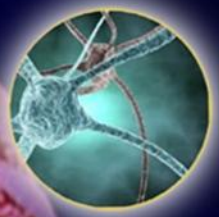
ZOOLOGY

WORKBOOK

ENGLISH MEDIUM



INTERMEDIATE FIRST YEAR

BOARD OF INTERMEDIATE EDUCATION

ANDHRA PRADESH

A WORK BOOK IN

ZOOLOGY

INTERMEDIATE

FIRST YEAR

Sri.V.RAMAKRISHNA IRS

SECRETARY,
BIEAP, VIJAYAWADA

PREFACE

"I hear and I forget: I see and I remember
I do and I understand: I Think and I learn"

The board of intermediate education, Andhra Pradesh, Vijayawada made an attempt to provide work books for the first time to the intermediate students with relevant and authentic material with an aim to engage them in academic activity and to motivate them for self-learning and self-assessment. These work books are tailored based on the concepts of "*learning by doing*" and "*activity oriented approach*" to sharpen the students in four core skills of learning - understanding, interpretation, analysis and application.

The endeavor is to provide ample scope to the students to understand the underlying concepts in each topic. The workbooks enable the students to practice more and acquire the skills to apply the learned concept in any related context with critical and creative thinking. The inner motive is that the students should shift from the existing rote learning mechanism to the conceptual learning mechanism of the core concepts.

I am sure that these compendia are perfect tools in the hands of the students to face not only the intermediate public examinations but also the other competitive Examinations.

My due appreciation to all the course writers who put in all their effort in bringing out these work books in the desired modus.

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UNIT – 1
DIVERSITY OF LIVING WORLD

MAJOR LEARNING OBJECTIVE

- Students will be able to understand what is life? The fundamental characters of life, Need for classification.
- Students will be able to understand the diversity among living things, Reason for the extinction of species and how do we conserve biodiversity.

ACTIVITIES:-

1. **Prepare the Phylogenetic tree of your family with the help of your Parents and your lecturer.**
2. **Try to write the taxonomic categories of human being from kingdom to Species.**
3. **Collect the names of some more medicinal plants, their chemical extract and its use in treatment of diseases.**
4. **Write the scientific name of our National Bird, National Animal, Andhra Pradesh State Bird, Andhra Pradesh State animal with the help of your Lecturer/Internet.**

I. Locate and rewrite the difficult key words from the text book.

1.	11.	21.
2.	12.	22.
3.	13.	23.
4.	14.	24.
5.	15.	25.
6.	16.	26.
7.	17.	27.
8.	18.	28.
9.	19.	29.
10.	20.	30.

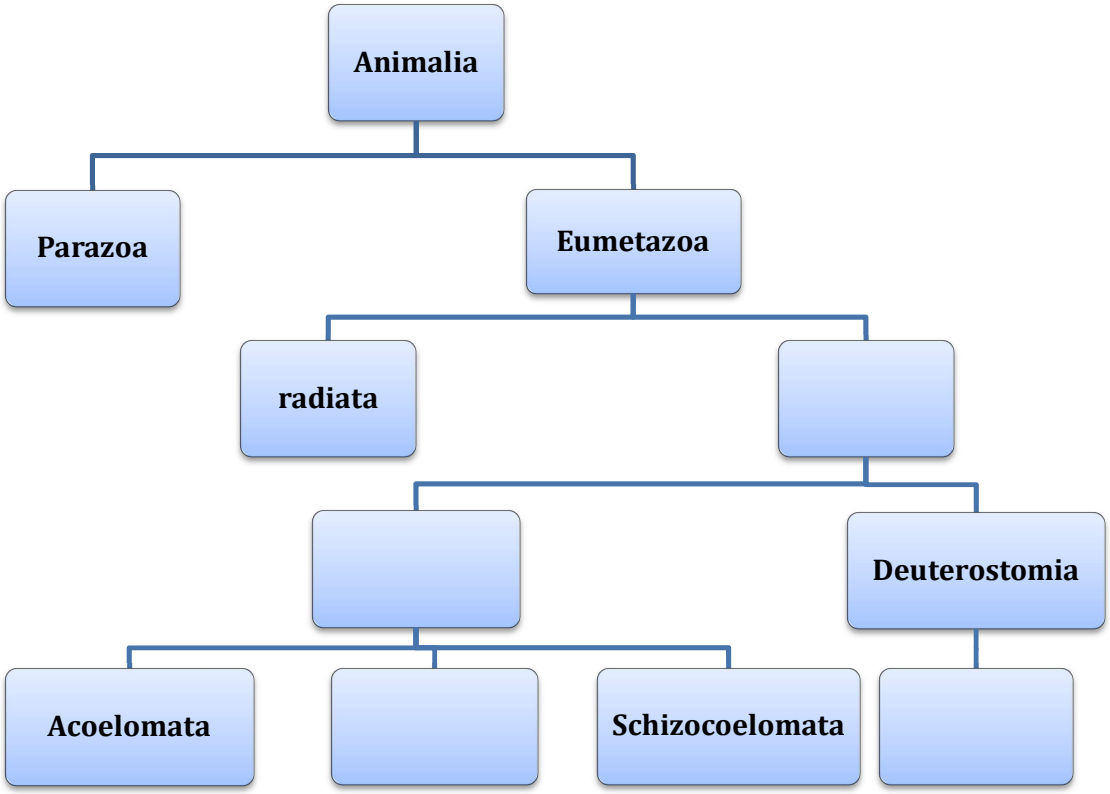
II. Name the different sacred groves & their Location in India.

Sl.No.	Name	State
1.		
2.		
3.		
4.		
5.		

III. Write any five examples to tautonymy

S.NO.	Common Name	Scientific Name
1.		
2.		
3.		
4.		
5.		

IV. Write correct taxonomic category in the blank boxes.



V. Collect the names of some extinct animals in the world with the help of your lecturer/internet.

Sl.No.	Name of Animal	Country
1.		
2.		
3.		
4.		
5.		

VI. Answer true or false

Sl.No.	Statement	True/False
1.	Cell without nuclear membrane but with genetic material is called as Eukaryotic cell.	
2.	Growth in non living things is from inside, where as in living things is by the accumulation of material on surface.	
3.	Cellular energy currency is the chief energy carrier for various reactions in living systems.	
4	Maintenance of relatively constant internal conditions is called haemostasis.	
5	Subspecies are probably new species in making.	
6	The reserve food in animals is mostly glycogen.	
7	Flat worms are the first true Eumetazoans	
8	Embryos of Deuterostomes are called mosaic embryos	
9	Tropical regions harbour more species than temperate regions.	
10	National parks are the earth's biologically richest and most threatened terrestrial ecoregions.	
11	Amazon produces 80% of the total oxygen in the earth's atmosphere.	
12	Digitalin extracted from fox glove is used in treating certain cardiac problems.	
13	Study of inheritance of characters from one generation to the next is called as Physiology.	
14	The term 'Genetics' was coined by the father of genetics.	

15	Charters shared by a pair of organisms inherited from a common ancestor are called homologous characters.	
16	Whales are included under the order Cetacea.	
17	Removal of critical species may affect the entire community and thus the entire ecosystem.	
18	Nile perch introduced into the lake Victoria in East Africa led to the extinction of African catfish, clarias gariepinus.	
19	In-Vitro culture is a type of In-Situ conservation.	
20.	Taxonomic Keys are tools that help in identification based on characters.	

VII. Fill in the Blanks

1.	_____ is the limiting membrane around the cell.
2.	Cellular energy currency is _____
3.	Every level of biological organisation involves energy transaction governed by the laws of _____.
4.	The fundamental source of energy for all biological systems is the _____.
5.	DNA is made up of _____
6.	Variations in organisms arise through _____
7.	Study of heredity and variations is called as _____.
8.	Characters shared by a pair of organisms due to convergent evolution are called as _____.
9.	Carlwoes' included the Prokaryotes which are closely related to the Eukaryotes under a separate domain _____.
10.	A cross between a female donkey and a male horse gives rise to the sterile offspring_____.
11.	Type of symmetry in first true metazoans is _____

12.	The term 'species' was coined by _____.
13.	Gibbons belong to the class _____.
14.	Study of fossils is called as _____.
15.	A species unique to a given area is called as _____.
16.	Scientific name of Kashmiri stag is _____.
17.	In India 'Project tiger' was launched in the year _____.
18.	Exploring the living world at molecular level or species level for Human welfare is called as _____.
19.	Monograph on Pheretima posthuma was writeen by _____.
20.	The concept of biodiversity originated by _____.

EXERCISE – 1
(LEVEL -1)

VIII. Multiple Choice Questions

1. The chemical basis of inheritance is

1. Ascorbic acid 2. Deoxyribo Nucleic Acid
3. Nuclear membrane 4. Ribosome

2. Molecular structure of DNA was discovered by

1. Charles Darwin 2. Carolus Linnaeus
3. Watson & Crick 4. J.B.Lamarck

3. Structural and functional units of the body ar

1. Cells 2. Tissues
3. Organs 4. Organ Systems

4. Showing response to external or internal stimuli is called as

1. Homeostasis 2. Senescence
3. Metabolism 4. Sensitivity

5. Life comes only from life. This is called as

1. Lipogenesis 2. Biogenesis
3. Neogenesis 4. Glycogenesis

6. Energy build up living process is called as

1. Anabalism 2. Catabolism
3. Ammensalism 4. Commensalism

7. Living process involving expenditure of energy is called as

1. Anabolism 2. Catabolism
3. Ammensalism 4. Commensalism,

8. Maintenance of relatively constant internal conditions in living beings is called as

1. Haemostasis 2. Thermostasis
3. Homeostasis 4. Sensitivity.

9. Natural selection theory was proposed by

1. Charles Darwin 2. Erasmus Darwin
3. Ernst Haeckel 4. George Cuvier

10. Identify the correct sequence of hierarchy of life

1. Cell --> Organism --- > Community--- > Population ---> Ecosystem.
2. Cell ---> Organism --- > Population ---> Ecosystem --- > Community
3. Cell--> Organism --- > Population--- > Community --- > Ecosystem .
4. Cell --> Organism ---> Ecosystem --- > Population--- > Community.

11. Culture of honey bees is called as

1. Aquaculture 2. Sericulture
3. Apiculture 4. Pisciculture

12. Culture of silk moths is called as

1. Aquaculture 2. Sericulture
3. Apiculture 4. Pisciculture

13. Study of microscopic structure of different tissues is called as

1. Taxonomy 2. Physiology
3. Ethology 4. Micro anatomy

14. Living organisms are characterised by

1. Sensitivity 2. Metabolism
3. Horneostasis 4. All the above

15. Study of cell as a structural and functional unit of living organisms is called as

1. Histology 2. Physiology
3. Cell biology 4. Ecology

16. Study of embryonic development and other developmental processes after birth is called as

1. Embryology 2. Developmental biology
3. Palaeontology 4. Cell biology

17. Study of plant fossils is called as

1. Palaeo botany 2. Palaeo zoology
3. Ecology 4. Ethology

18. Father of Taxonomy

1. Lamarck 2. Linnaeus
3. Haeckel 4. Herbert Spencer

19. Taxon ' Phylum ' was introduced by

1. Lamarck 2. Linnaeus
3. Haeckel 4. Herbert Spencer

20. The word ' Organic Evolution ' was coined by

1. Lamarck 2. Linnaeus
3. Haeckel 4. Herbert Spencer

21. Founder of Modern systematise

1. Lamarck 2. Linnaeus
3. Haeckel 4. Herbert Spencer.

22. First step in taxonomy is

1. Nomenclature 2. Identification
3. Classification 4. Characterisation.

23. Bears are included under order

1. Felidae 2. Canidae 3. Ursidae 4. Carnivora

24. Bears are included under the class

1. Felidae 2. Canidae 3. Ursidae 4. Carnivore

25. Name of the family is coined by adding a suffix _____to generic name

1. Ideal 2. Inael 3. Ales 4. Oidea.

26. If suffix ' inae ' is added to generic name it gives the name of

1. Family 2. Sub family 3. Class 4. Subclass

27. Identify the correct sequence of taxonomic categories.

1. Species Genus - Order - Family - Kigdom
2. Species Genus Order - Kigdom Family.
3. Species Genus - Family - Order Kigdom
4. Species Genus - Kingdom - Family Order.

28. Species name of Srilankan crow is

1. Corvus 2. Splendens
2. Insolens 4. Protegatus.

29. Sub species of Myanmar crow is

1. Corvus 2. Splendens
3. Insolens 4. Protegatus.

30. Interbreeding is possible between the two numbers of a

1. Species 2. Genus
3. Family 4. Class.

31. Monographs contain

1. Information about monocot plants.
2. Information about both plants and animals.
3. Information about all of the taxa. .
4. Information about any one of the taxon.

32. Taxon ending with suffix ' Oidea ' is

1. Family 2. Sub family 3. Superfamily 4. Sub species

33. Taxon which includes related orders

1. Family 2. Class 3. Phylum 4. Genus.

34. In a taxonomic hierarchy from species to kingdom

1. Morphological variations decrease
2. Number of common characters decrease.
3. Number of common characters increase.
4. Diversity in organisms decrease.

35. In the hierarchy of classification the highest and lowest categories respectively are.

1. Species & Genus
2. Species & Kingdom
3. Kingdom & Species
4. Kingdom & Genus.

36. Correct scientific name of lion at present

1. Felis leo, Linnaeus, 1758
2. Felis leo (Linnaeus, 1758).
3. Panthera leo, Linnaeus, 1758
4. Panthera leo (Linnaeus, 1758).

37. Catla catla is an example for

a. Tautonymy
b. Binominal nomenclature
c. Sub species
d. Trinominal nomenclature.

(1) a and c are correct
(2) b and c are correct
(3) a and b are correct
(4) b and d are correct

38. "The origin of species "was written by

1.Charles Darwin
2. Carolus Linnaeus
3. Dobzhansky
4. Buffon.

39. Concept of Mendilian Population was introduced by

1. Charles Darwin
2. Carolus Linnaeus
3. Dobzhansky
4. Buffon.

40. Individuals in a species are reproductively isolated from the individuals of other species. So species is considered as

1. Genetic unit
2. Breeding Unit
3. Ecological Unit
4. Evolutionary Unit.

41. Which of the following set of organisms show more number of similarities.

1. Pheretima posthunma & Panthera leo
2. Pheretima posthuma & Periplanata americana.
3. Panthera leo & Panthera tigris.
4. Panthera leo & Periplanata americana.

42. ICZN stands for

1. Indian Code of Zoological Nomenclature.
2. Indian Congress of Zoological Nomenclature.
3. International Congress of Zoological Nomenclature.
4. International Code of Zoological Nomenclature.

43. Multicellular animals without the formation of well defined tissues are included under the phylum.

1.Parazoa 2. Eumetazoa 3. Porifera 4. Radiata.

44. Combjellies are included under the 'Grade'

1. Radiata 2. Bilateria 3. Cnideria 4. Ctenophora.

45. Find the correct statement among the following

1. All protostomians are Eucoelomates.
2. All Eucoelormates are Protostomians.
3. All deuterostomians are Eucoelomates.
4. All Eucoelomates are deuterostomians.

46. Type of cleavage in Deuterostomians .

1. Radial and determinate.
2. Radial and indeterminate.
3. Spiral and determinate.
4. Spiral and indeterminate.

47. The term 'biodiversity' was popularized by

1. Norman Myers 2. Edward Wilson
3. Paul Ehrlich 4. Alexander von Humboldt.

48. Concept of biodiversity was proposed by

1. Norman Myers 2. Edward Wilson
3. Paul Ehrlich 4. Alexander von Humboldt.

49. Rivet popper hypothesis was proposed by

1. Norman Myers 2. Edward Wilson
3. Paul Ehrlich 4. Alexander Von Humboldt..

50. Vinblastin an anticancer drug is obtained from the plant.

1. Rauwolfia vomitoria 2. Vinca rosea
3. Fox glove 4. Digitalis purpurea.

51. A species unique to a given area is called as

1. Critical species 2. Pandemic species.
3. Endemic species 4. Vulnerable species.

52. Species diversity between two adjacent ecosystems is called as

1. Genetic diversity 2. Alpha diversity
3. Beta diversity 4. Gamma diversity.

53. Amazon produces ___% of the total oxygen in the earth's atmosphere.

1. 50% 2. 80% 3. 30% 4. 20%

54. Which of the following is considered as 'Lungs of our Planet'?

1. Atlantic region 2. Himalayan region
3. Scandinavian region 4. Amazon rain forest.

55. Passenger pigeon became extinct due to

1. Habitat loss 2. Over exploitation.
3. Invasion of alienspecies 4. Co-extinction.

56. Gametes, embryos of threatened species are preserved by cryopreservation at

1. -100^0C 2. O^0c 3. -196^0c 4. -273^0c

57. All threatened species are listed in the

1. Blue data book 2. Green data book
3. Red data book 4. Orange data book.

58. 17th Biosphere reserve in India is

1. Seshachalam hills 2. Simhachalam hills
3 Aravali hills 4. Himalayan region.

59. The first National Park in India is the

1. Jim Corbett National Park.
2. Kaziranga National Park.
3. Periyar National Park.
4. Keoladeo Ghana National Park.

60. Specific endangered faunal species are protected in

1. National Park. 2. Sanctuaries
3. Biosphere reserves 4. Sacred groves.

61. Scientific name of Red panda is

1. Grus Leucogeranus 2. Loris tardigradus
3. Antelope cervicapra 4. Ailurus ochraceus.

62. Scientific name of Siberian crane is

1. Grus Leucogeranus 2. Loris tardigradus
3. Antelope cervicapra 4. Ailurus ochraceus.

63. Scientific name of Andhra Pradesh State animal

1. Grus Leucogeranus 2. Loris tardigradus
3. Antelope cervicapra 4. Ailurus ochraceus.

64. Zoological survey of India is located in

1. Dehradun 2. Kolkata 3. Meghalaya 4. Chhattisgarh

65. A natural habitat strictly reserved for protection of natural life is described as

1. National Park 2. Biosphere reserve 3. Sanctuary 4. Sacred grove

66. Scientific name of Pygmy hog

1. Cervus elaphus hanglu 2. Sus salvanius
3. Macace silenus 4. Ailurus Ochraecus .

67. Scientific name of 'National animal of India'

1. Panthera leo 2. Antelope cervicapra
3. Panthera tigris 4. Loris tardigradus.

EXERCISE-II
(LEVEL –II)

68. Match the following and find the correct answer

I. Charles Darwin	a) Organic evolution
II. Herbert Spencer	b) Molecular structure of DNA
III. Whittaker	c) Descent with modification
iv. Watson & Crick	d) 5 Kingdom classification.

	I	II	III	IV
1.	a	c	d	b
2.	c	a	b	a
3.	c	a	b	d
4.	a	c	b	d

69. Correct taxonomic hierarchy of human being

1. Animalia Deuterostomia Mammalia Primata Homo
2. Mammalia Deuterostomia Animalia Primata Homo
3. Animalia Mammalia deuterostomia Primata Homo
4. Animalia Deuterostomia Primata animalia Homo

70. Museum's have

1. Collection of living animals.
2. Collection of skeletons of animals.
3. Wild animals which are endangered
4. Specimens of plants and animals.

1) I & II are correct 2) II & III are correct

3) II & IV are correct 4) all are correct.

71. Find the Odd one

1. Kingdom 2. Division 3. Order 4. Family.

72. What is the middle taxon of obligate categories

1. Phylum 2. Family 3. Order 4. Class

73. Match the following and find the correct answer

I. Protozoans	a) Sterile
II. Planarians	b) Fragmentation
III. Mule	c) Budding
IV Hydra	d) Binary fission

	I	II	III	IV		I	II	III	IV
(1)	d	b	a	c	(2)	d	c	a	b
(3)	b	d	a	c	(4)	b	c	a	d

74. Correct statements regarding Haeckle

I. Coined the term 'Ecology'

II. Introduced the taxon ' Family'

III. Introduced the Phylogenetic tree

IV. One of the Neo-Darwinist

1) All except I 2) All except II

3) All except III 4) All except IV

75. Match the following and find the correct answer

	Name of the scientist	**Word coined**
I.	Bateson	a) Organic evolution
II.	Heackel	b) Taxonomy
III.	A.P.de Candolle	c) Ecology
IV.	Herbert Spencer	d) Genetics

	I	II	III	IV		I	II	III	IV
1)	a	b	c	d	2)	b	a	c	d
3)	c	d	a	b	4)	d	c	b	a

76. Find the correct set among the following.

	Column – 1	**Column – 2**	**Column – 3**
I.	John Ray	---- Word species	----- Historia Generalis plantarum
II.	Buffon	---- Biological concept of species	---- Natural history
III.	Linnaeus	---- Binominal nomenclature	--- Systema naturae
IV.	Charles Darwin- Natural selection		---- Origin of species.

77. Correct statements among the following

I. All schizocoelomates are Protostomians

II. All schizocoelomates are not Protostomians

III. All protostomiams are schizocoelomates

IV All Protostomiams are not schizocoelomates

1) I & II 2) II & III 3) I & III 4) I & IV

78. Match the following and find the correct statements .

Name of the Branch	**Study of**
1. Microanatomy	a) Fossils
2. Physiology	b) Animal behaviour
3. Palaeontology	c) Different body functions
4. Ethology	d) Environment
	e) Structure of tissues

	I	**II**	**III**	**IV**		**I**	**II**	**III**	**IV**
1)	e	c	a	d	2)	c	b	a	d
3)	e	c	a	b	4)	c	e	a	d

79. Find the correct set among the following.

I. Rauwolfia vomitorea	-Reserpine	- High B.P.
II. Vinca rosea	-Vinblastin	- Anticancer
III. Fox glove	-Digitalin	- Cardiac problems

1) I, II & III 2) I only 3) I & II 4) I & III

80. Match the following and find the correct answer

Organism	**Order**
I. Bats	a) Chiroptera
II. Cats	b) Carnivora
III. Rats	c) Rodentia
IV. Whales	d) Cetacea

	I	II	III	IV		I	II	III	IV
1).	a	b	c	c	2).	b	a	c	b
3).	d	c	b	a	4)	b	a	d	c

81. Match the following and find the correct answer

I. Habitat loss	a) Nile Perch
II. Over exploitation	b) Steller's sea cow
III. Invasion of alien species	c) Amazon Rain Forest
IV.Co-extinction	d) Plant – Pollinator mutualism

	I	II	III	IV		I	II	III	IV
1).	c	a	b	d	2).	c	a	d	b

3). c b d a 4) c b a d

82. Correct statements regarding binominal nomenclature

I. First word is the species and the second work is genus.

II. Specific name begins with capital letter & genus with small letter.

III. Species and genus must be in latin or in Latinized form.

1). I & II 2). II & III 3). All except III 4). Only III

83. Match the following and find the correct answer.

Name of the sacred grove	**State**
I.Khasi & Jaintia hills	a) Madhya Pradesh
II.Aravali Hills	b) Chattisgarh
III.Sarguja	c) Rajastan
IV.Chanda	d) Meghalaya

I II III IV I II III IV

1). a b c d (2). d c b a

3). a b d c (4). d c a b

84. March the following and find the correct answer

I. Wild life act	a). 1972
II. Earth summit	b) 1997
III. Wild life protection society of India	c) Kolkata
IV). Zoological survey of India	d) Dehradun.

I II III IV I II III IV

1). a b c d 2). b a c d

3). a b d c 4) b a d c

85. Odd one out regarding sub species

1). They are probably new species in making.

2) Basic unit of classification.

3) Geographically isolated population of a species.

4) Capable of interbreeding with the individuals of other subspecies of the same species.

86. Match the following and find the correct answer

	Common Name	Scientific Name
I.	African catfish	a) Clarias batracus
II.	Carrot grass	b) Lantana
III.	Spanish flag	c) Eichhornia
IV.	Water hyacinth	d) Parthenium
		e) Clarias garipinus.

