteins		thesize aminoacids are - Mycetocytes
•	Formation of sclerites is known as	•	The cells which secrete lipids and store them are
	- Sclerotisation.		- Oenocytes
•	Arthrodial membrane is without - Exocuticle	•	The cells which store uricacid are -Urate cells
•	Pigmented region of cuticle is -Exocuticle	•	Fat bodies are analogous to liver of vertebrates
•	The innerlayer with chitin and without sclerotisation		
	- Endocuticle	•	Running locomotion with the help of legs is
•	The region which undergoes lysis before each moult-		- Cursorial Locomotion
	ing or ecdysis -Endocuticle	•	During cursorial locomotion cockroach forms
•	Arthrodial membrane is without - Exocuticle		- 2 Iripods with its legs
•	Epidermis of bodywall is with the following cells	•	roreleg and nindleg of one side and middle leg of
	a) Columnar epidermal cells - with glandular cells	_	Un a twine of the lease thick with the lease t
	secrete the cutitcle and enzymes for the lysis of endocuticle	•	- Foreleg

•	The leg which pushes	the body -Hind le	g 10.	Type of segmentation	on in Arthropoda.			
•	The leg which acts as	pivot		1. Homonomous external				
		-middle leg of othersid	e	2. Homonomos internal				
•	In the tripodal locomo	tion the insect moves in		3. Heteronomous	internal			
		- Zig zag manne	r	4. Heteronomous external				
	FLYING I	LOCOMOTION	11.	In Heteronomous segmentation of				
•	The wings that are spre	ead at right angles to the boo	ly	Arthropods, the b	ody segments are grouped			
	whileflying	-Forewing	s	to form bodily reg	ions called			
•	The wings that help in	flight are - hind wing	s	1. Terga	2. Sterna			
		- (Second pair of wing	5)	3. Tagmata	4. Stigmata			
•	Up and down moveme	ents of wings are effected l	y 12.	The imprevious w	axy chitinous Exoskeleton			
	- Logitudinal and to	ergosternal muscles		of arthropods is a	n adaptation to			
*	JR INTER - UNIT-V	II ARTHROPODA*		1. Terresstrial life	2. Aquatic life			
INT	RODUCTION			3. Fossorial life	4 1, 2 & 3			
LE	VEL-I		LE	VEL-II				
1.	The main features of	the phylum Arthropoda	13.	The following are	the statements about the			
	is/are			success of arthop	ods			
	1. Chitinous exoskele	eton		I)Hard and rigid e	xoskeleton which is in the			
	2. tagmatisation			form of chitinous	cuticle helps in the			
	3.Metamerism			maintenance of th	he shape of the body			
	4.Chitinous exoskele	ton		II) Waxy epicuticl	e prevents dehydration in			
	,tagmatisat	ion, metamerism		terrestrial arthrop	ods			
2	Phylum Arthropoda w	vas established by		III) Jointed legs sh	now rapid movements with			
	1)Hyman	2) VonSiebold		the help of non str	iated muscles			
	3) Leuckart	4) Cuvier		IV) Haemocoel is	s a part of closed type of			
3	Cockroach belongs to	the Class		blood vascular sy	stem which serves to			
	1) Pentapoda	2) Tripoda		bathe the tissues				
	3) Tetrapoda	4) Hexapoda		1)Only I st and II nd	are correct			
ΕV	OLUTIONARY	CHARACTERS O	F	2)Only III rd and I	V th are correct			
	ARTHROPODA			3)I st and IV th are correct				
LE	VEL-I			4)I, II, III & IV				
4.	The blood of cockroa	ch is called	14.	Statement (S): All tis	ssues of organs in cockroach			
	1) hydrolymph	2) haemolymph		are bathed in haemo	lymph			
	3) cytolymph	4) histolymph		Reason (R) : In coc	kroach, open type of blood			
5.	Blood vascular system	n of Arthropods is		vascular system is pr	esent			
	1) Open type	2) Closed type		•				
	3) Not present at all	4) In the developing stag	e	COCKR	OACHES			
6.	Body cavity of Arthro	poda is	LE	VEL-I				
	1) Hydrocoel	2) Enterocoel	15.	The common hou	se hold cockroach is			
	3) Haemocoel	4) Pseudocoel		1. Blatta Orientlis	2. Periplaneta americana			
7.	The exoskeleton of Ar	rthropod is formed of		3. Blatta australias	se4. Blatella germanica			
	1) Siliceous plates	2) Chitinous Cuticle	16.	Number of genera	a of cockroaches present			
	3) Calcareous plates	4) Cellulose plates		in the world is	*			
8.	These muscles appe	eared for the first time	n	1.1200 2	2. 1800 3. 2600 4. 3600			
	Arthropoda among in	vertebrates	LE	VEL-II				
	1) Cardiac muscles	2) smooth muscles	17.	Match the following				
	3) Visceral muscles	4) Striated muscles		List-I	List-II			
9.	One of the following	is not a tagma in the coc	ς- Α. C	German cockroach	I. Periplaneta americana			
	roach body	e e	B . 1	Indian cockroach	II. Blatella germanica			
	1) Neck	2) Head	C. C	Common house hold	III. Blatta orientalis			
	3) Abdomen	4) Thorax	.	cockroach				
FΔN	ACET-JUNIOR ZOOL OC	SY T	220		UNIT-V			

D. Cockroach not found IV. Blatta australiasae in India

	A	B	С	D
1)	Π	Ι	III	IV
2)	IV	III	II	Ι
3)	Π	III	Ι	IV
4)	III	Ι	Π	IV

18. **Statement** (S): Periplaneta americana belongs to class Insecta (or) Hexapoda

Reason (R): Its body does not show functional regions.

- 19. The following are the statements about the segments of cockroach
 - (i) In adult cockroach, abdomen contain eleven segments
 - (ii) The embryo of cockroach contain twenty segments

(iii) First six segments are fused to from the head. The correct combination is

- 1) i and ii 2) ii and iii
- 3) i and iii 4) All are true

EXTERNAL FEATURES

LEVEL - I

- 20. The number of segments present in the embryo of cockroach is 1. Six 2. Eleven
 - 3. Nine 4. Twenty
- 21. The number of segments present in the abdomen of embryo of cockroach is
 - 1. Three 2. Six
 - 3. Ten4. Eleven
- 22. The head of Cockroach is formed by the fusion of
 - 1. Three segments2. Head capsule3. Six segments4. Nine segments

LEVEL - II

- 23. The following are the statements about the external features of the cockroach
 - (i) The body consists of three tagmata
 - (ii) The first and second tagmata are joined by cervicum.
 - (iii) Frons is the largest sclerite of the first tagmata.
 - The correct statements are
 - 1) i and ii 2) ii and iii 3) i and iii 4) i, ii & iii

HEAD CAPSULE LEVEL - I

24. Largest sclerite of the head of cockroach is 1) Frons 2) Clypeus 3) Gena 4) Vertex 25. Paired Sclerites of the head capsule of Cockroach 1) Genae 2) Epicranial plates 3) Clypeus 4) Both 1 & 2 26. The opening on the posterior side of the head capsule is 1) Foramen of Monro 2) Foramen ovale 3) Occipital foramen 4) Foramen panizza 27. White spots at the base of antenna represent 1) Simple eyes 2) Fenestrae 3) Vestigial ocelli 4) 1, 2 and 3 28. The top of the head of cockroach present between the two compound eyes is called 1. Cervicum 2. Tentorium 4. Fenestrae 3. Vertex 29. The top of the head (Vertex) is covered by 1. Epicranial Plates 2. Frons 3. Genae 4. Clypeus 30. The unpaired sclerite present below the largest sclerite of the head of cockroach is 2. Epicranial Plates 1. Clypeus 3. Frons 4. Gena 31. The sclerite which lies below the epicranium is 1. Clypeus 2. Gena 3. Cervicum 4. Frons 32. Below the two compound eyes and on the lateral sides of frons and clypeus a pairof sclerites present On the head of cockroach is 1. Cervical sclerites 2. Notal Plates 3. Genae 4. Epicranial Plates LEVEL-II 33 Match the following and select the correct combination regarding the cephalic appendages of cockroach. List-1 List-II I) Fused appendages of 6th A. Antennae head segment B. Labium II) Appendages of 1st head segment. C Mandibles III) Appendages of 2nd headsegment D.Maxillae IV) Appendages of 5th head segment. V) Appendages of 4th head segment.

		Α	В	С	D	1
	1)	Π	III	IV	V	
	2)	III	V	IV	Π	
	3)	III	Ι	V	IV	39
	4)	III	Π	V	IV	
34.	Match	the foll	owing			
	List-I			List-	II	
Α.	Frons	I. Scl	lerite prese	ent below	the large sclerite	
В. С	Clypeus	s II. Si	mple eyes			
C. (Genae	III. La	rge scleri	te of hea	ıd	
D. F	Fenestra	ae IV. P	osterior op	bening of	fhead	
		V. C	heek scle	rites		A
		A	В	С	D	
	1)	IV	Ι	III	V	40
	2)	III	Ι	V	Π	
	3)	Ι	III	Π	IV	
	4)	Ι	Π	V	III	41
35.	Th	e follow	ving are va	rious par	ts in the head	
	of	cockroa	ich.	-		
	A)	Labrun	1	B) Ve	ertex	
	C)	Clypeu	s	D) Fr	rons	
	Ar	range th	nese from t	op to bot	ttom in a	
	cor	rect sec	quence.			42
	1)	B-D-C-	-A	2) B-	C-D-A	
	3)	B-A-C-	-D	4) B-	C-A-D	
36.	Th	ese are	various ap	pendage	s of head of	1 12
	coc	ckroach	l			43
	A)	Mandił	oles	B)Ar	ntennae	
	C)	Labium	l	D)M	axillae	
	Ar	range th	iese in an a	scending	g order of their	
	seg	ment of	origin			
	1)	B-A-C-	-D	2) B-	A-D-C	44
	3).	A-D-C-	-B	4) A-	C-D-B	
37.	Stater	nent (S) : Cockroa	ach has h	ypognathous head	
	D	(D)	T., 1	1. 1	. 1 1	
	Rease	on (K):	In cockre	of the h	ad is bent at right	45
	dimont	s to the	iong axis	of the b	ouy and Jaws are	
	1) Do	th S or	d D are	arraat	D is the correct	
	1) D0	ni Sai		someer,	K is the confect	
	$2) \mathbf{R}_{0}$	th S on	d D ore co	rraat D	is not the correct	
	2) DU	n 5 and		neer, K	is not the correct	
		auon u	tbut Ris	false		46
	A B_{0}	th S and	I Dui K IS I R are fale			
28	That	ollowin	and the st	atemento	about the head of	
50.	cocke	onowin oach	g are the St	atements	about the nead of	
		bauli na haad	of coolzeo	ch is col	led hypograthous	L
	(i) If (ii) (ii)	coinite	foramen	is preser	t on the posterior	47
	cide o	f the b	ad	is presen	n on me posterior	(
	Giil) E		au	theonia	ranium	
	(m) r	ions al	Joined by	and epic	uu11u111.	1

1	Choose the correct co	mbination
	1) ii and iii	2) i and ii
	3) All are true	4) i and iii
39.	The following append	ages are associated with the
	head of cockroach	
	a) Labium	b) Antennae
	c) Maxillae	d) Mandibles
	Arrange the above part	ts in the order of embryonic
	segments from the ant	erior end.
	1) a-d-b-c	2) b-d-c-a
	3) a-c-d-b	4) d-c-a-b
API	PENDAGES OF HEA	ND Í
LEV	VEL-I	
40.	Multisegmented part	of antenna is
	1) Scape	2) Pedicel
	3) Flagellum	4) Tentacle
41.	This type of mouth	parts are present in
	Cockroach	
	1. Piercing and suc	king type
	2. Sponging and su	cking type
	3. Biting and chewi	ing type
	4. Siphoning type	
42.	Labrum or upper li	p of cockroach attaches
	to this head sclerite	1).
	1. Frons	2. Gena
	3. Clypeus	4. Epicranial Plate
43.	The inner surface of	of labrum of cockroach
	bears	
	1. Olfactory sensill	ae
	2. Gustatory sensill	ae
	3. Thermoreceptor	sensillae
	4. Mechanorecepto	ors
44.	Which one of the fo	ollowing in cockroach
	helps in tasting and	handling the food
	1. Labrum	2. Mandible
	3. Maxilla	4. Fenestrae
45.	The Postmentum o	f the labium of cockroach
	is a representative	of
	1. Two fused stipes	5
	2. Two fused cardo	DS
	3 Two fused lacini	a
	4. Two fused galea	a
46.	The first segment o	f the postementum of the
1	labium of cockroac	ch is
	1. Submentum	2. Mentum
	3. Prementum	4. Lingua
	VEL-II	
47	Study the following	g regarding cockroach.
Ce	ephalic. Name of	Function
se	gment No the appen	idages
I		

I)	1	Antennae		Tactile and olfactory			Arrar	nge these	in a co	rrect sec	juence	from
				organs			base	to tip				
II)	2	Compound of	eyes	Vision			1) A-	D-C-B		2) C-	-A-D-E	3
III)	4	Mandibles		Chewing the food			3) A-	C-D-B		4) B-	A-C-D)
IV)	6	Labium		Holds the food and	56.		Mate	h the follo	owing			
				prevents the food			List-	[List-	Π	
				from falling down			A. Pro	ementum	I. L	ower lip)	
				during chewing			B.Po	stmentur	n II. F	used ga	lea and	lacinea
Whi	ich of the a	bove are corr	rect				C. Lig	gula	III. U	Jpper lij	3	
	1) I an	d II	2) III and IV			D. La	bium	IV. F	used sti	pes	
	3) I an	d III	4) II and IV					V. T	wo fuse	d cardo	os
48.	The fo	llowing are va	arious	parts of antenne				1	R	C	מ	
	of coc	kroach		-			1)	л W	п	U V	и Т	
	A)Flag	gellum B) F	Pedice	elC) Scape			2)	IV IV	ш	т	I V	
	Arrang	ge these in a c	orrect	sequence from			2) 3)	IV III	III IV	II V	п	
	base to	o tip					<i>1</i>)	TV	V	п	T	
	1) C –	B - A	2) C-A-B	57		т) Matel	the foll	wing	11	1	
	3) B-C	C-A	4) B-A-C	37.		I ist_	I the long	Jwing	I ist_	п	
49.	The foll	owing are th	he st	atements about the			Δ Pa	Iniger	ΙМ	andible	11 c	
	appendag	ges of head of	Perip	laneta.			R Pa	Inifer	III	ahium	5	
	(i) The fe	ourth segmen	t bear	rs a pair of genae.			C Lie	nıla	III Is	t maxills	ae	
	(ii) The fi	ifth segment b	ears a	pair of maxillae			D Pr	ostheca	IV P	araoloss	æ ae glov	ssae
	(iii) The	second segme	ent be	ars a pair of antennae			D.11	ostileed	V H	vnonhar	vnx	Joue
	The corre	ct combinatio	on is						-	,popilai	J112	
	1) i and iii	i	2) All are correct				A	B	C	D	
	3) ii and ii	i	4) i and ii			1)	I	Ш	III	IV	
MO	UTH PAI	RTS					2)	IV	III	Π	Ι	
LEV	VEL-I						3)	Π	III	IV	Ι	
50.	Palpigers	are the parts	of				4)	III	Π	IV	V	
	1) Labrun	n	2) Ma	andibles	58		Mate	h the follo	owing			
	3) Labiun	ı	4) Ma	axillae	List	t-I				List-	II	
51.	The struc	tures that clea	n the	legs and Antennae are	A. L	Lab	rum	I. Dig	gestion	of food		
					B. N	/lai	ndibles	II. De	etects th	ne food	by the	
	1) Maxilla	ary palps	2) La	bial palps				olfa	ctory s	ensilla		
	3) Glossa	e	4) Pa	raglossae	C. N	Лa	xillary	palpsIII.	Biting	and chev	ving the	e food
52.	The sense	ory lobe of ma	ndibl	e is called	D. I	Lab	oial palj	os IV. Cl	eaning	the ante	nnae, fi	ront legs
	1) Palpige	er	2) Pa	lpifer				V. Tas	sting an	d handli	ng the f	food
	3) Prosth	eca	4) Op	oisthotheca				A	B	С	D	
53.	Ligula is a	a part of					1)	V	III	IV	II	
	1) Labrun	n	2) La	bium			2)	V	III	IV	Ι	
	3) Mandil	ble	4) Ma	axillae			3)	III	IV	V	II	
54.	Movemen	nt of mandible	es is co	ontrolled by			4)	V	II	III	IV	
	1)Adduc	tor muscles	2)At	ductor muscles	59.	A	sserti	on (A):	Eachn	nandible	bears	a sensory
	3) Radial	muscles	4) Bo	oth 1 & 2		lo	be call	ed prost	heca ne	ear its ba	se	
LEV	VEL-II					F	Reason	(R): Ma	andible	s are mo	ved by	two pairs
55.	The fo	llowing are va	arious	parts in the labium		of	fmuscl	es callec	l adduc	tor and a	ıbducto	r muscles
	of coc	kroach				1)) Both	S and F	l are co	orrect,	R is th	e correct
	A) Sub	mentum B)L	_1gula	C) Mentum		ez	xplanat	tion to S				
	D) Pre	mentum				2)) Both	S and R	are cor	rect, R	s not th	ne correct
						ey	xplanat	tion to S				
					-							

60.	 3) S is correct but R is fa 4) Both S and R are false The following are the states of cockroach. (i) Labrum helps in tasting (ii) Labrum bears gustato surface (iii) Labrum is also called 1 The correct combination is 1) i, ii and iii 3) i and ii The following parts are Cockroach a) Pre-mentum c) Submentum Arrange the above from the head. 	lse ments about the Labrum g and handling the food ry sensillae on its inner ower lip 2) ii and iii 4) i and iii present in labium of b) Glossa d) Mentum he site of attachment to	LE 65. 66.
62.	 a-b-c-d b-c-d-a Mouth Character 	2) c-d-a-b 4) c-b-a-d Use	68
(i) 1	parts Labrum Lower lip	Tasting and handling of food	
(ii) I (iii) (iv)	Mandible Triangular, unjointed Hypopharynx Chitinous, rod like Ist maxillae Also called upper lip	Biting and chewing of food Divides preoral cavity into cibarium and salivarium Cleaning the antennae and front legs correct combination is	LE' 69. SI.N I II
63. (i) 1 (ii) 1 (iii) 1 (iii) 1 (iii)	 ii and iii i and ii Part Character Palpifer Small sclerite Palpiger Small sclerite Galea Soft & blunt and Mentum Fused cardos 	 2) ii and iv 4) iii and iv Location Ist maxillae Ind maxillae Attached to hood like stipes of IInd maxillae Labium	III IV 70.
NE (LE) 64.	Which of the above two an 1) i and iii 2) ii and iii 3) CK VEL-II The following are the stater of cockroach (i) Cervicum is short and a sclerites	re wrong i and ii 4) iii and iv nents about the cervicum supported by two dorsal	71.