	I	II	III	IV		I	II	III	IV
1). a	d	b	c		2)	e	d	b	c
3). a	b	c	d		4)	e	d	c	b

87. Incorrect statements regarding Animalia.

I. Includes eukaryotic, multi cellular , autotrophs

II. Reserve food is mostly in the form of glycogen.

III. Tissue formation is common except in poriferans

IV. Nutrition is mostly holozoic

1) All except I 2) All except III

3) Only I 4) Only III

88. Match the following and find the correct answer

I. Wild life protection society of India a) Kolkata

II. Zoological survey of India. B) Dehradun

III. Earth summit c) Johannesburg

IV.World summit on sustainable development. D) Rio de Janiero

	I	II	III	IV		I	II	III	IV
1)	b	a	d	c	2)	b	a	c	d
3)	a	b	d	c	4)	a	b	c	d

89. Correct statements regarding Zoological parks.

I. Places where wild animals are protected in their natural habitats.

II. A type of ex-situ conservation.

III. They are the tools of classification.

1) I & II 2) Only I 3) All except I 4) Only III

90. Correct statements among the following

I. Biodiversity is uniform throughout the world.

II. Terrestrial biodiversity increases from poles to the equator.

III. When Latitude increases species diversity decreases.

1) I & II 2) II & III 3) I & III 4) All the three.

91. Find the incorrect statements.

I. In vitro culture is a type of In-situ conservation.

II. There are about 34 Biodiversity hot spots in India.

III. Amphibian diversity in eastern Ghats lesser than that of Western Ghats.

1) I II 2) II & III 3) III Only 4) I only

E X E R C I S E –III (LEVEL-III)

92. Assertion (A) : Living beings are said to be immortal
Reason (R) : Living beings are born, grow into mature forms, undergo aging process and finally die.

1) 'A' and ' R' are correct ' R' explains ' A '
2) 'A' and 'R' are correct but 'R' is not the correct explanation of 'A'.
3) 'A' is true but 'R' is false.
4) 'A' is false but ' R' is true.

93. A : Species is considered as an evolutionary unit.
R : **Species is a group of individuals which are sharing the same ecological niche.**

1). 'A' and ' R' are correct ' R' explains ' A '
2). 'A' and 'R' are correct but 'R' is not the correct explanation of 'A'.
3). 'A' is true but 'R' is false.
4). 'A' is false but ' R' is true.

94. Find the correct statements.

I. Biologist who proposed ' Natural selection theory was considered as ' Father of Evolution '.

II. Binominal nomenclature was popularised by 'Father of Taxonomy'.

III. Biologist who introduced the method of phylogenetic tree, coined the term Ecology.

IV. First taxonomist to establish definite hierarchy of taxonomic categories is the ' Founter of Modern systematics'.

1) I, II & III 2). II, III & IV 3) I, III & IV 4) I, II, III & IV

95. A : Species is considered as a genetic unit

R : Individuals in a species are showing similarity in the karyotype.

1) 'A' and ' R' are true, R is the correct explanation to A.
2) A and R are true, R is not the correct explanation to A
3) A is true R is false.
4) Both A and R are false.

96. A : Species is dynamic

R : Species is the basic unit of classification.

1) 'A' and ' R' are true, R is the correct explanation to A.
2) A and R are true, R is not the correct explanation to A
3) A is true R is false.
4) Both A and R are false.

97. A : Nematodes are included under the division protostomia

R : Nematodes show spiral and determinate cleavage.

1). A & R are true R explains A
2) A & R are true R is not the correct explanation to A
3). A is true R is false.
4) Both A and R are false.

98. A : Flat worms are included under the subdivision Acoelomate.

R : Flatworms are the triploblastic animals with solid body plan.

1). A & R are true R explains A
2) A & R are true R is not the correct explanation to A
3). A is true R is false.
4) Both A and R are false

99. A : Chordates are included under the sub-division deuterostomia.

R : In chordates mouth is the first aperture in the embryonic development.

1). A & R are true R explains A
2) A & R are true R is not the correct explanation to A
3). A is true R is false.

4) Both A and R are false

100. A : Biodiversity is greater in tropics than temperate regions.

R : Tropical climates are frequently changed than that of the temperate region.

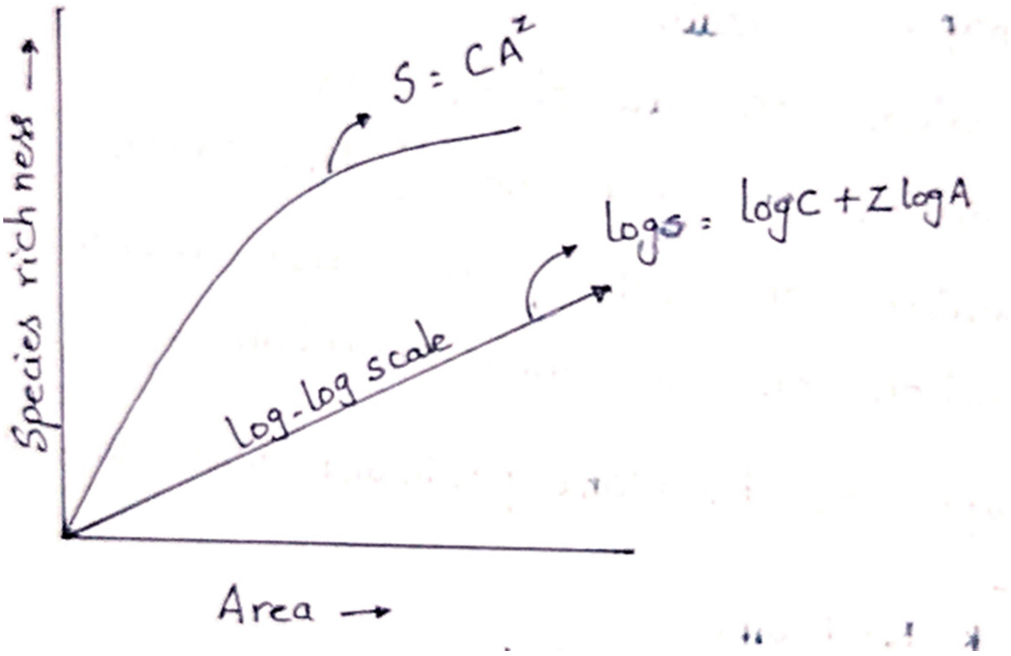
1). A & R are true R explains A

2) A & R are true R is not the correct explanation to A

3). A is true R is false.

4) Both A and R are false

101.



In the above diagram 'S ' indicates.

1). Slope of the line. **2). Species richness**

3). Specific Area **4) Y - Intercept**

EXERCISE – IV
(LEVEL-IV)

102. Hinny is produced by the crossing between

1) Stallion & Jennet 2) Jack & Mare

3) Stallion & Mare 4) Jack & Jennet.

103. Musca domestica belongs to the order

1). Orthoptera 2) Hemiptera 3) Diptera 4) Hymenoptera

104. A pair of contrasting characters in keys are called

1). Simplets 2) Doublets 3) Triplets 4) Couplets

105. Monographs contain

1). Information on all of the taxa.

2) Information on any one of the taxon.

3) Information on both plants and animals.

4) Information on all micro organisms.

106. The first National Park/Oldest National park in the world is

1). Jim Corbett National Park

2) Yellowstone National Park

3) Galapagos National Park.

4) Great Barrier Reef National Park.

107. Animal protected in first National park in India.

1). Lion 2) Bengal Tiger 3) Elephant 4) Rhinoceros.

108. One horned Rhinoceros are prote4cted in the

1) Jim Corbett National park 2) Kaziranga National park

3) Gir National Park 4) Keoladeo Ghana National park.

109. Keoladeo Ghana National park is formerly known as

1) Ranthanbore National park.

2) Gir National park.

3) Bhartpur Bird sanctuary.

4) Indravathi National park.

110. Biggest National park in India is

1) Hemis National Park – Jammu & Kashmir.

2) Jim Corbett National Park – Uttarakhand.

3) Gir National Park – Gujarat.

4) Desert National Park – Rajasthan.

111. 18th Biosphere Reserve in India is

1) Seshachalem hills 2) Panna Biosphere Reserve

3) Rann of Kutch 4) Manas Biosphere reserve.

112. First established Biosphere Reserve in India

1) Manas Biosphere Reserve – Asam.

2) Panna Biosphere Reserve – M.P.

3) Rann of Kutch Biosphere Reserve – Gujarath

4) Nilagir Biosphere Reserve – Tamil Nadu, Kerala, Karnataka.

113. Correct set among the following

	National Park	**Location**	**Protected animal**
I.	Jim Corbett	Uttarakhand	Bengal Tiger
II.	Kaziranga	Assam	One horned Rhinoceros
III.	Gir	Gujarath	Asiatic lion

1) I & II 2) II & III 3) I & III 4) I, II & III.

VIII. Assigment questions (Answer in separate note book)

Very Short Answer Type Questions :-

1. Define the term metabolism. Give any one example?
2. What is biogenesis ?
3. What is trinominal nomenclature ? Give an example?
4. What is meant by tautonymy ? Givt two examples?
5. Differentiate between Protostomia and Deuterostomia?
6. 'Echinoderms are erterocoelomates' comment?
7. Define species richness?

8. What is ecological diversity ? Mention the different types of ecological diversities?
9. Mention any two products of medicinal importance obtained from Nature?
10. Write the full form of IUCN. In which book threaterned species are enlisted ?

SHORT ANSWER TYPE QUESTIONS :-

1. Define species. Explain the various aspects of species .
2. What is genetic diversity and what are the different types of genetic diversity?.
3. What is 'evil quartet '?
4. Explain Rivet popper hypothesis?
5. Write short notes on In-Situ conservation?

KEY

III - FILL IN THE BLANKS

1. **Plasma membrane**
2. **ATP (adenosine Tri Phosphate)**
3. **Thermodynamics**
4. **Sun**
5. **Nucleotides**
6. **Mutations, genetic recombination's.**
7. **Genetics.**
8. **Analogous characters.**
9. **Archaea.**
10. **Hinny**
11. **Radial symmetry**
12. **John Ray**
13. **Mammalia**
14. **Palaeontology**
15. **Endemic species.**
16. **Cervus elaphus hanglu.**
17. **1972**
18. **Bio-Prospecting.**
19. **K. N. Bahl.**
20. **Norman Myers.**

II. Answer true or false.

1. **False – (they are called Prokaryotes).**
2. **False – (Growth in living thing is from inside where as in nonliving things is by the accumulation of material on surface).**
3. **True**
4. **False (It is called homeostasis).**
5. **True**
6. **True**
7. **False (Cnidarians' are first true eumetazoans).**
8. **False (They are called regulative embryos).**
9. **True**
10. **False (They are Biodiversity hot spots).**
11. **False (20% of 0_2)**
12. **True**
13. **False (It is called as Genetics).**
14. **False**
    (term Genetics was coined by Bateson, but the father of Genetics is Mendal).
15. **True**
16. **True**
17. **True**
18. **False (It led to the extinction of 200 species of cichlid fish)**
19. **False (It is a type of Ex-situ conservation).**
20. **True.**

EXERCISE – 1

IV. Multiple Choice Answers

Que. No	Ans.	Explanation/Notes • First one is an example. • The students should explore unknown options &make note as shown here.
1	2	
2	3	
3	1	
4	4	
5	2	

6	1	
7	2	
8	3	
9	1	
10	3	
11	3	
12	2	
13	4	
14	4	
15	3	
16	2	
17	1	
18	2	
19	3	
20	4	
21	2	
22	4	
23	3	
24	4	
25	1	
26	2	

27	3	
28	2	
29	3	
30	1	
31	4	
32	3	
33	2	
34	3	
35	3	
36	4	
37	3	
38	1	
39	3	
40	2	
41	3	
42	4	
43	3	
44	1	
45	3	
46	2	
47	2	

48	1	
49	3	
50	2	
51	3	
52	3	
53	4	
54	4	
55	2	
56	3	
57	3	
58	1	
59	1	
60	2	
61	4	
62	1	
63	3	
64	2	
65	1	
66	2	
67	3	

EXERCISE - II

68	2	
69	1	
70	3	
71	2	
72	3	
73	1	
74	2	
75	4	
76	4	
77	4	
78	3	
79	1	
80	1	
81	4	
82	4	
83	2	
84	3	
85	2	
86	2	
87	3	

88	1	
89	3	
90	2	
91	1	

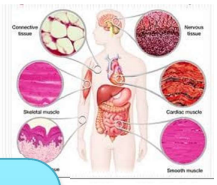
EXERCISE–III

92	4	
93	2	
94	4	
95	1	
96		
97	2	
98	1	
99	4	
100	4	
101	2	

EXERCISE – IV

102	1	
103	3	
104	4	
105	2	

106	2	
107	2	
108	2	
109	**3**	
110	**1**	
111	**2**	
112	**4**	
113	**4**	



Unit 2
Structural Organisation in Animals

MAJOR LEARNING OBJECTIVES:

- To know the levels of organization from the protozoans to higher metazoans.
- To know the importance of Symmetry in understanding the organization of an animal.
- To know the importance of coelom in the evolution of the efficient organ system.
- To know different tissues and to understand their role in different physiological functions of our body.

Levels of Organization Symmetry, coelom

ACTIVITIES

I. Define the following key words

II.Identify the type of symmetry and write the symmetry of the given animals.

III. True or false statements.

IV. Fill in the blanks

Match the following

VI.Multiple choice questions

Tissues

ACTIVITIES

I.Define the following

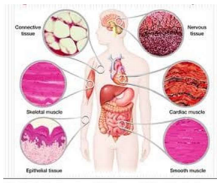
II.Match the following

III.Fill in the blanks

IV.True or false statements

V.Write down the differences and give examples

VI.Objective Type Questions



Levels Of Organization Symmetry, coelom

I.Define the following key words

1. Mesoglea :-

2.Tissue :-

3.Organ :-

4.Incomplete gut :-

5.Open circulatory system :-

6.Closed circulatory system :-

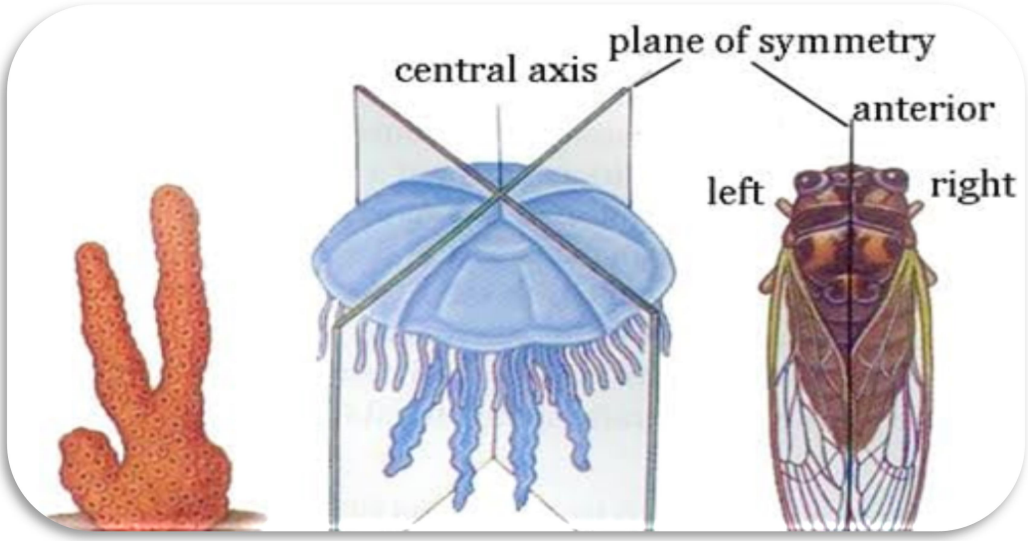
7.Diploblastic :-

8.Symmetry :-

9.Antimeres :-

10. Cephalization :-

II.Identify the type of symmetry and write the symmetry of the given animals



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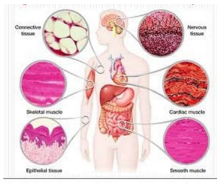


1.Sycon _____ 2. Pila _____

3. Aurelia _____ 4.Hydra _____

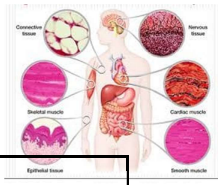
5.Starfish _____ 6.Frog _____

7.Sea anemones _____ 8.Veliger larva_____

9.Bipinnaria larva_____ 10.Elephant _____

III. True or false statements

SNo	Statements	True/False
1.	In Parazoans the cells can differentiate and redifferentiate and perform certain functions that are not their usual functions.	
2	Protozoans are the simplest protists	
3.	Tissues assembled to form organs and organ systems.	
4.	There is no division of labour in sponges	
5.	In parazoans sensory and nerve cells are present.	
6.	The formation of tissues is the' first key transition in the evolution of animal body plan.	
7.	Organ level of organisation is the highest level of organisation among the animals.	
8	An aggregation of different tissues which is specialized for a particular function is called an organ system.	
9.	Organ level of organization first appeared in the phylum Platyhelminthes.	
10.	In triploblastic animals, the evolution of endoderm resulted in structural complexity.	
11.	The alimentary canal In the members of Platyhelminthes has only a single opening.	



12.	In a closed circulatory system the blood flows in a series of blood vessels like arteries , veins and capillaries of varying diameters.	
13.	In Cnidarians in between ectoderm and endoderm a noncellular mesoglea is present.	
14.	Tissues are not organized into organs which form excretory,nervous,digestive,reproductive,circulatory and other systems.	
15.	Sponges and adult gastropods are asymmetrical.	
16.	Pentamerous radially symmetrical animals have five planes of symmetry.	
17.	Enterocoelomates do not show radial and indeterminate cleavage	

IV. Fill in the blanks

1. In metazoans the cells may be functionally isolated or grouped together to form _____

2. The inner layer lining the spongocoel is formed by_____

3. The organ level of organization appeared for the first time in the members of the phylum_____

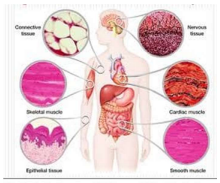
4. In Urochordates the circulatory system is of _____type.

5. _____symmetry is an advantage to sessile and slow moving animals.

6._____is the principle type of symmetry in triploblastic animals.l

7. Concentration of nerve and sensory cells at the anterior end of the head is known as_____.

8. Animals in which the body cavity is formed by the splitting of the mesoderm are called_____



V.Match the following

1.

Set I.			Set II
1.Nerve cells and sensory cells	(	)	A.Spongocoel
2.Choanocytes	(	)	B.Bilateral symmetry
3.Platyhelmenthes	(	)	C.Cephalization
4.Arthropoda	(	)	D.Incomplete gut
5.Triploblatica	(	)	E.Open blood circulation

2.

Set-I			Set- II
1.Acoelomates	(	)	A.True coelom
2.Pseudocoelomates	(	)	B.Platyhelminthes
3.Visceral peritoneum	(	)	C.Nematoda
4.Retroperitoneal organs	(	)	D.Covers the visceral organs
5.Secondary body cavity	(	)	E.Peritoneum only on their ventral side

VI.Multiple choice questions

1. The tissue grade of organisation evolved for the first time in which animal phyla

   1. Platyhelminthes 2.Cnidaria
   3. Nematoda 4.Annelida

2. The cells which perform same function are arranged to form

   1. Organ 2.Tissue
   3. Organ system 4. Animal

3. The cells that conduct water from outside into spongocoel in poriferans

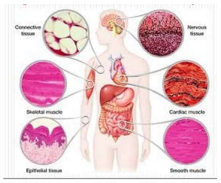
   1. Choanocytes 2.Mesoglea
   3. Porocytes 4.Spongin fibres

4. The first key transition in the evolution of the animal body plan is

   1. The formation of Tissues 2.The formation of organs
   3. Cephalization 4.Formation of gut

5. Among the following in which animals the blood pumped out of the heart flows through open spaces bathing the cells and tissues directly

   1. Arthropods 2. Annelids
   3. Vertebrates 4.Cephalochordates.



6. The symmetry exhibited by adult Echinoderms

1. Bilateral 2.Radial

3. Pentamerous radial 4.Biradial

7. The regular arrangement of body parts in a geometrical design relative to the body axis is called

1. Cephalization 2.Metamerism.

3. Symmetry 4.Antimeres

8. The first animals which exhibit Tube within a tube organization are

1. Nematoda 2.Rotifera

3. Both 1&2 4.Arthropoda

9. The term coelom was coined by

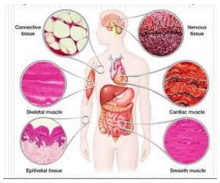
1. Haeckel 2.Linnaeus

3. John Ray 4.Darwin

TISSUES

I.Define the following

1. Microanatomy :-
2. Hormones :-
3. Fibroblasts :-
4. Mast cells :-
5. Macrophages :-
6. Plasma cells :-
7. Adipocytes :-
8. Osteoblasts :-
9. Osteoclasts :-
10. Osteon :-
11. Os penis :-
12. Hematology :-
13. Haemopoesis :-
14. Erythrocytopenia :-
15. Erythropoietin :-
16. Polycythemia :-



17. Diapedesis :-

18. leucopoesis :-

19. Leucocytosis :-

20. Leukemia :-

21. Leucocytopenia :-

22. Granulocytes :-

23. Agranulocytes :-

24. Fascicle :-

25. Satellite cells :-

26. Ependymal cells :-

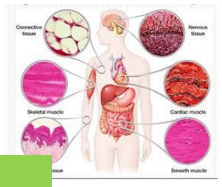
27. Microglea :-

II.Match the following

1.	Set I		Set II
1.Tight junctions	( )	A. Outer covering of the body and lining of internal organs	
2. Desmosomes	( )	B.prevent leakages of body fluids	
3.Gap junctions	( )	C.Increase the surface area of cells.	
4.Microvilli	( )	D.cytoplasmic channels between adjacent cells	
5. Epithelial cells	( )	E. Act as Rivets for binding the cells	

2.	Set I		Set II
1.Simple squamous epithelium	( )	A. Salivary glands, pancreas	
2. Non-ciliated columnar epithelium	( )	B. Fallopian tubules, ventricles of t	
3.Transitional epithelium	( )	C. Inner lining of stomach and intestine.	
4.Ciliated columnar epithelium	( )	D.Urinary bladder .	
5.Glandular epithelium	( )	E. Endothelium of blood vessels,pericardium	

3.	Set I		Set II
1.Mucous connective tissue	( )	A. Epiglottis	
2.Elastic connective tissue	( )	B. Inter vertebral discs	
3.Hyaline cartilage	( )	C. Wharton's jelly	
4.Elastic cartilage	( )	D. Nasal septal cartilage	
5.Fibrous cartilage	( )	E. Vocal cords	



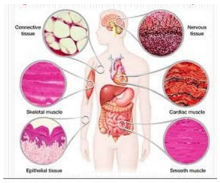
4. Set I		Set II
1.Anticoagulant	( )	A. Attach skeletal muscles to bones
2.Vasodialator	( )	B .Attach bones to other bones
3.Vasoconstictor	( )	C. Histamine
4.Tendons	( )	D. Heparin.
5.Ligaments	( )	E. Serotonin

III.Fill in the blanks

1. Muscle cells are provided with _____ which act as rivets binding the cells together into strong sheets
2. _____attach the skeletal muscles to bones.
3. During ageing the proportion _____material increases in Bone making is more brittle.
4. _____ are phagocytic cells involved in resorption of bone.
5. The study of blood is called_____
6. The process of formation of blood cells is called_____
7. Fall in the levels of albumin in the blood plasma, results in_____
8. _____ and _____ are required for the maturation of RBC.
9. A group of cell bodies in the central nervous system is called a_____
10. The bundle of nerve fibers in the peripheral nervous system form a_____
11. A group of cell bodies in the peripheral nervous system is called a_____
12. The strongest of all types of cartilages is_____
13. The total volume of blood in an adult human being is about _____to ____liters.
14. The adipose tissue forms_____ in whales and _____ in camels.

IV.True or false statements

1. Epithelial tissue is avascular.
2. Columnar epithelium consists of a single layer of tall and slender cells with oval nuclei located near the base.
3. The inner lining of the central canal of spinal cord and bronchioles are lined by ciliated columnar epithelium.
4. The secretions of endocrine glands are called enzymes .



5. Tissue fixed macrophages are called histiocytes and others are wandering macrophages.
6. Collagen fibers are yellow in colour fibers and elastin fibers are white in colour.
7 Adipose tissue acts as shock absorber in palms and soles..
8. White fat is metabolically active.
9. Matrix of cartilage is secreted by mast cells.
10. Pinnae of the eternal ear and epiglottis are made up of fibrous cartilage.
11. Bones have a hard and non-pliable matrix in calcium salts and collagen fibers .
12. The percentage of total volume occupied by RBCs is called Haematocrit value.
13. Gamma globulins are the antibodies, also called immunoglobulins.
14. RBC in man are enucleated and their life span is 120 days. Most neurons in our body are multipolar

Write down the differences and give examples

1.

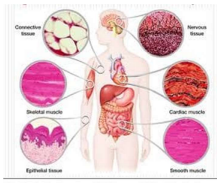
Ciliated epithelium	Non ciliated epithelium

2.

Merocrine glands	Apocrine glands	Holocrine glands

3.

S.no	Striated muscle	Smooth muscle	Cardiac muscle



4.

Sensory neurons	Motor neurons	Interneurons

VI.OBJECTIVE TYPE QUESTIONS

Level I

1. The study of tissues is known as _____

1. Hematology 2.Autecology
3. Synecology 4.Microanatomy

2. Among the following in which glands the entire cell disintegrates to discharge the contents._____

1. Mammary glands 2.Pancreas
3. Sebaceous glands 4.Goblet cells

3. Which among the following is a vasoconstrictor._____

1. Seratonin 2.Heparin
3. Histamin 4.Antibodies

4. Larynx is formed by which cartilage_____

1. Elastic cartilage 2.Hyaline cartilage
3. Fibrous cartilage 4.None of these

5. The major organic substance in bone_____

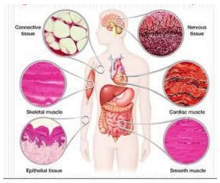
1. Collagen 2.Elastin
3. Calcium carbonate 4.Hydroxyapatite

6. Wrist bones of mammals are of_____

1. Investing bones 2.Sesamoid bones
3. Visceral bones 4.Spongy bones

7. In the final stage of embryonic development and after birth the primary site of haemopoiesis is_____

1. Redbone marrow 2.Yolk sac
3. Liver,spleen 4.None of these



8. Among the following which cells occupied 62% of the total leucocytes.

1. Acidophils 2.Badophils
3. Neutrophils 4.Monocytes

9. Among the following which cells secrete thromboplastin and play an important role in blood clotting

1. Red blood cells 2.White blood cells
3. Histiocytes 4.Platelets

10 .The cells, which are quiescent and help in muscle regeneration

1. Satellite cells 2.Neuroglia
3. Microglia 4.Tendon

11. which cells of the nervous system are involved in the formation of blood brain barriers.

1. Oligodendrocytes 2.Ependymal cells
3. Astrocytes. 4. Microglia

Level II

1. Presence of extracellular basement membrane is the peculiarity of

1. Epithelial tissue 2.Nervous tissue
3. Muscular tissue 4.Connective tissue

2. Brush border is the peculiarity of

1. Secretory cells 2.Nerve cells
3.Absorptive cells 4.Blood cell

3. Pavement epithelium is the name of

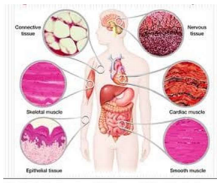
1. Cuboidal epithelium 2.Squamous epithelium
3. Columnar epithelium 4.Ciliated epithelium

4. Which of the following is a holocrine secretion?

1. Mammary 2.Sebaceous
3.Pancreas 4. Sweat

5. Which part of nephron is lined by brush border microvilli

1. Proximal convoluted tubule 2.Collecting duct
3. Henle's loop 4. Distal convoluted tubule



6. Brown fat is found in

1. Frog
2. Foetuses and infants
3. Both 1and 2
4. None of these

7. Reticular tissue is present in

1. Bones
2. Cartilage
3. Blubber of Whale
4. Bone marrow, spleen and lymph nodes

8. Perichondrium is absent in

1. Hyaline cartilage
2. Elastic cartilage
3. Fibrous cartilage
4. None of these

9. Which salt is present in bone in maximum quantity?

1. Potassium salts
2. Calcium salts
3. Magnesium salts
4. Sodium salts

10. If a bone is kept for three days in 10% KOH solution, it will

1. Dissolve
2. Soften
3. be unaffected
4. break

11. A bone kept in HCL for three days

1. Become soft
2. Break in pieces
3. No change
4. dissolve completely

12. Colloidal osmotic pressure of blood is mainly depend upon

1. Globulins
2. Albumin
3. Both 1&2
4) Fibrinogen

13. In normal healthy female the number of RBC per cubic millimeter of blood is

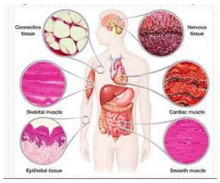
1. 5.5million
2. 4.5 million
3. Million
4. 4.6 million

14. Cardiac muscles are structurally different from smooth muscles because it

1. Is branched
2. is involuntary
3. Has a single nucleus
4. does not fatigue

15. Which of the following contains the largest quantity of extracellular material?

1. Striated muscle
2. Areolar tissue
3. Stratified epithelium
4. Myelinated nerve fibers



16. Mammary gland is a modified

1. Endocrine 2.Exocrine

3. Merocrine 4. Apocrine

17. Apocrine secretion of the gland means

1. When the product is released the cell remains intact

2. Entire contents of the cell is discharged with the destruction of the cell.

3. Apical part of the cell is pinched off with secretary product

4. None of these

18. Find out the wrongly matched pair

1. Squamous epithelium---skin of frog

2. Columnar epithelium---Peritoneum of body cavity

3. Ciliated epithelium---Bronchioles

4Stratified cuboidal epithelium---Esophagus

19. Cardiac muscles are

a.Striated b. nonstriated c. voluntary d. involuntary

1. a and c are correct

2. b and d are correct

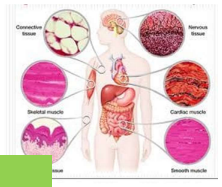
3. a and d are correct

4. a,band c are correct

20. Which one is the most abundant protein in the animal world

1.Collagin 2.Hemoglobin

3.trypsin 4.Iron



Level III

1.Curved portion of Henle's loop of the nephrons are lined by

1.Columnar epithelium 2.Squamous epithelium

3.Ciliated epithelium 4.Cuboidal epithelium (Karnataka CET2008)

2. Identify the correctly matched pair/pairs of the following germ layers

A. Ectoderm- epidermis

B. Endoderm- dermis

C. Mesoderm -muscles

D. Endoderm-enamel of teeth

1. A and D only 2. A and B Only

3. A, C and D only 4. A, B, C and E only (Karnataka CET 2009)

3. The type of connective tissue that is associated with umbilical cord is

1) Areolar connective tissue

2) Jelly-like connective tissue

3) Adipose connective tissue

4) Reticular connective tissue (EAMCET-AP-2009)

4. Note the following

A. It forms the lining of alveoli and lungs

B. It forms the lining of wet surfaces like buccal caity and oesophagus

C. It occurs in the ducts of sweat glands

D. It forms the lining of salivary glands and sweat glands

E. It is a loose connective tissue

Which of the above are associated with simple epithelial tissue?

1. A and D
2. B and C
3. C and A
4. D and A (EAMCET-AP 2009)

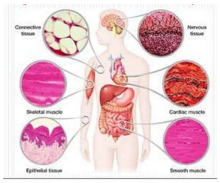
5. Cells that maintain marrow cells are called

1) Osteocytes

2) Chondrocytes

3) Osteoclasts

4) None of these (AFMC2009)



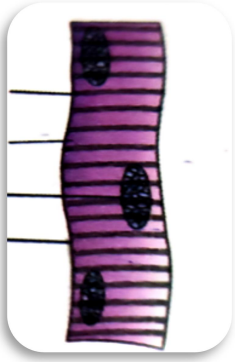
6. The most active phagocytic white blood cells are

   1) Neutrophils and monocytes
   2) Neutrophils and eosinophils
   3) Lymphocytes and macrophages
   4) Eosinophils and Lymphocytes

7. Choose the correctly matched pair

   1) Cartilage - Loose connective tissue
   2) Tendons- Specialized connective tissue
   3) Adipose tissue- Dense connective tissue
   4) Areolar tissue - Loose connective tissue.

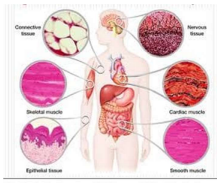
8. The diagram below represents the striped muscle fibre. Label the parts ABCD



1. A- Sarcolemma B- Nucleus C-Dark band D- light band
2. A-Dark band B- light band C-Nucleus D- Sarcolemma.
3. A-Light band B- sarclemma C-Nucleus D-Dark band
4. A-Dark band B- Sarcolemma C- Nucleus D- Light band

9. Blood is a type of

1. Skeletal tissue 2. connective tissue 3.skeletal tissue 4. muscular tissue



Key

1.Levels of organization, Symmetry and Coelom

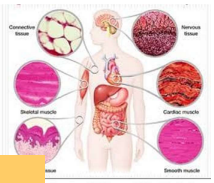
I. Definition for keywords

1. The gelatinous material in between ectoderm and endoderm.
2. Group of cells that have similar structure and specific function.
3. Grouping of tissues that perform specific functions in the body.
4. It has a single opening ,which serves as both mouth and anus.
5. Blood pumped out of the heart flows through open spaces bathing the cells and tissues directly.
6. Blood is circulated through blood vessels.
7. Animals with ectoderm and endoderm.
8. Arrangement of body parts related to the axis of the body.
9. One of the two halves of the bilaterally symmetrical animal.
10. Concentration of nerve cells and sensory cells in the anterior end of the body.

II. Identify the type of Symmetry and write the Symmetry of the following animals

a) Asymmetry
b) Radial symmetry
c) Bilateral symmetry

1. Asymmetry
2. Asymmetry
3. Radial
4. Radial
5. Pentamerous radial
6. Bilateral
7. Biradial
8. Bilateral
9. Bilateral
10. Bilateral



III.True or False statements

1. True
2. True
3. True
4. False. There is division of labour in sponges.
5. False. In parazoans sensory and nerve cells are absent
6. True
7. True
8. False.An aggregation of different kinds of tissues which is specialized for a particular function is called an organ.
9. True
10. False. triploblastic animals, the evolution of mesoderm resulted in structural complexity.
11. True
12. True
13. True
14. False.Tissues are organized into organs which form excretory, nervous, digestive, reproductive,circulatory and other systems.
15. True
16. True
17. False .Enterocoelomates do not show radial and indeterminate cleavage

IV.Fill in the blanks

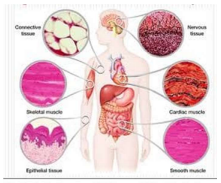
1. Tissue
2. Choanocytes
3. Platyhelminthes
4. Open
5. Radial
6. Bilateral
7. Cephalization
8. Schizocoelomates

V.Match the following

1. 1-C ,2-A, 3-D, 4-E,5-B
2. 1-B, 2-C, 3-D, 4-E, 5-A

VI. Multiple choice questions

1	1	2	2	3	3	4	1	5	1
6	3	7	3	8	3	9	1		



Key

Animal tissues

II.Match the following.

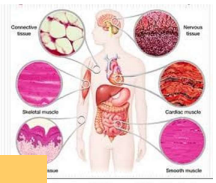
1. 1-B, 2-E, 3-D ,4-C, 5-A
2. 1-E, 2-C, 3-D, 4-B, 5-A
3. 1-C, 2-E, 3-D, 4-A, 5-B
4. 1-D, 2-C, 3-E, 4-A, 5-B

III.Fill in the blanks

1. Desmosomes
2. Tendons
3. Inorganic
4 Osteoclasts
5. Haematology
6. Haemopoiesis
7.Oedema
8.VitB12 & Folic acid
9.Nucleus
10.Nerve
11.Ganglion
12.Fibrous cartilage
13.5, 6
14.Blubber ,Hump

IV.True or false statements

1.True
2.True
3.True
4.False
5.True
6.False
7.True
8.False
9.True
10.False
11.True
12.True
13.True
14.True



Level I

1	4	2	3	4	2	5	1	6	2	
7	1	8	4	9	4	10	1	11	3	

Level II

1	2	2	3	3	2	4	2	5	1
6	2	7	4	8	3	9	2	10	3
11	1	12	2	13	2	14	1	15	2
16	2	17	3	18	2	19	2	20	1

Level III

1	4	2	3	4	1	5	1	6	1
7	4	8	2	9	2				

UNIT 3
ANIMAL DIVERSITY I
(Invertebrate Phyla)

MAJOR LEARNING OBJECTIVES:

- To create interest in students about invertebrates
- To know their habit ,habitat , general and species specific characters.
- To know what are invertebrate phyla and the systematic position of invertebrate animals basing on their salient and species specific features
- To Know the scientific terminology for different keywords and scientific names of different invertebrate animals.
- To know the importance of invertebrates for sustainability of human beings on earth.

16. objective type questions
    a. Level I
    b. Level II
    c. Level III
17. Assignment questions
18. Project work
19. Key for activities

I. INTRODUCTION TO INVERTEBRATES

The animals which lack a notochord are called Invertebrates.the majority of animal species are invertebrates: according to one estimate 95% of animal species are invertebrates.

Invertebrates are especially important as agriculture pests, parasites, or agents for the transmission of parasitic infections to humans and other vertebrates

Invertebrates serve as food for humans and are key elements in food chains that support birds, fish and many other vertebrate species.

- Many Invertebrates are stunningly beautiful:
- Impressively large body sizes:
  - The largest living invertebrate is 19 m long, weighs over 500 kg, and can swim at 25 kph in water! (giant squid)
  - Crabs may have a leg span exceeding 4 m! (Japanese spider crab)
  - Earthworms may exceed 3 m in length! (Australian earthworm)
  - Marine ribbon worms may reach 30 m in length! (Nemertea)
  - Worms 2 m long & 3-4 cm diam. have no gut! (Vestimentifera)
- Impressively large body parts:
  - Worms with a proboscis 350 times longer than the body! (Echiura)
  - Crab with one claw at 40% of total body weight! (fiddler crab)
- Impressive abilities, some dangerous to humans:
  - The amazing mimicries (e.g., 'wonderpus' octopus) and symbioses
  - Shrimp that can snap fish out of the water, or pulverize a snail shell by pounding! (mantis shrimps)
  - Snails that paralyze fish & swallow them whole! (cone snail)
- Knowing basic invertebrate biology can yield valuable clues about human biology; evidence that life has a common heritage:
  - Field of immunology founded by Elie Metchnikoff in 1883 based on the simple observation of clumping amoebocytes in injured starfish larvae; he

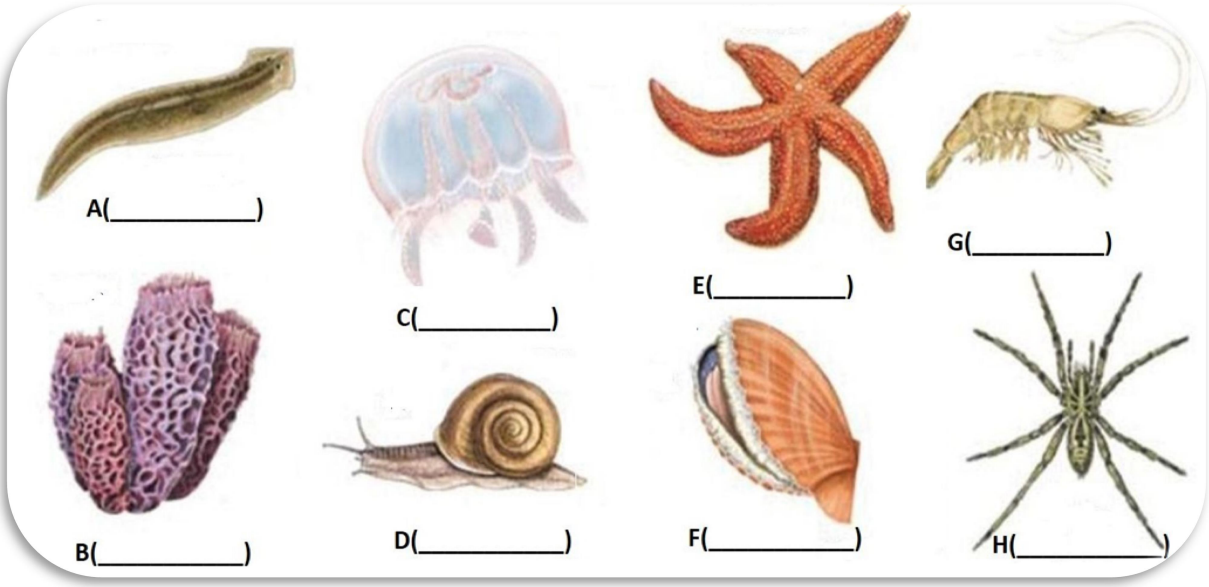
later won the Nobel prize in medicine

- Model invertebrate systems (e.g., nematodes, fruit flies) help us understand gene functions & possible roles in human disorders
- Light-emitting jellyfish yielded a molecule to visualize calcium

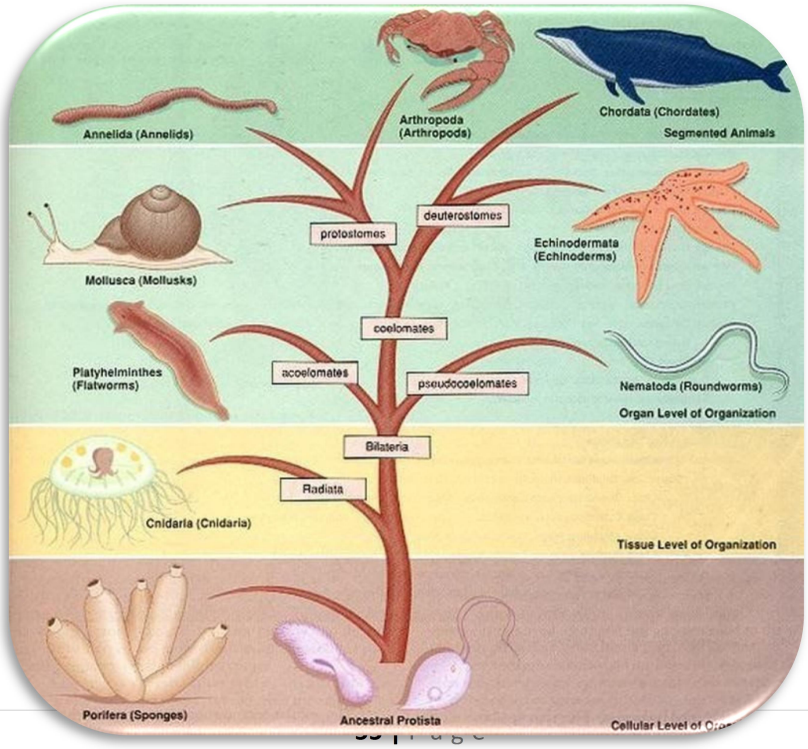
II. Keywords - Explanation

1. Invertebrates- Animals without notochord or vertebral column.
2. Diploblastic -primary germ layers are two -1.Ectoderm 2.Endoderm
3. Triploblastic-Primary germ layers are three- 1.Ectoderm 2.Mesoderm 3.Endoderm
4. Symmetry -Arrangement of body parts.
5. Radial symmetry- Body parts are arranged around the central axis
6. Bilateral symmetry- Body parts are arranged on either side of the central axis.
7. Coelom- The cavity present between the body wall and gut
8. Monoecious /Hermaprodites/Bisexual-Both sperms and ova are produced by the same animal.
9. Dioecious/Unisexual- Sexes are separate,male animal produced sperms and female produced ova.
10. Metagenesis/Alternation of generation- Alternation sexual and asexual life cycles.
11. Fertilization- Union of male and female gametes.
12. External Fertilization- Fertilization takes place outside the animal
13. Internal Fertilization -Fertilization occurs inside the animal.
14. Direct development-. Embryonic development without larval form.
15. Indirect development-Embryonic development with larval form.
16. Oviparous animal - Egg laying animals
17. Viviparous- Animals giving birth to young ones.

ACTIVITY- 1. Can you identify the following animals



ACTIVITY- 2. Observe the phylogenetic tree and answer the multiple choice



Questions

1. Among the following which one is radially symmetrical with tissue grade of organisation

1. Sponge 2. Jellyfish 3. Flatworm 4. Earth worm

2. Among the following the animal with organ grade of organization, bilaterally symmetrical and a pseudocoelomate

1. Flatworm 2.Earth worm 3.Roundworm 4.Jellyfish

3. Which animal is with organ grade of organization , bilaterally symmetrical and a true coelomate protostome

1. Star fish 2. Flatworm 3.Earthworm 4.Fish

4. Among the following which one is a deuterostome

1.Star fish 2.Pila 3. Crab 4. Sponge

5. Among the following which animal/ animals are true coelomates

1.Crab 2.Pila 3.Star fish 4.all

ACTIVITY- 3. True or false statements:

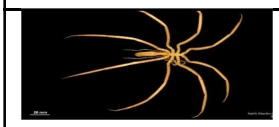
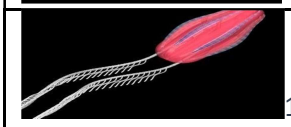
Statement	True/False
1.Metazoa includes unicellular, heterotrophic eukaryotes .	
2.Tissue level of organization is present in sponges	
3.Cnidarians are diploblastic animals.	
4.InSea anemones mesoglea contains connective tissue.	
5.In ctenophores, comb plates are useful for excretion.	
6. All tapeworms are endoparasites.	
7.Eutely is observed in nematodes.	
8.Chaetogaster annandelei is the longest earth worm.	
9.Cleavage in Annelida is holoblastic and spiral.	
10.Stiated muscles appeared for the first time in in Annelids.	
11.Scorpions are oviparous.	
12.Development in Mollusca is mostly direct without larval stages.	
13.Nepridia and gills show serial repetition in Monoplacophora, which is called as internal segmentation.	
14.Echinoderms possess closed type of circulatory system	
15.Heart is dorsal in Ptychordera	

ACTIVITY- 4. Fill up the blanks with suitable answers.

1. The most abundant protein in the Animal kingdom is_____.
2. The_____of the kingdom protista are the closest living relatives of the metazoans.
3. The central cavity in sponges is called as_____.
4. The class under *Porifera* which includes Six –rayed siliceous spicules is _____
5. In coral forming Cnidarians the exoskeleton is composed of_____.
6. In turbellaria the body wall consists of cilia and mucous forming cells called _____
7. Round worms have_____level of organization.
8. The term Annelida was coined by_____.
9. The coelomic fluid provides a_____for the earthworm during locomotion.
10. In Crustaceans the haemolymph contains a respiratory pigment called _____.
11. In Scaphopoda a large number of thread like structures called_____ help in the capture of food.

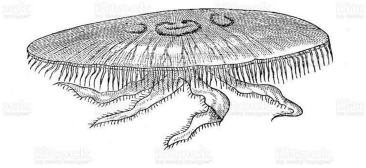
ACTIVITY 5:-Match the following animals with the Phylum to which they belong

Animal	Name of the phylum
 1	Mollusca
 2	Ctenophora
 3	Annelida

 4	Arthropoda
 5	Nematoda
 6	Echinodermata
 7	Porifera
 8	Platyhelminthes
 9	Cnidaria
 10	Hemichordata

ACTIVITY 6:- Fill in the blanks for the animals in the pictures.