	(ii) Cervicum is short and	l supported by two ventral
	sclerites	
	(iii) Cervicum is long and	l supported by both dorsal
	The compation bination	i.
	1) 1 and 11 2) 1 and 111 3	() 11 and 1114) 1, 11 and 111
LEO	GS	
LEV	VEL-I	
65.	In cockroach, locomoti	on on rough surface
	is helped by	
	1) Plantulae 2) Claws and arolium
	3) Bristles 4) 1,2 and 3
66.	The fifth podomere or	the last podomere of the
	leg cockroach is called	
	1. Coxa 2	. Trochanter
	3. Tarsus 4	. Tibia
67.	Which of the following	g structures of cockroach
	helps in walking on smo	ooth surfaces.
	1. Plantulae	2. Arolium
	3. Claws	4.2&3
68	In cockroach legs are ar	ticulated with
	1) Plueura and sterna of	the thoracic segments
	2) Plueura and terga of t	the thoracic segments
	3) Plueura and sterna of	the abdominal segments
	4) Plueura and terga of t	the abdominal segments
LEN	VEL -II	
69 69	Study the following	regarding the legs of
07.	cockroach	regarding the legs of
SI N	Jo Name of No. of	Description
91. 1 v	the next the next	Description
т		Eine ininte dass de marca
1	Tarsus 1 st part	Five jointed podomere
11 	Trochanter 2 nd part	Smallest podomere
III	Tibia 4^{th} part	Thin and long podomere
IV	Femur 3 rd part	Strongest podomere
	Which of the above are	correct
	1) I,II and III	2) II, III and IV
	3) III, IV and I	4)All
70.	The following are variou	us podomeres in the leg of
	cockroach	
	A) Femur B	b) Trochanter
	C) Coxa D) Tarsus E) Tibia
	Arrange these in a corre	ect sequence from
	point of attachment.	
	1) C-A-B-D-E	2) C-B-E-A-D
	3) C-A-E-B-D	4) C-B-A-E-D
71.	Statement (S): The co	ockroach can move on a
	rough surface	
	Reason (R): The last tar	somere contains plantulae
	between the claws	-
	1) Both S and R are c	orrect, R is the correct
	explanation to S	
	explanation to S 2) Both S and R are con	rect, R is not the correct
	explanation to S 2) Both S and R are con explanation to S	rect, R is not the correct

	3) S is correct but R is	false	LEV	EL-II
	4) Both S and R are fals	e	79.	Statement (S
72.	The following are the sta	atements about the Legs		tegmina and h
	ofCockroach			Reason (R):
	(i) Each leg has five po	odomeres		muscles only.
	(11) Femur 1s articulated	with sternum of thoracic		1) Both S an
	segments			explanation to
	(111) The proximal podo	mere is called coxa		2) Both S and
	Choose the correct com	bination		explanation to
	1) 11 and 111 2)	1 and 11		3) S is correc
72	3) 1 and 111 4)	All are true	0.0	4) Both S and
/3.	The following are the o	different parts of leg of	80.	The following
	Cockroach			of cockroach
	a) Femur b) Coxa c)) Tarsus d) Trochanter		(1) Fore wing
	Arrange the above par	rts in correct sequence		(11) Fore win
	towards the site of attach	iment of the leg.		(111) Hind Wing
	1) c-b-a-d (2)	b-c-d-a		Choose the co
	3) a-b-c-d 4)	c-a-d-b		1) 1 and 111
74.	Segment Character	Base to tip	A D I	3) 1 and 11
		arrangement of a leg	ABL	DOMEN
		arrangement or a leg		
	(i) Femur Long,	Present next to	81.	
	cylindrical	trochanter		1) $/^{\text{th}}$ sternum
	(ii) Tibia Long and thin	Present between	00	3) / " tergum
	() 6	coxa and trochanter	82.	1) 7th and 9th
				1) / $and 8^{an}$
	(111) Coxa Stout and	First and proximal	07	3)9 th Sternur
	broad	segment	03.	the middle of
	(iv) Tarsus Three jointed	Last segment.		1) 7th Stormur
	Which of the above two a	are correct		$\frac{1}{2} 0^{th} \text{Stermur}$
	1); and :::	2) ii and iii	81	Jp male cock
	1) Tallu III 2) \vdots and \vdots	2) If and in (1) i and iv	04.	on
XX /T	5) III and IV	4) Tand IV		1) Dorsal Pha
				3) Right Phall
LE 75	V EL -1 Tu11		85	Abdomen has
73.	1) Dueth are signification	e 2) Magathangaia win ag	00.	1) Ten tergal
	2) Motothoracic wings	2) Mesothoracic wings 4) A nodemos		2) Ten tergal
76	Nervures in the wings of	4) Apodellies		3) Nine terga
70.	1) Hoemolymph 2)	Nerves		4) Nine terga
	2) Trachen (1)	1 2 & 2	86.	Which of th
77	The muscles that move t	$1, 2 \propto 3$	00.	phonorecepto
//.	1) A dductor and Abduct	or muscles		1) Anal styles
	2) A lory muscles	of muscles		3) Paraprocts
	2) Protractor and Datrac	tor muscles	87.	Genital poc
	4) Tergosternal and longi	tudinal muscles	5	by the stern
78	The Second pair of wing	s of cockroach are present		$1 5^{\text{th}} 6^{\text{th}} a$
10	on	on cochroden are present		3 7 th 8 th a
	1 Prothoray 2	Mesothorax	88	In cockroach
	3 Metathoray A	1 st abdominal segment	00.	hetween
	5. Inicianiorax 4.			$1) 9^{\text{th}} \text{ and } 1$
				$\frac{1}{2} Oth and 1$

	79.	Statement (S): Cockroach flies with the help of		
		tegmina and hindwings		
		Reason (R): wings are moved by tergosternal		
		1) Doth S and B are connect. B is the connect		
		1) Both S and K are correct, K is the correct		
		2 Both S and D are correct. D is not the correct		
explanation to S				
		3) S is correct but R is false		
		4) Both S and R are false		
	80.	The following are the statements about the wings		
	001	of cockroach		
		(i) Fore wings are called tegmina or elytra		
		(ii) Fore wings are present on prothorax		
		(iii) Hind wings help in flight		
		Choose the correct combination		
		1) i and iii 2) ii and iii		
		3) i and ii 4) All are true		
	ABI	DOMEN		
	LEV	TEL -I		
	81.	Gynovalvular plates are formed by		
		1) 7 th sternum 2) 8 th Sternum		
		3) 7^{th} tergum 4) 8^{th} tergum		
	82.	Three pairs of female gonapophyses arise from		
		1) 7^{th} and 8^{th} Sterna 2) 8^{th} and 9^{th} Sterna		
	07	3) 9 ^{ar} Sternum 4) 8 ^{ar} Sternum		
	83.	In remain cockroach the genital pore is present in		
		1) 7^{th} Sternum 2) 8^{th} Sternum		
		$3) 9^{th} \text{Sternum} \qquad 4) 8^{th} \text{Sternum}$		
	84.	In male cockroach the genital aperture is located		
	0.11	on		
		1) Dorsal Phallomere 2) Left Phallomere		
		3) Right Phallomere 4) Ventral Phallomere		
	85.	Abdomen has		
		1) Ten tergal and Ten sternal plates		
		2) Ten tergal plates and nine sternal plates		
		3) Nine tergal and nine sternal plates		
		4) Nine tergal and ten sternal plates		
	86.	Which of the following in cockroach act as		
		phonoreceptors		
		1) Anal styles 2) Anal cerci		
	07	3) Paraprocts 4) Epiprocts		
	87.	Genital poch in Iemale cockroach is formed		
		by the sterna of these abdominal segments		
		1. 5^{m} , 6^{m} and 7^{m} 2. 6^{m} , 7^{m} and 8^{m} 2. 7^{th} 8 th and 0 th 4. 8 th 0 th and 10 th		
	00	5.7^{m} , 8^{m} and 9^{m} 4.8^{m} , 9^{m} and 10^{m}		
	00.	hetween		
		1) 9^{th} and 10^{th} segments on the dorsal side		
		2) 0^{th} and 10^{th} segments on the ventral side		
		2) 7 and 10 segments on the ventual side		

3) 8^{th} and 9^{th} segments on the dorsal side					e dorsal side	C. Right phallomere III. Pseudopenis, titillator						
	4) 8^{th} as	nd 9 th s	egment	ts on the	e ventral side	asparate lobe						
89.	In cock	roach tl	ne stern	um of th	nis abdominal	D	D. Phallomeres IV. Hook, serrate lobe				rate lobe	
	segmer	nts bear	s a pair o	ofgynov	valvular				V. Go	napoph	yses of the r	nale
	plates p	osterio	rly						coc	kroach		
	1)7 th at	odomin	al segm	nents				Α	В	С	D	
	2)8 th at	odomin	al segm	nents			1)	V	III	II	IV	
	3)9th ab	odomin	al segm	nents			2)	III	II	IV	Ι	
	$4)10^{th} a$	bdomir	ial segn	nents			3)	Π	III	IV	V	
LEVE	L-II						4)	III	Π	IV	V	
90	Study th	he follo	wing sta	atement	s regarding	93.	93. Statement (S); The male cockroach exhibit sexua					exual
the abdoment of cockroach					dimorph	ism.						
	I)8 th and	d 9 th ab	domina	ıl sterna	are infolded to		Reason	n (R): A	nal style	s are pre	esent in the	male
	form th	e genita	l pouch	1			cockroa	ich				
	II)A pa	ir of uns	segmen	ited anal	styles is	94.	The fol	lowing	are the st	atement	ts about the	anal
	attache	d to 9 th	abdomi	inal ster	num one on		cerci of	cockroa	ch			
	Either s	side in r	nales				(i) Ana	l cerci o	ccur only	in male	es	
	III) The	e 9 th ster	mum be	ears valv	vifers and		(ii) Ana	l cerci o	ccur in bo	oth male	s and female	es
	second	basival	vulae				(iii)Ana	l cerci h	elp in rec	eiving g	round vibrat	ions
	IV)Gor	napophy	yses are	helpful	in copulation		Choose	the wron	ng combi	nation		
	formati	onofo	otheca a	and ovip	osition		1) i and	iii		2) ii a	nd iii	
	V)The	sternum	1 of seve	enth abd	lominal		3) i and	ii		4) All	are wrong	
	segmer	nts bear	s a pair (ofgynov	valvular	95.	The fol	llowing	are the	statem	ents about	the
	plates	Poster	iorly				gonapo	physes o	fcockroa	ach		
	1)Only]	I st and I	Ind are	correct			(i) Gona	apophyse	es of the r	nale coc	kroach are c	alled
	2) Only	y III rd aı	nd IV th	are corr	rect		phallom	eres				
	3)I st , I	$\mathrm{V}^{ ext{th} ext{ and }} \mathrm{V}$	th are c	orrect			(ii) The	male ger	nital aper	ture is p	resent at the	base
	4) I, II,	III, IV	& V				of the ventral phallomeres					
91.	Match t	the follo	wing				(iii) The	left phall	omere be	ars titilla	tor,asparate	lobe,
	List-I		Ĭ	List-II		pseudopenis and acculobolus lobe						
	A. 9th	sternur	n I	. Form	ation of cocoon	The correct combination is						
	B. Gyr	novalvu	lar plate	es II. F	ertilization		1) i and	iii only		2) ii a	nd iii only3)) i
	C. Gyr	natrium	Î	II. Floo	or of the genital		and ii or	ily		4) i, ii	andiii	
	•			pou	ch	96.	Part	Char	acter	Locat	ion	
	D. 8th	sternur	n I	V. Roo	of of the genital	(i)	Anal cere	ci Apper	ndages	Junctio	n between 9) th
				pou	ch			of vest	igial			
			V	V. Ante	rior wall of the			11th seg	ment	10 th se	egment on t	he
				genita	al pouch			C		dorsal	side	
		Α	В	Č	D	(ii)	Paraproct	s Triang	lular plat	te At the	posterior si	de
	1)	Ι	Π	III	IV			like st	ructure	belov	v the	
	2)	IV	III	Π	V					9th ter	gum	
	3)	IV	II	III	Ι	(iii)	Gynoval	vular For	m the	7th ab	dominal	
	4)	Π	IV	V	III		plates	floor	of the	sternu	m	
92	Match t	the follo	wing				I			brood	pouch	
	List-I		U	List-]	Π	(iv)	Gonapo	physes ł	nelps in	7 th ar	nd 8 th stern	um
A. <i>A</i>	Anal styl	es	I. See	condary	v sexual		of	co	pulation	female	•	
	5-		char	acters o	f the female		Which	of the ab	ove two	are corre	ect	
			coc	kroach			1);1	;;;		n ::-	nd iii arlee	
B. Le	eft phalle	omere	II. Sec	condarv	sexual characters		1) 1 and	moniy		∠) 11 ai	na momy	
	Ŧ		ofthe	e male c	ockroach		3) iii an	d iv only	r	4) i ar	nd iv only	

BODY WALL LEVEL-I 97. Cuticular layer that forms sclerites is 1) Epicuticle 2) Exocuticle 3) Endocuticle 4) Enterocuticle 98. Wax secreting cells of the epidermis of body wall of cockroach are 1) Tormogencells 10 2) Oenocytes 4) Columnar cells 3) Mycetocytes 99. Cuticular layer absent in arthrodial membrane is S 1) Epicuticle 2) Exocuticle I 4) Enterocuticle 3) Endocuticle 100. Cuticular layer without chitin is Π 1) Epicuticle 2) Exocuticle 3) Endocuticle 4) Enterocuticle III 101. The inner layer of epicuticle of cockroach IV consists of 1. Wax 2. Lipoprotein cement 4. Chitin 3. Polyphenols 102. The rigid middle layer of the cuticle in cockroach is 1. Epicuticle 2. Exocuticle 3. Endocuticle 4. All the above The cuticle between the segments of the 103. body and at joints of appendages is soft and flexible due to 10 1. Absence of Exocuticle 2. Presence of Epictuticle 3. Absence of Endocuticle 4. Presence of exocuticle 104 In Cockroach the rigidness of the sclerites is due to 1. Polymerisation of chitin and cross linking of proteins 2. Lysing of endocuticle just before each 10 moulting 3. Presence of Wax and Polyphenols 4. Absence of exocuticle 105. The epidermis of cockroach consists of 1)A single layer of columnar epithelial cells 2)Two layers of columnar epithilial cells 3)Three layers of columnar epithelial cells 4)Many layers of columnar epithelial cells LEVEL-II 106. The following are the statements about the 11 epidermis of cockroach I)It is the single layered containing cuboidal epithelial cells II)Most of the cells are glandular which secretes digestives enzymes

	III)Trichoge	ncells form mo	vable bristles						
	IV)Tormogen cells form the sockets in which								
	the movable bristles are buried								
	V)Oenocytes secrete wax layer of epicuticle								
	Which of th	e above are co	rrect						
	1) I and II	2)]	I,IIand III						
	3)II,IIIand I	V 4)	III,IV and V						
7.	Study the fo	llowing regard	ing the body wall						
	ofcockroac	h.							
.No.	Layer	Location	Composed of						
	Endocuticle	Inner most	Several layer of						
		layer	cuticle						
	Exocuticle	Middle	chitin and proteins						
		layer							
	Epicuticle	Outer layer	Lipoproteins, wax						
			and polyphenols						
r	Epidermis	Innermost	Single living layer						
			ofcolumnar						
			epithelial cells						
			of body wall						
	Which of the	e above are con	rect						
	1) I, II, III a	nd IV	2) I and II only						
	3) I and IV	only	4) II, III and IV						
(only								
8.	The followi	ng are various j	parts in the body						
	wall of cock	croach.							
	A) Basemer	nt Membrane							
	B) Epicuticle	e C)Epidern	nis						
	D) Exocutic	le E) Endocu	ticle						
	Arrange the	se in a correct	sequence form						
	outer to inne	er							
	1) B-C-D-H	E-A 2)	D-B-E-C-A						
	3) B-D-E-C	C-A 4)	C-B-D-E-A						
19. St	tatement (S)	: Appendages of	of cockroach bend at						
th	e joints								
ŀ	Reason (R): A	Arthrodial mer	nbrane is present at						
th	e joints of ap	pendages of co	ockroach						
1)ł	Both A and R	are correct, F	t is the correct						
•	exp	lanation to A	D 1						
2)) Both A and	R are correct,	R is not the correct						
ey	xplanation to A	A							
3) Both A and	R are false							
4)) A 1s correct	but R is false							
0. T	he following a	are the statemen	its about the bodywall						
0	t cockroach	11 0 1							
(i) Tormogen	cells form the	sockets of movable						
bı	ristles	11 0 1	1111.						
(i	i) Trichogen	cells form the n	novable bristles						
(1	11) Uenocyte	es secrete the	e wax layer of the						

e	exocuticle	vinction	 FAT	4) Stern	a of 5th a	and 6th	segmer	its	
1	Lioose the wrong control	2) ii and iii anky	I EVEL II						
1) i and iii anly		118 Motoh the following and select the correct						maat
111 7	5) Fand III Only The fellowing one mu	118. Match the following and select the correct						hadiaa	
111. 1	The following are pre	sent in the body wall of		com	Dination r	egardii	ig the ce	ns of fat	bodies
С				orco	ckroach		.		
а	i) Epidermis	b) Exocuticle		List -	l ,		List	-11	. 1
С	e) Endocuticle	d) Epicuticle		A. Tro	ophocyte	S	I) lip	olds secre	etion and
F	Arrange the correct see	quence of the above from					stora	uge	
i	nner to outer of body w	all		B. My	/cetocyte	s	II)Co	ontain syı	mbiotic
1	l) a-b-c-d	2) b-c-a-d					proti	sts that sy	ynthesize
3	3) a-c-b-d	4) d-c-b-a					amin	o acids	
END	OSKELETON			C Oe	nocytes		III)	Store uri	c acid
LEVI	EL-I			D. Ur	ate Cells		IV) S	Store gly@	cogen,fats
112.	In cockroach rigid su	urfaces for the attachment					and p	roteins	
	of muscles are offere	ed by					V) C	ontain sy	mbiotic
	1. Phragmata and ten	torium					bacte	eria that s	synthesize
	2. Apophyses and ph	ıragmata					amio	n acids	
	3. Phragmata and ap	odemes							
	4. Apodemes and Ap	oophyses			Α	B	С	D	
113.	Apophyses form			1)	V	Ι	IV	III	
	1. Phragmata 2. Te	ntorium		2)	IV	V	Ι	III	
	3. Apodemes			3)	V	II	IV	III	
	4. Phragmata and Ap	oodemes		4)	III	V	VI	V	
BOD	Y CAVITY AND CO	ELOM	119.	State	ement (S)) : Fat b	odies of	fcockroa	ach are
LEVI	EL-I		analogous to the liver of the vertebrates						
114.	The body sinus of co	ckroach surrounding		Reas	son(R):	Corpor	a adipos	sa in cocl	kroach
	the alimentary canal i	S		is fur	nctionally	[,] simila	r to the l	iver of th	e
	1)Dorsal pericardial	sinus		verte	brates				
	2)Middle periviscera	l sinus		1)If	both A ar	nd R are	e true ar	d R is co	orrect
	3)Ventral perineural s	sinus		expla	anation of	fA			
	4)Anterior head sinu	s		2)If	both A ar	nd R are	e true bu	t R is no	t
115.	The body sinus of co	ckroach surrounding		corre	ect explar	nation c	ofA		
	the heart			3)If /	A is true a	and R is	false		
	1)Dorsal pericardial	sinus		4)If	A is false	and R i	s true		
	2)Middle periviscera	l sinus							
	3)Ventral perineural s	sinus			DIC	GESTI	VE SYS	STEM	
	4)Anterior head sinu	S	•	Cavity s	surround	ed by m	nouth pa	rts is	
116.	The body sinus of co	ckroach surrounding		-		•	-	- Preor	al cavity
	the nerve cord	-	•	Hypoph	harynx div	vides th	e preora	l cavity i	nto
	1)Dorsal pericardial	sinus		-]	Dorsal ci	bariur	n and v	entral sa	alivariun
	2)Middle perivisceral sinus 3)Ventral perineural sinus				tary cana	l is divi	sible into	o 3 parts.	
					- (a) foregut or stomodaeum				
	4)Anterior head sinu	s		(b) M	idgut or	·Mese	nteron		
STIN	STINK GLANDS			(c) Hi	ndgut or	· Proct	odaeun	1	
LEVI	LEVEL-I			Foregut	and Hin	d gut ar	e lined l	у	
117. S	Stink glands of cockroa	ch are present between the		-		-	Ectode	rm or e	pidermis
1) Terga of 4th and 5th	segments	•	Mesent	eron is lir	ned by	- F	ndoder	mal cells
2	2) Terga of 5th and 6th	segments	•	Foregut	or stome	daeum	include	S	
3	3) Sterna of 4th and 5th	segments		- P	haryx, C)esoph	agus, C	rop and	Gizzard
	s) sterna er var and e ar segments								

228

•	Crop is useful for - Storage	- Holding the food during chew	ing
•	Gizzard is with- 6 toothed or denticulate plates	• Falling down of food is prevented by	
•	Grinding or trituration part of cockroach is	-Labrum and Labi	um
	- Gizzard	RESPIRATORY SYSTEM	
•	Stomodaeal valve is a membranous projection of	Blood of cockroach is without	
	- Gizzard	- Respiratory pigme	ent
•	Between the gizzard and mesenteron there are	Tracheal respiratory system is with	
	- Hepatic caecae	- Stigmata, Trachee and Tracheo	les
•	Function of mesenteron is	• Number of stigmata - 10 Pa	irs
•	- Secretion y and absorptive	All spiracles participate in respiration	
•	Peritrophic membrane is secreted by	- Holopneustic tracheal syst	em
	- Gland cells of mesenteron	• Spiracles are surrounded by - Peritre	me
•	Hind gut is with - Ileum. Colon and Rectum	• Spiracles lead into - Atri	um
•	Ileum collects uric acid from	• Iracheae is with	
	- Malpigian tubules and undigested food from	- Outer Dasement, indule epithenum, ind	ner
	mesenteron	Intima of tracheae forms spiral thickenings call	ed
•	Rectum with six longitudinal folds are	- Taeni	dia
	- Rectal papillae	Taenidia are absent in - Tracheo	oles
•	The structures which help in reabsorption of water	The number of longitudianl tracheal trunks	
	in rectum is - Rectal papillae	-six (3 pai	irs)
•	Each salivary gland has many lobules called	- A pair of dor	sal
	- Acimi	- A pair of Vent	ral
•	A cini is with number of - Secretory cells	- A pair of late	ral
•	An actin is a group of secretory cens caned Zymogen cells	• 3 pairs of tracheal trunks are inter connected b	у
•	Common salivary duct is formed by the union of	- commissural track	iea
	- Ductules of Acini	• Tracheal branches end in - Tracheole	ell
•	Two common salivary ducts are fused and form into	• Tracheole is internally lined by a protein called	•
	- Median salivary duct	- Irach	the
•	Reservoir ducts unite to form	• when the cockroach is active, tissue fluid in	the sos
	- Common reservoir duct	• When the cockroach is inactive the tissue fluit	d in
•	The sac like structures present between the 2 lobes	the tracheoles -Increases or mo	ore
	of salivary glands and stores saliva is	• Expiration occurs due to the contraction of	
	- Salivary receptacle	- Tergo-sternal musc	les
•	Median salivary duct opens into	During inspiration	
	- Common reservoir duct or common	- thoracic spiracles are kept op)en
	receptacillar duct	- Abdominal spiracles are clos	ed.
•	- A mylase and Invertase	Inspiration is -Passive proc	ess
•	Hepatic caecae are with - Symbiotic bacteria	Expiration is -Active proc	ess
•	Glandular cells of mesenteron secrete - Maltase.	During expiration	
	invertase, proteases like trypsin and lipases	- Thorocic spiracles are kept clos	sed
	PHVSIOI OCV OF DICESTION	-Addominal spiracles are kept op)en
•	Cockroach is _an Omnivore	- CO tension in hemolymph and O tension	יy nof
•	olfactory sensillae, antennae, labial nalps, maxillary	tracheae	1 01
	palps help in -Food collection	• Cockroach and insects like grass hoppers	and
•	Forelage Jahrun & Jahrun halagin	Beetles exhibit a phenomenon of	
	Forelegs, labrum & labrum helps in		
	-seizing of food	-Discontinuous ventilati	ion
•	-seizing of food Laciniae, galiae, glossae & Paraglossae help in	-Discontinuous ventilat	ion