S.no	Animal	Fill the blanks
1		a.Respiratory organs_____ b. Respiratory pigment_____ c.Development_____
2.		a.Excretion and osmoregulation by_____ b.Fertization_____ c.Development_____

3.		a.Locomotion and Respiration by_____ b.Fertilization _____ c.Larva _____
4.		a.Commonly called as_____ b.Mesoglea contains_____ c.Germ cells are derived from_____.
5.		a..Food captured by _____ b.Respiratory organs are_____ c.Larval form is_____
6.		a..Shell is_____.b.The number of arms are___ c..Circulatory system is_____type.

ACTIVITY 7:- Write scientific names of the following animals

S.no	Common name of the animal	Scientific name
1	Lug worm	
2	Hook worm	
3	Sand worm	
4.	Pin worm	
5.	Dead man's fingers	
6.	Sea Fan	
7	Sea Urchin	
8.	Moon jelly	
9.	Blood Fluke	
10.	Sea pen	

ACTIVITY 8:- Find the habitat of the following animals

S.no	Name of the animal	Habitat
1.	Sycon	
2.	Spongilla	
3.	Adamsia	
4.	Hirudinaria	
5.	Nereis	
6.	Pheretima	
7.	Palaemon	
8.	Neomania	
9.	Mytilus	
10.	Ophiothrix	

ACTIVITY 9. Name the animal Phyla with the following characteristics

1. Spiny Skin----------
2. Jointed legs ----------
3. With water canal system ---------- --.
4. Pseudo coelomates with complete alimentary canal_----------
5. Nephridia for osmoregulation and excretion----------
6. Unsegmented body covered by calcareous shell----------
7. Body is divided into Proboscis, collar and trunk----------
8. flame cells for osmoregulation and excretion ---------- --.
9. With two basic body forms called polyp and medusa----------
10. With Cnidoblast cells----------

ACTIVITY 10:- Which of the following example does not come under particular class of invertebrate

1.Adamsia, Corallium rubrum, Beroe, Gorgonia

2.Ascaris, Ancylostoma, Enterobius, Pheritima

3.Hirudinaria , Pontobdella, Haemodispa, Hylonema

4.Echinus, Sepia, Octopus,Nautilus

5.Unio, Asterias, Astropecta, Pentaceros

ACTIVITY 11. Given below are the list of five animals each followed by three features underline the term which does not match with the animal

1. Hydra - Tentacles, Cnidarian, Proboscis

2.Earth worm - Insecta, Segmented body, litellum

3.Lepisma - Wings, Malpighian tubules, pairs of legs

4. 4.Echinus - Radula, Aristotle lanterna, Test

5.5.Balanoglossus- Bilaterally Symmetrical, Pisces, Proboscis

ACTIVITY 12. Assertion---reason questions

Read the assertion and reason carefully to mark the correct option out of the options given below:

1) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.If both the assertion and reason are true but the reason is not a correct explanation of the assertion

If the assertion is true but the reason is false.

2) If both the assertion and reason are false.

1. Assertion: Sponges belong to Porifera. Reason: Sponges have pores on their body.

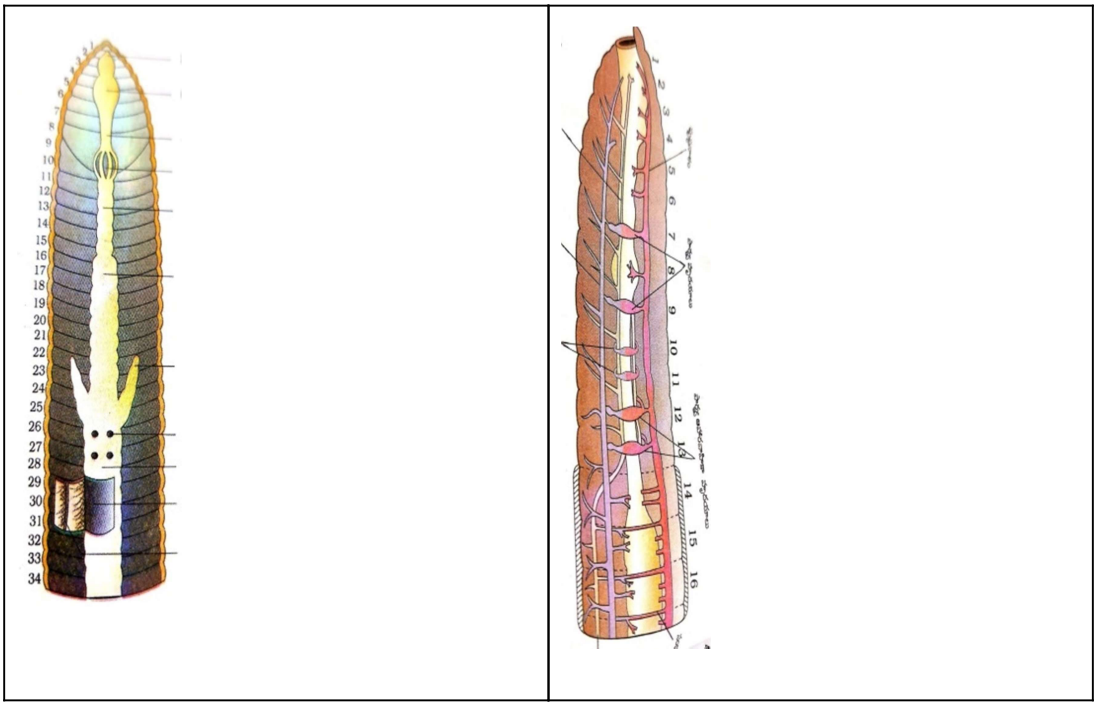
2. Assertion: Fertilization in sponge is internal Reason: Sponges are aquatic organisms.

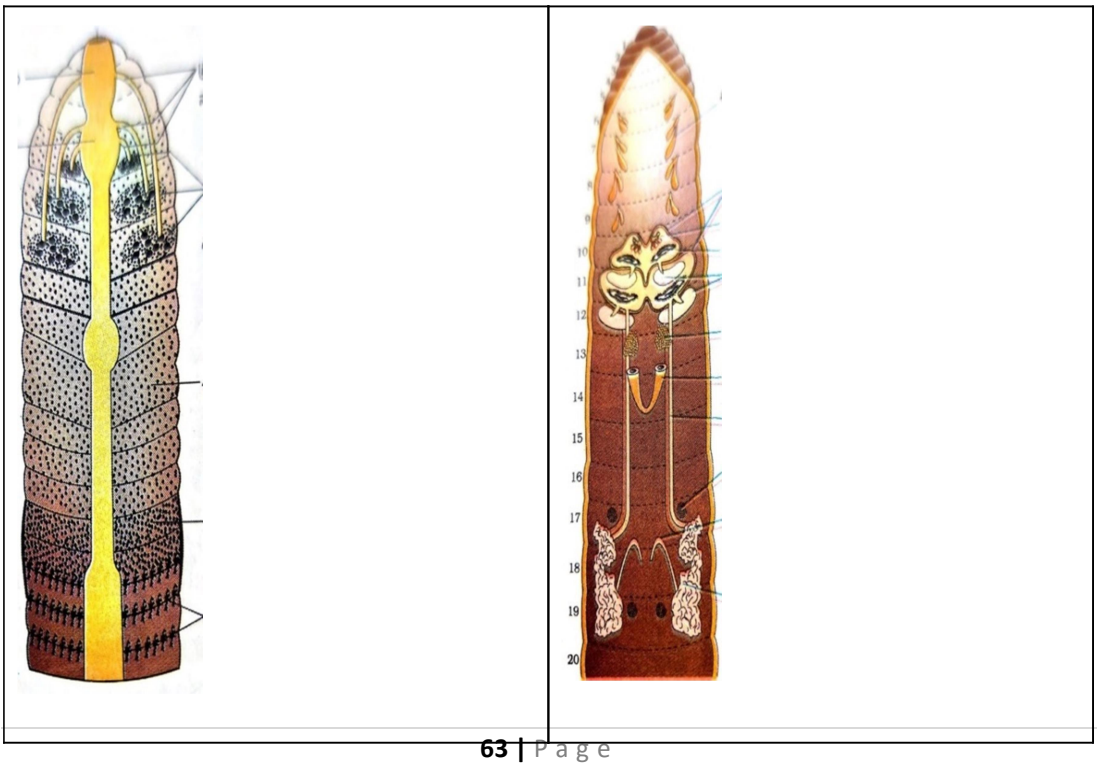
3. Assertion: The skeleton of sponges is made up of spicules. Reason: Type of spicules help in classification of sponges.
4. Assertion: Coelenterates are triploblastic.
   Reason: Coelenterates contain mesoderm in between ectoderm and endoderm
5. Assertion: Coelenterates are called cnidarians.
   Reason: They possess cnidoblasts on tentacles and the body.
6. Assertion: Bioluminescence is well marked in ctenophores. Reason: All ctenophores are exclusively marine.
7. Assertion: Platyhelminthes are known as flat worms Reason: Platyhelminthes have laterally compressed body
8. Assertion: Digestive system of platyhelminthes is incomplete.
   Reason: They have single opening to outside of the body, serve as both mouth as well as anus.
9. Assertion: Nematodes are pseudocoelomate.
   Reason: Body cavity in these organisms is not lined with mesoderm.
10. Assertion: Annelids shows metameric segmentation
    Reason: Body of annelids divided externally as well as internally.

ACTIVITY 13. Match the following Set-I with Set-II

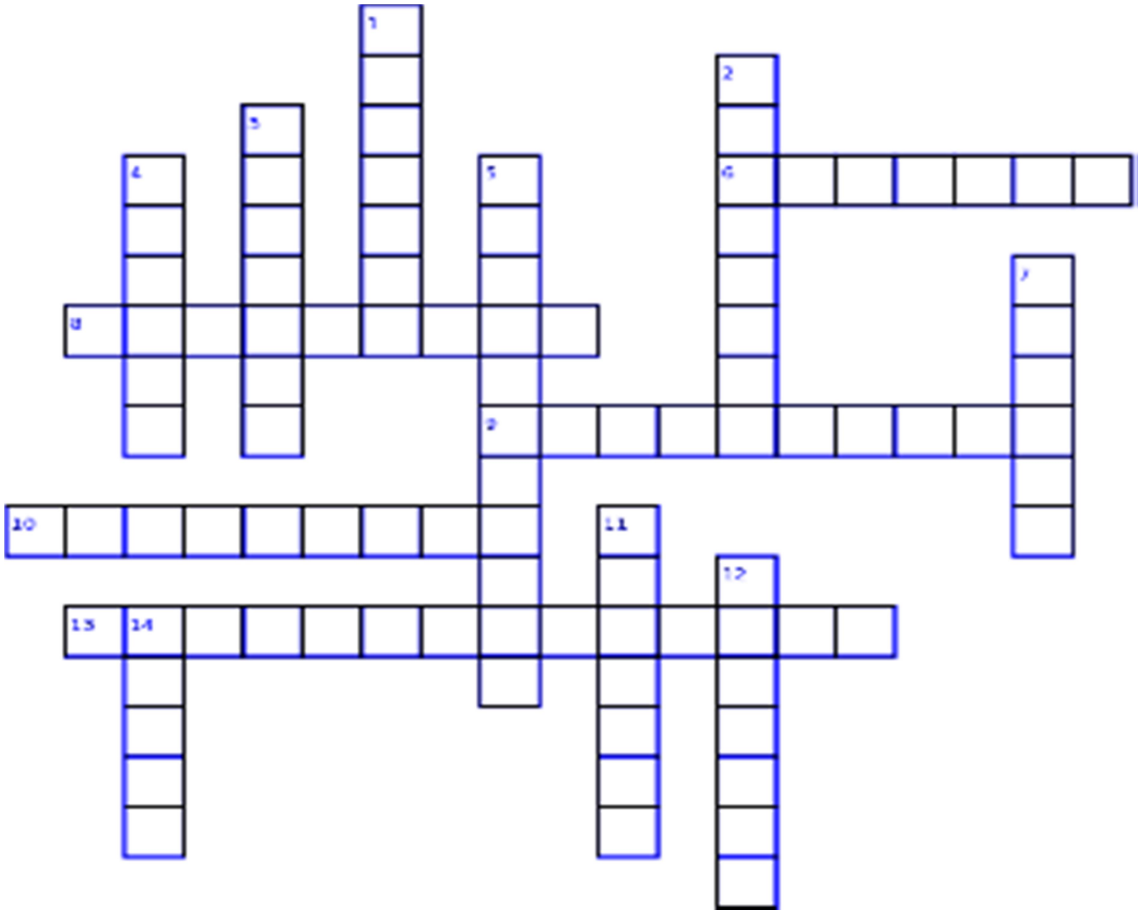
1.Porifera	A. Planula
2.Cnidaria	B. Trochopore
3.Ctenophora	C. Auricularia
4.platyhelminthes	D. Chironomid larva
5.Nematoda	E. Cidippid
6.Annelida	F. Veliger Larva
7.Arthropoda	G. Cercaria larva
8.Mollusca	H. Microfilaria
9.Echinidermata	I. Tornaria
10. Hemichordata	J. Parenchymula

ACTIVITY 14: Identify and label the following Diagrams.





Activity 15. Solve the following Crossword puzzle



Down:

1. Externally the Earthworm is covered by
2. In Earthworms the sexes are not separate. Hence they are
3. In Earthworms the mature sperms and eggs are deposited in
4. The dorsal and ventral blood vessels in Pheretima are connected by
5. The First body segment of Earthworm is
7. In Earthworms development is
11. In the nervous system of Earthworm the nerve ring is present around the
12. The part of digestive system called as grinding mill in Pheretima is
14. The parts which play an important role in the locomotion of Earthworm are

Across:

6. In Earthworm the humic acid present in the humus of the soil is neutralized by calciferous glands of
8. Basing on the excretory material Earthworms are mostly
9. Internal median fold of dorsal wall of the intestine in Pheretima is called
10. In mature Pheretima Segments 14-16 consists of a dark band of glandular tissue called
13. Enteronephric nephridia in Earthworm have a role in

ACTIVITY- 16. Objective type questions

Level-I

1. Members of Phylum Porifera are commonly called as
   1. Round worms 2. Flat worms 3. Sponges 4. Jelly Fishes
2. Which is not a character of sponges
   1. cells are functionally independent 2. Tissue level of organization
   3. multicellular 4. cellular level of organization
3. sponges are
   1. Bilateral 2. Biradial 3. Asymmetrical 4. Pentamerous radial
4. Water enters through minute pores into the central cavity of sponges , the pores are known as
   1. 0stia 2. osculum 3. nephridiopores 4. gonopores
5. Digestion in sponges is
   1. Extracellular 2. Intracellular 3. both 1&2 4. None of these
6. Select the freshwater sponge from the following
   1. Sycon 2. Euspongia 3. spongilla 4. Hyalonema
7. Another name of Sycon is
   1. scypha 2. Gorgonia 3. Euspongia 4. spongilla
8. The character possessed by all sponges is
   1. That all are fresh water 2. External Fertilization
   3. Hermaphrodites 4. Tissue level of organization
9. The undifferentiated layer present between ectoderm and endoderm in Coelenterates
   1.Mesoderm 2. Gastrodermis 3. Mesoglea 4. choanoderm
10. The Phylum which shows tissue level of organization
    1. Porifera 2. Protozoa 3. Cnidaria 4. all
11. The first diploblastic animal belongs to
    1. Platyhelminthes 2. annelid 3. Cnidaria 4. Nematoda
12. Cnidoblast is the characteristic feature of
    1. Ctenophora 2. Coelenterata 3. Annelida 4. Arthropoda
13. Select the correct pair of organisms which show both intra and extracellular digestion
    1. Earthworm and Taenia 2. Amoeba and Plasmodium
    3. Gorgonia and Pennatula 4. Neiris and Echinus
14. Among the following which phylum includes the first bilaterally symmetrical, triploblastic, acoelomates with organ system level of organization

1. Annelida 2. Platyhelminthes 3. Nematoda 4. Arthropoda

15. Pseudometamerism is exhibited by
    1. Taenia 2. Dugesia 3. Fasciola 4. Schistosoma
16. Muller's larva is present in the development of
    1. Fasciola 2. Taenia 3. Echinococcus 4. Convoluta
17. Which class of Platyhelminthes includes Flukes
    1. Cestoda 2. Trematode 3. Turbellaria 4. None of these
18. Rabdites in turbellarians secrete
    1. Heparin 2. Hypnotoxin 3. Mucous 4. Hemoglobin
19. Presence of Collagenous cuticle is a Unique character of
    1. Nematodes 2. Flat worms 3. Annelids 4. Cnidarians
20. Excretory system of nematodes is consists of
    1. Nephridia 2. Malpighian tubules 3. Renette gland 4. Flame cells
21. Amphids in nematodes are concerned with
    1. Chemoreception 2. Glandulo-sensory 3. Tactile 4. Photoreception
22. Among the which animal consists of both amphids and phasmids
    1. Trichinella 2. Trichuris 3. Taenia 4. Ascaris
23. The term Annelida was coined by
    1. Linnaeus 2. Lamarck 3. Robert.E.Grant 4. Ronal Ros
24. Select the right pair of annelids in which the development is indirect
    1. Nereis & Aphrodite
    2.irudinarea&Pontodella
    3.Megascolex and Tubiflex
    4. Tubiflex and Haemadipsa
25. Clitellum is absent in which of the following animals
    1. Megascolex 2. Pheritima 3. Hirudinaria 4. Nereis
26. Botryoidal tissue is present in
    1. Earthworm 2. Leech 3. Cockroach 4. Sea mouse
27. Closed circulatory system is present in
    1. Ascaris 2. Loligo 3. Cockroach 4. Pheritima
28. Which of the following is the largest Phylum
    1. Nematoda 2. Cnidaria 3. Arthropoda 4. Annelida
29. Exoskeleton of Arthropods is chitinous and it sheds at intervals for growth and development. The process is known as
    1. Autotomy 2. Metamerism 3. Ecdysis 4. Aestivation
30. Which of the following is correct about reproduction in Arthropoda
    1. Usually dioecious ,mostly oviparous 2. Internal fertilization
    3. Some exhibit Parthenogenesis 4. All of these

31. Which of the following is true for Arthropoda?
    1.Development may direct or Indirect
    2.2. open circulatory system
    3. Excretion takes place by green glands, coxal glands and Malphigian tubules
    4. all the above
32. Select the living fossil from the following
    1. Loligo 2. Locust 3. Limulus 4. Lac insect
33. Following mosquitoes used as vectors for various diseases.
    1. Culex 2. Anopheles 3.Aedis 4. All of these
34. Trilobate is the larval form of
    1. Limulus 2. Palamnaeus 3. Scolopendra 4. Julus
35. Select the correct matching
    1. Arenicola - Sea mouse 2. lepisma- silver fish
    3. Arenia - Scorpion 4. Palamneus—Spider
36. Select the incorrect one
    1. Limulus-king crab 2. Sarcoptes- Itch mite
    3. Astacus-Crayfish 4. Palaemon –Marine prawn
37. The second largest phylum in animal kingdom is
    1. Mollusca 2. Arthropoda 3. Annelida 4. Echinodermata
38. The function of ctenidia in Molluscs
    1. Respiration 2. Excretion 3. Both 1&2 4.Testing the purity of water
39. Primitive worm like marine molluscs are included under the class
    1. Aplacophora 2. Monoplcophora 3. Gastropoda 4. cephalooda
40. In Aplysia the shell is
    1. external 2. internal 3. Absent 4. chambered
41. In Gastropoda the uneven growth and rotation of visceral mass upto !80^0 is called
    1. Reversal 2.Torsion 3. serial repetition 4. Autotomy
42. The thread like structures , helps in food capture in tusk shells are called as
    1. Radula 2. Aristotle's lanterna 3. Captacula 4. Cirri
43. Which among the following animals consists of Byssus threads for attachment to the substratum
    1. Dentalium 2. Pila 3. Mytilus 4. Octopus
44. Pinctada is a
    1. Pearl oyster 2. Cuttle fish 3. Devil fish 4. Marine mussel
45. The common name of Loligo is
    1. Sea Fan 2. Pen 3. sea mouse 4. sea hare
46. Among the following largest living invertebrate is
    1. Octopus 2. Jellyfish 3. Architeuthis 4. Sepia

47. In which of the following Phylum adults are radially symmetrical and the larvae are bilaterally symmetrical

    1. Annelida 2. MOllusca 3. Arthropoda 4. Echinodermata

48. Among the following which phylum members consists of mesodermal endoskeleton of calcareous ossicles

    1. Annelida 2. mollusca 3. Echinodermata 4. Hemichordata

49. The most characteristic feature of Echinoderms is

    1. Gastrovascular cavity 2. Canal System

    3. Water vascular system 4. Cnidoblasts

50. The function of water vascular system

    1. Respiration 2. Locomotion

    2. 3. Capturing and transport of food 4. All of these

51. Which among the following is correct about reproduction in Echinoderms

    1. Unisexual 2. External fertilization 3. Indirect development 4. All of the above

52. Aristotle's lantern is a characteristic feature of

    1. Starfish 2. sea urchin 3. Brittle stars 4. Holothurians

53. Pedicellariae are modified

    1. Tube feet 2. Integumentary structures 3. Spines 4. spicules

54. Bipinnaria larva found in the development of

    1. Sea -lily 2. Starfish 3. Sea cucumber 4. Sea urchin

55. Cloacal respiratory trees represent in

    1. Star fish 2. Sea urchin 3. Sea cucumber 4. feather star

56. Which phylum has the following features?

    a. Body consists of anterior Proboscis, a collar and along trunk

    b. Worm like, unsegmented marine animals

    c. Respiration is by gills.

    d. Circulatory system open.

    1. Arthropoda 2. Mollusca 3. Hemichordata 4. Urochordata

57. Larva of hemichordata is

1. Amphiblastula 2. Tornaria 3. Echinopluteus 4. Planula

58. The body which is cylindrical and composed of anterior proboscis , a collar and a long trunk is found in

1. Ascidia 2. Salpa 3. Doliolum 4. Saccoglossus

59. Among the following which one is a free ,solitary and borrowing animal

1. Balanoglossus 2. Rhabdopleura 3. Cephalodiscus 4. Echinus

60. Among the following which one is a sedentary, colonial and tube dwelling animal

1. Balanoglossus 2. Synapta 3. Thyone 4. Rhabdopleura

Level II

1. The closest living relatives of metazoans are

1. Blue green algae 2. Choanoflagellates 3. Archaebacteria 4. Cyanobacteria

2. The diploblastic organisms show co-ordination between body parts, due to the presence of

1. Nerve cells 2. Sensory cells 3. Both 1&2 4. Ectoderm and endoderm

3. The cleavage in deuterostomes

1. Spiral and Indeterminate 2. Spiral and determinate

3. Radial and Indeterminate 4. Radial and determinate

4. Water path in sponges is

1 Ostia → Spongocoel → Osculum 2. Osculum → Spongocoel → sculum

3. Ostia → Spongocoel → Ostia 4. Spongocoel → Ostia → Osculu

5. Select the total number of statements belonging to sponges:

a. Cellular level of organization.

b. Body is supported by an endoskeleton made up of spicules or spongin fibres.

c. Larva stage is morphologically different from adults.

d. Pathway of water transport is helpful in gathering food, respiratory exchange and removal of waste.

e. Hermaphrodite organism.

f. They show the power of regeneration.