	NERVOUS SYSTEM	wall of crop
•	Nerve ring is present around the - Oesophagus	4) Proventricular ganglion present - on Gizzard.
•	Nerve ring is formed by	• Acetyle choline is secreted by the nerve endings of
	- a) a pair of supra-oesophageal ganglia	- Autonomousnervous system
	b) a pair of sub-oesophageal ganglia	Heart of cockroach is - Neurogenic
	c) a pair of circum oesophageal connectives	Simplest sense organs are Sensilla
•	Brain or supra oesophageal ganglia is	• A sensillum consists of - Trichogen cell,
	- Sensory and endocrine center	Tormogen cell and Sensory neuron
•	Sub oesophageal ganglia is - Motor centre	Chordotonal sensilla are - Mechanoreceptors
•	The ganglion which controls the movements of	Auditory sersillae are present on
	mouth parts & wings-Sub oesophageal ganglion	- Pedicel of antenna and on anal Cerci
•	First four abdoninal ganglia present in	Olfactory sensilla are present on
	-1-4 abdominal segments	- Antennae, maxillary palps and Labial palps
•	The abdominal segment in which ganglion is absent	• Gustatory sensilla are present on
	-5 th abdominal segment	- The inner surface of the Labrum, Maxillary
•	5 th abdominal ganglia is present in	
	- 6 th abdominal segment	• I nermoreceptor sensiliae are present on
•	6 th abdominal ganglia present in - 7 th segment	- 1%,2 st and 5 st segment of the tarsus of leg
•	The abdominal segement without ganglion is	other appendages as bristles
	- 5 th segment	other appendages as bristles.
•	6" abdominal ganglion is the largest and formed by	COMPOUND EYE
	The sthe of the and 10th and any inclusion of	• Functional units of compound eye - Ommatidia
	- /",o",9" and 10" abdominal segmental	Outermost part of ommatidium is - Cornea
•	gangna Nerves of supra pesophageal ganglia are	• It is secreted by- Corneagen cells of epidermis
•	- a) Ontic nerves of eves	• Four vitrillae or cone cells present below the
	b) Antennary nerves to antennae	- Lenticular Or corneagen cells
	c) Labro frontal nerves to labrum and frons	Light absorbing dark iris pigment sheath is present
•	Sub-oesophageal ganglia supply nerves to	around the - Vitrillae
	- Mandibles, Maxillae and Labium	• The transparent conical structure secreted by cone
•	Thoracic ganglia supply nerves to - Wings and Legs	cells -crystalline cone
•	The first abdominal segment is innervated by	• Number of corneagen cells is - 2(1W0)
	-Nerves coming from Meta thoracic ganglia	• Number of cone cens -10ur
•	Organs of 7 th to 10 th abdominal segments	Cornea, corneagen cens, vitrinae and crystalline corne together celled Diantrical or focussing
	reproductive, copulatory organs, Analcerc and anal	region
	styles receive nerves from	Rabhdome is surrounded by
	- Last abdominal ganglia	- Seven ratinular cells or Ratinulae
•	Autonomous nervous system is called	Retinulae are Photorecentor cells
	- Stomato - gastric nervous system or visceral	Rhabhdome and Retinulae together called
	nervous system	- Retinal or recentor region
•	Autonomous nervous system controls	Super position image is formed in
	- Muscles of the alimentrary canal and the	- Nocturnal insects like cockroaches
	heart	• Image formed by overlapping of images is called -
•	Number of ganglia present in autonomous nervous	superposition image and it is a blurred image
	system is - 4	Retinulae are deep below the
	1) Frontal ganglion -infront of brain on dorsal wall	- vitrellae and crystalline cone in nocturnal
	or pharynx	insects
	2) Occipital / nypocerebral ganglion : present on	Apposition images are formed in
	2) Viscorol (induvial conclice present of the	- Diurnal insects like house flies
	5) visceral/ingluvial ganglion present -on the	

DIGESTIVE SYSTEM B С Α IV V LEVEL-I 1) Ι 2) V VII I 120 This acts as sieve and grinding mill 1) Stomodael valve 2) Oesophages 3) V Π IV 4) Crop 4) III Π IV 3) Gizzard 132. 121 Anterior chamber of preoral cavity is called Match the following: 2) Salivarium 1) Cibarium List – I List-II 3) Enterocoel 4) Haemocoel A. Cibarium I. Posterior chamber of 123 The major function of malphigian tubules is preoral cavity 1) Digestion 2) Excretion B. Salivariam II. Foregut 3) Respiration 4) Absorption C. Stomodaeum III. Anterior chamber of 124 Number of denticulate plates in the gizzard of cockpreoral cavity roach is D. Proctodaeum IV. Midgut 1)4 2) 6 3) 8 4) 10 V. Hindgut 125 the only part of the gut which is lined by Endoder-Α B С mal cells in Cockroach is 1) Ш Π IV 1) Gizzard 2) Crop 3) Mesenteron 4) Il-2) III IV Π eum 3) Ш Ι Π 126 Peritrophic membrane in cockroach is secreted by Ι 4) Π Ш 1) Gizzard 2) Crop 133. Match the following: 3) Mesenteron 4) Hepatic Caecae List - I 127 Rectal papillae are concerned with 1) Digestion of foods 2) Absorption of food A. Rectalpapillae I. 6 to 8 finger shaped 3) Reabsorption of water 4) Defecation diverticula 128. Proventricculus in cockroach is also called B. Malpighian tubules II. Six chitinous plates 1. Gizzard 2. Pharynx C. Denticulate plates III. Six longitudinal folds 3. Crop 4. Rectum D. Hapatic caecae IV. Six bundles of yellow 129. The funnel like membranous projection of tubules the gizzard into the mesenteron of V. Six transverse folds cockroach is called Α B С 1. Peritrophic membrane 1) Ш IV Π 2. Stomodael valve 2) Ι IV Π 3. Sphincter muscle 4. Rectal papilla 3) V Ι Ш Which one of the following in cockroach 130. 4) Π I IV prevents the backward passage of food 134. Study the following regarding the digestive from the mesenteron into the gizzard. system of cockroach. 2. ileo-caecal valve 1. Sphincter muscles Sl.No. Part **Belongs to** 3. Stomodaeal valve 4. Pyloric sphincter Ι Rectum Hindgut LEVEL-II 131. Match the following and select the correct Π Malpighian Proctodeaum combination regarding the digestive system tubules of cockroach III Gizzard Stomodoeum List-1 List-II I) Most of the food is digested A) Crop IV Mesenteron Foregut B) Gizzard II) Secretes peritrophic membrane membrane C) stomodial valve III) Reabsorbs water Which of the above are correct D) Rectal papillae IV) Grinding mill and sieve 1) I and IV 2) II and III 3) I and III 4) I, II, III and IV

D

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III

V

D

I

V

V

IV

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Function

of water

uric acid

Reabsorption

Excretion of

Grinding and

filtering of food

Formation of

peritrophic

List - H

Е

Π

V

Ι

I

135. The following are various parts in the alimentary canal of periplaneta A) Mid gut caecae B)Rectum C) Stomodaeal valve D) Crop F) IIeum E) Mesenteron G) Pharynx H) Colon J) Gizzard I) Oesophagus Arrange these in a correct sequence form anterior to posterior direction. 1) G-I-D-J-A-C-E-F-H-B 2) G-I-D-J-C-A-E-F-H-B 3) G-I-D-J-C-E-A-F-H-B 4) G-I-D-J-C-A-E-H-F-B 136. The following are the statements about the gizzard (i) Gizzard has six toothed (or) denticulate plates (ii) Gizzard stores the food (iii) Gizzard acts as a grinding mill and sieve Choose the wrong combination 1) i only 2) ii and iii 4) ii only 3) i and iii only 137. The following are the statements about the digestive system of cockroach (i) It consists of only alimentary canal. (ii) The cavity present before the mouth is called preoral cavity. (iii) Hepatic caecae have secretory and absorptive cells. Choose the correct combination 1) i and ii 2) ii and iii 3) i and iii 4) i, ii, iii 138. Part Character Function Protects the wall of the (i) Peritrophic Porous, membrane mesh like mesenteronfrom chitinous hard food particles membrane (ii) Malpighian Fine yellow Absorptive tubules in function tubules (iii) Rectal Six Reabsorption of water papillae longitudinal folds (iv) Hepatic 2-4 finger Storage and digestion caecae shaped of some food stuffs diverticula Which of the above two are correct. 1) ii and iii 2) i and iii 4) ii and iv 3) iii and iv SALIVARY GLANDS LEVEL-I 139. Cells of the salivary glands that secrete saliva are 1) Trichogen cells 2) Zymogen cells 3) Oxyntic cells 4) Acinarcells

140. In Cockroach two common salivary ducts are joined to form 1. Median salivary duct 2. Common receptacular duct 3. Efferent salivary duct 4. Common reservoir duct 141. In Cockroach median salivary duct opens into the common receptacular duct to form 1. Afferent salivary duct 2. Efferent salivary duct 3. Common salivary duct 4. Receptacular duct LEVEL-II 142. The following are various parts in salivary glands A)Acini B) Common salivary duct C) Efferent salivary duct D) Ductules E) Median salivary duct F) Salivarium Arrange these in a correct sequence as per the direction of flow of saliva 1) A-D-B-E-C-F 2) A-C-E-B-F-D 3) F-A-E-C-B-D 4) A-F-D-B-E-C The following are various parts in the 143. salivary glands of cockroach A) Salivary receptacle B) Ductules C) Median salivary duct D)Receptacular duct E) Common salivary duct F)Acini G) Common receptor duct Arrange these in a correct sequence as per the secretion and storage of saliva 1) A-D-G-C-E-B-F 2) F-B-E-C-G-D-A 3) F-B-E-C-D-G-A 4) F-C-E-B-G-D-A 144. Statement (S): The foregut contain cuticular lining on its innerside. **Reason** (R): forgut is internally lined by ectoderm or epidermis. PHYSIOLOGY OF DIGESTION LEVEL-I 145 Cockroach detects the food by means of 1)Antenna 2) Maxillae 3) Mandibles 4) Hypopharynx 146. The complete absorption of digested food takes place in 1) Stomodaeum 2) Proctodaeum 3) Mesenteron 4) Foregut

147.	What will	happen if peritrop	bhic membrane is			in Hindgut		into glucose.	
	not forme	d around food bol	us in cockroach	(iv) Tr	ypsin	Salivary glan	ıd	Convert proteins	
	1)Digestic	on of food will stop	into aminoacids.						
	2)Mesente	eron will be dama	ged	V	Vhich of the	above two a	re co	rrect	
	3)Absorpt	tion of food will st	top	1) i and ii		2) i	i and iv	
	4)Excretion of uric acid will stop The nature of anterior and posterior parts of			3) ii and iii		4) i	ii and iv	
148.				RESP	PIRATORY	SYSTEM	., .		
	mesentero	on of cockroach re	espectively are	LEVEL-I					
	1)Secreto	ry and absorptive		155. Tracheae of cockroach arise from					
	2)absorpti	ive and secretive		1) Stigmata		2)A	trium	
	3)Support	tive and secretory	7	3) Peritreme		4) S	piracles	
	4)Support	tive and absorpiti	ve	156 S	, tructures w	hich prevent	the c	collapse of trachee	
149.	Cockroac	h seizes the food	with the help of	a	re	1		1	
	1)Antenna	a, Labial palps and	l maxillary palps	1) Trachein		2)T	aenidia	
	2)Fore leg	legs, Labrum and Labium) Intima		4)E	pidermis	
	3)Lacinia	, galeae,glossae ar	nd paraglossae	157. T	he tracheal	system of coo	ckroa	ich is called	
	4)Labrum	and Labium		1)Holopneus	stic	2)H	lemipneustic	
150.	In cockroa	ach invertase dige	sts	3)Apneustic		4)E	pipneustic	
	1)Sucrose into glucose and fructose				Vhich of the	following exh	ibit c	liscontinuous venti-	
	2)Maltose into glucose molecules				ation	C			
	3)Lactose	into glucose and	1) Cockroac	h	2) C	brass hoppers		
	4)Sucrose	into glucose and	galactose	3) Beetles		4) 1	, 2 and $\overline{3}$	
151.	In cockroa	ach cellulose of fo	ood is digested by	159 T	rachein is a				
	the enzym	e cellulase secrete	ed by	1) Carbohyd	rate	2) P	rotein	
	1)Glandul	lar cells of the mes	senteron	3)Enzyme		4)L	ipid	
	2)Hepatic	caeca		160 S	piracles ope	en into			
	3)Micro o	rganisms present	in the hind gut of	1)Atrium		2) P	eritreme	
		ich 4)Rectal paj	pillae of rectum	3) Taenidia		4)H	laemolymph	
	L-II Stataman	(\mathbf{C}) . In a solution of	h aallulaaa	161 B	Besides nerv	ous system,	open	ing and closing of	
132.	digastion	(S): In cockroac	n cellulose	spiracles in Cockroach is controlled by					
	Descon (E) · Mieroorgonier	gui	1) CO ₂ tensi	on in haemoly	ympł	n, and O_2 tension in	
	hindout of	foockroach secret	e cellulase	tr	racheae				
	enzume		e centulase	2) O_2 tension in haemolymph and CO_2 tension in					
153 Tł	e following	a are the statement	s about the direction	tr	racheae				
in	cockroach	g are the statement.	s about the digestion	3) CO_2 tensi	on in haemoly	ympl	h and tracheae	
(i)	Maltase	converts maltose i	nto fructose	4) O_2 tension	n in haemolyr	nph a	and tracheae	
(i) (ii) Inverta	se breaks sucros	e into glucose and	162.H	lolopneustic	systems mea	ns		
frı	ictose.		e mile Bracese and	1) Having 10	pairs of spira	icles		
Gii	i) Maltase	converts maltose	into glucose	2) 4 pairs of s	piracles func	tion		
Ċ	100se the c	orrect combinatio	on	3) All spiracle		al sta	te	
1)	i and ii	2) i	i and iii	4) Only thora	cic spiracies a	are It		
3)	i and iii	4) <i>A</i>	All are true	103. 1	() Solomond	pigment is at	oseni 2) s	in the blood of	
154. E	nzyme	Secreted by	Function	1) Salamanu) Earthuarn		2)S	Calleroach	
(i) Inv	ertase	Glandular cells	Breakssucrose into	164	Which on	l 1 of the fellow	4)C		
(1)		ofmidaut	alucose and	104	during eve	viration in coc	ving : deroa	spiracies open	
		ormugui	maltose		1 All there	acic and abde	min	al spiracles	
(ii) ∆m	manust.			2. 1 st thoracic spiracles					
(11) 7311	y1030	San vai y giana	disaccharides	3 2 nd thoracic spiracles					
(iii)Cel	Ilulase Bacteria precent Convert cellulose				4 Allahda	minal sniracl	les		
	1414.50	Ductoriu present				Spiraci			

165.	Which of the following spiracles open during					
	inspiration of cockroach?					
	1. All thoracic spiracles	173				
	2. All abdominal spiracles					
	3. All thoracic and all abdominal spiracles	A.]				
	4. Only 1 st and 2 nd pairs of abdominal					
	spiracles	B. A				
166	Each spiracle leads into small chamber	C. 7				
	called.	D.]				
	1. Atrium 2. Ostium					
	3. Stomata 4. Osculum					
167	In cockroach blood cannot transport oxygen					
	because					
	1) It has respiratory pigment dissolved in the					
	plasma of the blood					
	2)It has respiratory pigment inside the RBC	174				
	3) It has no respiratory pigment in the blood					
	4)It has haemocyanin in a dissolved state in	A				
	the plasma of the blood					
168	Spiracles of cockroach are the openings in	B				
100	1)The tergs of their respective segments					
	2)The sterna of their respective segments					
	3)The pleura of their respective segments	ר ח				
	4)The arthrodial membranes of their					
	respective segments					
LEVE						
169	The following are the various parts of					
10,71	tracheal system of cockroach					
	A) Trachea B) Atrium					
	C) Tracheoles D) Spiracle	174				
	E) Traehcole cell	1/1				
	Arrange these in a correct sequence of					
	passage of air in inspiration					
	1) C-E-A-B-D 2) D-B-A-C-E					
	$3) D-B-A-E-C \qquad 4) D-A-B-E-C$	176				
170	Statement (S): Intima and taenidia are					
1,01	absent in the tracheoles of cockroach					
	Reason (R): The inner surface of					
	tracheoles is lined with trachein in					
	cockroach	172				
171	Statement (S) : Inspiration in cockroach is					
1,11	regarded as a passive process					
	Reason (R): In cockroach inspiration is					
	affected by the relaxation of the	178				
	dorsoventral and longitudinal muscles					
172	Statement (S): In cockroaches grass					
1/2.	hoppers and beetles discountinuous					
	ventilation occurs					
	Reason (R) : In cockroaches $\sigma rass =$					
	hoppers and beetles continuous exchanges					
	hoppens and secures continuous exchanges					
		004				

of gases is interrupted by extended periods during which, spiracles are closed.

	uurm	g willen	, spiraer		useu.			
73.	Matcht	the follo	wing					
	List -	- I		List	II			
. Н	olopneus	stic syste	em I.	I. Cockroach, beetles,				
			1	grasshopper				
B. Ał	odomina	l spiracle	es I	I. 10 p	pairs			
C. Tł	noracic s	piracles	I	I. 8 pa	irs			
). D	iscontinu	ious ver	ntilation	IV. Co	ckroach			
				V. 2 Pairs				
		Α	В	С	D			
	1)	III	Π	Ι	IV			
	2)	IV	III	V	Ι			
	3)	Π	III	IV	Ι			
	4)	Ι	II	III	V			
74.	Match t	he follow	wing					
	List -	- I			List - II			
. Sp	oiral thic	kening o	ofcuticl	e I. St	igmata, Trache	ae,		
				Trac	neole cell			
B. Cł	nitinous r	ing		II. Tae	nidia			
. Sp	oiracles		Ι	II. Intin	na Tracheae,			
				Trac	neole cell.			
). Tr	acheal s	ysem]	V. Peri	treme			
				V. Stig	mata			
		Α	В	С	D			
	1)	Π	IV	V	Ι			
	2)	Ι	II	V	IV			
	3)	III	II	Ι	IV			
	4)	IV	Ι	V	III			
75.	Stateme	ent (S) :	The le	vel of t	racheolar fluid	l in		
	trachea	falls dov	wn when	n cockre	bach is action			
	Reason	(R) : T	he cocl	kroach	is physically a	and		
	metabol	ically ac	ctive & 1	the track	aole is filled w	vith		
	fluid							
76.	Stateme	nt(S):T	The open	ing and	closing of spirad	cles		
	takes pla	ices duri	ing respi	iration				
	Reason	(R): Th	e openi	ng and c	losing of spirac	eles		
	is contro	lled by C	CO, tensi	ion in tra	acheae and oxy	gen		
	tension i	n haema	lymph.					
77.	Stateme	ent (S) :	The tra	acheae a	are ectoderma	l in		
	origin.							
	Reaso	n (R) :	The t	rachea	e are formed	as		
	invagina	tions of o	epiderm	is.				

8. The following are the statements about the respiration in cockroach

(i) During inspiration only thoractic spiracles are kept open.

(ii) Discontinuous ventilation can be observed in cockroach.

(iii) Internal respiration is absent in cockroach

Chose the correct combination. 187. 1) ii and iii only 2) i and ii only 3) i and iii only 4) iii only 179. The following are the statements about the tracheae in cockroach (i) An innermost layer of trachea is called intima. (ii) Cartilagenous ridges of tracheae is called taenidia (iii) An outer most layer of tracheae is called basement membrane. Choose the correct combination. 2) ii and iii only 1) i and iii only 3) i and iv only 4) i, ii and iii 180. The following are the statements about the stigmata of cockroach. (i) Ten pairs of stigmata are present (ii) All stigmata are functional (iii) Each spiracle leads into the atrium Choose the correct combination. 2) i and ii 1) i and iii 4) ii and iii 3) i, ii and iii 181. The following parts are present in the respiratory system of Cockroach a) Tracheole cell. b) Peritreme c) Trachein d) Atrium Arrange the above parts in correct sequence towards the tissue 1) c-b-a-d 2) a-d-b-c 3) a-d-c-b 4) b-d-a-c **CENTRAL NERVOUS SYSTEM** LEVEL-I 182. Abdominal gang lia is absent in 1) 4th abdominal segment 2) 5th abdominal segment 3) 6th abdominal segment 4) 7th abdominal segment 183. Largest abdominal ganglia is located in the segment 1) 7th 2) 6th 3) 9th 4) 10th 184. Socket of the movable hair is formed by 1) Trichogen cell 2) Tormogen cell 4) Oenocyte 3) Sensory Cell 185. Which of the following ganglia supply nerves to reproductive organs, anal cerci and copulatory organs in cockroach 1) Brain 2) Metathoracic ganglia 3) 1st abdominal ganglia 4) Last abdominal ganglia

a	195. Gangna	Luci
inly 2) Motor 4) Both 1 and 3	i) Thoracic ganglia 235	Thorsegn

cockroach is 1. First abdominal ganglion 2. Second abdominal ganglion 3. Third abdominal ganglion 4. sixth abdominal ganglion 188. The sixth abdominal ganglion of cockroach is formed by the fusion of ganglia of these segments 1.6,7,8,9 2.7,8,9,10 4.7.8.9 3. 5, 7, 9, 10 In cockroach ganglionated double ventral 189. nerve cord extends upto 1)2nd abdominal segment 2)5th abdominal segment 3)6th abdominal segment 4)7th abdominal segment In cockroach 5th abdominal ganglion is 190.