1. 5 2. 6 3. 4 4. 3

6. Which of the following is correct about reproduction in sponges?
   1 .The mode of asexual reproduction such as gemmule formation, budding and fragmentation.
   2 .Fertilization is internal
   3 3. Development is indirect
   4 .All of these
7. Select the total number of marine sponges from the following:
   Leucosolenia, Euspongia, Spongilla, Sycon, Hyalonema
   1) 3 2) 4 3) 5 4) 2
8. The phylum in which first time nerve net arises
   1 Porifera 2. Coelenterate 3. Platyhelminthes 4. Mollusca
9. Gastro-vascular cavity with single opening is found in
   1 Porifera 2. Coelenterate 3. Aschelminthes 4. Annelida
10. Coelenterates asexually reproduce by
    1 Budding 2. Gametes 3. Spores 4. Gemmules
11. Body bears eight external rows of ciliated comb plates present in which phylum
    1 Coelenterata 2. Porifera 3. Ctenophora 4. Platyhelminthes
12. Ctenophores show
    1 Extra and intracellular digestion 2. Sexual reproduction only
    3. Bioluminescence 4. All of these
13. Example of ctenophores is
    1 Pleurobrachia 2. Beroe 3. Both (a) and (b) 4. None of these
14. Platyhelminthes are called flatworms because
    1 They are triploblastic 2. Their body is dorsoventrally flattened
    3. They have organ level of organization 4. Bilaterally symmetrical
15. Which platyhelminthes possess high power of regeneration
    1 Dugesia 2. Taenia 3. Fasciola 4. Liver fluke
16. The body of the nematodes is circular in cross section. Hence, they are named as
    1 Tapeworms 2. Acorn worms
    2 3. Hookworms 4. Roundworms

17. The following features belong to which of the following phylum?

a) Triploblastic b) Bilateral symmetry

c) Eucoelomate d) Metamerism

1. Porifera 2. Aschelminthes 3. Platyhelminthes 4. Annelida

18. The following features are seen in which of the below options?

a) Exoskeleton of chitin

b) Malpighian tubules as excretory organ

c) Tracheal system for respiration

d) Three pair of legs in thoracic region

1. Limulus 2. Prawn 3. Spider 4. Cockroach

19. Which of the following are sensory organs in phylum Arthropoda?

a) Simple or compound eye b) Statocyst or balance organ

c) Malpighian tubules d) Antennae

1. All except d 2. All except a 3. All except c 4. All except b

20. Match the following:

Column I	**Column II**
A. Locusta	1. Apis
B. Honey bee	2. Locust
C. Silkworm	3. Bombyx
D. Lac insect	4. Laccifer

1. A–4, B–1, C–3, D–4 2. A–2, B– 1, C–4, D–3

3. A–2, B–1, C–3, D–4 4. A–4, B–3, C–1, D–4

21. Match the following

Column I	**Column II**
A. Pila –	1. Tusk shell
B. Doris–	2. Apple snail
C. Dentalium –	3. Cuttlefish
D. Sepia –	4.Sea lemon

1. A–2, B–1, C–4, D–3 2. A–2, B–4, C–1, D–3

3. A–4, B–2, C–3, D–1 4. A–4, B–3, C–2, D–1

Level-III

1. In which one of the following organisms its excretory organs are **correctly** stated? (AIPMT 2010)

   1) Frog . Kidneys, skin and buccal epithelium

   2) Humans . Kidneys, sebaceous glands and tear glands

   3) Earthworm . Pharyngeal, integumentary and septal nephridia

   4) Cockroach . Malpighian tubules and enteric caec

2. Which one of the following structures in Pheretima is correctly atched with its function (AIPMT 2011)

   (1) Clitellum - secretes cocoon

   (2) Gizzard - absorbs digested food

   (3) Setae- defence against predators

   (4) Typhlosole - storage of extra nutrients

3. The figure shows four animals (a), (b), (c) and (d). Select the correct answer with respect to acommon characteristics of two of these animals. (AIPMT 2011)

   (1) (a) and (d) respire mainly through body wall

   (2) (b) and (c) show radial symmetry

   (3) (a) and (b) have cnidoblasts for self-defense

   (4) (c) and (d) have a true coelom

4. Which of the following are correctly matched with respect of their taxonomic classification?(NEET 2013)

   (1) Flying fish, cuttlefish, silverfish – Pisces

   (2) Centipede, millipede, spider, scorpion-Insecta

   (3) House fly, butterfly, tsetsefly, silverfish-Insecta

   (4) Spiny anteater, sea urchin, sea cucumber-Echinodermata

5. Which group of animals belong to the same phylum ? (NEET 2013)

   (1) Malarial parasite, *Amoeba*, Mosquito

   (2) Earthworm, Pinworm, Tapeworm

   (3) Prawn, Scorpion, *Locusta*

   (4) Sponge, Sea anemone, Starfish

6. One of the representatives of Phylum Arthropoda is : (NEET 2013)

   (1) Cuttlefish (2) silverfish (3) pufferfish (4) flying fish

7. Select the Taxon mentioned that represents both ? (NEET 2014) marine and freshwater species

   (1) Echinoderms (2) Ctenophora (3) Cephalochordata (4) Cnidaria

8. *Planaria* possess high capacity of (NEET 2014)

   (1) Metamorphosis (2)Regeneration

   (4) Alternation of generation (4)Bioluminescence

9. Body having meshwork of cell, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of phylum. (NEET 2015)

   (1) Porifera (2)Mollusca (3) Protozoa (4) Coelenterate

10. Which of the following features is not present in the Phylum-Arthropoda? (NEET 2016)

    (1) Chitinous exoskeleton (2) Metameric segmentation

    (3) Parapodia (4) Jointed appendages

11. Microtubules are the constituents of: (NEET 2016)

    (1) Cilia, Flagella and Peroxisomes

    (2) Spindle fibres, Centrioles and Cilia

    (3) Centrioles, Spindle fibres and Chromatin

    (4) Centrosome, Nucleosome and Centrioles

12. Match Column–I with Column–II for housefly classification and select the correct option using the codes given below : (NEET 2016)

Column-I	**Column-II**
a) Family	(i) Diptera
b) Order	(ii) Arthropoda
c) Class	(iii) Muscidae
d) Phylum	(iv) Insecta Codes

	a	**b**	**c**	**d**
(1)	iv	iii	ii	i
(2)	iv	ii	i	iii
(3)	iii	i	iv	ii
(4)	iii	ii	iv	i

13. In case of poriferans, the spongocoel is lined with flagellated cells called : (NEET 2017)

(1) Oscula (2) Choanocytes (3) Mesenchymal cells (4) Ostia

14. Ciliates differ from all other protozoans in(NEET 2018)

1) Using pseudopodia for capturing prey
2) Having a contractile vacuole for removing excess water
3) Using flagella for locomotion
4) Having two types of nuclei

15. Which of the following animals does not undergo metamorphosis ? (NEET 2018)

(1) Moth (2) Tunicate (3) Earthworm (4) Starfish

16. Consider following features :

(a) Organ system level of organization (b) Bilateral symmetry

(c) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics

(1) Arthropoda, Mollusca and Chordata

(2) (2) Annelida, Mollusca and Chordata

(3) Annelida, Arthropoda and Chordata

(4) (4) Annelida, Arthropoda and Mollusca (NEET 2019)

17. Match the following organisms with their respective characteristics :

(a) Pila (i) Flame cells

(b) Bombyx (ii) Comb plates

(c) Pleurobrachia (iii) Radula

(d) Taenia (iv) Malpighian tubules

Select the correct option from the following : (NEET 2019)

(a) (b) (c) (d)

(1) (ii) (iv) (iii) (i)

(2) (iii) (ii) (iv) (i)

(3) (iii) (ii) (i) (iv)

(4) (iii) (iv) (ii) (i)

18. Match the following columns and select the correct option. (NEET 2020)

Column-I	**Column-II**
(a) Gregarious,polyphagous pest	(i) Asterias
(b) Adult with radial symmetry and larva with bilateral symmetry	(ii) Scorpion
(c) Book lungs	(iii) Ctenoplana
(d) Bioluminescence	(iv) Locusta

(a) (b) (c) (d)

(1) (ii) (i) (iii) (iv)

(2) (i) (iii) (ii) (iv)

(3) (iv) (i) (ii) (iii)

(4) (iii) (ii) (i) (iv)

19. Bilaterally symmetrical and acoelomate animals are exemplified by

(1) Annelida (2) Ctenophora (3) Platyhelminthes (4) Aschelminthes

Assignment questions Short answer type questions

1. Write Short notes on the salient features of anthozoans.
2. What are the salient features of Polychaetes?
3. What are the chief characters of crustaceans?
4. Mention the general characters of Arachnida
5. What are the chief characters of Echinoidea?
6. Mention the salient features of Holothuroidea

Project work.

1. Observe the invertebrates in your house and in your surroundings. Write down the characters of the observed animals and systematic position of those animals basing on their salient and specific features.
2. Pick your favourite invertebrate to research and produce a poster telling people all about it. Be sure to include: - the habitat or microhabitat it lives in - the adaptations it has that help it live in its habitat - it's diet (herbivore/omnivore/carnivore) . - it's predators or prey.
3. Identify harmful and useful invertebrates in your locality collect their pictures and write their scientific names and witr about them

Key

1. Can you identify the following animals
   1. Dugesia 2.Sponge 3.Jelly fish 4.Snail
   5.Star fish 6.Bivalve or Scallop 7.Prawn 8.Spider
2. Observe the following picture answer the questions
   1)2 2) 3 3)3 4)1 5)4
3. True or False statements
   1. False -Multicellular, heterotrophs
   2. 2.False-Cellular level
   3. True
   4. True
   5. False- for Locomotion 6.True
   6. True
   7. True
   8. True
   9. True

10. False -In Arthropoda
11. False- Viviparous
12. False- Indirect with larva
13. True
14. Open type
15. True

4. Fill up the blanks with suitable answers
   1. Collagen
   2. Choanoflagellates
   3. Spongocoel
   4. Hexactinellida
   5. Calcium carbonate
   6. Rhabdites
   7. Organ system
   8. Lamarck
   9. Hydrostatic skeleton
   10. Haemocyanin
   11. Captacula
5. Match the following animals with their phyla

   1-Porifera, 2-Mollusca, 3-Cnidaria, 4-Nematoda, 5-Platyhelminthes, 6-Annelida, 7-Arthropoda, 8-Echinodermata, 9-Hemichordata, 10-Ctenophora.

6. Fillup the blanks with suitable answers for the given pictures

1. a.Book lungs	b. Haemocyanin	c.Direct
2. a.Flame cells	b.Internal	c. Indirect
3. a.Parapdia	b.External	c.Trochophore
4. a.Jellyfish	b.Amoebocytes	c. Endoderm
5. a.Pedicellariae	b.Papulae	c.Brachiolaria
6. a.absent	b.Eight	c. Closed

7. Write scientific names of the following animals

.1.Arenicola	2.Ancylostoma	3.Nereis	4.Enterobius
5. Chalina	6.Gorgonia	7.Echinus	8.Aurelia
9.Schistosoma	10.Pennatula		

8. Find the habitat of the following animals

1.Marine water	2.Fresh water	3.Marine water	4.Fresh water
5.Marine water	6.Terrestrial	7.Fresh water	8.Marine
9.Marine	10.Marine		

9. Name the animal phyla..

1.Echinodermata	2.Arthropoda	3.Porifera	4.Nematoda
5.Annelida	6.Mollusca	7.Hemichordata	8.Platyhelmenthes

9.Cnidaria 10.Cnidaria

10. Activity

1. Beroe 2.Pheritima 3.Hyalonema 4.Echinus 5.Unio

11. Activity

1. proboscis 2. Insects .Wings 4.Radula 5. Pisces

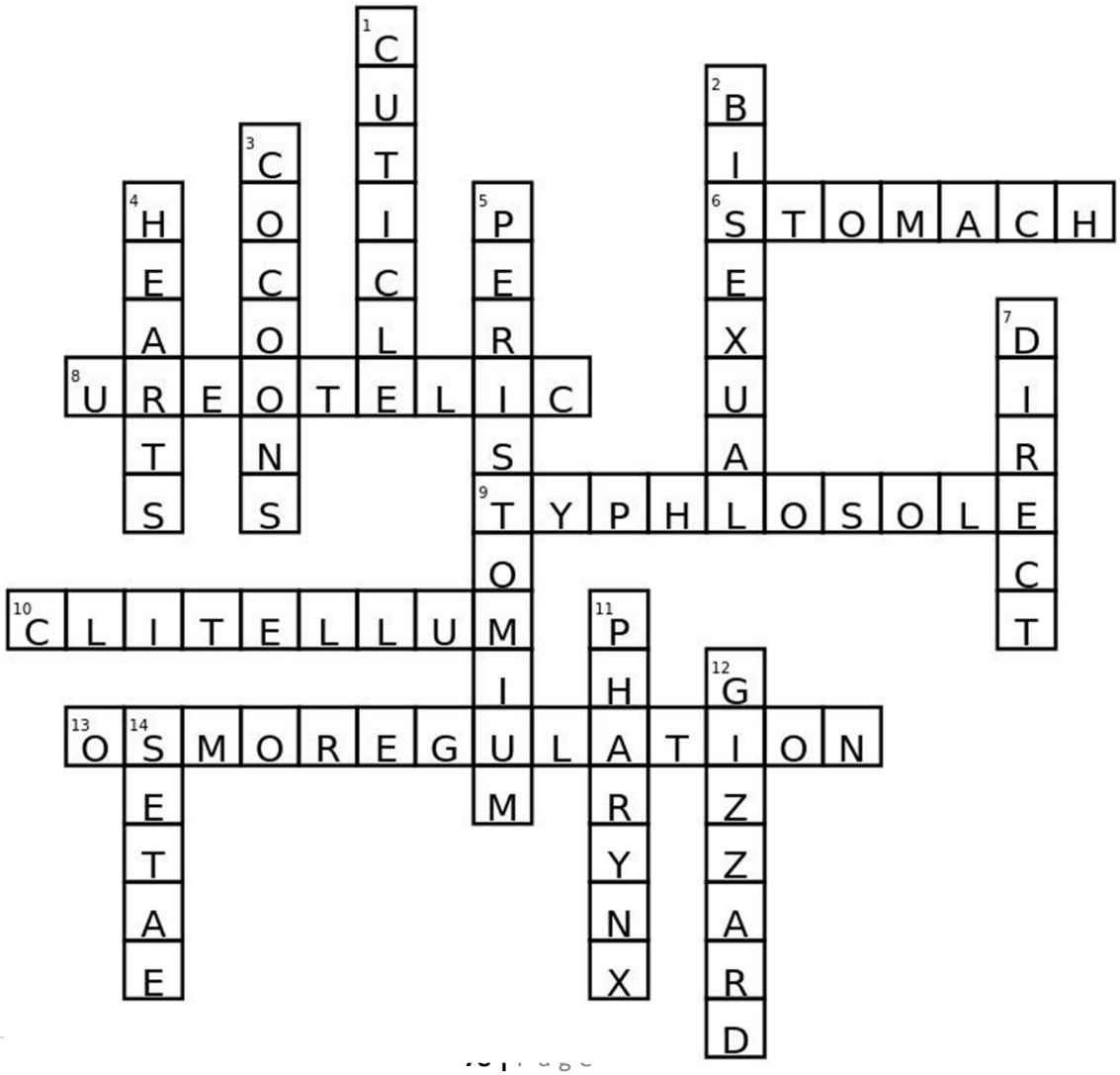
12. Assertion- Reason questions:

1	**1**	**2**	**2**	**3**	**2**	**4**	**4**	**5**	**1**
6	**2**	**7**	**3**	**8**	**1**	**9**	**1**	**10**	**13**

13. Match the following:

1-J, 2-A, 3-E, 4-G, 5-H, 6-B, 7-D, 8- F, 9-C, 10-I

15.Crossword puzzle:



16.

Level 1

1	**3**	2	**2**	3	**3**	4	**1**	5	**2**
6	3	**7**	1	**8**	3	**9**	3	**10**	**3**
11	3	**12**	2	**13**	3	**14**	1	**15**	**4**
16	2	**17**	3	**18**	1	**19**	3	**20**	**1**
21	4	**22**	2	**23**	1	**24**	4	**25**	**2**
26	4	**27**	3	**28**	3	**29**	4	**30**	**4**
31	3	**32**	4	**33**	1	**34**	4	**35**	**1**
36	3	**37**	1	**38**	2	**39**	2	**40**	**3**
41	3	**42**	1	**43**	2	**44**	3	**45**	**4**
46	3	**47**	3	**48**	4	**49**	4	**50**	**2**
51	3	**52**	2	**53**	3	**54**	3	**55**	**2**
56	**4**	57	**1**	58	**4**				

Level 2

1	**2**	2	**3**	3	**3**	4	**1**	5	**2**
6	3	**7**	2	**8**	2	**9**	1	**10**	**3**
11	4	**12**	3	**13**	2	**14**	1	**15**	**4**
16	**4**	17	**4**	18	**3**	19	**3**	20	**2**

Level 3

1	**3**	2	**1**	3	**4**	4	**3**	5	**3**
6	2	**7**	4	**8**	2	**9**	1	**10**	**3**
11	2	**12**	3	**13**	2	**14**	4	**15**	**3**
16	**3**	17	**4**	18	**3**	19	**3**		

UNIT-IV
ANIMAL DIVERSITY-II

MAJOR LEARNING OBJECTIVES:

After completing this lesson the students are able

- To understand the animal kingdom.
- To differentiate between vertebrates and invertebrates.
- Distinct characteristics of vertebrates and invertebrates.
- To explain characteristics of each vertebrate group: mammal, reptile, amphibian, bird, and fish.
- To identify and define a vertebrate and an invertebrate.
- able to classify animals as a vertebrate or an invertebrate
- To understand the taxonomic position of fishes to mammals
- To understand the origin and evolutionary relationship of different phylum from fishes to mammals.

Activities:

1. **Locate and rewrite the difficult key words from the text book**
2. **Defining the key words**
3. **Write the comparison of chordates and non-chordates**
4. **Write the chambers of heart for the following**
5. **Identify the typical chordate parts**
6. **Name the following animals**
7. **Name the following animals**
8. **Give an example for each of the following**
9. **Fill in the blanks**
10. **True or False**
11. **Multiple choice questions**

LEVEL-II

LEVEL-III

Assignment questions:

Answers to the activities

I. Locate and rewrite the difficult key words from the text book

1	9	17
2	10	18
3	11	19
4	12	20
5	13	21
6	14	22
7	15	23
8	16	24

II. Defining the key words

1. Placenta
2. Solenocyte:
3. Acrodont:
4. Polyphyodont:
5. Placoid scales:
6. Chyme
7. Lachrymal glands
8. Temporal fossae
9. Carinate birds
10. Cochlea
11. Heterodont
12. Sinus venosus
13. Columella auris
14. Stapes
15. Amnion

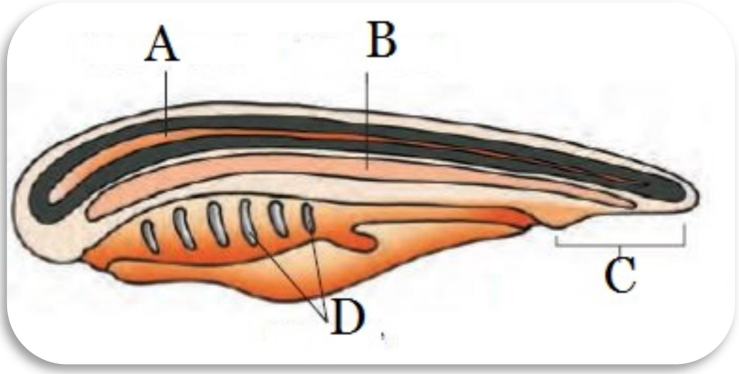
III. Write the comparison of chordates and non-chordates

S.No.	Chordates	Non-chordates
1		
2		
3		
4		
5		

IV. Write the chambers of heart for the following

Class	No of chambers
1. Pisces	
2. Amphibia	
3. Reptilia	
4. Aves	
5. Mammalia	

V. Identify the typical chordate parts



A. _____ B._____

C. _____ D._____

VI. Name the following animals

1. 'National Animal' of India:_____
2. 'State Animal' of Andhra Pradesh:_____
3. 'National Bird' of India:_____
4. 'State Bird' of Andhra Pradesh :_____

VII. Name the following animals

1. Flying fish:_____
2. Flying frog:_____
3. Flying lizard:_____
4. Flying fox:_____

VIII. Give an example for each of the following

1. A viviparous fish:_____
2. A fish possessing poison sting:_____
3. A fish possessing electric organs:_____
4. A fish possessing sucker:_____
5. A fish possessing brood pouch:_____

IX. Fill in the blanks

1. The name chordate refers to the presence of a solid, elastic rod like supporting structure called the_____
2. In vertebrates notochord is replaced by_____
3. Birds and mammals are _____animals.
4. The skin of fish is usually covered with _____
5. Smallest bird_____
6. _____is largest animal in the world.
7. Remnants of notochord occur as _____in the intervertebral discs of mammals.
8. Urochordata and Cephalochordata together referred as _____.
9. Renal portal system is absent in_____
10. The larvae of petromyzon_____

11. Golden age of fishes_____
12. In pisces eyes are protected by _____
13. The mass of eggs released by the female frog is called_____
14. The study of poikilothermic tetrapods is called_____
15. _____the specialized olfactory structures present in lizards and snakes.
16. _____is a living fossil endemic to New Zealand.
17. The last thoracic, lumbar, sacral and anterior few caudal vertebrae are fused to form_____
18. In mammals to halves of cerebrum are connected by_____
19. The connecting link between reptiles and birds is _____
20. National bird of New Zealand_____

X. True or False

S.No		True/false
1	1. Hemichordata, Chordata and Echinodermata are deutrostomes	
2	Urochordate body is covered by a test or tunic composed of cellulose.	
3	Urochordate circulatory system is closed type	
4	Sternum appeared for the first time in amphibians	
5	The body of frog is divisible into head, neck and trunk	
6	Corpora quadrigemina are present in amphibians	
7	Larynx is the sound producing organ in birds	
8	Mammary gland are modified sweat glands	
9	Mature RBC are nucleate in mammals	
10	The two halves of the cerebrum are connected by corpus callosum	
11	In birds preen gland is present	
12	Teeth are present in the birds	
13	Sternum has keel in the ratite birds	
14.	Dr. Salim Ali is a world famous Indian ornithologist	

15	Left systemic arch is present in birds	
16	In sankes cranial nerves are 10 pairs	
17	Mesozoic era is golden age of reptiles	
18	Frogs and toads are poikilothermic anamniotes	
19.	In frogs columella auris which is modified hyomamdibula of the fishes	
20	Caudal fin is heterocercal in Osteichthyes	

XI. Multiple choice questions

Level I

1. Phylum chordata is divided into how many subphyla?

   A.2 B.3 C.4 D.5

2. In chordates , basically the pharynx is

   A. Perforated

   B. not perforated

   C. Present in the gut of the larva only

   D. A source of thyroxine which controles metamorphosis

3. Which of the following is a shared characteristic of all chordates?

   A. Scales B. jaws

   C. vertebrae D. double hollow nerve cord

4. What is one characteristic that separates chordates from all other animals?

   A. True coelom B. post-anal tail

   C. blastophore which becomes the anus D. segmentation

5. Frogs belongs o which order

   A. anura B. Urodela C. Caudeta D. Apoda

6. Which of the following reptiles has four chambered heart?

   A. Turtle B. Sphenodon C. King cobra D. Crocodile

7. which of the following animal is not a vertebrate?

   A. Oryctolagus B. Amphioxus C. Sparrow D. Fish

8. which is not an insect?

   A. Spider B. Termite C. Mosquito D. Ant

9. which is limbless amphibian?

A. Alytes B. Hyla C. Ichthyophis D. frog

10. cold blooded animals are

A. Which have cold blood

B. Who feel cold a lot

C. Who can regulate their temperature

D. who can not regulate their temperature

11. which of the following is a non poisonous snake?