The largest of all the abdominal ganglia of

present in this segment 1)4th abdominal segment 2)5th abdominal segment 3)6th abdominal segment 4)7th abdominal segment

LEVEL-II

191. Statement (S) : Sub-oesophageal ganglion of cockroach control the movements of mouthparts, legs, wings Reason (R): Sub-oesophageal ganglion is a motor

center in cockroach

1) Both A and R are correct, R is the correct explanation to A

2) Both A and R are correct, R is not the correct explanation to A

3) A is correct but R is false

4) Both A and R are false

192. The following are the statements about the ventral nerve cord of Periplaneta.

(i) 6th abdominal ganglia are the largest of all abdominal ganglia

(ii) The 5th abdominal ganglia is present in 6^{th} abdominal segment

(iii) The 6th abdominal ganglia is present in 7th segment.

Choose the correct combination

1) 1 and 11 only 3) i ii and iii		2) 11 and 111 only 4) Only i is correct
193. Ganglia	Location	Distribution of nerves
i) Thoracic	Thoracic	Nerves to
ganglia	segment	wings and legs
5		UNIT-VI

- 186. Brain of cockroach is mai
 - 1) Sensory

3) Endocrine EAMCET-JUNIOR ZOOLOGY

ii) 5 th a	bdominal	6 th segment	Nerves to the		In the	eabove				
g	anglia		7 th segment	1)Only I and II are correct						
iii) 6 th	abdominal	7 th segment	Nerves to 6 th	2)Only III and IV are correct						
gai	nglia		to 10 th segment		3) I a	nd IV ai	re corre	ct		
iv) 4 th	abdominal	5 th segment	Nerves to 4 th	4) 1, 11, 111 and 1V 200 Motch the following and select the compact					raat	
gai	nglia		segment	200.	ontio	n regard	ing the s	and sele	ci ille col pastric ne	
о Т	Ubich of the	above two are	Wrong		syster	n of co	nig nie s ekroach	somatog	zasure ne	ivous
`	which of the	above two are	e wrong	List 1 List II						
1) i and ii 2) i and iv					nglion	on the do	orsal	List		
3) ii and iv	4) iii and iv	wall	l of the	nharvnx		roventri	cular gar	notion
194.	Protocere	ebrum, deu	utocerebrum and	B)Ga	nglion	on the oi	zzard II)	Frontal	oanolion	
	tritocerebrum in cockroach receive sensory					on the	III)	Hypoce	rebral oa	nolion
impulses respectively from					lofthe	crop		nypoee	icolul 5u	inghon
	1. eyes, lab	rum and anten	nae	D) Ga	nglion	above	IV)V	visceral g	anglion	
	2. Labrum,	, antennae and	eyes	the	oesoph	agus	1,,,,	ibeerar g	ungnon	
	3. Antenna	e, eyes and lab	brum		r	Α	В	С	D	
	4. Eyes, an	tennae and lab	rum		1)	П	I	ĪV	Ш	
AUTO	JNOMOUS	NERVOUS	SYSTEM		2)	I	П	IV	III	
	CL-I	o 11 ·			3)	Ι	III	IV	Π	
195. Which of the following controls the movement of				4)	Ш	П	IV	Ι		
mouth parts in cockroach			201.	The f	ollowing	g are vari	ious gan	glia in the	e	
1) Supra $oeso$		a	autonomic nervous sytem of cockroach						h
2) First abdom	linal ganglia			A)Fr	ontal gai	nglion	B)Oc	cipital ga	nglion
3) Protnoració	gangna			C) Pr	oventric	ular gan	glion		-
4 106 L) Suboesphag	gear gangna	~		D) In	gluvial ga	anglion	-		
190.11	igiuviai gang) Occomboour	Arrange these in a correct sequence from anterior to posterior direction. 1) A-B-D-C 2) A-B-C-D						om
1) Crop) Gizzord	2) Desopnagus							
107 E	rontal gangli	+ on in cockross	b lies							
197.1) Infront of B	Proin 2) Rehind Brain	3) B-A-C-D 4) B-A-D-C						
3) Above cro	$n \qquad 2$	Below crop	202. The following are the statements about the						
198	The nervol	' is system of co	ckroach which	Autonomous nervous system						
170.	narticularly	controls the n	nuscles of the	(i) It is also called visceral nervous system						
	alimentary	canal and the	neart is	(ii) Stor	natogas	tric nerv	ous sys	tem inclu	ides four
	1)Central n	ervous system	 1	g	anglia		_			
	2)Periphera	al nervous syst	em	(iii) Pe	ripheral	l nervoi	us syste	em is als	o called
	3)Stomatog	gastric nervous	s system	s	tomato	gastric n	ervous s	system.		
	4) 1,2 and	3	•		Choose	the corre	ect com	oination	1	
Level	-II) 1 and 1	11		2) 18	111 II	
199.	The follow	ing are the stat	ements about		$)$ 11 and $\sum_{n=1}^{\infty}$			4) AI	l are corr	rect
	autonomou	is nervous syst	tem of cockroach	SENS LEVI	SE OR	GANS				
	I)This syste	em is also calle	ed stomatogastric		ĽL - I 31 1 . 4	1	.:11			
	nervous sy	stem or viscera	al nervous System	203.0		onal sen	sina rep	resent		11.
II)It controls the visceral organs particularly)Audit)Teetil	ory sensi) Olfact	ory sensi	11a 11a
	the muscle	s of alimentary	canal and the	נ ד 20/1	ango r	e sentara	are pres	ent on a cl	ory sensi	na
heart				1) on na	Ins	are pres) on lea	S	
	III)In the h	ead it has an oc	ccipital ganglion) on an	tennae	4) 1.2 ar	nd 3	
	infront of th	ne brain			, un			, ., _ ui		
	IV)It has a	visceral gangl	10n on the crop and							
	aningluvia	l ganglion on th	ne gizzard							

	205. W	/hich of	the following	ng receptors are sensitive to		legs	The corre	ect comb	oination i	s		
	pi	ressure				1) 1, 2 & 3 2) 1, 2 & 4						
	1)) Gustat	ory receptor	2) Mechanoreceptor		3)2,	3&4	4) 1,	2,3&4			
	3)) Therm	oreceptor	4) Tangoreceptor	213.	213. Match the following and select the correct						
	206. A	uditory	sensillae are	present on		combination regarding the sensiliae of						
	1)) Scape		2) Pedicel		cock	roach	_				
	3))Flagell	um	4) Lacinia			List -	1		List-	-II	
	207. M	laxillary	γ and labial p	alps contain	A)Ch	ordoto	nal sensıl	la I) Ser	isitive to	smell		
1) Olfactory and gustatory sensillae				B)Ol	factory	sensilla	II) M	echanore	eceptor	s		
	2)) Olfacto	ory and audit	ory sensillae	C)Gu	istatory	sensilla	III) L	ocated o	on 1 st , 2	nd and	
	3))Audito	ry and gustat	ory sensillae				3 rd	tarsome	res		
	4)) Gustate	ory sensillae	only	D) Th	ermore	eceptor se	ensilla I	V) Sensit	to ta	aste	
	208.	In Coc	kroach olfac	tory sensillae are	E Ph	otorece	eptors	V) P ₁	resent in	ocellı		
		distrib	uted over				A	В	C	D	E	
		l.Ana	l cerci and pe	edicel of antenna		1)	V	IV	III	II 	l	
		2. Ante	ennae, maxıll	ary palps and labial		2)	V	IV	1	111	11 -	
		palp	os 			3)	V	11	IV	111	l	
		3. Lab	rum, Maxilla	ary and labial palps		4)	ll	I	IV	. 111	V	
		4 Firs	t second and	third segment of the	214.	Stud	y the follo	owing re	garding	the sens	silla of	
			tarsus of l	egs.		cock	roach.	~	_			
	209.	Therm	o receptor se	ensilla of cockroach are	Nam	e of the	e	Sens	se detect	ted Lo	cation	
		presen	ton		sensi	lum		~				
		l. Ana	al Cerci and p	bedicel of antenna		hordoto	onal	Groun	nd and	Anals	styles	
		2. Lab	rum maxillar	y and labial palps	sei	nsilla		sound		scape	of	
		3. Ante	enna, maxılla	ry and labial palps		10		vibrati	ons	anten	na	
		4. F1rs	t, second and	I the third segments of		II. Olfactory				Anter	nnae	
	• • •	tarsı	is of leg		sensila			The second se		and palps		
	210.	The ur	nits of mehan	oreceptors of chrodo-	III. Thermoreceptor			Temp	erature	1^{st} , 2^{int} and 3^{st}		
		tonal c	organs are cal	led	sensilla					podoi	meres of	
		1. Sco.		2. Ommatidia					Light		legs	
	011	3. Sens	5111a	4. Semper cells		IV. Photoreceptors Light				Compound		
	211.	The or	gans that are	sensitive to ground		W 71. !	-1 f 41	.1		eyes a	and ocelli	
		VIDraul	ons manal	2 Sub second				abovea	$\frac{2}{1}$	л ЛПТ		
		1.1 ym	ipanai	2. Sub-genual		1)11	and IV		2) I ar			
	теле	3. Vitri	llae 4.	lympanal and sub – genual	215	3) I an	(a 11 	Olfest		4) III 11a ana 4	and IV	
		L-II Thefe	11 arrig a ana 4	h a stata wa anto ali avet tha	213.	State	ement (S)	Onact	ory sensi	na are a	i Kind	
	212.		nowing are t	ne statements about the		Dage	(D)	purs				
		sensiii	Chandatan	icn al consillo ano		Reas	son (R):	In cock	the inn	istatory	/	
		1)		al sensilla are		recept	ors are to		n the inn	er suria		
			chemorece	ptors present on anal		orther	labrum ai	nd on a r	naxillary	and lat	biai	
		2)	Cerci and p	edicel of antenna			S stle A and	Davate			us at	
		2)	ollactory s	ensiliae are		1) D(oln A and	R are u	rue and f	C 1S COL	rect	
			cnemorece	ptors present on the			anation of	IA Dava ti			4	
			antennae m	axillary paips and labial		2) b0	oth A and	K are ti	rue but R	ls not	correct	
		2)	paips				anation of		.1			
		3)	Gustatory s			5)A	is true an	u K IS Ia	aise			
			cnemorece	piors present in the inner	216 7	4)A 11-1-1	is faise a	na K 18 1 a tha -t	rue	h	o gene 11.	
		4)	surface of I	adiai Paips	216.	i ne ioll	lowing ar	e the sta	lements a	about th	ie sensilla	
		4)	I nermorec	reptors are	(1) Ulf	actory se	insilla a	are prese	ent on a	intennae,	
			located in	$1^{-1} 2^{-1} 3^{-1}$ tarsomeres of		naxilla	ry paips,	iaoiai pa	aips.			
					-							

(ii) Gustatory sensilla are present labrum, maxillary and labial palps

(iii) Thermoreceptor sensilla are present on femur. Choose the correct combination.

1) i and iii	2) i and ii
3) ii and iii	4) Only iii is correct

217. Sensilla	Location	Function
i) Olfactory	Antennae	Sensitive to
sensilla		odour
ii) Gustatory	Labrum,	Smelling the
sensilla	maxillary palps, labial palps.	food
iii) Thermorecepto sensilla	or 1 st ,2 nd , 3 rd segment of tarsus	Detect changes in temperature
iv) Tango receptors	Labial palps	Sensory to touch

Which of the above two are correct. 1) ii and iii 2) i and ii 3) i and iii 4) iii and iv

z COMPOUND EYE

LEVEL-I

218. Ocelli are I. Sensitive to the changes in light intensity II. Each consists of a single facet III. Present in the larvae of hemimetabolous insects Correct combination is 2. I, II & III 1. I, II only 3. II, III only 4. I, III only 219 Dioptrical region of ommatidium is formed of 1) Rhabdome, retinulae 2) Cornea, corneagen cells, crystalline cone and vitrillae 3) Retinulae cone cells cornea 4) Cornea, rhabdome, retinulae 220. Superposition images are formed in the eyes of 1) Wingless insects 2) Nocturnal insects 3) All insects 4) Diurnal insects 221. Number of retinulae and cone cells in the ommatidium respectively Is 2) 7, 4 3) 2, 7 4) 7, 2 1) 4, 7 222. Crystalline cone is secreted by 1) Lenticular cells 2)Vitrillae 3) Retinulae 4) Epidermal cells 223. Number of corneagen cells is 1)4 2) 7 3)6 4) 2

224.	Number of vitrillae or cone cells present in
	each ommatidum of cockroach is

	1.2	2.4	3.6	4.8	
225.	Light a	bsorbin	g dark ir	is pigm	ent sheath is
	prese	ent aroun	d		
1.	Rhabd	omeres	2. Ret	inulae	
3	. Corne	ea	4. Vitr	illae	
226.	Retinu	lae lie in	mediate	ly belo	w the vitrillae and
	cryst	alline coi	ne in	-	
	1. Di	urnal ins	ects like	house f	lies
	2. No	octurnal	insects li	ike cocl	kroaches
	3. Da	y neutra	l insects	like mo	osquitoes
	4.1	& 2			•
LEVI	EL-II				
227.	The f	following	g are the	stateme	ents about the
	omm	atidia of	insects		
	I) Co	rnea is sl	hed off c	luring e	cdysis of
	nym	ohs and a	new co	rnea is:	formed
	II) Th	ne cornea	a,cornea	gen cell	ls,the vitrellae
	and c	rystallin	e cone to	ogether	constitute the
	dio	ptrical re	gion of	the omr	natidium
	III) R	habdom	e is com	posed	of seven units
	calle	d rhabdo	meres		
	IV)F	Rentinula	e act as	photore	eceptors cells
	ofor	nmatidiur	n		
	V) R	etinulae	are surre	ounded	by retinal
	sheat	h which	absorbs	light ra	ys
	Whic	ch of the	above is	not app	plicable to
	cock	roach			
	1)On	ly V		2) IV	⁷ and V
	3) II	and III		4)Al	l except IV
228.	Mate	h the fol	lowing a	and sele	ect the correct
	optio	n regardi	ng the or	mmatid	ium of
	cock	roach			
	List	-1			List-II
A) Ph	otorece	eptor cell	l	I) Cry	ystalline cone
B) Spo	ecialize	ed cells o	fepiden	mis II) (Cornea
C) Co	nvergir	ng lens		III) F	Rhabdome
D) Co	mpose	d of seve	en units	IV)I	enticular cells
				V)V	itrellae
				VI) F	Retinulae
	Α	В	С	D	
	1)	V	Ι	IV	III
	2)	V	VII	VI	III
	3)	V	II	IV	III
	4)	VI	IV	II	III
229.	Mate	ch the fol	lowing		
	List	-1			List - II
A. Su	perposi	tion imag	ge	I. C	orneagen cells.

B. Apposition image.

II. Cockroach.

C. Len D. Cor	ticular c ne cells	ells		III. Vitr IV. Ho	illae. usefly.	235
				V. Co	rnea	I. N
		A	В	С	D	
	1)	III	II	Ι	IV	11.
	2)	Π	IV	Ι	III	
	3)	III	IV	V	Π	III
	4)	III	IV	Π	Ι	IV
230.	Study t	the follow	wing reg	arding th	ne	
C1 N	ommat	tidium of	t cockroa	ach		
SI.No.	Part of	ommatio	lium No	0.1n omn		
т	DI 1 1		- K	Legion d	of ommatidium	
I T	Rhabd	omeres	/	Recept	or region	
	Cornea	a	1	Dioptri	c region	
	Retinu			Retinal	region	
IV	Crysta	lline con	e 4	Focuss	ing region	
	Which	of the a	bove are	e correct		
	1) 11 aı	ndIV		2) I and		•
	3) I an	dII			4) III and IV	
231	Assert	ion (A):	Cornea	oform	atidium is	•
	shed d	uring eco	dysis of	nymphs	and a new	
	cornea	is form	ned in p	lace of i	t	•
	Reason	n(R):	Cornea	ofomm	atidium is a	
	cuticul	ar secret	ion of sp	ecialize	d cells of	
(epidermi	is				
232.	Statem	nent(S):	In diurn	al insect	s only light	
	rays en	itering th	e cornea	oform	natidium	•
	convei	rge on th	e rhabd	ome		
	Reason	n(R): Ir	n diurnal	insects	in the	•
	omma	tidium vi	trillae ar	e surrou	nded by iris	
	sheath	and reti	nulae are	e surroui	nded by	•
	retinal	sheath.				
	Which	absorbl	ight rays	8		
233.	Statem	nent (S):	Innoct	urnal ins	sects the	
	rhabdo	ome and i	retinulae	e of an or	nmatidium	
	also re	eceive lig	ght rays 1	that ente	er through	•
	the cor	nea of th	e adjoin	ing omn	natidia	
	Reason	n(R) : Ir	nocturi	nal insec	ts retinal	
	region	present	deep be	low the o	dioptric	•
	region	and reti	nal shea	th is abs	ent	
234. T	he foll	owing a	are the	statem	ents about the	
01	nmatidi	um of co	mpound	leye		•
(i) Lentio	cular cel	ls secre	te a new	cornea at each	
m	oultoft	he nymp	h.			•
(ii	ı) Vitrilla	ae secret	e crystal	line cone	2.	
(ii	ii)Rabd	ome is su	ırrounde	ed by ret	inulae	
С	hoose th	ne correc	t combi	nation		
1)) i and iii	i only		2) ii ar	id iii only	
3)) i and i	i only		4) i, ii a	ndiii	

35. Study the following	and findout the correct
combination	
. Microvilli of each retinul	ar cell collectively
form a rhabdomere	
II. Retinulae are the nerve	e cells from which sensory
nerve fibres formed	l as optic nerve to reach the
III.Rhabdome and retinula	e form the retinal region
IV. Retinulae are inner mo ommatidium	st and elongated cells of an
1. I, II and III	2. II, III and IV
3. I, III and IV	4. I, II, III and IV

PHYLUM - ARTHROPODA (Mouth parts & Economic Importance of insects)

- Mouth parts of insects are modified from

 cephalic appendages.

 Cenhalic appendages of insects are modified into
 - Cephalic appendages of insects are modified into -mouth parts.
 - Cephalic appendages of insects are
 - 1. Antennae,
 - 2. Mandibles
 - 3. I pair of maxilla and
 - 4. II pair of maxilla.
- Mouth parts of insects are best examples for homologous organs.
 - The basic structure of mouth parts of all insects is same.
- The organs having same origin and structure but different in shape and function are called

- homologous organs.

• The primitive pattern of mouth parts is

- biting and chewing type.

• Biting and chewing type of mouth parts are regarded as premitive because - **they are present**

in the larval stages of all insects.

From the evolutionary point of view mouth parts of insects are best example for - **adaptive -ra**

diation or divergent evolution.

• All types of mouth parts are derived from

- biting and chewing type.

Based on the pattern of feeding, mouth parts of insects can be classified into 4 types, namely -

1.Biting and chewing type.

- 2. Piercing and sucking type.
- 3. Sponging and sucking type and
- 4. Siphoning type.

•	Biting and chewing type of mouth parts are present	•	Structures useful to make a wound in skin are
	in-Cockroach, grasshopper, beetles, dragon		– mandibles and maxilla.
	flies, and the larval stages of all insects.	•	The mouth parts of female mosquito with serrated
•	Type of mouth parts present in the insects feed on		tips are – maxilla.
	solid food material is - biting and chewing type.	•	The first step in the process of feeding of female
•	The structures well developed in biting and chewing		Anopheles mosquito is
	type of mouth parts in insects are – mandibles.		– pressing of labella on the skin.
•	Galea, lacinia and palps are present in	•	In the piercing and sucking type of mouth parts the
	-I pair of maxilla.		wound of host skin is kept open by
•	Glossa, paraglossa and palps are present in		- servated tips of maxilla.
	– II pair of maxilla or labium or lower lip.	•	Blood is sucked through food canal by the sucto-
•	Piercing and sucking type of mouth parts are present		rial action of
	in - blood sucking insects	•	The anti coagulant present in the saliva of blood
•	Blood sucking insects are called		sucking female mosquitos — haemolysin
	_ sanguivarous insects		The substance that prevents clotting of blood is
•	Blood sucking insects are - female mosquitoes		- anti coagulant
	bad bugs lice to the flies and flies atc		Bite of mosquito causes
•	Food of famala magnuitans is		itching and mild inflammation
•	blood of warm blooded wartsbrotes		- Itching and find inflation.
	- blood of war in blooded ver tebrates.		would parts absent in the male mosquito are
•	Stylet like mouth parts are present in		
	- Diood sucking insects.	•	In the male mosquito first maximae are – vestigiai.
•	1 Labinaria	•	
	1. Ladium		- labium or proboscis.
	2. Labrum - epipharynx	•	Male mosquito feeds on– plant Juice (cell sap).
	3. Hypopharynx	•	Type of mouth parts present in housefly is
	4. a pair of mandibles and		- sponging and sucking type.
	5. a pair of maxilla or first maxilla.	•	Housefly feeds on – organic matter, exposed
•	In female Anopheles mosquito and housefly the la-		food, open wounds, faecal matter etc.,
	bium is also called – proboscis.	•	Housefly consumes only – liquid food.
•	Elongated, fleshy, flexible, unpaired structure with	•	Sugar containing solid food is taken by housefly by
	a groove along its mid dorsal side in female		- Scrapping and liquifying it
	Anopheles mosquito is – labium or proboscis.	•	The labium of housefly is divided into three parts
•	A pair of lobe like structures present on the distal		namely-
	part of labium in female mosquito is – labella.		1. Rostrum2. Haustellum3. Labellum
•	The labella are interconnected by	•	The basal part of proboscis of house fly is -Ros-
	– Dutton's membrane.		trum.
•	Labella of mosquito represent	•	Rostrum is attached to head by – clypeus.
	– reduced labial palps.	•	Rostrum is attached to haustellum by-hinge Joint.
•	During rest mandibles, maxilla and hypopharynx in	•	In the housefly the rostrum encloses
	female Anopheles mosquito are enclosed in the		– muscular pharynx and salivary duct.
	groove of – labium.	•	In the housefly the pharynx communicates with the
•	In the female mosquito labrum and epipharynx will		food channel of haustellum through – mouth.
	combine to form – labrum - epipharynx.	•	In the housefly mandibles are – absent .
•	In the female Anopheles mosquito food canal is	•	In the housefly the 1st pair of maxillae is represented
	formed by the union of		by a pair of unjointed palps present on the
	– labrum epipharynx and hypopharynx.		- rostrum.
•	Long, flat structure with salivary duct in female	•	The middle part of proboscis in housefly is
	mosquito is – hypopharynx.		- haustellum.
•	In the female Anopheles mosquito long, stylet like	•	The part of proboscis which contains dorsal groove
	mouth parts with a blade like tip are – mandibles.		in housefly is – haustellum

- hypopharynx and labrum epipharynx.

• In the housefly food canal is formed by

- labrum epipharynx and hypopharynx.
- In the housefly salivary canal lies in

-hypopharynx

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• In the housefly theca is present underneath the

– haustellum.

- The terminal part of proboscis of housefly is labellum.
- The two lobes of labellum are called labella.
- The aperture present between the two labella of housefly is pre–oral opening.
- The teeth present on under surface of labella of house fly are prestomial teeth.
- Labellum is useful for the detection of
 - taste and smell.
- Sensilla present on the labellum of housefly are
 - gustatory and olfactory.
- The part containing grooves in the labium of housefly is Labellum.
- In the housefly the grooves of labella are supported by - semicircular chitinous rings.
- The grooves of labella of housefly resemble trachea.
- In the housefly pseudo trachea are found in labella.
- The grooves of labella resemble trachea due to the Presence of chitinous rings like taenidia.
- All the pseudo trachea of both labella converge into pre- oral opening.
- In the housefly during rest the haustellum and labellum are present underneath the - **rostrum**.
- The function of peristomial teeth is
 breaking the solid food into pieces by scrabblling.
- In the housefly the food is liquified by

- saliva secreted on food.

• Liquid food enters the pseudo - trachea by

-capillary action.

- Entry of liquid food into pseudo- trachea by capillary action is called **sponging.**
- The liquid food is sucked by food channel due to the suctroial action of pharynx.
- From the pharynx the food enters **oesophagus.**

SIPHONING TYPE

• Siphoning type of mouth parts are present in - adult silk moth, butterflies and moths.

- The type of mouth parts best suited to draw nectarfrom flowers is- siphoning type.
- In the siphoning type of mouth parts well developed structure is - **proboscis**.
- In the siphoning type proboscis is formed by the union of galeae of maxillae.
- In the siphoning type of mouth parts the labium is reduced and present in the form of

- triangular plate.

- The structures absent in siphoning type are – mandibles, hypopharynx, salivary glands and salivary duct.
- The two galea are locked up by

- pegs and sockets.

- When the butterfly is at rest the proboscis is coiled like a watch spring.
- In the siphoning type of mouth parts the maxillary palps and labial palps are reduced.
- During feeding the proboscis is straightened up by - flow of haemolymph into galeae under high pressure.
- The nectar is sucked up by the suctorial action of **pharynx.**

MOUTH PARTS OF INSECTS LEVEL - I

- 236. Mouthparts of insects are best example for
 1) Homologous organs2) Adaptive Radiation
 3) Divergent evolution4) 1, 2 and 3
 237 Primitive type of mouth parts of insects is
 - 1) Piercing and sucking type
 - 2) Siphoning type
 - 3) Biting and chewing type
 - 4) Sponging and sucking type
- 238. All types of mouth parts of insects are derived from this type
 - 1) Biting and chewing type
 - 2) Piercing and sucking type
 - 3) Sponging and sucking type
 - 4) Siphoning type
- 239 Mandibles are well developed in this following type of mouth parts
 - 1) Biting and chewing type
 - 2) Piercing and sucking type
 - 3) Sponging and sucking type
 - 4) Siphoning type
- 240. Dutton's membrane is the thin membrane interconnecting the two
 - 1) Glossa2) Paraglossa3) Galea4) Labella

241. In the female Anopheles mosquito and housefly the	253. During the formation of proboscis in the butterfly
1) I abrum with aninhar ray	1) Hings joint 2) Dogs and sockets
2) Labrum aninhar my with hymonhar my	2) Dutton's mombrons 4) These
2) Labrum epipharynx with mondibles	3) Dutton's memorane 4) Theca
4) Labrum epipinaryix with inandioles	234. In the siphoning type of moun parts during feeding
4) Labrum with abrum	into galac with
242. Long, hat structure with salivary duct in temale mos-	1) Lich terre ersture 2) Low terre ersture
quito is	2) High recovery 4) Low recovery
2) Ikwandari (2) Maxilla	3) Fligh pressure 4) Low pressure
3) Hypopharynx 4) Labrum epipharynx 242 In the female meaguite the structures useful to	255. In the siphoning type of mouth parts nectar is sucked
245. In the female mosquito the structures useful to	1) Phag may 2) Occor house
1) Maxilla anky 2) Mandiklas anky	2) Cron 4) Cigrand
2) Maxilla only 2) Mandibles Only	3) Crop 4) OIZZału 256 Kinda of ports in hiting and showing type of mouth
244 In the male magnite the hymerhold my is fured with	230. Kinds of parts in blung and chewing type of mouth
1) Mondibles 2) Maxille	$\begin{array}{c} \text{parts} \\ 1 \\ 2 \\ 2 \\ 3 \\ 5 \\ 2 \\ 5 \\ 2 \\ 5 \\ 2 \\ 5 \\ 2 \\ 5 \\ 2 \\ 5 \\ 2 \\ 5 \\ 2 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$
2) I show with a gray (1) I show	1)2 $2)3$ $3)0$ $4)3$
3) Labrum epipnarynx 4) Labium	257. The long fleshy, flexible, unpaired structure
245. The basal part of probosels of Musea is	naving a mid dorsal groove present in the
2) Houstellure (1) Lobellure	1 Labium 2 Labum aninhamu
24(The middle next of much again of here of here	1. Labium 2. Labium–epipnarynx
246. The middle part of probosols of housefly is	3. nypopnarynx 4. 1 & 2
1) Crypeus 2) Rostrum 2) Houst allows 4) Lobaltons	258. The two labella present at the up of labium
3) Haustelium 4) Labelium	or mosquite represents
247. The function of labelium in the houseffy is to detect	1. Reduced maximary paips
1) Tests 2) Small	2. Well develoed maxillar under
1) Taste 2) Smell	3. Well devolped maxiliary paips
3) Touch 4) Taste and Smell	4. Reduced lablat paips
248. The part containing semicircular chilinous rings in	259. The manufoles are long stylets with blade
1) Bostrum 2) Houstollum	with corrected ting in the mouth ports of
2) Haustenum	1 Mala magguita 2 Famala magguita
240 The structures of housefly useful for breaking the	3 Housefly A Butterfly
solid food into pieces by scrapping are	260 Chewing and laning type of mouth parts are
1) Maxilla 2) Mandibles	found in
3) Hypopharyny (1) Prestomial teeth	1 Anis 2 Bombuy
250 Labium is reduced and present in the form of	3 Musea 4 Anonheles
triangular plate in this type of mouth parts	261 The type of mouth parts present in
1) Sponging and sucking type	cockroaches grasshoppers dragonflies and
2) Sinhoning type	beetles is
2) Diercing and sucking type	1)Sinhoning type
4) Lanning and chewing type	2)Sponging and sucking
251 The following mouth parts are absent in sinhoning	3) Piercing and sucking 4) Biting and chewing
type	5) i terenig and sucking 4) Ditting and enewing
1) Mandibles 2) Hypopharyny	
$\begin{array}{ccc} 2) \text{ I shrum} & 2) \text{ I and 2 of showe} \\ 4) \text{ I and 2 of showe} \\ \end{array}$	262 The following are the statements about the
252 Greatly elongated semi- tube like structures of	mouth parts of mosquito
butterfly are	DMaxillae are vestigeal
1) Galea 2) Lacinia	IDMandibles are modified into stylets with
3) Glossa 4) Paradossa	hlade like tins
	III)Hyponharyny is fused with proboseis

	IV)It Whick mosqu	feeds on h of the a uito:	plants j above a	uices re applio	cable to	male	266.	4) Mate	III ch the pinatio	II following n regardin	I and sel g the m	V ect the co outh part	orrect ts of
	1) I, I	I , III an	d IV	2)All	except]	Π		house	efly	-	-	-	
	3)All	except I	V	4)On	ly III			List	-1		List	-II	
263.	The fo	ollowing	, are the	stateme	nts abou	ut the		A)U	njointe	ed	I) M	andibles	
	mouth	n parts of	housef	ly				B) Pr	oxima	l part of la	bium II)Maxilla	
	I) The	mouth	parts of	housefly	y are spo	onging		C) Ps	seudot	rachea	III) F	Rostrum	
	and su	icking ty	vpe					D)A	bsent		IV)H	Haustellu	m
	II) Th	e rostrur	n enclos	ses the n	nuscular	pharynx		E) Er	ncloses	s pharynx	V)L	abellum	
	and sa	livary du	ict hence	e it is the	partof	proboscis					VI) I	Hypopha	rynx
	contri	buted by	y head								VII) N	Maxillar	y palps
	III) Ha	austellui	n is the	middle	part of th	ne							
	probo	cis and p	proxima	l part of	labium				Α	В	С	D	Ε
	IV)T	he labell	a bear n	nany gro	poves			1)	V	Ι	IV	III	II
	suppo	orted by s	semicirc	ular car	tilaginou	IS		2)	V	VII	VI	III	Ι
	rings,	and are	called	pseudo	trachea	e		3)	VI	IV	V	I	III
	Whic	h of the	above a	re corre	ct?			4)	III	VII	VI	V	Ι
	1)All	except I	V	2)I, I	l, III and		267.	Study	y the fo	ollowingre	egarding	g the mou	ıth
264	3) On	ly I and	III	4)On	ly II and	IIV	T	parts	of ins	ects.		a • •	•.
264.	Match	the foll	lowing a	ind sele	ct the co	rrect	Type	of mou	ith	Example	9	Special	ity
	comb	ination r	egarding	g the mo	outh part	SOI	parts	1		Deetler		0.1	
		e mosqu	1110	T :	т		I.Biun	gand		Beetles		Only ma	indibles
		I	uny D	LISt -	-11 d tin		I Dior	ng type	; A	Formala		are pres	log oro
	A) II B) Ma	popilar	yiix I)	Serrate Containe	u up solivor	v conol	n.Plen	cing an	la	remale	90	stylet lik	ies are
	C Du	utton's		Vith ven	tral groc	y Callal	Suking	stype		mosquito	65	blade lil	c with
	memb	nton s orane	111 <i>)</i> v		uai giot	JVC	III Sn	onging	and	House fli	96	Mandih	les are
	D) I a	hium	IV) F	orms nr	oboscis		suckin	onging io type	, and	110use III	05	absent	ies are
	E) lab	rum enir	harvnx	V)C	onnects		IV Sir	honing	o tvne	Moths		Mandib	les are
	L) 140	rann op n	511ai y 1111	labe	ellae			Jiioiiiig	Supe	mound		vestigea	1
	F) Ma	xilla		VI) B	lade lik	e tip		Whie	ch of t	he above a	re corre	ect	
	Á	В	С	Ď	Е	F		1) I a	nd II			2) II	and III
1)	V	Ι	IV	III	Π	VI		3) III	and I	V		4) IV	′ and I
2)	V	VII	VI	III	Π	Ι	268.	Study	y the fo	ollowing re	egarding	g the mou	ıth
3)	Π	VI	V	IV	III	Ι		parts	ofins	ects.		-	
4)	III	Π	VI	V	Ι	VI	Probo	oscis is		Insect		Feed	ls on
265.	Match	n the foll	owing a	and sele	ct the co	rrect	forme	ed by					
	comb	ination r	egarding	g the mo	outh part	sof	I.Gale	ae of 1	st	Butterf	ly	Nect	ar from
	maler	nosquite)				maxilla	ae				flow	ers
	List -	1		List -	-II		II. Onl	y labiu	m	Housef	ly	Solid	s only
	A) Ve	stigeal	I) Lab	orum epi	pharyny	Σ.	III. On	ly labi	Jm	Female	emosqu	iito Only	blood
	B)Ab	sent	II) La	bium			IVOnl	y labiu	m	Malen	nosquite	o Only	plant
	C) Fu	sed with	n probos	cis III)	Hypopł	narynx						juices	5
	D) Fo	rms pro	boscis	IV) N	Iandible	es,		Identif	y the c	correct sets	5.		_
			F	(V)	Maxilla	ne		1) I a	ind II		2) I,	II and II	
	• `	A	В	C	D			3) I a	ind IV		4)Al	ll	
	1)	V	l	IV	 ••								
	2) 2)	V	IV п	III NZ	II III								
	3)	V	11	IV	111								
							-						

269. Statement (S): In the biting and chewing type of mouthparts mandibles are well developed. Reason (R): Insects with biting and chewing type of mouth parts feed on solid food 270.

- Statement (S): Biting and chewing type of mouthparts is regarded as the primitive type Reason (R): The larvae of mosquitoes, houseflies, butter flies and honey bees all have biting and chewing type of mouth parts, where as the mouth parts of the adults are of different type.
- 271. Statement (S): The proboscis of butterfly is straightened up during feeding Reason (R): During feeding haemolymph flows into the proboscis of butterfly under high pressure
- 272. Statement (S) Blood sucking insects have piercing and sucking type of mouth parts. **Reason** (R) - In the blood sucking insects the mouth parts are elongated and stylet like to pierce

the skin of host.

- 273. Statement (S) In the female Anopheles mosquito mouth parts labella are the reduced labial palps. **Reason** (R) - Labella are inter connected by Dutton's membrane.
- 274. Assertion (A) Male mosquitoes feed on plant juices.

Reason (R) - Maxilla are absent in male mosquitoes

275. Assertion (A) - Male mosquitoes can not suck blood

Reason (R) - In male mosquitoes mandibles are absent and maxillae are vestigeal

- 276. Statement (S) House flies are omnivores **Reason** (R) - Houseflies feed on all types of food material
- 277. Statement (S) Butterfly sucks nectar from flowers

Reason (R) - Butterfly has siphoning type of mouth parts

- 278. Statement (S) Mandibles and hypopharynx are absent in butterfly. Reason (R)-Butterfly has sponging type of mouth parts
- 279. Assertion (A) In butterfly galea are elongated and form food channel while sucking nectar.

Reason (R) - When the two galea are applied together along the length and locked up by pegs and sockets in the butterfly, they form a long tubular proboscis.

280. Assertion - (A) - In the housefly prestomial teeth break small food particles and solid food is dissolved in the saliva released on the food. Reason (R) - House flies cannot consume solid food material directly.

281. Study the following statements

(i) Mouth parts of insects are best example for analogous organs.

(ii) Most primitive type of mouth parts is biting and chewing type.

(iii) Mouth parts of insects are best example for homologous organs.

The following is the correct answer.

1) i and iii 2) i and ii 3) ii and iii 4) All are correct

- 282. Study the following statements.
 - (i) In housefly pseudotracheae are present in 1st maxilla

(ii) Pseudotrachea absorbs liquified food.

(iii) In housefly maxillary palp is unsegmented.

The following is the correct answer.

1) i and iii	2) i and ii
3) ii and iii	4) All are correct

ECONOMIC **IMPORTANCE OF INSECTS**

USEFUL INSECTS

Useful insects are also called - productive insects

Useful insects are

٠

- 1. Honey bee
- 2. Silk moth and

3. Lac insect.

1. HONEY BEE

Phylum-Arthropoda Class – Insecta Genus – Apis

Species – 1. indica; 2. dorsata; 3. florea; 4. mellifera.

• Culturing (Rearing) of honey bees is called - apiculture •

Honey bee is a - colonial and social insect.

- Honey bees construct a bee hive for the purpose - propagating their race. of
- Species of honey bees found in India are
 - -1. Apis indica
 - 2. A. dorsata

	3. A. florea.	•	Total number of eggs laid by a queen in life span is
•	A. indica is commonly called – Indian bee.		- 15,00,000
•	The honey bee which is domesticated and reared in	•	The eggs laid by queen are of two types, namely –
	India is – A. indica		1. Fertilized eggs and
•	Wooden boxes used to construct bee hives in bee		2. Unfertilized eggs.
	farms are called – apiaries.	•	Fertilized eggs develop into – females (diploid).
•	The honey bee commonly available in our	•	Unfertilized eggs develop into
	surroundings is – A. indica.		- drones or males (haploid).
•	The largest honey bee species is $-\mathbf{A}$. dorsata.	•	A diploid young one that is developed from zygote
•	Highly aggressive honey bee is		feeds on royal Jelly and develops into – Queen.
	-A. dorsata	•	Female, diploid young one developed from zygote
•	A. dorsata is commonly called $-$ wild rock bee.		teeds on pollen grain develops into – worker.
•	The smallest honey bee species is - A. florea	•	Workers are – sterile females.
•	The bee nive constructed by a colony of insects	•	Development of egg into embryo without fertilization
	generally nangs from a		is called – partnenogenesis.
•	- Fock, of arch of bunding of branch of tree.	•	Drones of males are developed by
•	The total number of bees in a colony may be about		- par menogenesis.
•	In a bee hive several beyagonal chambers are made	•	are
	of - bee way	•	Honey bees with large wings and reduced mouth
•	Hexagonal chambers of bee hive are of two types		narts are - drones
	namely	•	Drones are fed by – workers.
	1. Storage chambers	•	The only function of male bee is
	– store honey and pollen grains		- to copulate with queen.
	2. Brood chambers – contain eggs for brood-	•	Life span of drones is - short.
	ing.	•	The life span of worker bees is - 2-4 months.
•	The food of larvae is – honey and pollen grains.	•	Worker bees collect pollen grains from flowers by
•	The larger chamber is intended to lodge – Queen.		– pollen brushes.
•	Individuals present in the bee hive are	•	In workers pollen grains are stored in
	of three types namely		– pollen baskets.
	1. Queen	•	In workers pollen brushes are present on
	2. Drones and		– Tarsus of prothoracic and meso-thoracic legs.
	3. Workers.	•	In workers pollen baskets are present on
•	Largest bee with reduced wings is – Queen.		– Tibia of meta-thoracic legs.
•	The only fertile female of the colony is $-$ Queen.	•	Food of queen is – royal Jelly.
•	The life area of succes is shout	•	Food of drones is – noney and pollen grains.
•	The file span of queen is about -5 fears.	•	Sting is present at the up of addomentin - workers
•	Chromosome number of queen and workers is 32 (diploid condition)		The sterile and busiest members of the colony are
•	Chromosome number of drones is	•	- workers
-	-16 (hanloid condition)	•	Nectar of the flowers is converted into honey by
•	The queen stores millions of sperms in		workers in
	– spermathecae	•	Workers convert the nectar into honey by the en-
•	Flight of queen and drones for copulation is called		zvmatic action in - Crop
	- nuptial flight or marriage flight.	•	Honey and pollen grains are stored in
•	After copulation the female becomes		– storage chambers and brood chambers.
	– new queen.	•	Queen chamber is cleaned by – Workers.
•	The new colony is started by - new queen.	•	New chambers of beehive is constructed by
•	The function of queen is - to lays eggs.		– workers.
•	Queen lays eggs at the rate of - 2000 per day.	•	Bee hive is formed by - bee wax.