A. Krait B. Cobra C. Viper D. Python

12. Amphioxus is considered as typical chordatedue to

A. Presence of unpaired fins B. presence of cranium

C. presence of tail D. all chordate characters being persistent

13. which of the following is as chordate but not a vertebrate

A. Scoliodon B. Salamander C. Amphioxus D. snake

14. Tadpole is the larvae of

A. Amphioxus B. Balanoglossus C. Herdmania D. Branchiostoma

15. Tunicin is similar to

A. Cellulose B. Cuticle C. Scleroprottein D. Urochordata

16. Notochord occurs all through the length of body and throughout life in

A. Hemichordata B. urochordata C. Cephlochordata D. Vertebrata

17. find out the difference between urochordata and cephalochordates

A. position of endostyle B. performed pharynx

C. length of notochord D. All of the above

18.Excretory organs of Amphioxus are

A. Metanephridia B, protonephridia

C. mesonephric kidneys D. metanephric kidneys

19. The group amniota includes

A. Reptiles and birds only B. Reptiles and mammals only

C. Reptiles, birds and mammals D. Mammals and birds only

20. Which one of the following is egg-laying mammal [RPMT 2001; MPPMT2001]

A. Pangolin B. Tachyglossus C. Porcupine D. Bat

21. Which of the following is not a mammalian character [MH CET 2002]

A. Hairy skin B. Muscular diaphragm

C. 3-chamberd heart D. RBCs enucleated

22. The respiratory organ in reptiles is

A. gills B. epidermis C. skin D. lungs

23. Aquatic reptiles are

A. ammonotelic B. ureotelic

C. ureotelic over land D. ureotelic in water

24. vertebrae of reptiles are

A Amphicoelous B Procoelous C Platycoelous D Gastrocoelous

25. A urinary bladder is absent in

A Chameleon B House lizard

C Snake and Crocodile D. none of the above

26. the tympanum is absent in

A. Rays B. cartilaginous fish C. Bony fish D. all the above

27. Hippocampus is called “sea horse” because

A. It has horse like body

B. its snout resembles horse tail

C. its tail resembles horse tail

D. it swims fast like fast running horse

28. In fishes the teeth are of

A. heterodont type B. Acrodont type C. Thecodont type D. Pleurodont type

29. pharyngeal gill-slits are found in

A. Cray fish B. Cuttle fish C. Flying fish D. silver fish

30. a flying fish is

A. Acipenser B. Amia C. Exocoetus D. Fistularia

31. Pristis is commonly known as

A. Electric Ray B. Saw fish C. Sea fish D. Sucker fish

32. Gambusia is a

A. pest on fishes B. pathogenic fish

C. parasite fish D. fish predator of mosquito larvae

33. In fishes, the cranial nerves are

A. 6 pairs B. 8 pairs C. 10 pairs D. 12 pairs

34. cycloid scales occur in

A. Lizard B. Toad C. Bony fishes D. Cartilaginous fish

35. Excretory products of fishes

A. Ammonia B. Urea C. uric acid D. Both 1 and 2

36. which is most distinct character of fishes are

A. Gills B. Scales C. lateral line organ D. paired fins and rays

37. the most remarkable step in development of amphibians was

A. Development of lungs B. Transition from water to land

C. Releasing shelled eggs D. Both 1 and 2

38. A good example of parental care in amphibian is

A. Ichthyophis B. Rana C. Amblystoma D. All of the above

39. In the amphibian order urodela

A. Limbs are small in front and long behind B. Limbs are of equal size

C. Hind limbs are absent in adults D. Limbs are absent

40. which of the following amphibian has largest RBC

A. Amphiuma B. Ambystoma C. Siren D. Triton

41. girdles are absent in

A. Ichthyophis B. Siren C. Necturus D. Frog

42. Axolotl is the larvae of

A. protteus B. Siren C. Ambystoma D. Necturus

43. Flying lizard is

A. Chameleon B. Draco C. Caloes D. Varanus

44. the largest lizard is

A. Chameleon B. heloderma C. Ophiosaurus D. varanus

45. The most highly advanced character in crocodile is the presence of

A. Powerful Jaws B. Shelled eggs

C. Pleurodont dentition D. Four chambered heart

46. The poison glands of a poisonous snakes are the modified

A. Buccal glands B. Salivary glands C. Sebaceous glands D. Lacrimal glands

47. In reptiles the skin is covered by

A. Plates B. Horny scales

C. Horny scutes D. All of the above but not in same animal

48. which is not a homeotherm

A. Aptenodyttes B. Testudo C. delphinus D. Neophron

49. Alligator is the member of

A. pisces B. Aves C. Reptilian D. Amphibian

50. Non-poisonous snake among the following

A. Cobra B. Krait C. Viper D. Rat snake

51. A bifid tongue and jacobson's organs are found in

A. crocodiles B. Lizards C. Snakes D. both B and C

52.The most poisonous snake is

A. Krait B. tree snake C. Python D. rat snake

53. A common wall lizard can climb on smooth wall because it has

A. Suckers on mouth B. Sticky ventral side of the body

C. Claws on the fingers D. adhesive pads on the fingers

54. In which of the following tympanum is absent

A. Birds B. Frog C. Lizard D. Snake

55. Snakes belongs to the which order

A. Reptilian B. Squamata C. Ophidia D. Lacertilia

56. Oviparity is common in

A. Rabbit B. Bat C. Whale D. Penguin

57. the wish bone of bird is derived from

A. hind-limbs B. Pelvic girdle C. pectoral girdle D. Skull

58. secretion of 'pigeon's milk by

A. Crop glands B. mammary glands C. Salivary glands D. Gizzard

59. birds with amphibious nature

A. Dodo B. Penguin C. Kiwi D. Ostrich

60. which of the following is a flightless bird

A. Psittacula B. Struthio C. Columbia D. Neophron

LEVEL-II

1. Which one of the following is not a characteristic feature of all the vertebrates with out exception?
   A. Dorsal nerve cord
   B. Presence of coelum
   C. A diaphragm separating thorax from abdomen
   D. Pharyngeal gill clefts in the early embryonic stages
2. Which on of the following groups of animals is correctly matched with its one characteristic feature without even a single exception?
   A. Mammalian-give birth to young ones
   B. Reptilian-possess 3-chamberd heart with one incompletely divided ventricle
   C. Chordata-possess a mouth provided with an upper and a lower jaw
   D. Chondrichthyes-possess cartilaginous endoskeleton
3. Which of the following statements is true?
   A. Invertebrates posses a tubular nerve cord
   B. Non chordates have a vertebral column
   C. All chordates are vertebrates
   D. All vertebrates are chordates
4. Sharks, skates and rays are also called----------fishes
   A. Jawless B. bony C. cartilagenous D. Freshwater
5. The only group of animals that begin their lives breathing through gills in the water and as adults can live on land breathing with lungs
   A. Amphibians B,Arthropods C.Mammals D.Fish
6. What group of vertebrates are snakes and lizards?
   A. Amphibians B. Reptiles C. Mammals D. Fish
7. In which order human is placed
   A. Carnivora B. Rodentia C. Primate D. None of the above
8. Members of which group of the followings, have three ossicles in their internal ear
   A. Amphibia B. Reptilia C. Aves D. Mammalia
9. Egg-laying mammals are grouped as
   A. Eutheria B. Prototheria C. Rodentia D. Metatheria

10. 'Bat' is classified as a mammal because

    B. It has hairs B. It can fly C. It has pinna D. It has testes

11. External ears are characteristics of

    A. Birds B. Mammals C. Birds and mammals D. Mammals and reptile

12. Corpora bigemina is not present in

    A. Frog B. Snake C. Birds D. Rabbit

13. 13. Why do mammals lack mucus glands in their skin

    A. The skin is not slippery B. The skin is tough

    B. The epidermis has many layers of cells D. The skin is not respiratory

14. To which of the taxonomic group does whale belong

    A.Fishes B. Reptilia C. Mammalia D. Arthropoda

15. The mammal which possesses both the reptiles and mammalian characters

    A. Marsupials B. Monotremes C. Equus D. Oryctolagus

16. Monotremata is a group of animals which includes

    A. Fishes with a single gill aperture

    B. Insects with a single pair of functional spiracles

    C. Mammals with a single common cloacal opening

    D. Protozoans with single flagellum

17. Apart from mammals, other group of animals maintaining a high and constant body temperature is

    A. Insects B. Fishes C. Worms D. Birds

18. Which of the following is a matching set in taxonomy

    A. Man, chimpanzee, monkey B. Cuttle fish, jelly fish, silver fish

    C. Bat, pigeon, crow D.Oyster, octopus, star fish

19. Dolphins are

    A. Fishes B. Amphibians C. Reptiles D. Mammals

20. Hairs occur in all mammals except those of

    A. Chiroptera B. Rodentia C. Cetacea D. Primates

21. Which character is not same in aves and mammals

    A. Single systemic arch B. Metanephric kidney

    C. Seven cervical vertebrae D. Homoiotherms

22. Flippers of seal are modified

A. Fins B. Hind limb C. Forelimb D. Gills

23. Which of the following structures is present characteristically only in mammalian brain

A. Corpus fibrosum B. Corpus striatum

C. Corpus luteum D. Corpus callosum

24. Which of the following is not found in mammals

A. Hepatic portal system B. Hypophysial portal system

C. Renal portal system D. Hepatic and Hypophysial portal system

25. Whale is included among mammals because it has a

A. Pair of lungs B. Pair of nostrils

C. Four chambered heart D. Diaphragm between thorax and abdomen

26. Egg laying mammals are found in

A. India B. South Africa C. Africa D. Australia

27. One of the following is a very unique feature of the mammalian body

A. Four chambered heart B. Rib cage

C. Homeothermy D. Presence of diaphraghm

28. All mammals [AMU 2002]

A. Give birth to live young B. Have a thick coat of hair

C. Nourish their young with milk D. Have a uterus

29. The pelvic girdle of birds is attached to a complex structure formed by the fusion of last thoracic, all lumbar and first five caudal vertebra. This structure is called

A. Synsacrum B. Symphysis C. Synkaryon D. Sympelvis

30. Archaeopteryx called a connecting link, carried the characters of

A. Reptile and bird B. Reptile and mammal

C. Fish and amphibian D. Amphibian and reptile

31. Which animals have a beak with jaws but no teeth

A. Aves B. Snakes C. Mammals D. All the above

32. Dicondylic skull along with ten pairs of cranial nerves is found in

A. Mammalia B. Amphibia C. Reptilia D. Pisces

33. This about Class Amphibia is correct

i. fertilization is internal

ii. respiration is through gills only

iii. body is divisible into head and trunk

iv. heart is two chambered – one ventricle and one auricle

A. only (i)

B. only (iii)

C. (i), (ii) and (iv)

D. all are correct

34. A frog has

A. jaws but no teeth B. eyes but no lids

C. ears but no pinnae D. hands but no fingers

35. Even after attaining sexual maturity, larval characters are retained. It is known as

A. Phylogenesis B. Neoteny C. Parthenogenesis D. Ontogenesis

36. The differentiating factor of the venous system of frog and rabbit is in the presence of thi**s**

A. hepatic vein B. Three vena cavae

C. renal portal system D. Hepatic portal system

37. Neck is not found in a frog. This absence helps the frog to

A. swim in water B. Respire C. Catch prey D. Jump on ground

38. The body temperature of a frog is 20 degrees celsius in an environment having a temperature of 30 degrees celsius. The temperature of the frog in the new environment is

A. 25 degrees Celsius B. 20 degrees celsius

C. 30 degrees Celsius D. Between 20-30 degrees Celsius

39. This is not a true amphibian animal

A. Toad B. Salamander C. Tortoise D. Frog

40. Animals of which order have tail in their larval forms

A. Apoda B. Urodela C. Anura D. None of them

41. The common name of necturus is [CBSE PMT 1988]

A. Cave salamander B. Congo eel C. Hell bender D. Mud puppy

42. Midwife toad is another name for [MP PMT 1994]

A. Alytes B. Hyla C. Rhacophorus D. Pipa

43. The name of flying frog is [EAMCET 1998]

A. Rhacophorus B. Bufo C. Phyllobates D. Necturus

44. Frog which lives on the trees [RPMT 1999]

A. Alytes B. Bufo C. Hyla D. Rana

45. A hibernating frog respires with

A. Lung B. Diaphragm C. Buccal epithelium D. Skin

46. The glands present in the skin of frog are [AFMC 1993]

A.Mucous and poisonous B.Sweat and mammary

C. Sweat and sebaceous D. Mucous and sweat

47. Axolotl larva belongs to the order [EAMCET 1994]

A. Urodela B. Anura C. Apoda D. Stegocephalia

48. Which of the following pair is unmatched for the animals of Reptilia class?

A. Cleiodoic eggs and constant body temperature

B. meroblastic cleavage and lack of metamorphosis

C. 12 pairs of cranial nerves and rough skin

D. Skull monocondylic and skin with scales

49. Only poisonous lizard of the world is

A. Heloderma B. Ophiosaurus C. Phrynosoma D. Varanus

50. Character of birds is

A. Unisexual and sexual dimorphism absent

B. Bisexual and sexual dimorphism absent

C. Unisexual and sexual dimorphism present

D. Bisexual and sexual dimorphism present

LEVEL-III

1. All mammals without any exceptions are characterized by [AIMS-2006]
   1. Viviparity and biconcave red blood cells
   2. Extra-abdominal testes and a four chambered heart
   3. Heterodont teeth and 12 pairs of cranial nerves
   4. A muscular diaphragm and milk producing glands

2. Which of the following pairs are correctly matched? [CBSE-2007]

Animals	Morphological features
a. Crocodile	- 4- chambered heart
b. Sea urchin	- parapodia
c. Obelia	- metagenesis
d. Lemur	- thecodont

   1. Only a and b
   2. b,c, and d
   3. a,c,and d
   4. Only a and d

3. what is common between parrot, platypus and kangaroo? [CBSE-2007]
   1. oviparity
   2. Homeothermy
   3. Toothless jaws
   4. Functional mammary glands

4. which one of the following in birds, indicaters their ancestry? [CBSE-2008]
   A. eggs with a calcareous shell
   B. Scales on their hind limbs
   C. four chambered heart
   D. Two special chambers crop and gizzard in their digestive tract

5. which one of the following pairs of animals arises jawless fishes? [AIPMT-2009]
   A. 1. lampreys and eels 2. Meckerals and rohu
   B. 3. lampreys and hag fishes 4. Copies and hag fishes

6. crocodile and Penguin are similar to Whale and Dogfish in which one of the following features?
   A. possess bony skeleton
   B. have gill slits at some stage of development
   C. possess a solid single stranded central nervous system
   D. lay eggs and guard them till they hatch

6. which one of the following statements in incorrect regarding notochord [CBSE -2011]
    a. it is present only in larval tail in ascidian
    b. It is replaced by vertebral column in adult
    c. It is absent throughout life in humans from the very beginning
    d. it is present throughout life in Amphioxus

8. A feature of mammals without any exception is [AFMC-2011]

    1. seven cervical vertebrae 2. Diaphragm
    3. vivipary 4. Warm blooded nature

9. which one of the following groups of animals is correctly matched with its characteristic feature without even a single exception? [CBSE -2011]
    a. chonbdrichthyes – possess cartilaginous endoskeleton
    b. mammalian – give birth to young ones
    c. reptilian – possess 3 – chambered heart with one incompletely divided ventricle
    d. chordate – possess a mouth provided with an upper and lower jaw

10. which are exclusively viviparous? [AIMS – 2012]

    1. bony fishes 2. Cartilaginous fishes 3. Sharks 4. Whales

11. which one of the following pairs of animals are similar to each other pertaining to feature stated against them [CBSE- 2012]
    1. Pteropus and Ornithorhynchus – viviparity
    2. garden lizard and crocodile-three chambered heart
    3. Ascaris and Ancylostoma – Metameric segmentation
    4. Sea horse and Flying fish – cold blood

12. which one of the following categories of animals is correctly described with no single exception in it? [AIPMT =2012]
    1. all reptiles possess scales, have a three chambered heart and cold blooded
    2. all bonyfishes have four pairs of gills and an operculum on each side
    3. all sponges are marine and have collared cells
    4. all mammals are viviparous and possess diaphragm for breathing

13. which group of animals belong to the same phylum?
    1. Earthworm, Pinworm, Tapeworm
    2. Prawn, Scorpion, Locusta
    3. Sponge, Sea anemone, Starfish
    4. Malarial parasite, Amoeba, Mosquito

14. Match the name of the animal(columnI), with one characteristics (column II), and

The phylum to which it belongs: [NEET- 2013]

	Column I	Column II	Column III
1	Ichthyophis	Terrestrial	Reptilian
2	Limulus	Body covered by chitinous exoskeleton	Pisces
3	Adamsia	Radially symmetrical	Porifera
4	Petromyzon	Ectoparasitte	Cyclostomata

15.A marine cartilaginous fish that can produce electric current is; [AIPMT-2014]

1. Scoliodon 2. Pristis 3. Torpedo 4. Trygon

16. which one of the following animals has two separate circulatory pathways? [AIPMT-2015]

1. Shark 2. Frog 3. Lizzard 4. Whale

17. A jawless fish, which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is [AIPMT – 2015]

1. Petromyzon 2. Eptaretus 3. Myxine 4. Neomyxine

18.choose the correct statement [NEET – 2016]

1. all mammals are viviparous
2. all cyclostomes do not possess jaws and paired fins
3. all reptiles have a three- chambered heart
4. all pisces have gills covered by an operculum

19. which of the following characteristics features always holds true for the corresponding by the animals? [NEET-2016]

1. viviparous	Mammals
2.possess a mouth with upper And lower jaw	Chordates
3. Three chambered heart with one incompletely divided	Reptilia Ventricle
4.cartilaginous endoskeleton	chondrichthys

20. which one of the following represents order of 'Horse'?

1. Equidae 2. Perssodactyla 3. Caballus 4. Ferus

21. Which among the correct combination of aquatic mammals? [NEET- 2017]

    A. Seals, Dolphins, Sharks

    B. Dolphins , Seals, trygon

    C. Whales, Dolphins, Seals

    D. Trygon, Whales, Sealss

22. Which one of these animals is not a homeotherm? [NEET-2018]

    1. Macropus 2. Camelus 3. Chelone 4. Psittacula

23. Which of the following animals does not undergo metamorphosis? [NEET-2018]

    1. Earthworm 2. Moth 3. Tunicate 4. Starfish

24. Identify the vertebrate group of animals characterized by crop and gizzard in the digestive system [NEET-2018]

    1. Amphibian 2. Aves 3. Reptilian 4. Osteichthyes

Project work:

1. Observe external features of your surrounding animals and place the animal which vertebrate class they belongs to.

Assignment questions:

I. Very short answer questions

1. List out the characters shared by chordates and echinoderms.
2. Write four salient features of cyclostomes.
3. What is the importance of endostyle in lancelets and ascidians?
4. Name the type of caudal fin and scales that are present in a shark and catla, respectively.
5. What is the importance of airbladder in fishes?
6. How do justify the statement 'heart in fishes is a branchial heart'
7. Distinguish between milt and span.
8. What is 'force pump' in frog? Why is it named so?
9. How do you distinguish between a male frog and female frog?
10. Name the two poisonous and nonpoisonous snakes found in south India.
11. Name the four extra embryonic membranes?
12. What are the Jacobson's organs? What is their function?
13. What is wish bone? What are the skeletal components that form it?
14. Name the three meninges. In which group of animals do you find all of them?
15. Name the vertebrate groups in which renal portal system is absent.

II. Short answer questions

1. Give three major differences between chordates and non chordates, and draw the sketch of a chordate's body showing those features.
2. Compare and contrast sea squirts and lancelets.
3. List out eight characteristics that help distinguish a fish from the other vertebrates.
4. Compare and contrast cartilaginous and bony fishes.
5. Write eight salient features of the class amphibian.
6. Describe the male reproductive system of frog with the help of a labeled diagram.
7. What are the modification that are observed in birds that help them in flight?
8. What are the features peculiar to ratitae birds? Give examples of ratitae birds.
9. Write the generic name of the following.
    a. An viviparous aniamal
    b. Flying fox
    c. Blue whale
    d. Kangaroo
10. Describe the structure of heart of the frog.

Answers to the activities

III. Write the comparison of chordates and non-chordates

S. No	Chordates	Non-chordates
1	Notochord is present	Notochord is absent
2	Central nervous system is dorsal, hollow, single and non-ganglionated	Central nervous system is ventral, solid, double and ganglionated
3	Pharynx is perforated by gill slits	Gill slits are absent
4	Heart is ventral	Heart is dorsal
5	A post-anal tail is present	Post-anal tail is absent

IV. Write the chambers of heart for the following

1. 2
2. 3
3. Incompletely divided four chambers
4. 4
5. 4

V. Identify the typical chordate parts

A. Nerve cord
B. Noocord
C. Post-anal tail
D. Gill slits

VI. Name the following animals

1. Tiger
2. black buck
3. Peacock
4. Indian roller

VII. Name the following animals

1. Exocoetus
2. Rhacophorus
3. Draco
4. Pteropus

VIII. Give an example for each of the following

1. Scoliodon
2. Trygon
3. Torpedo
4. Echineis
5. Hippocampus

IX. Fill in the blanks

1. Notochord	11. Divonian
2. vertebral column	12. nictating membrane
3. warm blooded	13. spawn
4. seale	14. Herpatology
5. Humming bird	15. Jacobson's organ
6. blue whale	16. Sphenodon
7. nuclei pulposi	17. synsacrum
8. protochordata	18. Corpus callosum
9. mammals and cyclostomata	19. Archeopteryx
10. ammocoete	20. Kiwi

X.True or False

1. True	11. True
2. true	12. False
3. False	13. False
4. True	14. True
5. False	15. False
6. False	16. True
7. False	17. True
8. True	18. True
9. False	19. True
10. True	20. False

XI. Multiple choice questions

LEVEL- I

1-B	7-B	13-C	19-C	25-C	31-B	37-D	43-B	49-C	55-B
2-A	8-A	14-C	20-B	26-D	32-D	38-A	44-D	50-D	56-C
3-D	9-C	15-A	21-C	27-B	33-C	39-B	45-D	51-D	57-C
4-B	10-D	16-C	22-D	28-B	34-C	40-A	46-B	52-A	58-A
5-A	11-D	17-C	23-B	29-	35-D	41-A	47-D	53-D	59-B
6-D	12-D	18-B	24-B	30-C	36-C	42-C	48-B	54-D	60-B

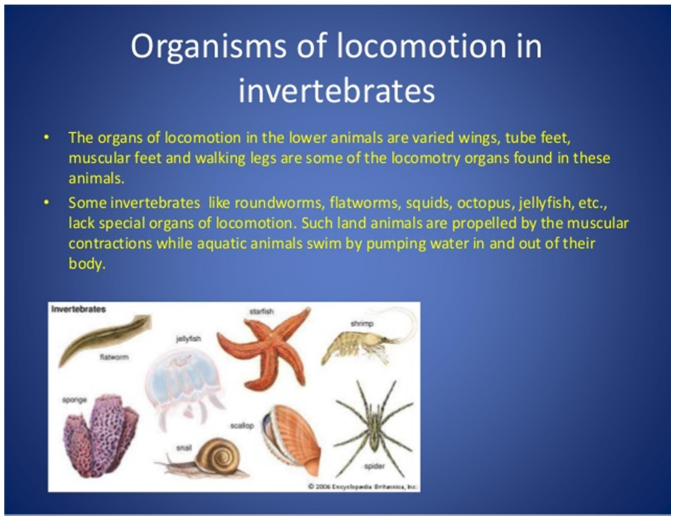
LEVEL-II

1-C	6-C	11-B	16-C	21-C	26-D	31-A	36-C	41-D	46-D
2-D	7-C	12-D	17-D	22-C	27-B	32-B	37-D	42-A	47-A
3-D	8-D	13-D	18-A	23-D	28-D	33-B	38-C	43-A	48-A
4-C	9-B	14-C	19-D	24-C	29-A	34-C	39-C	44-C	49-A
5-A	10-A	15-B	20-C	25-A	30-A	35-B	40-C	45-D	50-C

LEVEL-III

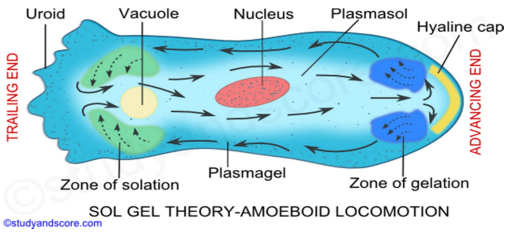
1-4	4-2	7-3	10-4	13-2	16-4	19-4	22-3
2-3	5-3	8-2	11-4	14-4	17-1	20-3	23-1
3-2	6-2	9-1	12-2	15-3	18-2	21-3	24-2

UNIT-5
LOCOMOTION AND REPRODUCTION



Topics covered

1. Pseudopodia
2. Flagella
3. Cilia
4. Flagellar and Ciliary Movement



MAJOR LEARNING OBJECTIVE

- Students will be able to recognize, identify, understand and apply the knowledge of the locomotion in living organisms.
- Students will be able to understand the importance of locomotion in living organisms**"(in search of food, shelter, mate and escape from predators)**

LEARNING OUTCOMES

- Be able to name the organs of locomotion.
- Be able to describe the major functions of locomotory organelles.
- Be able to explain the role of pseudopodia, flagella and cilia.
- Be able to list the parts of locomotory organells
- Be able to describe the function of pseudopodia, flagella and cilia

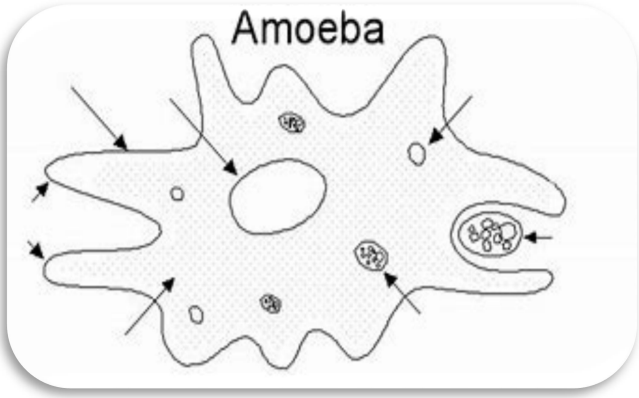
1. Locate and rewrite the difficult key words from the text book

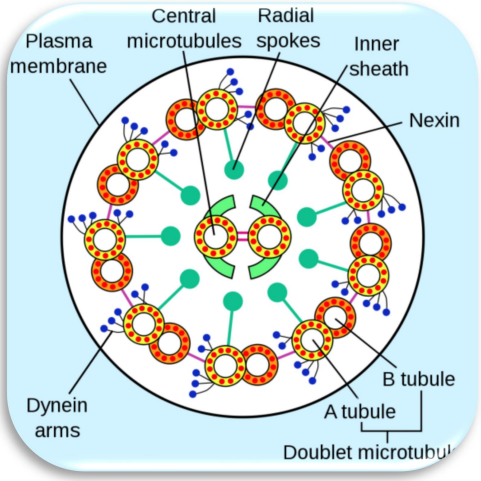
1. Pseudopodia	6. infra ciliary system
2. Flagella	7. axoneme
3. Cilia	8. synchronus movement
4. Myonemes	9. metachronous movement
5.sol-gel theory	10. neuro motorium

2. Defining key words: (Search through the Text and write)

1.reticulopodia	
2.Heliopodia	
3.microtubules	
4.kinetosome	
Kinety	
6.panto cro nematic	
7.anematic	
8. neuromotorium	
9.simple conical gyration	
10.gliding locomotion	

3. Identifying the parts of the AMOEBA



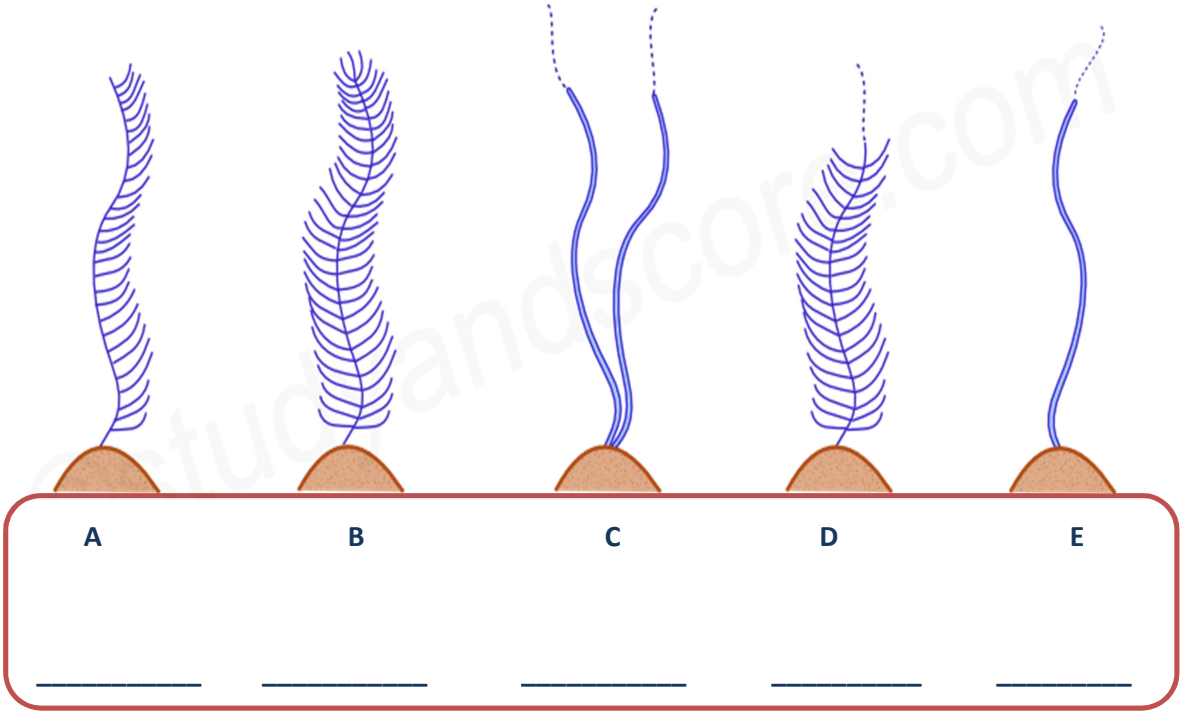


_____ _____ _____

_____ _____ _____

_____ _____ _____

4. identify the names of flagella



_____ _____ _____ _____ _____

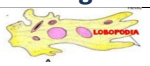
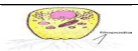
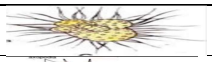
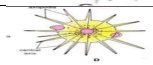
5. concept based

1. The voluntary movement from one place to another place in search of food, shelter or mate or escape from the predators is called_____

2. Locomotion in protozoans is performed by _____

   a. cellular extensions _____ eg._____
   b. short hair like cell organelles _____ eg. _____
   c. whip like cell organelles _____ eg. _____
   d. contractile fibrils _____ eg. _____

3. Types of pseudopodia:

Sl No.	pseudopodia	Shape	Example	diagram
1	Lobopodia	_____	Amoeba, Entamoeba	
2	_____	Fibre or thread	Euglypha	
3	Reticulopodia	Net-like	_____	
4	_____	Sun ray like	Actinophris	

4. The sol gel transformation theory is the most accepted theory.

Plasma gel $+H_2O$ (solation) → plasma sol- ? → pseudopodium _____ displacement of the body in the forward direction.

5. Axoneme: is the central _____ micro tubular structure of flagellum

6. An axoneme is made up of 2 central _____ and _____ doublets.

7. Microtubules formed by the protein _____

8. Peripheral doublets are interconnected by linkers called _____

9. Dynein arms are made up of the protein _____

10. AXONEME

C1, C2 tubules-made	----------
C1,C2 tubules connected	----------
A ,B tubules –made	----------
A tubule arms	----------
Linkers	----------
A ,B tubules attached	----------

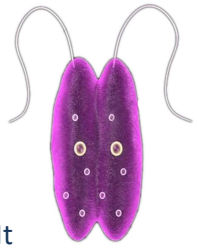
11.Types of flagella

Type of flagella	Number of rows of Mastigonemes on axoneme	Terminal filament(y/n)	Example animal
Sticho-nematic	----------	No	Euglena& ----------
----------	Two rows	No	Peranema&monas
A-cro-nematic	----------	Yes	----------&polytoma
Panta-cro-nematic	Two rows	----------	urceolus
A----------	No mastigonemes	No	Chilomonas, cryptomonas

12. Number of flagella:

Animal	No of flagellas
Euglena	----------(long and short)
----------	One(long)
Trichomonas	----------
Giardia	Four pairs
----------	Many

13. Small hair like structures found in ciliate protists, epithelial lining of respiratory tract, genital ducts, ventricles of brain etc. are ----------



14. ---------- system is located just below the pellicle in the ectoplasm of a ciliate. It includes kinetosomes, kinetodesmal fibrils and kinetodesmata.

15. The kinetosomal fibrils are connected to the kinetosomes and run along the right side of each row of kinetosomes as a cord of fibres called ----------

16. A longitudinal row of ---------- together with ----------constitute a unit called kinety.

17. The infracilairy system and motoorium form the ---------- that controls and coordinates the movement of cilia.

18. ---------- are the contractile fibrils present below the pellicle in the ectoplasm. They occur in flagellates, apicomplexans and ciliates

19. Swimming locomotion in protozoans is brought by ----------&----------

20. Bending movement of a flagellum is brought about by the sliding of ---------- past each other due to the functioning of ----------arms by utilizing ATP

21. Flagellum becomes rigid and starts bending to one side beating against the water. This beating against water is at right angles to the body axis and the organism moves forwards is called----------

22. Flagellum becomes comparatively soft so as to after least resistance to water and moves backwards to its original position. It is called----------

23. In ----------movement, a flagellum turns like a screw. This exerts the propelling action that pulls the organism forwards through water with a spiral rotation around the axis of movement and gyration on its axis.

24. The small zig-zag movement in some protozoans caused by the contraction and relaxation of myonemes present below the pellicle in the ectoplasm is called ----------

25. Gliding movements are shown by flagellates, ----------, cnido-sporans and ----------

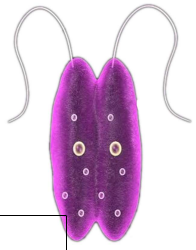
26. ---------- are the fastest protozoans

27. In paramecium, cilia helps in the movement of food through ---------- and in locomotion (NCERT)

28. Hydra can use its ---------- for capturing its prey and also use them for locomotion (NCERT)

6. STATEMENTS TRUE OR FALSE

Sl. No.	Statement	True/ False
1	pseudopodia is cellular extension	
2	cilia and flagella are the cellular extensions	
3	myonemes are the contractile proteins	
4	pseudopoidia are found in rhizopoda	
5	the sol-gel theory is the less accepted theory	
6	Allens theory of front contraction or fountain theory is more appropriate	
7	Amoeboid movement is performed by polystomella & actinophrys	
8	flagella are found in rhizopoda protozoans	
9	An axoneme is made up of 9+ 2 array	
10	Microtubules are made with dynein	
11	peripheral tubules are made with tubulin	
12	dyenin arms are made up of tectin	
13	radial spokes helps the doublets ,during the bending movements	
14	flagella arises from kinetosome	
15	basal granule has 2 central singlets and 9 peripheral doublets	
16	sticho nematic flagella has two rows of mastigonemes	
17	Panto nematic flagella has two rows of mastigonemes and terminal filament	
18	A cro nematic has one row of mastigonemes and has terminal part	
19	panta cronematic has two or many rows of mastionemes and terminal part	
20	chilomonas has Anematic flagelllum.	
21	Tripanosoma has one, Eugleena has two, trichomonas has four, giardia has four pairs and many flagella in trichonympha	



22	in verticella, the entire body is covered by cilia	
23	paramecium is the advanced ciliate	
24	in the suctorians (acinata) the cilia are confined to the juvenile stages only	
25	Adult suctorians posses suctorial tentacles which help in feeding	
26	Euglena has infra ciliary system	
27	A longitudinal row of kinetosomes together with kinetodesmata is called neuro motor system	
28	Myonemes are cellular extensions which present in flagellates, apicompleians and ciliates	
29	Flagella and cilia are also called undulipodia by hymen	
30	Bending movement of a flagellum by the dynein arms, by utilizing ATP.	
31	Dynein arms are the sites of ATP ase activity in the cilia and flagella	
32	Undulation movement from base to the tip, causes the organism is pushed forwards	
33	Undulation movement from tip to the base, causes the organism is pulled backwards	
34	The organism moves forward by the effective stroke	
35	The sequential movement of cilia, in a longitudinal row, one after the other in one direction is called synchronous movement	
		Answers at the end….

7. MULTIPLE CHOICE

1. Reticulopodia, netlike pseudopodia are found in

a. entamoeba b. actinophrys c. euglypha d. Elphidium

2. An axoneme is made up of

a. 2 peripheral doublets and 9 central singlets
b. 2 central singlets and 9 peripheral doublets
c. 2 central doublets and 9 peripheral singlets
d. No central singlets and 9 peripheral triplets

3. The protein in dynein arms

a. Tubulin b. nexin c. dynein d. tectin

4. Go through the statements and which is the incorrect

a. all locomotions are movements and vice versa
b. streaming of protoplasm in amoeba is a type of movement.
c. methods of locomotions vary with the habitats of organisms
d. paramecium employs cilia for pushing food in cytopharynx and in locomotion.

5. The flagella which has two rows of mastigonemes and terminal filament

A. pato nematic b. acro nematic c. anematic
d. pantacronematic e. sticonematic

6. The number of flagella in Giardia

a. four b. four pairs c. many d. two

7. the cilia are confined to the juvenile stages only in

a. paramecium b.acinata c.vorticella d. euglena

8. Streaming of the cytoplasm /cyclosis in

a. Amoeba b. macrophages c. both a &b d. none

9. Each row of kinetosomes as a cord of fibres called

a. kinetodesmata b. kineto fibrils c. kinety d. motorium

10. In undulation movement of flagella, the backward movement is

a. from base to tip, pushing force,
b. from tip to the base , pulling force
c. from tip to the base, pushing force
d. from base to tip, pulling force

11. Cilia in longitudinal beat one after the other in one direction is called

a. synchronous movement
b. metachronous movement
c. gliding movement
d. conical gyration movement

12. Which locomotion is faster?

a. amoeboid b. flagellar c. ciliary d. none

8. MATCH THE FOLLWING

13. **Locomotion of PROTOZOANS by the help of**

A. Cellular extensions	1) flagella euglena
B. Short hair like cell organelles	2) myonemes euglena
C. Long whip like cell organelles	3) cilia paramecium
D. Contractile fibrils	4) pseudopodia, amoeba

(a) A=4, B=3, C=1,D=2

(b) A=1, B=3, C=4, D=2

(c) A=2, B=3, C=1,D=4

(d) A=2, B=1, C=4,D=3

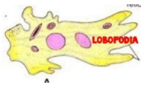
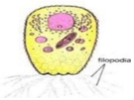
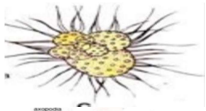
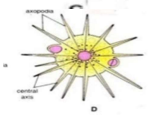
14. Study the following question, choose the correct option

Coloumn-I	**coloumn-II**
A. Reticulopodia	1. Sun ray like, Actinophris
B. Filopodia	2.Fibre or thread, Euglypha
C. Lobopodia	3.Net-like Elphidium
D. Heliopodia or axo podia	4.Blunt finger Amoeba, Entamoeba

(a) A=3,B=4,C=2,D=1 (b) A=4,B=3, C=2,D=1

(c) A=4,B=3,C=1,D=2 (d) A=3,B=2, C=4 ,D=1.

15. Study the following question, choose the correct option

Coloumn-I	**coloumn-II**
A. 	1. Actinophris
B. 	2.Elphidium
C. 	3. Euglypha
D. 	4. Aamoeba

(a) A=3,B=4,C=2,D=1 (b) A=4,B=3,C=2,D=1

(c) A=4,B=3, C=2,D=1 (d) A=4;B=3,C=1,D=2.

16. Study the following question, choose the correct option

Coloumn-I		**coloumn-II**
1.Panta-cro-nematic	( )	a.One row of mastigonemes no terminal filament
2.Anematic or simple	( )	b.Two rows of mastigonemes no terminal filament
3.A-cro-nematic	( )	c.No mastigonemes, terminal filament
4.Sticho-nematic	( )	d.Two rows of mastigonemes, terminal filament
5.Panto-nematic	( )	e.No mastigonemes no terminal filament

a)1=a, 2=b, 3=c, 4= d,5=e (b) 1=d, 2=e, 3=c 4=a,5=b

(c)1=a, 2=d, 3=c 4= d,5=b (d) 1=b, 2=a, 3=c 4= d,5=e

17. **Study the following question, choose the correct option**

Coloumn-I		**coloumn-II**
1.Panta-cro-nematic	( )	a. Euglena, astasia
2.Anematic or simple	( )	b. Chlamydomonas, polytoma
3.A-cro-nematic	( )	c. urceolus
4.Sticho-nematic	( )	d. Peranema, monas
5.Panto-nematic	( )	e. Chilomonas, cryptomonas

(a) 1=a, 2=b, 3=c, 4= d,5=e (b) 1=d, 2=e, 3=c 4=a,5=b

(c) 1=c, 2=e, 3=b 4= a,5=d (d) 1=b, 2=a, 3=c 4= d,5=e

18 **Study the following question, choose the correct option**

Coloumn-I		**coloumn-II**
1. euglena	( )	a. One(long) flagellum
2. trypanosome	( )	b. Many flagella
3. giardia	( )	c. Four flagella
4. trichonympha	( )	d. Four pairs flagella
5. trichomonas	( )	e. Two(long and short) flagella

(a) 1=a, 2=b, 3=c, 4= d,5=e (b) 1=e, 2=a, 3=d, 4=b,5=c

(c) 1=a, 2=d, 3=c 4= d,5=b (d) 1=b, 2=a, 3=c 4= d,5=e

19. **Study the following question, choose the correct option**

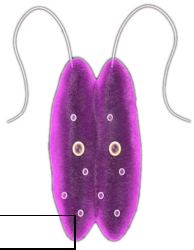
Coloumn-I		**coloumn-II**
1. A ,B tubules attached	( )	a. Tubulin
2. Linkers	( )	b. Nexin
3. A tubule arms	( )	c. Dynein
4. A ,B tubules –made	( )	d. Tectin

(a) 1=d, 2=b, 3=c, 4= a, (b) 1=e, 2=a, 3=d, 4=b,

(c) 1=a, 2=d, 3=c 4= d, (d) 1=b, 2=a, 3=c 4= d,

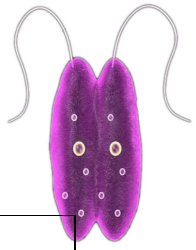
Answers for concept based.

1	Locomotion
2	a. pseudopodia, amoeba b. cilia, paramecium c. flagella, Euglena d. euglena, Euglena
3.	<table><tr><td></td><td>Blunt finger</td><td></td></tr><tr><td>Filopodia</td><td></td><td></td></tr><tr><td></td><td></td><td>Elphidium</td></tr><tr><td>Heliopodia or axo podia</td><td></td><td></td></tr></table>
4	H_2O(gelation)
5	---------- longitudinal.
6	2 central singles and 9 peripheral doublets(9+2 array).
7	Tubulin
8	Nexins
9	Dynein
10	Dynein Nexin Tubulin Dynein Nexin Tectin

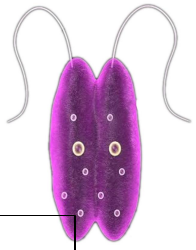


11	FLAGELLA			
	TYPE OF FLAGELLA	MASTIGONEMES	TERMINAL FILAMENT	EXAMPLE
		One row		Astasia
	Panto-nematic			
		No mastigonemes		Chlamydomonas,
			Yes	
	A-nematic or simple			
12	ANIMAL		NUMBER OF FLAGELLA	
			Two(long and short)	
	Trypanosome			
			Four	
	Trichonympha			
13	Cilia			
14	infra ciliary system			
15	kinetodesmata.			
16	kinetosomes ,kinetodesmata			
17	neuro motor system			
18	myoneme			
19	flagella& cilia			
20	peritubules &dynein arms			

Answers for concept based.	
21	effective stroke
22	recovery stroke
23.	simple conical gyration
24	Gliding
25	sporozoans, cnidosporans &some ciliates
26	Ciliates
27	Cytopharynx
28	Tentacles



Note: Correct Statements are given in the brackets.	
1	**True**
2.	False (cell organelles)
3	**True**
4	True
5	False (most accepted)
6	**True**
7	**True**
8	**True**
9	**True**
10	False (tubulin)
11	**True**
12	False (dynien)
13	**True**
14	**True**
15	False (central tubules absent)
16	False (one row)
17	False (no terminal filament)
18	True
19	**True**
20	**True**
21	**True**
22	False(only peristomial part)
23	False(vorticella is advanced)
24	**True**
25	**True**
26	False(axoneme, it has flagella)
27	False (infraciliary system &motorium called neuro motor system)
28	**True**
29	**True**



30	**True**
31	**True**
32	False (backward movement)
33	False (farword movement)
34	True
35	False (metachronous)

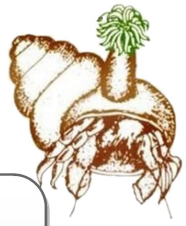
Multiple choice

1	**D**
2	**B**
3	**C**
4	**A**
5	**D**
6	**B**
7	**B**
8	**C**
9	**A**
10	**A**
11	**B**
12	**C**
13	**A**
14	**D**
15	**B**
16	**B**
17	**C**
18	**B**
19	**A**

9.

VSAQ**	1	Draw a labeled diagram of T.S of flagellum
**	2	List any two differences between a flagellum and a cilium
***	3	What are dynein arms ?what is their significance
***	4	What is a kinety
**	5	Distinguish between synchronus and metachronous movement
	6	Distinguish between lobopodium and filopodium. Give an example to each of them
SAQ*	7	Name the system that controls the fastest swimming movement of protozoans and write its components
***	8	Write the mechanism of bending of flagellum and explain effective and recovery strokes
*	9	What are lateral appendages? Based on their presence and absence ,write the various tpes of flagella giving atleast one example for each.
*	10	Give an account of pseudopodia
***	11	Give an account of the structure of an axoneme

Contd……..



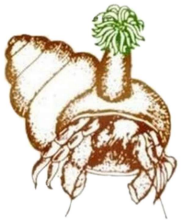
UNIT-6
BIOLOGY IN HUMAN WELFARE

Major learning objective and Learning out comes.

Students will be able to know the definition and difference and different types of Parasites, Hosts and reservoirs

- **Students will be able to know the parasitism and parasitic adaptations and its effects on hosts**
- **Students will be able to know the key words Health and disease**
- **Different parasites and their life history**
- **Students will be able to understand the adverse effects of TDA Abuse**
- **Students will know the adolescence changes and how to overcome from vulnerable phase period.**

CONTENTS.



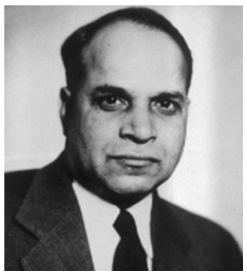
8.TDA Abuse (Tobacco, Drugs and Alcohol abuse)

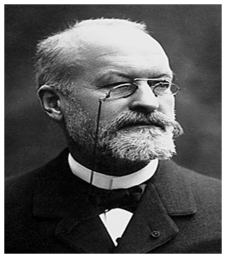
i. Tobacco
ii. Drugs
iii. Alcohol
iv. Adolescence and TDA abuse
v. Addiction and Dependence
vi. Adverse effects of drugs and alcohol abuse
vii. Prevention and Control

9. Level-I, II, III Questions.(Multiple choice questions, Fill in the blanks, True or False Pictorial and Assertion and reason)
10. Key.