		· · · · · · · · · · · · · · · · · · ·
•	Bee wax is secreted by	4. Adult or imago .Hence it is called Holom-
	– wax glands present in workers.	etabolous insect.
•	In the workers wax glands are situated on	• Number of eggs laid by a female on the upper sur-
•	- 2-5 abdominal segments	Tace of mulberry leaf is $-300-500$
•	to broad chamber by	• In a rew days the egg natches into
•	Workers perform two types of dances namely	 The larva of silk moth is called
•	1 Round dance and 2 Waggle dance	- caternillar or silk worm
•	Ree dance communicates about source distance	• The body of caternillar can be divided into
•	and direction of food from the bee bive	head thoray and abdomen
•	Workers direct others regarding the source and	 Type of mouth parts present in the larva of silk-
	distance of food by bee dance	worm is
•	The scientist who got nobel prize for the discovery	Caterpillars voraciously feed on mulberry leaves for
	of bee dance is	- 2-3 weeks
•	Honey is collected from – honeycombs	Number of moults takes place in caterpillar to in-
•	Sugars present in honey are – levulose , dextrose	crease the body size
	and maltose.	• In the final stage of caternillar the salivary
•	Honey is used in the manufacture of	glands are modified into
	– Jellies. Jams and cakes	Similar are meaned meet some grands
•	The wax extracted from bee hive is used in making	• Silk secreted from silk glands spun by – Spinneret.
	- polishes, candles	• Spinneret is located on the – labium.
•	Honey bees are – best pollinators.	• As silk fluid comes out, it solidifies and becomes
•	Venom of honey bee is used in the treatment of	– silk thread.
	– arthritis.	• The larva completely covered by a case of silk thread
•	Honey is applied on the wounds to prevent infec-	is called – cocoon.
	tion because it is a good – antiseptic.	• The length of the silk thread of a cocoon is
		– 1000 – 1200mts.
		1000 12001105
	2 SILK MOTH	• In the cocoon the larva metamorphoses into
	2. SILK MOTH Phylum – Arthropoda	• In the cocoon the larva metamorphoses into - pupa.
	2. SILK MOTH Phylum – Arthropoda Class – Insecta	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called – chrysalis.
	2. SILK MOTH Phylum–Arthropoda Class – Insecta Genus–Bombyx	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called – chrysalis. Phenomenon of transformation of larva in adult stage
	2. SILK MOTH Phylum–Arthropoda Class – Insecta Genus–Bombyx Species–mori	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called
•	2. SILK MOTH Phylum–Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called – chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis.
•	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called Bombyx mori is popularly called	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage.
•	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called - sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk	 In the cocoon the larva metamorphoses into pupa. pupa of silk worm is called – chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is – non feeding stage. All the larval characters are reduced and adult
•	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth.	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage.
•	2. SILK MOTH Phylum–Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called - sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia.	 In the cocoon the larva metamorphoses into pupa. pupa of silk worm is called – chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is – non feeding stage. All the larval characters are reduced and adult characters are developed during – pupal stage. The silk thread is formed by
•	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world.	 In the cocoon the larva metamorphoses into
•	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white.	 In the cocoon the larva metamorphoses into pupa. pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread is
• • •	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white. Type of mouth parts present in adult silk moth is	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread is — fibroin.
• • •	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called – Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white. Type of mouth parts present in adult silk moth is	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread is fibroin.
• • •	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white. Type of mouth parts present in adult silk moth is – siphoning type.	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread is fibroin. Soluble protein present on the surface of silk thread is — serecin.
• • •	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called – Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white. Type of mouth parts present in adult silk moth is – siphoning type. Mouth parts of silk moth resemble with – butterfly mouth parts.	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm is — non feeding stage. All the larval characters are reduced and adult characters are developed during — pupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread is fibroin. Soluble protein present on the surface of silk thread is — serecin. The function of serecin is
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• • • • • • • • • • • • • • • • • • • •	2. SILK MOTH Phylum – Arthropoda Class – Insecta Genus – Bombyx Species – mori Rearing of silk worm is called – sericulture Bombyx mori is popularly called –Chinese silk worm moth or mulberry silk worm moth. Bombyx mori is a native of – Asia. At present B.mori is reared – all over the world. Body color of adult silk moth is – creamy white. Type of mouth parts present in adult silk moth is – siphoning type. Mouth parts of silk moth resemble with –butterfly mouth parts. Life span of adult male and female silk moth is – 2 or 3 days. Male silk moth dies – after copulation. Female silk moth dies – after laying eggs. Life cycle of silk moth includes four stages , namely –1. Egg ; 2. Larva ; 3. Pupa and	 In the cocoon the larva metamorphoses into pupa. The pupa of silk worm is called — chrysalis. Phenomenon of transformation of larva in adult stage is called metamorphosis. Pupa of silk worm isnon feeding stage. All the larval characters are reduced and adult characters are developed duringpupal stage. The silk thread is formed by serecin and fibroin proteins. Tough, fibrous insoluble protein of silk thread isfibroin. Soluble protein present on the surface of silk thread isfibroin. Soluble protein of serecin isbinding the fibroin threads. Time taken for the metamorphosis of pupa into adult isabout three weeks. The enzyme secreted by imago to digest silk fibers to make hole in the cocoon through which the winged insect comes out iscoonase.

three pairs of legs.

• Three types of activities takes place in sericulture are -

 Production of high yielding strains of moths.
 Hatching the larva and rearing in special trays and feeding them with chopped mulberry leaves, and

3. Extraction of silk from cocoons.

• Generally silk thread can be obtained from the cocoon at the age of

- one week after cocoon formation.

- Killing of cocoons of 10 days old by keeping them in hot water is called – stifling.
- Fresh cocoons are called seed.
- Pulling of silk thread from cocoons is called
 - -reeling.
- The country that occupies the first place in the silk production in the world is China.
- The state occupies the first place in the silk production in India is **Karnataka.**
- The number of cocoons required to produce one kg of silk is 50,000.
- Eri silk is produced by Attacus receni.
- Tassar silk is produced by Antherea paphia.
- Muga silk is produced by Antherea assama.
- Best quality of silk is Mulberry silk.
- Inferior qualities of silks are

– Eri silk, Tassar silk and Muga silks.

3. LAC INSECT

- The scintific name of Indian Lac insect is - Laccifer lacca/Tachardia lacca. Type of mouth parts founds in Lac insect - Piercing and sucking Lac insect lives on the trees of • - Ficus, Accasia and zigupus. After copulation the male insect - dies The nature of female lac insect is - sedentary ٠ Lac is secreted by - Cutaneous glands of nymph Wingless with piercing and sucking mouth parts and -Nymphs 3 pairs of legs are Number of moultings that take place in the nymph to develop into adult is - 3 Time taken for the transformation of nymph into adult - 6 - 8 weeks in lac insects is Raw lac is called - stick lac Refined lac is called -Shellac • The body of lac insect is used in the medicine - Ayurveda.
- The function of lac is for the preparation of toys,

warnish, paints, gramphone records. buttons, bangles etc.

- The red dye extracted from the bodies of lac insect is used in dying of clothes and wollen
- The first place in the lac production is occupied by India
- The second place that occupied in the lac production is
 - Myanamar
- In India lac production is maxmimum in Bihar
- Bodies of lac insects have -Medicinal Value
- Central lac research institute is located at

- Namkum near Ranchi in Vanamanchal

USEFUL INSECTS

LEVEL - I

283. Eri, muga and tassar silks are respectively produced by
1. Philosamia recini, Antheraea assemensis and Antheraea paphia
2. Antheraea assamensis, philosamia recini

and Antheraea paphia

3. Philosamia recini, Antheraea paphia and Antheriaea assamensis

4. Antheraea paphia, philosamia recini and Antheraea assamensis

284. Findout the mismatch

- 1. Stick lac crushed lac
 - 2. Seedlac repeatedly washed dust lac
- 3. Shellac processed and heat treated seedlac
- 4. Dustlac Crushed lac
- 285. The caterpillar of silk worm moth is called 1. Eruciform 2. Grubs
 - 3. Wriggler 4. Chrysalis
- 286. In cruciform larva pseudolegs are present on 1. 4th, 5th, 6th segment
 2. 3rd, 4th, 5th, 6th and last segment
 - 2. 3rd, 4rd, 5rd, 6rd and last segment
 - 3. 2^{nd} , 3^{rd} , 4^{th} , 5^{th} and last segments
 - 4.8th abdominal segment
- 287. Venomous insects from the following
 - 1. Fireants, wasps and horsefly
 - 2. Hornets, fireants and wasps
 - 3. Silver fish, wasps and mosquito
 - 4. Bed bug, mosquito and housefly
- 288. The pheromone that is secreted by queen bee
 - 1.9-hydroxydecenoric acid
 - 2. 5-hydroxyoctonoic acid
 - 3. Cantharidian oil
 - 4. Propolis

289.	Pollen basket is also ca	lled						
	1. Pollen pross	2. Pollen rake						
	3. Corbicula	4. Arista						
290.	1 to 10 days old and 1	0to 20 days old						
_,	tively called as							
	d laving workers							
	 Darleing workers and nurse workers 							
	3. Laving workers and	nurse workers						
	4. Nurse workers and	House workers						
291	Age of field worker be	es						
2,11	1. Above 10 days	2. Below 20 days						
	3. Above 20 days	4. Below 10 days						
292	Resins and tree sans at	re made into bee						
<i>L)L</i> .	olue by							
	1 Queen bees	2 Laving workers						
	3 Nurse workers	4 Field workers						
293	Propolis is a	1.1 leid workers						
275.	1 bee noison	2 Ree way						
	3 Ree glue	4 Ree enzyme						
294	The ground nut shaped	cells which are located						
274.	at lower edge of the co	mb accommdates						
	1 workerbee	2) drone						
	3) worker and drone	4) queen bee						
205	The number of eggs the	+) queen bee can lavin						
295.	its life time	at a queen bee ean lay in						
	1 1000	2) 1 billion						
	3) 1 million	4) 2000						
296	Unfertilized eggs can b	e laid by						
270.	1 Workerbees only	2) Queen bees only						
	3) Drones only	4) 1 and 2						
297	The hair restoring canth	aridian oil is a						
277.	product of	la falan on 15 a						
	1 Silver fish	2 Lae insect						
	3 Blister-beetle	4 Silk worm						
208	J. Dilster-beette	4. Slik wonin						
270.	1 Wriggler	2 Maggot						
	3 Grubs	4 Tumbler						
200 T	5. Grubs he scientific way of reari	ng of honey bees is						
277. II 1)	Sericulture	2) A quaculture						
3)	Apiculture	4) Wormi culture						
300 H	oney bees construct bee	hive for the purpose of						
1	Protection	2) Food collection						
3	Reproduction	4) Propagation of their						
ra	a spreaduction 4) riopagation of their							
301 T	he largest honey hee sne							
1	A Indica	2) A dorsata						
1) 2)	A Flores	4) A mellifere						
302 E	ach bee hive contains	TJA.IIICIIIICIA						
JUZ. E	Few queens many draw	nes and a larger						
1.	number of workers	nes and a larger						
	number of WURKIS							

	2. One queen, few drones	and large numbers of					
	workers						
	3. One queen, one drone workers	and large number of					
	4. One queen, few drones	s and few workers					
303.7	The life span of queen ho	nev bee is					
2021	1) 4 months	2) 2 years					
	3) 5 years	(4) 2 weeks					
304.	In the diploid condition the	e chromosomal number					
	of queen and worker hon	ev bees is					
	1) 16	2) 32					
	3) 36	4) 48					
305."	The chromosomal number	r of drones or male honev					
1	bees is	5					
	1) 16	2) 32					
	3) 36	4) 48					
306.	Oueen honey bee stores n	nillions of sperms in					
	1) Ovary	2) Ootheca					
	3) Ovisac	4) Spermathecae					
307.	In the honey bees fertiliz	ed diploid zygotic eggs					
	develop into	1 20 00					
	1) Drones 2) Q	lueen					
	3) Workers 4) Q	ueen and workers					
308.	Parthenogenetically deve	loped honey bees are					
	1) Queen 2) Di	rones					
	3) Workers 4) 1,	2 and 3					
309.	Female, diploid young c	one developed from the					
	zygote feeds on royal jelly	y and becomes					
	1) Queen	2) Drone					
	3) Worker	4) 1,2 and 3					
310.	The sterile female honey	bees are					
	1) Queen	2) Drones					
	3) Workers	4) 1,2 and 3					
311.	The honey bees that ha	we no father but have					
	grandfather are						
	1) Queen	2) Drones					
	3) Workers	4) 1,2 and 3					
312.	The honey bees that have	larger wings but reduced					
1	mouth parts are						
	1) Queen	2) Drones					
	3) Workers	4) 1,2 and 3					
313.	In worker honey bee polle	n grains from flowers are					
	collected by						
	1)Antenna	2) Mandibles					
	3) Pollen baskets	4) Pollen brushes					
314.	In the worker honey bees p	ollen brushes are present					
	on the tarsus of						
	1) Prothoracic and Mesot	horacic legs					
	2) Prothoracic and Metatl	noracic legs					
	3) Legs	4) Metathoracic legs					

315. In the worker honey bees pollen baskets are present							
on the tibia of							
1) Prothoracic legs	2) Mesothoracic legs						
3) Metathoracic legs							
4) Meso and Meta thoracic legs							
316. Workers convert the nectar into honey by the							
enzymes present in							
1) Salivary glands	2) Pharynx						
3) Oesophagus	4) Crop						
317. Bee hive is constructed b	by bee wax secreted by the						
workers with the help of	wax glands located on						
1) 1-4 abdominal segme	nts						
2) 2-5 abdominal segme	nts						
3) 1-3 thoracic segments	5						
4) 6-10 abdominal segm	ents						
318. Eggs are regularly transfe	erred from queen chamber						
to brood chambers by							
1) Queen	2) Drones						
3) Workers	4) 1,2 and 3						
319. The scientific way of rea	ring of silk moth is called						
1)Apiculture	2) Lac culture						
3) Seri culture	4) Worm Culture						
320. Bombyx mori is popular	ly known as						
1) Tassar silk moth							
2) Chinese silk worm mo	oth						
3) Mulberry silk worm n	noth						
4) Both 2 and 3	11 1						
321. The larva of slik moth is							
1) Maggot	2) Wriggier 4) Catawaillan						
3) NIIS	4) Caterpillar						
322. Type of mouth parts prese	nt in the farva of slik moth is						
2) Piting and showing tu	ng						
2) Sinhoning type	pe						
4) Spanging and sucking	timo						
323 The total number of mo	ults that take place in the						
szs. The total number of hio	increase the body size						
1) 3 2) 4	$3) 6 \qquad 4) 1$						
324 In the silk moth larvae	silk comes out from an						
aperture called spinnere	t located on						
1) Abdomen	2) Thoray						
3) Head	4) Labium						
325. The length of a silk thr	ead of each cocoon mea-						
sures							
1) 300 mts	2) 200 mts						
3) 500 mts	4) 100 mts						
326 The pupe of silk moth is	called						
1) Trumpet	2) Wrigoler						
3) Chrysalis	4) Caternillar						
J) Chi youno	1) Cutorphilui						

327.	The protein present in the	silk thread is
	1) Serecin only	2) Fibroin only
	3) Carotene	4) Serecin and fibroin
328.	Tough, fibrous, insoluble p	rotein of silk thread is
	1) Fibroin	2) Serecin
	3) Carotene	4) Actin
329.	In the silk moth life cycle t	ime taken for metamor-
	phosis of pupa into adult	
	1) 3 weeks	2) 4 weeks
	3) 6 weeks	4) 1-3 weeks
330.	The enzyme secreted by in	nago to digest silk fibres
	to make a hole in the coc	oon through which the
	winged insect comes out is	6
	1) Ptvalin	2) Pepsin
	3) Gastrin	4) Cocoonase
331.	Number of cocoons requ	ired to produce 1 kg of
0011	silk is	
	1) 20 000	2) 50 000
	3) 1 00 000	4) 10 000
332	Tassar silk is produced by	1) 10,000
552.	1) Rombyx mori	2)Attacus receni
	3) Antherea paphia	4) Antherea assama
333	Scientific name of Indian la	ac insect is
555.	1) Tachardia lacca	2) Laccifer lacca
	3) Anthrea nanhia	4)1 and 2 above
334.	Lac secreting glands in the	e female and nymph are
	located in	
	1) Epidermis of skin2) Hy	odermis of skin
	3) Mouth	4) Tail
335.	Number of moults that tak	e place in the nymph of
	Lac insect to metamorpho	se into an adult is
	1) 3 2) 1	3) 4 4) 6
336.	The central Lac Research	Institute is located at
	1) Dehradoon in H.P	
	2) Lucknow in U.P	
	3) Bangalore in Karnataka	l
	4) Namkum in Jarkhand	
337.	A queen bee lays eggs of	,
	1. One type from which	all the 3 casts
	develop	
	2. Two types one formi	ng queen and
	workers and second	forming drones
	3. Threetypes forming	queen. drone and
	workers	1 , 0110 0110
	4. Unfertilized and fertil	ized eggs
	disintegrate and 3 ca	sts are produced
	from fertilized eggs	promotion
338	Honey is a good antiser	otic and applied to
	wounds to prevent	rr
	1. Dehvdration 2. Blee	ding of Blood
		0

	3. Infectoin 4. Inflat	nmation					
339.	Rearing the silk worm and extracting silk						
	from the cocoon is an in	ndustry called					
	1. Apiculture	2. Sericulture					
	3. Aquaculture	4. Mariculture					
340.	Legs and wings are abs	ent in					
	1. Adult male lac insect						
	2. Adult female lac inse	ct					
	3. Both male and femal	e lac insects					
	4. Nymph of lac insect						
341.	Identify a correct staten	nent regarding					
	nymph of Lac insect						
	1. Legs and wings are a	lbsent					
	2. Legs are present but	wings are absent					
	3. Legs are absent but v	wings are present					
	4. Biting and chewing t	ype of mouth parts					
	are present						
342	The queen bee lays						
	1)500 eggs per a day						
	2)1,000 eggs per a day	,					
	3)2,000 eggs per a day	,					
	4)3,000 eggs per a day	,					
343	In workers bee wax gla	ands are present on					
	these abdominal segment	nts					
	1)1st 2^{nd} , 3^{rd} and 4^{th}	2)2nd 3^{rd} ,4th and 5^{th}					
	3) 3^{rd} 4^{th} , 5^{th} and 6^{th}	4)4th 5th ,6th and 7th					
344	The scientist, who deco	ded the language of					
	bee, explained their dan	ces for					
	communications and w	as awarded the					
	nobel prize for it was						
	1)Charles Darwin	2)Karl Von Frisch					
	3)William Harvey	4)Carolus Linnaeus					
345	Spinneret is present in						
	1)Labium of the caterpi	llar larva of silk moth					
	2)Labium of the wriggle	er larva of mosquito					
	3)Labium of the maggo	t larva of housefly					
	4)Labium of the nymph	n of bed bug					
346	The host trees for lac in	sect in India					
	1) Ziziphus, Butea						
	2) Butea, Azadirachta						
	3) Ficus, Cassia						
	4) Recinus, Machillus						
LEVE							
347	The Following are the s	tatements about					
	Bombyx mori	1 / 1 1					
	I) The Life history is ho	lometabolous					
	II) The pupa is called ch	rysalis					
	111) The pupa moults 4	umes and					
	metamorphoses into i	mago.					

IV) The adult moth has 2 pairs of legs and 3 pairs of wings. V) The males die soon after copulation and females die after laying eggs. Correct combination is 1) I,II and V 2) III, IV and V 3) I,II and III 4) I, III and V 348 Study the following statements regarding sericulture I) About 10 days after the formation of the cocoon, the pupae are killed by keeping them in hot water, a process called reeling. II) Fresh cocoons are called seed in the industry. III)The free end of silk thread over the cocoon is held and the entire thread is pulled out. This process is called stifling. IV) China occupies first position in silk production in the world. Correct combination is 1) I and II 2) III and IV 3) II and IV 4) I, II, III and IV 349. Study following statements about lac insects I) Male lac Insects secrete lac in nymphal stage. II) Female Lac insects secrete lac in nymphal as well as in adult stage III) Lac is a resinous substance secreted by the hypodermal glands of skin. IV) Lac glands are present in the 2nd, 3rd 4th and 5th abdominal segments only Correct combination is 1) All except I are correct 2) All Except IV are correct 3) All Except II are Correct 4) I, II, III and IV Statement (S): Worker bees communicate 350. with each other through two types of dances Reason (R): The meaning of bee dances

351. Statement (S) - Drones have no father but have grand father
Basson (R) - Drones develop by parthenegen

Reason (R) - Drones develop by parthenogenesis

352. Statement (S) - The larva of silk moth is called caterpillar Reason (R) - Silk moth exhibits indirect development 353. **Statement** (S) - Sericulture plays an important role in Indian economy

Reason (R) - India is earning good foreign exchange through export of quality silk

354. **Statement** (S) - Bombyx mori is commonly called mulberry silk worm

Reason (R) - Larvae Bombyx mori feed on young mulberry leaves

355. **Statement** (S) - Female lac insect leads stationary life

Reason (R) - In female lac insect wings and legs are absent

356. **Statement** (S) - Bihar produces largest quantity of lac in India.

Reason (R) - The central lac research institute is located at Namkum near Ranchi in the state of Jarkhand.

357. **Statement** (S) - Housefly belongs to order Diptera **Reason** (R) - Housefly has only one pair of wings on prothorax

358. Study the following statements

- (i) Drones are haploid honey bees
 - (ii) Workers lay unfertilized eggs
 - (iii) Queen is the only fertile female
 - The following is the correct answer.

1) i and iii 2) i and ii 3) ii and iii 4) i, ii and iii

- 359. Study the following statements
 - (i) Drones are the only potent males of bee hive
 - (ii) Chromosome number of workers is 16
 - (iii) Queen feeds on royal Jelly.
 - The following is the correct answer.
 - 1) i and iii 2) i and ii
 - 3) ii and iii 4) All are correct
- 360. Study the following statements
 - (i) Bee dance is performed by workers
 - (ii) Karl von Frish observed bee dance

(iii) Workers feed on royal Jelly and become drone The following is the correct answer.

- 1) i and iii 2) i and ii 3) ii and iii4) All are correct
- 361. Study the following statements

(i) Caterpillar of silk moth voraciously feeds on mulberry leaves for 2 or 3 weeks.

(ii) Pupa of silk moth is non-feeding stage.

(iii) Adult silk moth has siphoning type of mouth parts.

The following is the correct answer.

- 1) i and iii 2) i and ii
- 3) ii and iii 4) i,ii and iii

- 362. Study the following statements
 - (i) Female lac insects are larger than males
 - (ii) Queen honey bee is smaller than drone.
 - (iii) Worker bees are smaller than queen.
 - The following is the correct answer.
 - 1) i and iii 2) i and ii
 - 3) ii and iii 4) All are correct
- 363. The following stages are noticed in the life cycle of Bombyx mori

a) Caterpillar	b) Chrysalis
c) Imago	d) Egg
Arrange the above in corre	ect sequence.
1) d, a, b, c	2) a, c, d, b
3) b, a, c, d	4) a, d, c, d

HARMFUL INSECTS

1. HOUSE FLY

Phylum-Arthropoda

Class – **Insecta**

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Order – **Diptera** Housefly that is world wide in distribution is

– Musca domestica.

• Scientific name of Indian housefly is

– Musca nebula.

• Housefly has one pair of flying wings on

- mesothorax.

- Small rod like wings present on the metathorax of housefly are called **halters of balancers.**
 - Function of halters is -balancing.
- A pair of three segmented antenne are present on head
- Number of legs present on the thorax of housefly -3 pairs.
 - -3 pairs. Number of eggs laid by an housefly at a time is

– 100 – 125.

• Housefly lays eggs on

$- \, {\rm decomposing} \, {\rm organic} \, {\rm matter.}$

• Life history of housefly includes

– egg, larva, pupa, and imago or adult.

- The larval stage of housefly is maggot.
- Maggot does not possess Distinct head
- Small, stumpy legs present in maggots are called spiniferous pads
- Maggots feed on organic matter.
- Number of moultings takes place in the metamorphosis of maggot into pupa two.
- Housefly exhibits complete metamorphosis hence called

- holometabolous insect.

- Cockroach is a paurometabolous insect.
- Silver fish, (Lepisma) is- an ametabolous insect.
- The legs of housefly are hairy.
- Diseases spread by housefly are

 amoebic dysentery, ascariasis, typhoid, cholera and tuberculosis.
- Houseflies acts as **-an agent of contamination and** paratenic host of disease causing Pathogens
- Typhoid is caused by
 Cholera is caused by
 Vibrio cholerae
- Tuberculosis Mycobacterium tuberculosis
- Disease caused due to laying of eggs by housefly on the open wounds of man is **myiasis**.
- Cavity like pathological condition caused in the wounds due to maggots of housefly is – myiasis.

2. MOSQUITOES

Phylum-Arthropoda

- Class Insecta
- Order Diptera
- Family-Culicidae
- Species 1. Anopheles; 2. Culex; 3. Aedes
- Mosquitoes are world wide in distribution, but abundant in - tropical countries.
- Three genera of mosquitoes found in India are - Anopheles, Culex and Aedes.
- The body of mosquito can be divided into
 - head, thorax and abdomen.
- Mosquitoes have a pair of flying wings on mesothorax and a pair of halters on - metathorax.
- Halters act as organs of- sound production and Balancers
- Life history of mosquito includes
 - egg, larva, pupa and imago
- Mosquito lays eggs on stagnant water
- Larval stage of mosquito is called Wriggler.
- Larva feeds on organic matter
- Pupa of mosquito is called tumbler.
- Larva breaths air through respiratory siphons
- Pupa breaths air through respiratory trumpets
- Anopheles sps., spread diseases like malaria
- Culex sps spread diseases like

- filaria, encephalitis and bird malaria.

- Aedes aegypti spreads viral diseases like
 - yellow fever, dengue fever etc.
- Psorophora transmits the eggs of botfly that causes -Dermatobiasis in Cattle

3. BED BUG

- Phylum–Arthropoda Class–Insecta
- Genus Cimex

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Species – lectularius

Scientific name of Indian bed bug is - Cimex hemipterus (formerly called cimex rotundus)

• The type of mouth parts of bedbug is

-Piercing and sucking

- Bedbug lives in **crevices in furniture, houses, theatres, buses, trains etc.,**
- The body of bed bug is
 - dorso ventrally flattened.

• Reduced fore wings of bed bug are called

- hemielytra
- In bed bugs hind wings are **absent**. In the bed bug stink glands are located at the -
- base of legs on the ventral side of metathorax.
- Bed bugs can live without food after a full meal of many months.
- When the bed bugs are starved they exhibit
 - cannibalism. hemimetabolous insects
- Bed bug is -
 - Life cycle of bed bug includes
 - 1. egg 2. nymph and 3. adult
- Number of moults that occur in the metamorphosis of nymph into adult in bed bug

- several times.

- Bed bugs spread diseases like
 - **1. Relapsing fever (Borrelia species)**
 - 2. Typhus fever (Rickettisia prowazekii)
 - 3. Trench fever (Rickettisia quintana)
 - 4. Bubonic plague (Yersinia pestis)
 - 5. Leprosy. (Micobacterium leprae)

HEAD LOUSE

Phylum-Arthropoda

- Class-Insecta
- Order Anoplura
- Family-Pediculidae
- Genus Pediculus
- Species humanus
- Sub species capitis
- In the head louse wings are absent
- Head louse is a permanent ectoparasite.
- Scientific name of Indian head louse is

– Pediculus humanus capitis.

The body of head louse is

- dorso - ventrally flattened.

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•	Curved claws are	present in head louse.	1) Cholera
•	Number of eggs la	id by female in each time is	3) Dermetobiasis
		- 80 - 100.	374. Mosquito belongs to
•	The eggs of head l	ouse are whitish and are called	1) Muscidae
		— ' nits '.	3) Anophilidae
•	Eggs hatch into yo	ung ones in – seven days.	375. The larval stage found
•	The number of mo	oults that take place in young lice	1) Maggot
	to develop into ad	ult is – three.	3) Tumbler
•	Head louse can sn	read diseases like	376. The pupal stage four
	– Relar	osing fever and Typhus fever.	auito is
•	Relansing fever is	caused by – Borrelia sps.	1) Tumbler
•	Typhus fever is ca	used by	3) Chrysalis
	1)pilds iever is ed	– Rickettisia Prowazekii	377 Respiratory organs o
		Meketusia i i oważekii.	1) Trumpets
нлі	OMFUL INSECT	2°	3) Respiratory sinhor
I FN	NVIFUL INSECT		378 Despiratory organs o
LE 1 264	Dubie leure ie		1) Trumeneta 2) Decr
504.	Public louse is	1.:	$\frac{1) \text{ frumpets } 2) \text{ Kesp}$
	1. Pediculus pu	DIS	3) Gills 4) Abso
	2. Pediculus hui	manus numanus	3/9. Degenerated forewin
	3. Pithirus publ	S	I) Elytra
	4. Pithirus huma	anus capitis	3) Tegmina
365.	Body louse is		380. The location of stink
	1. Pediculus hu	manus capits	1) Ventral side of the
	2. Pithirus huma	anus hhumanus	2) Ventral side of the
	3. Pediculus hu	manus pubis	3) Ventral side of the
	4. Pediculus hu	manus hamanus	4) Abdomen
366	Maggots of hou	usefly are also called	381. Number of moults re
	1. grubs	2. Nits	tion of nymph into ad
	3. Gentles	4. Nymph	1) Two
367.	In the housefly fly	ing wings are located on	3) Three
	1) Prothorax	2) Mesothorax	382. The following is the p
	3) Metathorax	4) Abdomen	1) Bed bug
368.	Small rod like wir	ngs present on the metathorax of	3) Head louse
	housefly are		383. The scientific name c
	1) Elytra	2) Hemielytra	1) Pediculus humanis
	3) Tegmina	4) Halters or Balancers	2) Pediculus humanis
369.	The number of seg	ments in the antennae of housefly	3) Pediculus humanis
	is		4) Pediculus humanis
	1) 2 2) 4	3) 5 4) 3	384. Incubation period of
370.	Larval stage found	l in the life cycle of housefly is	1) 20 days
	1) Wriggler	2) Maggot	3) 7 days
	3) Tumbler	4) Nits	385. Number of moults tal
371.	Number of moulti	ngs takes place in the life history	tion of nymph into ad
	of housefly for the	transformation of larva into pupa	1) 4
	1) 3 2) 2	3) 4 4) 6	3) 6
372.	The following exh	ibits complete metamorphosis	386 The last segment of
	1) Bedbug	2) Head louse	1. Scape 2
	3) Cockroach	4) Housefly	3. Anodeme 4
373	Disease caused du	e to laying of eggs by housefly in	
213.	wounds of man is		
	o unuo or mun lo		

4) Myiasis this family 2) Culicidae 4) Psorophoridae l in the life cycle of mosquito is 2) Wriggler 4) Chrysalis nd in the life history of mos-2) Maggot 4. Wriggler of mosquito larvae are 2) Gills 4) Lungs ns of mosquito pupae piratory siphons ent ngs of bedbug are called 2) Halters 4) Hemielytra glands in the bed bug is prothoracic legs mesothoracic legs metathoracic legs equired for in the transformalult in bedbug 2) Four 4) Many permanent ectoparasite 2) Mosquito 4) Housefly of head louse is capitis s corporis s rotundus musca head louse egg is 2) 10 days 4) 30 days keing place in the transformalult in head louse 2) 2 4) 3 f antenna of housefly bears Arista Prostheca

2) Typhoid

387	The mouth parts present in Houselfy								
	1. Biting and chewing type								
	2. Piercing and sucking type								
	3. Sponging and sucking type								
	4. Siphoning type								
388	Identity sanguivorous intermittent								
	ectoparasites from the following								
	1. Female mosquito 2. Bed bugs								
	3. Male mosquito 4. 1 & 2								
389	Bed bug is a								
	1. Holometabolous insect								
	2. Hemimetabolous insect								
	3. Parametablouse insect	39							
	4. Ametabolous insect								
390	The respiratory structures present in the								
	Tumbler of mosquito are								
	1)Resporatory trees								
	2)Resporatory siphons								
	3)Resporatory trumpets4)Pulmonary sac								
391	The type of mouth parts present in bed bug								
	are								
	1)Piercing and sucking								
	2)Sponging and sucking								
	3)Lapping and chewing	39							
	4)Biting and chewing								
392	Identify a wingless, saguivorous permanent								
	ectoparasite with piercing and sucking type								
	of mouth parts from the following								
	1)Climex lectularis 2)Culex pipiense								
	3)Pediculus humanus capitis								
	4)Aedes egyptii								
393	Head louse transmits the following diseases								
	1)Relapsing fever and typhus fever								
	2)Typhus fever and trench fever								
	3)Bubonic plague and leprosy								
	4)Leprosy and trench fever	39							
LEVI	EL - II								
394.	The following are the statements about	S1.							
	housefly								
	I) The Indian housefly is scientifically called	I							
	Musca nebula								
	II) The metathoracic wings are small rod like								
	and are called hemielytra.								
	III) Antennae are three segmented	П							
	IV) It is a holometabolous insect.								
	Correct combination is								
	1) All expect IV 2) All except III								
a a -	3) I, III and $IV 4$) I, II, III and IV	111							
395.	I he following are the statements about	_T ,							
	mosquitoes								

I) They have only one pair of functional wings on the metathorax. II) Last pair of wings is modified into halteres. III) The wrigglers breathe air through respiratory trumpets. IV) The tumblers breathe air through respiratory siphon. Correct combination is 1) All are Correct 2) All are wrong 3) All except II are wrong 4) All except II are correct. 396. The following are the statements about bedbug. I) It is an intermittent ectoparasite with piercing and sucking type of mouth parts. II) It has reduced fore wings called elytra. III) Hind wings are absent. IV) Stink glands are present at the bases of legs on the ventral side metathorax Correct combination is 1) I,II and IV 2) I,III and IV 3) I,III and V 4) II, III, IV and V 397. The following are the statements about head louse I) It is a wing less sanguivorous permanent ectoparasite. II) The tips of the legs bear curved claws. III) The whitish eggs are called nits. IV) After several moults the nymphs become adults Correct combination is 1) I, II, III and IV 2) II, III and IV 3) I.II and IV 4) I,II and III 398. Study the following regarding Harmful insects. Sl.No. Insect Young one Diseases transmitted Housefly Maggot Amoebiasis, Ascariasis, T.B., Cholera, Typhoid etc. Bed dug Nymph Relapsing fever, typhus fever, trench fever, plague and leprosy Head louse Nit Relapsing fever and typhus fever Mosquito Wriggler Malaria, Filaria,

Yellow fever,

dengue fever etc.

	Which of the above a	are correct	40
	1)All	2) I, II and III	
	3) II, III and IV	4) I, II and IV	
399.	Statement (S): The h	alteres of housefly are	
	also called balancers		
	Reason (R): The halt	teres assist in	
	balancing the body du	uring flight in housefly	
	1)If both A and R are	e true and R is correct	
	explanation of A		
	2)If both A and R are	e true but R is not	
	correct explanation	ofA	
	3)If A is true and R is	false	40
	4)If A is false and R i	s true	
400.	Assertion (A) - Hou	sefly is a disease	
	spreading agent	5	
	Reason (R) - Housefly	contains poison glands	
	1) Both A and R are con	rrect. R is the correct ex-	
	nlanation to A		40
	2) Both A and R are co	rrect. R is not the correct	
	explanation to A		0
	3) A is correct but R is f	false	U
	4) Both A and R are fal	se	
401	Statement (S) - Bedbu	g hides in the narrow gans	т
401.	(or) crevices in the furni	ture theatres buses trains	л. П
	etc	ture, meanes, ouses, nams	Ш
	Reason (R) - Red bug	spreads diseases	п
	1) Both A and B are co	rrect R is the correct ex-	1 1
	nlanation to A	fileer, it is the confect ex-	
	2) Both A and R are con	rrect R is not the correct	
	explanation to A	fileet, it is not the correct	10
	3) Both A and B are fals	10	40
	(4) A is correct but R is	falce	
402	4) A is concer but IC is Study the following stat	ements	
4 02.	(i) I arval stage of hous	effy is called magget	
	(ii) Housefly is a holom	etabolic insect	
	(iii) Life history of house	etabolic lisect	
	stages only	eny menudes egg and adun	
	Stages only. The following is the com	root on suor	
	1) i and iii	2) i and ii	10
	$\begin{array}{c} 1 \\ 1 \\ 1 \\ 2 \\ \vdots \\ 2 \\ \vdots \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	$\frac{2}{1} \frac{1}{1} \frac{1}{2} \frac{1}$	40
402	5) II allu III Studiuth e fellouine etet	4) All are correct	
405.	(i) Dedbug is a conquir		
	(i) Deubug is a sanguiv	orous msect.	
	(II) Alter a full meal of f	iuman blood, bedbugs can	
	(iii) Dodbug group da di	s without 1000.	
	(III) Deabug spreads dis	eases like relapsing le	
	ver, typnus fever, tre	anch lever bubonic plague	
	and leprosy.		
	1 ne following is the com	2) i su 1 ¹¹	
	1) 1 and 111 2) $\frac{1}{10} = 1^{111}$	2) 1 and 11 (1) $\frac{1}{100}$ $\frac{1}{100}$	
	5) 11 and 111	4) 1, 11 and 111	

04. Study the following sta	tements						
(i) Mosquitoes are wor	(i) Mosquitoes are world wide in distribution						
(ii) Mosquitoes are abu	(ii) Mosquitoes are abundant in tropical countries						
(iii) In mosquitoes meta	(iii) In mosquitoes metathoracic wings are modified						
into halters.	into halters.						
The following is the co	rrect answer.						
1) i and iii	2) i and ii						
3) ii and iii	4) i, ii and iii						

LEVEL - III 05. Proximal part of tibia and anal cerci

respectively bear									
1. Vitrillae and tympanal organs									
2. sub-genual and tympanal organs									
3. Tympanal and vitrillae									
	4. Tympanal and sub-genual organs								
406.	Study	the fo	llowing	and choose	e the correct				
	combii	nation							
Orgar	nism		No.of	No.of segments Tip of the					
0			in ma	xillary	maxillary				
			palp	·	palp				
I. Ma	le Anop	heles	Five		Clubshaped				
II. Fer	nale clue	ex	Five		Pointed				
III.Ma	le culex		Three		Club shaped				
IV.Fer	nale		Three		Pointed				
And	pheles								
1	. I and I	Π		2. I	I and IV				
	3. I and	IV		4. I	II and IV				
407.	Which	one	of the fol	lowing is ir	ncorrect				
	1. The	larva	e of Cul	ex and And	pheles are				
	paralle	el to th	e surfac	e of water	1				
	2. Wrig	ggler	of Culez	x is at an an	gle to the				
	surfac	e of w	ater		0				
	3. Cule	ex in i	ts sitting	is parallel	to the skin of				
	the hos	st							
	4. Ano	phele	s in its s	itting is at a	n angle to				
	the ski	n of tl	ne host	-	-				
408	Match	the fo	llowing						
	List-I			List-II					
	A. Pla	ntulae	e I. Hel	p in respira	tion				
	B. Pul	villus	II. He	lp in flight					
	C. For	e wing	gs III. Lo	ocomotion of	on rough surface				
	D. Hin	d win	gs						
			IV. Lo	ocomotion	on smooth				
			surf	ace					
			V. I	Do not help	in flight				
		A	B	С	D				
	1.	II	Ι	V	III				
	2	IV	V	III	Π				

	3.	IV	III	V	II			A	В	С	D
	4.	Ι	Π	Ш	IV		1)	IV	III	Ι	V
409.	409. Match the following					2)	III	Π	Ι	IV	
	List - l	[List -	II		3)	Π	III	IV	Ι
A. Mo	tor centr	e		I. Auto	onomous nervous		4)	IV	III	Π	Ι
system					413.	Match	the follow	wing an	d choos	e correct com	
B. Sen	sory and	1	II. Sub	o-oesopl	nageal ganglia		binati	on			
ende	ocrine c	entre					List -	·I		List -	II
C. Peripheral nerves III. Optic nerves						A. Hy	ypophar	ynx.			
D. Stomato gastric IV. Supra-oesophageal nervous									I. Ab	sent in sp	ponging and
system ganglia.									suckir	ng type o	f mouth parts
			V. Cer	ntral ner	vous system.	B.M	andibles		II. Ab	sent in p	iercing and
		Α	В	С	D				suckir	ng type o	f mouth parts.
	1)	Π	V	III	Ι	C. Bl	adelike	maxillae	III. At	osent in s	iphoning type
	2)	ΠΙ	IV	II	V				ofmo	uth parts	
	3)	Π	IV	III	V	D. Ur	nsegmen	ited	IV. Sp	oonging a	and sucking
	4)	Π	IV	III	Ι				maxil	lary palp	s type of mouth
									parts p	present in	1
410.	Match th	ne follov	ving and	l choose	suitable answer.				V. Pre	esent in b	iting and chew
Insect	S		Mouth	1 parts					ing typ	pe of mo	uth parts.
A. Fen	nale Ano	pheles	I. Che	wing ar	nd lapping type			Α	В	С	D
B. Hou	isefly		II. Sipl	honingt	type		1)	I	III	IV	II
C. Butt	terfly		III. Bit	ing and	chewing type		2)	II	IV	Ι	III
D. Coc	ckroach	_	IV. Pie	ercing an	nd sucking type		3)	III	II	IV	V
			/. Spor	nging ar	nd sucking type		4)	III	1	II	IV
		A	В	C	D	414.	Mate	the fo	ollowir	ig and o	choose correct
	1)		II T	l	V	(combina	tion.	.		
	2)	V	l	III H			List-I		List	: - 11	
	3)	IV	V	II H	111 T		A. Apis	indica	I. L	Drone	
411 N	4)		· 111 · 1	1		B. Apis dorsata II. Mulberry silk moth.					
411. N		e follow	ing and	choose	suitable answer.	C. Apis florea III. Smallest bee.					
A N. T. 1	LIST -I		T M	LIST -	11 1	D. Bombyx mon IV. wild rock bee.					
A. Mai	le mosqu	ntoes	I. Max	killa wit	In serrated ends	v. Domesticated and com					
B. Hou	ise fiy		II. Gal	ea are e		monly reared bee					
C. Fell	hale mos	quitoes	III. Ma	xilla are			I ne corr	ect come	mation	15	
D. Duu	lerny		IV. Ey	es absel	lll alaant			•	р	C	D
		•	v. Iviai	C	absent.		1)	A	D N/	С Ш	D П
	1)	A III	D II	U I	D W		1)	V TII	т П	111 T	II V
	$\frac{1}{2}$	III V	11 TT	I T	IV П		2) 2)	ш		1 17/	v T
	2) 2)	V V	ш	I T			5) 4)	II T			I П
	3) 4)	v п	II T	I Ш		115	4) Moto	I h tha fall	III ouvin o d	IV and aho a	
41 2 1	4) Matah th	II a fallou	1 vincend	III abaaca	1v	415.	hinoti	on	lowing		
412. 1	iviation	e lollow	/ing and	choose	the correct com-			011. T			List II
Dination.						·I	~**	I Sh			
LIST-I LIST-II							haana maai				
A. Sponging and sucking type I. Butterflies						D.Au	thorse rect	III mhio			
B. Blung and chewing type II. Female lac insect							coifer los	ipilla	$\mathbf{III.} \mathbf{EI}$ $\mathbf{IV} \mathbf{T}_{2}$	sor sill	
C. Sipi	roing on a	her of the	tuno		ass noppers		D. La		Na	1 v. 1a V NA-	ssai siik 109 sill
D. FIEI	ionig and	1 SUCKIN	gtype	IV. DO	le lac insect					v. IVII	uga siik
v. maie fac filsect											

	The con	rrect con	nbinatio	n is.	1	
		Α	В	С	D	
	1)	Ш	П	Ι	V	
	2)	V	П	Ш	I	
	3)	Ш	I	П	IV	
	4)	Π	Ш	IV	I	
416	Match	the follo	wing and	d choose	the correct com	
110.	bination	וווס ופווס ז	ving un	a encose		
	List_I	1.			List - II	
	Δ Pedi	culus hu	manus		List II I Myjasis	
	R Cim	ev rotun	dus	II Rel	ansing fever	
	C Aed	es aemu	nti	III Ma	laria	
	D Ano	cs acgy _l nhalas	511	III. Ma IV Duk	ania plagua	
	D. Anophetes			V Den	one plague	
V. Deligue level.						
		A	B	С	D	
	1)	I	П	Ш	v	
	2)	П	IV	V	ш	
	3)	Ш	IV	V	I	
	4)	V	I	П	Ш	
417	Match	the follo	ı wing aı	nd choos	se correct com	
	bination	1	s tring u			
	List -I	1.			List - II	
	A Hea	d louse	I win	los are a	hsent	
	R Red	ngs are present				
	C House fly III 2 pairs of				vings are	
	C. Hou	se ny	nres	sent		
	D Mal	e lac ins	ect IV 2) Hemiel	vtra are present	
	D. Iviai		$V \Delta n$	air of wi	ngs are used	
			for fli	ght.	ings are used	
		Α	B	C	D	
				-		
	1)	Ι	IV	V	П	
	2)	IV	Ι	Π	Ш	
	3)	Π	III	IV	V	
	4)	Ι	Π	III	IV	
418.	Match	the follo	wing an	d choose	e correct combi-	
na	tion					
	List -I			List - I	I	
	A. Bon	nbyx mo	ri		I. Tumbler	
	B. Tach	nardia la	cca	II. Nyr	nph	
	C. Mus	sca dom	estica	III. Nit	s	
	D. Aed	es aegyp	oti	IV. Cat	erpillar	
				V. Ma	ggot	
		A	B	С	D	
	1)	IV	II	III	I	
	2)	IV	II	V	I	
	3)	II	V	III	IV	
	4)	V	IV	Ι	III	

	Α	B	С	D
1)	III	Ι	V	IV
2)	Ι	Π	III	IV
3)	III	Ι	IV	V
4)	Ι	III	V	IV
420. Statem	ent (S)	: The he	eart of co	ockroach is called
neuroger	nic hear	t.		
Reasor	n (R) : '	The cor	ntractior	ns of the heart of
cockroa	ch are c	ontrolle	d by mu	scles.
1) Both	A and	R are c	correct,	R is the correct
explanat	ion to A	L		
2) Both	A and F	are co	rrect, R	is not the correct
explanat	ion to A	L		
3) Both	A and R	are fals	se	
4) A is c	orrect b	out R is	false	
421 Statem	nent (S)) - Mou	th parts	of insects are the
best exam	mple for	r homol	ogous or	gan.
Reason	(R) - M	louth pa	arts of in	sects are the best
example	for ada	ptive rad	diation.	
1) Bo	oth A an	nd R are	correct	, R is the correct
explanat	ion to A	L		
2) Both	A and F	are co	rrect, R	is not the correct
explanat	ion to A			
3) Both	A and R	are fals	se	
4) A is c	orrect b	out R is	false	
422. The follo	owing an	re the sta	tements	about the nervous
system o	ofcockr	oach		
(i) Central no	ervous s	system c	onsists o	of only nerve ring.
(ii) Nerve rir	ng is also	o called	brain.	
(iii) Ventral n	erve coi	rd is soli	d, single	and ganglionated.
Choos	se the w	rong co	mbinati	on
1) i and	ii		2) ii a	and iii
3)All ar	e wrong	5.	4) O	nly ii is wrong
423. Study t	he follo	wing sta	atements	
(i) Pierc	cing and	l suckin	ig type o	f mouth parts are
presenti	n all mo	squitoe	s.	
(ii) Spor	nging ar	nd sucki	ng type	of mouth parts are
present i	n house	tlies.	-	
(iii) Sipl	noning	type of 1	nouth p	arts are present in
butterflie	s.			
The follo	owing is	s the cor	rect ansv	ver.
1) i and i	11		2) i a	and ii
1 257				(JNIT-VII

. Match the following and choose correct com

List - II

I. House fly

II. Pediculus

IV. Aedes V. Cimex.

III. Psorophora

419

bination List -I

B. Myiasis

A. Dermatobiasis

C. Dengue fever

D. Trench fever

	3) ii and iii	4) All are correct	(iii) In butterfly	/labrum is a	ıbsent.		
424	. Study the following sta	tements	The following is the correct answer.				
	(i) Biting and chewin	g type of mouth parts are	1) i and iii		2) i and ii		
	primitive type		3) ii and iii		4) All	are correct	
	(ii) Siphoning type of n	nouth parts are well devel-	430. Study the following statements.				
	oped.		(i) Biting and chewing type of mouth parts are				
	(iii) In the female Anop	heles mosquito the mouth	present in the l	arval stages	ofallin	sects	
	parts are stylet like.		(ii) In the fema	ale mosquit	oes hyp	opharynx is free	
	The following is the cor	rect answer.	and has a salivary duct.				
	1) i and iii	2) i and ii	(iii) Male moso	quitoes feed	l on plan	t juices.	
	3) 11 and 111	4) All are correct	The following	1s the correc	ct answe	er.	
425	Study the following state	1) 1 and 111		2) 1 an	d 11		
	(i) In the sponging type	e of mouth parts the labella	3) ii and iii		4) All a	are correct	
	are the reduced labial pa	alps.	431. The following	nervous stru	ictures a	are present in the	
	(11) The labella are con	nected by Dutton's mem-	nervous system	n of cockro	ach	1	
	brane in piercing and su	cking type mouth parts.	a) Occipital ga	inglion	b) End	locrine centre	
	(iii) In the mouth parts of	of Musca un jointed maxil-	c) Visceral gar	iglion	d) Fro	ntal ganglion	
	The following is the cor	reat an arran	Arrange the	above in c	orrect	ing to alimentary	
	1) i and iii	anterior to post	erior end wit	megaro	ing to animentary		
	2) ii and iii	2) Tallull 1) All are correct	canal		2)	4 h	
126	5) If and III Study the following state	4) All die collect	$\begin{array}{c} 1 \\ 3 \\ \end{array} \begin{array}{c} c \\ d \\ b \\ a \end{array}$		(2) a - (1)	h d	
420	(i) Proboscis of house	Ty can be divided into ros-	437 Part	Characte	+) a-c- r	Location	
	trum haustellum and lah	ellum	(i) Clypeus	Sclerite of	• Thead	Present below	
	(ii) Mandibles are abse	nt in the housefly	(I) Clypeus		neau	the frons	
	(iii) A pair of uniointed	nalps represent on the ros-	(ii) Prostheca	Sensory lo	obe	Ist maxillae	
	trum, represents I maxil	la in housefly	(iii) Saliyarium	Dorsal cha	amber	preoral	
	The following is the cor	rect answer.	(III) Suil (ullulli	Densaren		Cavity	
	1) i and iii	2) i and ii	(iv) Occipital	Opening		Posterior side	
	3) ii and iii	4) All are correct	Foramen	1 0		ofhead	
427	. Study the following state	ements.	Which of the a	above two a	re corre	ct	
	(i) In butterfly galea are	vestigial	1) ii and iii		2) i an	d ii	
	(ii) In the housefly pseu	idotracheae are present.	3) iii and iv		4) i an	d iv	
	(iii) In the female mosqu	ito maxillae and mandibles	433 Insect		Type	of mouth parts	
	are stylet like.		155 . Inseet		Snecis	l character	
	The following is the cor	rect answer.			Speen		
	1) i and iii	2) i and ii	1. Bedbug sucking	type	Piercii	ng and sucking	
	3) ii and iii	4) All are correct	type		Stylet	ike structures	
428	. Study the following state	ements.	2. House fly		Spong	ing type	
	(i) In housefly maxilla a	re vestigial			Primiti	ve type	
	(ii) In mosquito labium	is called proboscis.	3. Female mosquite	oes	Pierci	ng and sucking	
	(111) In butterfly galea d	evelop into proboscis.	type		Maxill	a absent	
	The following is the cor	rect answer.	4 Dutterfly		Cinhan	in a torus	
	1) 1 and 111	2) 1 and 11	4. Butterny		Siphor	ing type	
420	3) 11 and 111 $(11 - 1)$	4) All are correct			Auvan	ced type	
429	Study the following stat (i) In heatten flag and (i)	ements.	The correct cor	mbination is	s		
	(1) In outterily mandit	sies and hypopharynx are	1) 1 and 4		2) 2 ar	nd 3	
	(ii) I abium is triangular	r plate like structure in hut	3) 3 and 4		4) 1 ar	nd 2	
	terfly	i prate nike su deture ni out-			ć		
	willy						

434. Insect	Type of	Special	
	mouth parts	character	
1. Housefly	Sponging type	Pseudotrachea	
		present	
2. Butterfly	Siphoning type	Galea are elongated	
3. Female	Piercing and	Mandibles	
mosquitoes	sucking type	vestigial	
4. Cockroach	Biting and chewing type	Maxilla absent	
The correct c	combination is		
1) 1 and 2 3) 3 and 4	2) 1 4) 1	and 3 and 4	

435. Study the following.

Insect	Character	Economic
		Importance
I. Apis indica	Colonial	Nutritious honey is
	insect	produced.
II. Laccifer	Males can	Lac is used as
lacca	not fly	sealing material
III .Bombyx mori	Undergoes	Silk is produced
	four moultings	during metamorphosis
IV. Musca	II pair of wing	s Causes several
domestica	used for flight	diseases
Which of the abo	ove two are cor	rect
1) I & II	,	2) II & III
3) III & IV	2	4) I & III

436. Study the following.

Insec	t	Taxon	Spread diseases			
I. M	usca	Diptera	Typhoid and Cholera			
II. Cı	ılex (Culicidae	Encephalitis & filari			
			asis			
III. Ci	imex I	Hemiptera	Plague & Cholera			
IV. Pe	diculus		Pediculidae			
			Typhus & Typhoid			
Whic	h of the a	above two ar	re correct			
1) I &	żП		2) I & III			
3) III	& IV		4) II & IV			
437. Pro	oximal pa	art of tibia an	d Anal cerci			
res	pectively	y bear				
1. \	1. Vitrillae and tympanal organs					
2. sub-genual and tympanal organs						
3.]	Гутрапа	l and vitrillae	2			
4. [Гутрапа	al and sub-ge	nual organs			

438.	Study the following and choose the correct						
Organ	Organism			gments arv	Tip of the maxillary		
			palp	J	palp		
I. Ma	le Anop	heles	Five		Clubshaped		
II. Fen	nale clue	ex	Five		Pointed		
III.Mal	le culex		Three		Club shaped		
IV.Fen	nale		Three		Pointed		
Ano	pheles						
1	. I and I	Π	2. II and IV				
-	3. I and	IV		4. I	II and IV		
439.	Matcl	1 the f	following	(2004)			
	Ι			II			
Insect			Peculi	arity of			
				Mouth	n Parts		
A)	Laccife	er	1. Eloi	ngated g	alea		
B)	Musca	l	2. Wel	l develo	ped Mandibles		
C)	Beetle		3. Saw-like maxillae				
D)	Moth		4. Pseudotrachae				
			5. Vestigeal Mandibles				
		Α	В	С	D		
	1)	5	4	2	1		
	2)	3	4	5	1		
	3)	1	2	3	4		
	4)	3	4	2	1		
440.	The ty	pe of 1	nouth part	s found	in the insect		
	that is	know	n to spread	l Myiasi	s is : (2006)		
	1) Spo	nging	and suckir	ıg			
	2) Pier	cing a	nd sucking	5			
	3) Bitin	ngand	l chewing	4) Siph	oning		
441.	Match	the fo	llowing:	(2006)			
		Set-	I	Set-II			
a)	Olfacto	ory sei	nsillae	1.0mm	natidium		
b)	Peritro	phic n	nembrane	2. Diurnal insects			
c)	Cibariı	ım		3.Food bolus			
d)	Rhabd	ome		4.Hypopharynx			
e)	Appos	ition i	mage	5.Maxillarv palp			
,	The co	orrect	set is :		• • •		
	1) a - 1	3.b-	4, c 5, d -	2, e - 1			
	2) a -	3. b -	5, c - 4, d	- 1. e -	2		
	3) a -	5. h -	3. c - 1 d	-4.e-	2		
	4) a -	5 h -	3 c - 4 d	1 e - 3	-)		
	-ja-	2,0-	э, с - т, u	1, C - 2	-		

442.	Periplaneta americana sensillae on (2007)	has thermoreceptor			
	(1) 1st, 2nd and 3rd se	egments of tarsus of legs.			
	(2) 3rd, 4th and 5th se	gments of tarsus of legs.			
	(3) Pedicel of antenna				
	(4) 15th segment of ana	al cerci			
443.	Statement (S) : Arth cessful of all the know	ropoda are the most suc manimal groups.			
	Reason (R) : Arth	ropoda exhibit the great			
	est adaptive radiation	and have adapted to			
	diverse habitats.	(2008)			
	1) Both (S) and (R) ar (S)	e true and (R) explains			
	2) Both (S) and (R) and explain (S)	re true but (R) cannot			
	3) Only (S) is correct	but (R) is wrong			
	4) Both (S) and (R) and	re wrong.			
444.	(2008)				
	Statement (S) : Supe	er position images are			
	formed in the nocturna	al insects			
	Reason (R) : The	retinulae lie immediately			
	below the vitrellae and	d crystalline cone, these			
	sorb the light rays her	inal sheath which ab			
	images are formed in	nocturnal insects.			
	The correct answer is				
	1) Both (S) and (R) ar	e true and (R) explains			
	(S)	·····			
	2) Both (S) and (R) and	re true but (R) cannot			
	explain (S)				
	3) Only (S) is correct	but (R) is wrong			
	4) Both (S) and (R) and (R)	re wrong.			
445.	Match the following	(2008)			
	Set - I	Set -II			
	A. Pollen basket	1. Butterfly			
	B. Pseudotracheae	2. Laccifer lacca			
	C. Shellac	3. Mosquito			
	D. Dutton's membrane	e 4. Musca			
E. Well developed galea5. Worker bee					

The correct match is

1) A - 5 B - 4	C - 2	D - 3	E - 1
2) A - 4 B - 5	C - 3	D - 2	E - 1
3) A - 1 B - 5	C - 3	D - 4	E - 2
4) A - 3 B - 2	C - 4	D - 5	E - 1

INTRODUCTION KEY

1) 4	2) 2	3) 4	4) 2	5) 1	6) 3
7) 2	8) 4	9) 1	10) 4	11) 3	12) 1
13) 1	14) 1	15) 2	16) 3	17) 3	18) 4
19) 2	20) 4	21)4	22) 3	23) 4	24) 1
25) 4	26) 3	27) 4	28) 3	29) 1	30) 1
31) 4	32) 3	33) 3	34) 2	35)1	36) 2
37) 1	38) 2	39) 3	40) 3	41) 3	42) 3
43) 2	44) 1	45) 2	46) 1	47) 2	48) 1
49) 3	50) 3	51) 1	52) 3	53) 2	54) 4
55) 3	56) 4	57) 3	58) 1	59) 2	60) 3
61) 2	62) 1	63) 4	64) 1	65) 2	66) 3
67) 1	68) 1	69) 2	70) 4	71) 3	72) 3
73) 4	74) 1	75) 2	76) 4	77) 4	78) 3
79) 3	80) 1	81) 1	82) 2	83) 2	84) 4
85) 2	86) 2	87) 3	88) 1	89) 1	90) 4
91) 2	92)3	93) 1	94) 2	95) 1	96) 1
97) 2	98) 2	99) 2	100) 1	101) 3	102) 2
103) 1	104) 1	105) 1	106) 4	107) 1	108) 3
109) 1	110) 4	111)3	112) 3	113) 2	114) 2
115) 1	116) 3	117) 2	118) 2	119) 2	

DIGESTIVE SYSTEM

KEY

120) 3	121) 1	122) 2	123) 2	124) 3	125) 3
126) 3	127) 3	128) 1	129) 3	130) 1	131) 1
132) 3	133) 1	134) 4	135) 3	136) 4	137) 2
138) 2	139) 1	140) 2	141) 2	142) 1	143) 2
144) 1	145) 1	146) 2	147) 2	148) 1	149) 2
150) 3	151) 1	152) 1	153) 2	154) 3	155) 2
156) 2	157) 1	158) 4	159) 2	160) 1	161) 1
162) 3	163) 4	164) 4	165) 1	166) 1	167) 3
168) 3	169) 3	170) 1	171) 1	172) 2	173) 2
174) 1	175) 3	176) 3	177) 2	178) 2	179) 1
180) 3	181) 4	182) 2	183) 1	184) 2	185) 4
186) 4	187) 4	188) 2	189) 4	190) 3	191) 3
192) 3	193) 4	194) 4	195) 4	196) 1	197) 3
198) 3	199) 1	200) 1	201) 1	202) 2	203) 4
204) 4	205) 2	206) 1	207) 1	208) 2	209) 4
210) 1	211) 2	212) 3	213) 4	214) 1	215) 2
216) 3	217) 3	218) 2	219) 2	220) 2	221) 2
222) 2	223) 2	224) 2	225) 4	226) 1	227) 4
228) 4	229) 2	230) 3	231) 1	232) 1	233) 1
235) 4					

PHYLUM - ARTHROPODA KEV

	11271							
236) 4	237) 3	238) 1	239) 1	240) 4	241) 2			
242) 3	243) 3	244) 4	245) 2	246) 3	247) 4			
248) 3	249) 4	250) 2	251) 4	252) 1	253) 2			
254) 3	255) 1	256) 2	257) 1	258) 4	259) 2			
260) 1	261) 4	262) 2	263) 1	264) 3	265) 2			
266) 3	267) 2	268) 3	269) 1	270) 1	271) 1			
272) 1	273) 2	274) 4	275) 1	276) 1	277) 1			
278) 4	279) 1	280) 1	281) 3	282) 3				

ECONOMIC IMPORTANCE OF INSECTS

USEFUL INSECTS

KEY

283) 1	284) 1	285) 1	286) 2	287) 2	288) 1
289) 3	290) 4	291) 3	292) 4	293) 3	294) 4
295) 3	296) 4	297) 3	298) 3	299) 3	300) 4
301) 2	302) 2	303) 3	304) 2	305) 1	306) 4
307) 4	308) 2	309) 1	310) 3	311) 2	312) 2
313)4	314) 3	315) 3	316) 4	317) 2	318) 3
319) 3	320) 4	321) 4	322) 2	323) 2	324) 4
325) 1	326) 3	327) 2	328) 1	329) 1	330) 4
331) 2	332) 3	333) 4	334) 2	335) 1	336) 4
337) 2	338) 3	339) 2	340) 2	341) 2	342) 3
343) 2	344) 2	345) 1	346) 1	347) 1	348) 3
349) 2	350) 2	351) 1	352) 2	353) 1	354) 1
355) 1	356) 2	357) 1	358) 4	359) 1	360) 2
361)4	362) 1	363) 1			

HARMFUL INSECTS KEV

NLY									
365) 4	366) 3	367) 2	368) 4	369) 4					
371) 2	372) 4	373) 4	374) 2	375) 2					
377) 3	378) 1	379) 4	380) 2	381) 4					
383) 1	384) 3	385) 4	386) 2	387) 3					
389) 2	390) 3	391) 1	392) 3	393) 2					
395) 3	396) 2	397) 4	398) 4	399) 1					
401) 2	402) 2	403) 4	404) 4						
	365) 4 371) 2 377) 3 383) 1 389) 2 395) 3 401) 2	365) 4 366) 3 371) 2 372) 4 377) 3 378) 1 383) 1 384) 3 389) 2 390) 3 395) 3 396) 2 401) 2 402) 2	365) 4 366) 3 367) 2 371) 2 372) 4 373) 4 377) 3 378) 1 379) 4 383) 1 384) 3 385) 4 389) 2 390) 3 391) 1 395) 3 396) 2 397) 4 401) 2 402) 2 403) 4	KEY 365) 4366) 3367) 2368) 4371) 2372) 4373) 4374) 2377) 3378) 1379) 4380) 2383) 1384) 3385) 4386) 2389) 2390) 3391) 1392) 3395) 3396) 2397) 4398) 4401) 2402) 2403) 4404) 4					

LEVEL - III KEY

		-			
405) 2	406) 1	407) 1	408) 3	409) 4	410) 3
411) 2	412) 1	413) 4	414) 1	415) 4	416) 2
417) 1	418) 2	419) 3	420) 4	421) 2	422) 3
423) 4	424) 4	425) 4	426) 4	427) 3	428) 4
429) 2	430) 4	431) 1	432) 4	433) 1	434) 1
435) 1	436) 1	437) 2	438) 1	439) 4	440) 1
441)4	442) 1	443) 1	444) 3	445) 1	