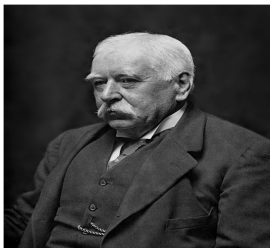
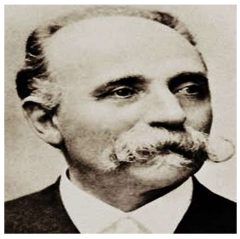
ACTIVITIES

- First read the text book thoroughly and logically
- Draw the neat labeled diagrams of life history of parasites
- Identify the difficult key words from the textbook
- Define key words
- Go through the additional reading material for the purpose of competitive Examinations
- Practice exercise consists of a number of sections like Multiple choice questions, fill in the blanks True or false
- Prepare thoroughly subjective questions including very short answer type and short and long answer type.

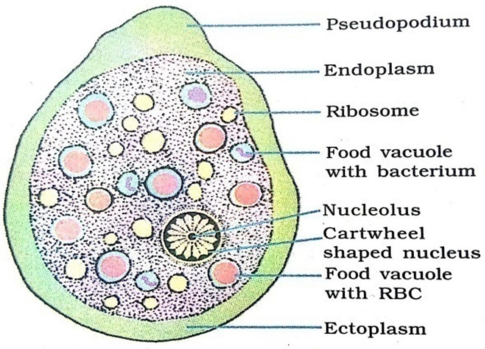
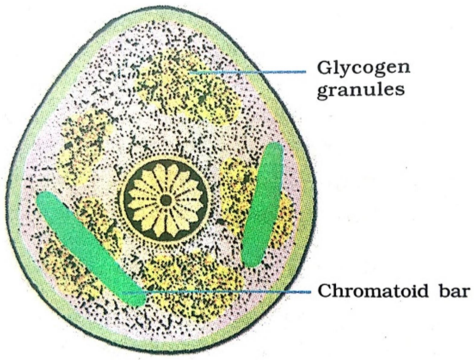
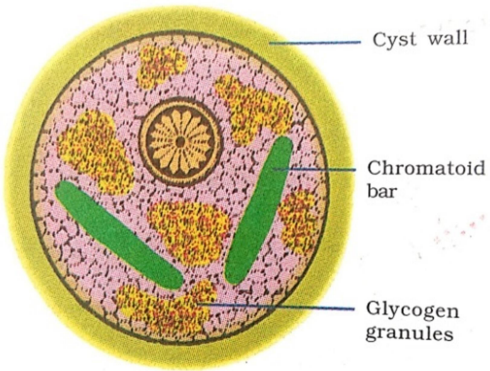
Dr.Yellapragada subbarao (Wonder Man of Miracle Drugs) 	➢ He was born at Bhimavaram,West Godavari district of Andhra Pradesh on 12th January 1895.The greatest Indian biochemist. **He discovered** ➢ **Folic acid (Vitamin B9)** for treatment to the "Tropical sprue" ➢ The function of **Adenosine Triphos Phate(ATP**) as energy source in the cell, ➢ Developed "**Methotrexate** " a chemotherapy drug to treat cancer and rheumatoid arthritis ➢ **Di Ethyl Carbomazine**(DEC popular brand name Hetrazan for treating filariasis ➢ Under **Dr.Subbarao guidance Benjamin Duggar** discovered **Tetra Cycline** and **Chol tetra cycline** antibiotics which are using for the treatment of cholera, plague, typhus fever, trench fever.

Charles Louis Alphonse Laveran 	➢ French physician born on 18th June 1845 ➢ Won Nobel prize in medicine in 1907 for **discovery of Malaria parasites Plasmodium and Trypanosoma**

Sir Ronald Ross 	➢ British medical doctor born on 13th May1857 ➢ **Won Nobel prize in 1902 for identification the oocysts of Plasmodium in the stomach walls of female Anopheles mosquito**

Sir Patrick Manson 	➢ Scottish physician born on 3rd October 1844 ➢ **Founder of the field of Tropical medicine** ➢ **Suggested that malaria might be spread by mosquitoes**
Camillo Golgi 	➢ Italian biologist born on 7th july1843 ➢ He shared the Nobel prize in 1906 with Santiago Ramon for their work on the structure of nervous system ➢ **In 1886 he discovered the Erythrocytic cycle of Plasmodium in human** ➢ **He discovered Cell organelle Golgi apparatus**

1.Draw the neat labeled diagrams of parasites and its life cycles

Trophozoite stage of Entamoeba histolytica  Fig. 6.1 Trophozoite Stage	**Draw labeled diagram of Trophozoite stage of Entamoeba histolytica**
Precystic stage of Entamoeba histolytica  Fig. 6.2 Precystic stage	**Draw labeled diagram of Precystic stage of Entamoeba histolytica**
Cystic stage of Entamoeba histolytica  Fig. 6.3 Cystic stage	**Draw labeled diagram of Cystic stage of Entamoeba histolytica**

Life cycle of Entamoeba histolytica

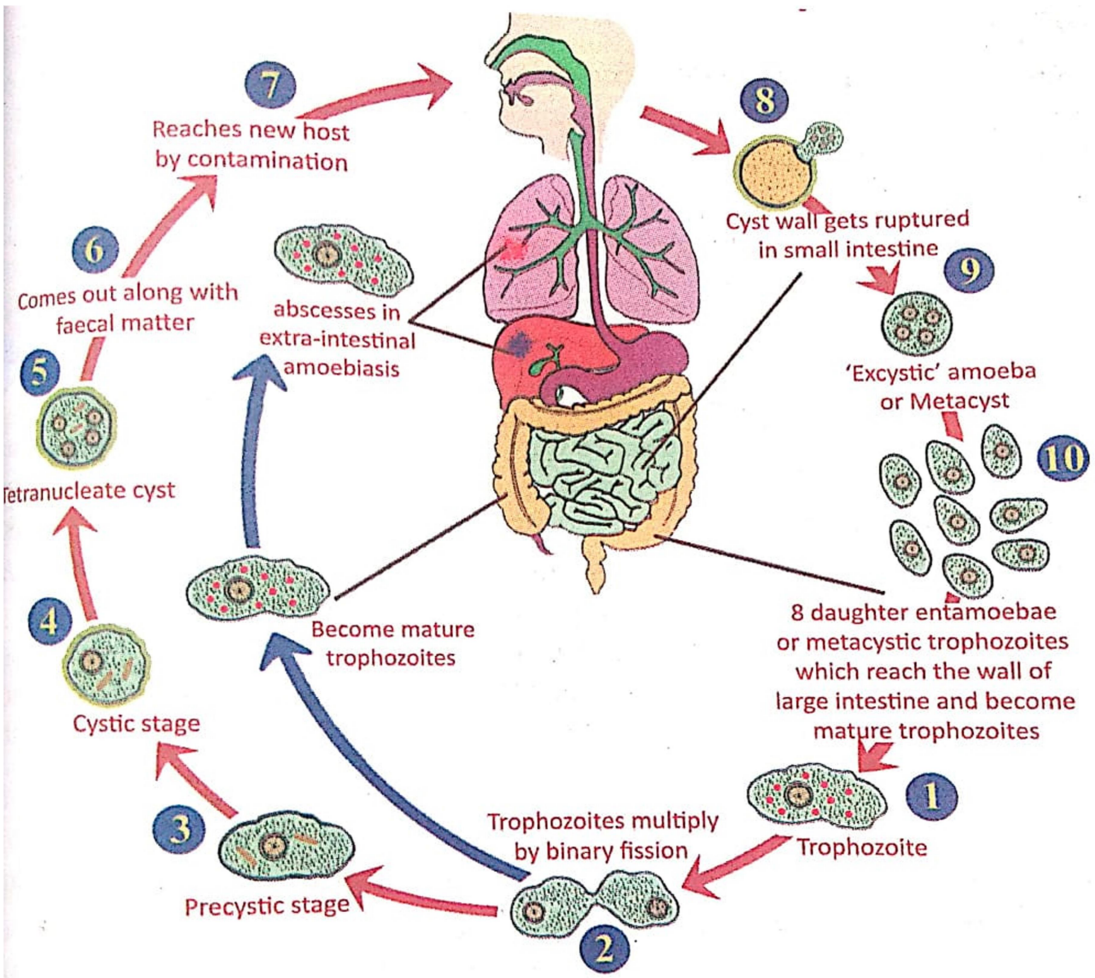
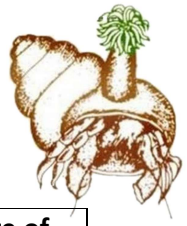


Fig. 6.4 Life cycle of *Entamoeba histolytica*

Draw Labeled diagram of the Life cycle of Entamoeba histolytica



Structure of Sporozoite of Plasmodium	Draw labeled diagram of Structure of Sporozoite of Plasmodium

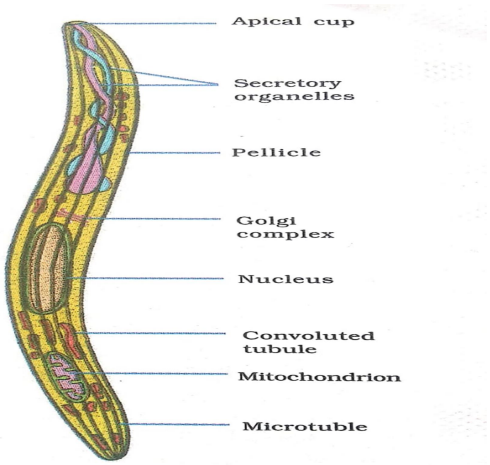


Fig. 6.5 Structure of sporozoite

Asexual life cycle of plasmodium in man	Draw labeled diagram of Asexual life cycle of plasmodium in man

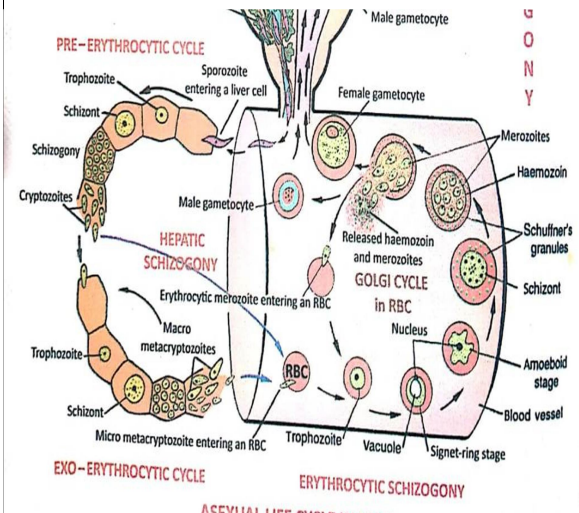
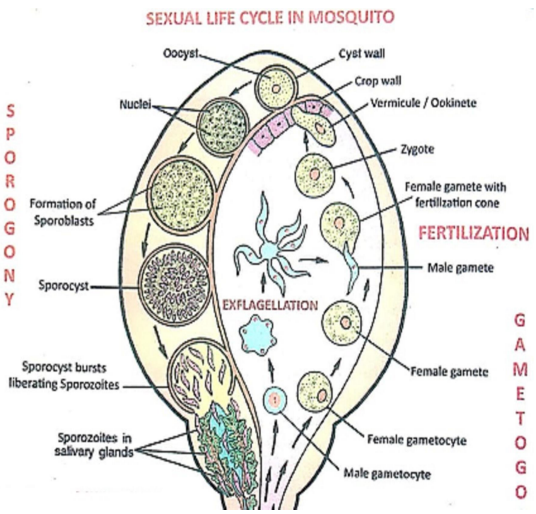


Fig. 6.6 Life cycle of *Plasmodium vivax*

Sexual life cycle of plasmodium in Mosquito	Draw labeled diagram of Sexual life cycle of plasmodium in Mosquito
	

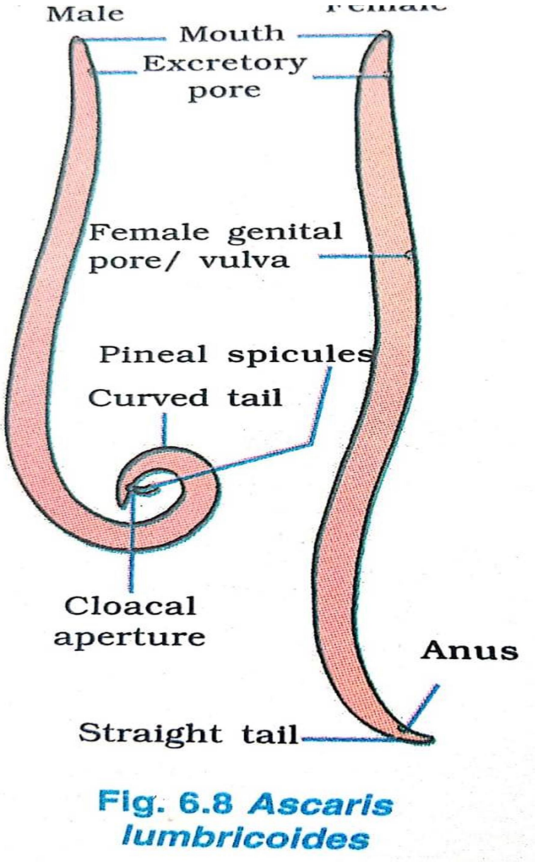
Ascaris lumbricoides Male and female	Draw labeled diagram of Ascaris lumbricoides Male and female
	

Fig. 6.8 *Ascaris lumbricoides*

Mammillated Eggs of Ascaris	**Draw labeled diagram of Mammillated Eggs of Ascaris**

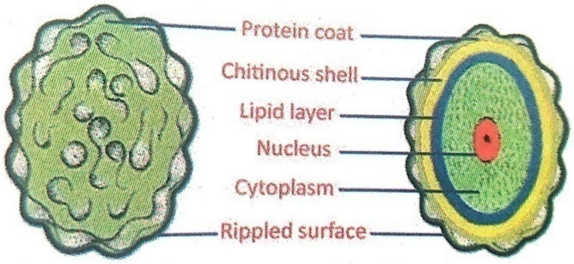


Fig. 6.9 Mammillated eggs of *Ascaris*

Diagram of the Life cycle of Wuchereria bancroftii

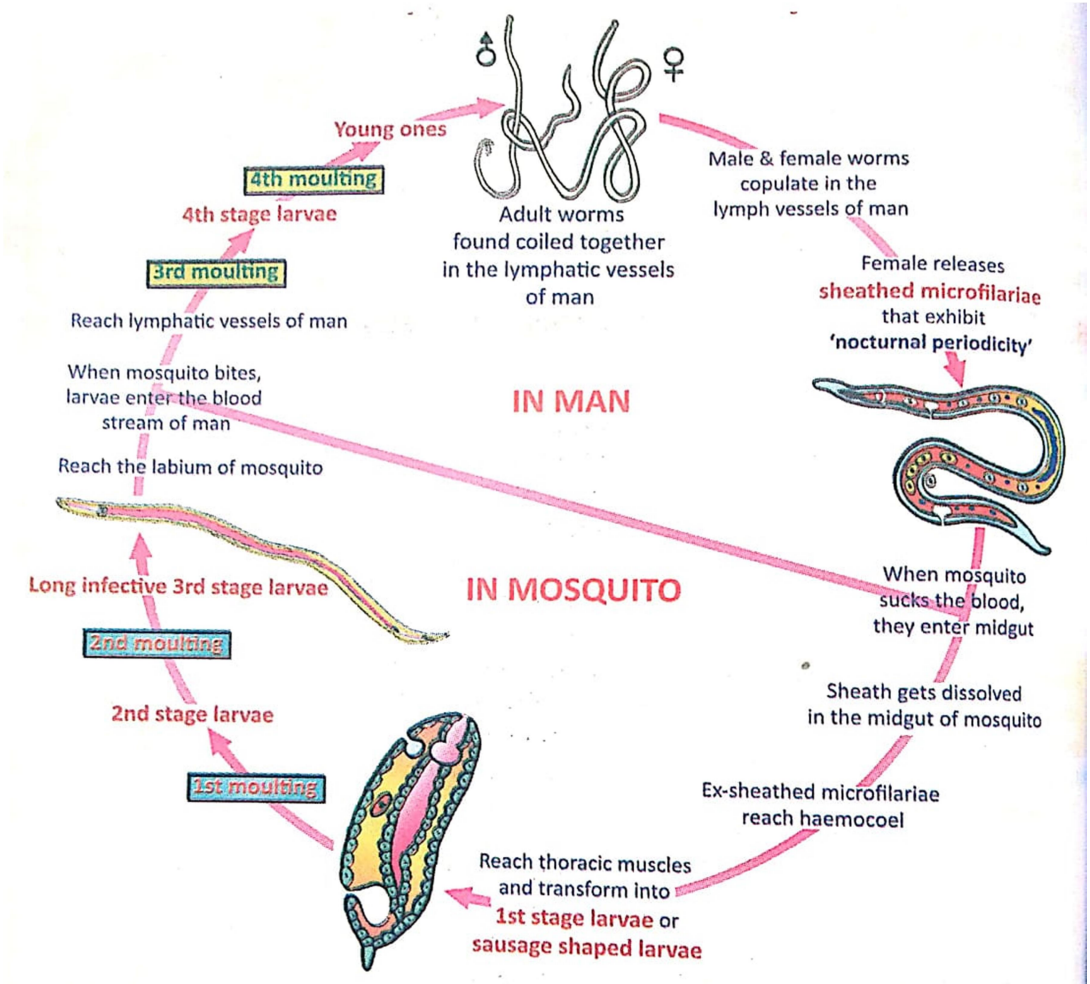
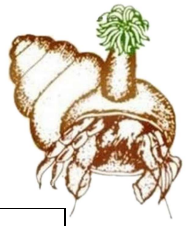
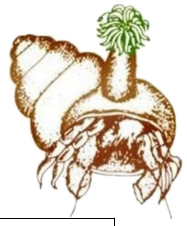


Fig. 6.12 Life cycle of *Wuchereria bancrofti*

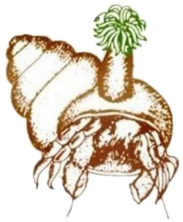


Draw labeled diagram of the Life cycle of Wuchereria bancroftii



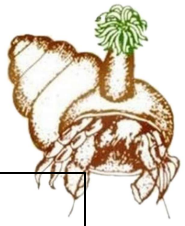
2. **Identify the difficult key words from the textbook**

1.	**26.**
2.	**27.**
3.	**28.**
4.	**29.**
5.	**30.**
6.	**31.**
7.	**32.**
8.	**33.**
9.	**34.**
10.	**35.**
11.	**36.**
12.	**37.**
13.	**38.**
14.	**39.**
15.	**40.**
16.	**41.**
17.	**42.**
18.	**43.**
19.	**44.**
20.	**45.**
21.	**46.**
22.	**47.**
23.	**48.**
24.	**49.**
25.	**50.**

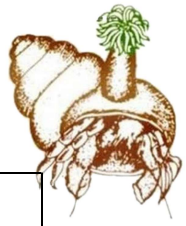


3. Defining key words (Search through the text book and write)

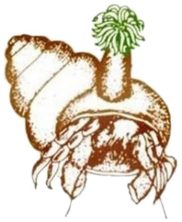
1.Parasite	
2.Host	
3.Reservoir host	
4.Vector	
5.Parasitic castration	
6.Neoplasia	
7.Gigantism	
8.Hyperplasia	
9.Hypertrophy	
10.Health	
11.Disease	
12.Pathogen	
13.Encystation	
14.Carriers	
15.Prepatent period	



16.Incubation period	
17.Gametogony	
18.Sporogony	
19.Splenomegaly	
20.Hypnozoites	
21.Mammillated eggs	
22.Lymphangitis	
23.Lymphadenitis	
24.Lymphoedema	
25.Elephantiasis	
26.Opioids	
27.Cannbinoids	
28.Coca alkaloid	
29.Adolescence period	
31.Euphoria	



32.Hallucinations	
33.Ovoviviparous	
34.Peer	
35.Tranquilizers	
36.Tropical sprue	
37.Vandalism	
38.Vulnerable	
39.Abscess	
40.Emaciation	
41.Epidemiology	
42.Vicious circle	
43.Vaccine	
44.Schizogony	

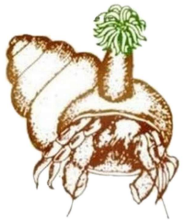


ADDITIONAL READING MATERIAL FOR COMPETITIVE EXAMINATIONS

1. Study of diseases – **Pathology**
2. Study of Disease Symptoms – **Symptomology**
3. Study of wounds – **Traumatology**
4. Study of Immunity/Vaccines – **Immunology**
5. Study of virus – **Virology**
6. Study of Bacteria – **Bacteriology**
7. Study of Fungi – **Mycology**
8. Study of Protozoans – **Proto zoology**
9. Study of Helminthes- **Helminthology**
10. Study of Transmission of diseases **– Epidemiology**
11. Study of Disease treatment-**Therapeutics**
12. Father of Pathology/Founder of modern Medicine **- Rudolf Virchow**
13. Father of immunology/Vaccination – **Edward Jenner**
14. Father of Mycology- **Michele**
15. Father of medicine – **Hippocrates**

Viral diseases

Disease	Causing Virus	Affected organs/Systems
1.Cold	Rhinovirus	Respiratory track
2.Chicken pox	Varicella	Skin
3.Small pox	Variola	Skin
4.Measles	Rubeola virus (Paramixovirus)	Skin, Respiratory system
5.Mumps	Myxovirus parotidus	Parotid salivary glands
6.Chicken gunya	Alpha virus(CHIKV)	Joints
7.Dengue	DENV (Flavi virus)	Circulatory system/joints/skin
8.Rabies	Rhabdo virus(Lyssa Virus)	Central nervous system/Hydrophobia
9.Hepatitis	HAV,HBV,HCV,HDV	Liver
10.Japanese encephalitis	JEV (Arbo virus)	Brain
11.Polio	PMV, Entero virus	Peripheral nervous system
12.Flu (Influenza)	Influenza virus(Ortho myxo virus)	Respiratory system
13.AIDS	HIV	Immunity system
14.Covid-19	Corona virus	Respiratory /Circulatory /Digestive systems



COVID-19 pandemic

The **COVID-19 pandemic**, also known as the **coronavirus pandemic**, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1] The disease was first identified in December 2019 in Wuhan, China.[4] The World Health Organization declared the outbreak a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on 11 March. As of 17 September 2020, more than 29.8 million cases have been reported in 188 countries and territories, resulting in more than 941,000 deaths; more than 20.3 million people have recovered.[5]

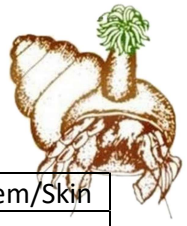
The disease mainly spreads between people when they are in close proximity.[b] It spreads very easily and sustainably, primarily via contaminated droplets produced during breathing, coughing, sneezing, talking and singing.[7][8] Many larger droplets rapidly fall to the ground, however some can be suspended in air as aerosols, especially in indoor spaces.[8] It may also be transmitted via contaminated surfaces, although this has not been conclusively demonstrated.[8][9][10] It can spread for up to two days prior to symptom onset, and from people who are asymptomatic.[8] People remain infectious in moderate cases for 7-12 days, and up to two weeks in severe cases.[8][11]

Common symptoms include fever, cough, fatigue, shortness of breath or breathing difficulties, and loss of smell. Complications may include pneumonia and acute respiratory distress syndrome. The incubation period is typically around five days but may range from two to 14 days. Recommended preventive measures include hand washing, covering mouth when coughing, social distancing, wearing a face mask in public, disinfecting surfaces, ventilating and air-filtering, and monitoring and self-isolation for people who suspect they may be infected. Authorities worldwide have responded by implementing travel restrictions, lockdowns, workplace hazard controls, and facility closures to slow the spread of the disease. Many places have also worked to increase testing capacity and trace contacts of the infected.

(Courtesy-Wikipedia)

Bacterial diseases

Disease	Causing Bacterium	Affected organs/Systems
1.Cholera	Vibrio cholera	Alimentary canal
2.Typhoid	Solmonella typhi	Alimentary canal
3.Pneumonia	Streptocococcus pneumonia/Diplococus pneumonia/Haemophilus influenzae	Lungs
4. Diphtheria	Corinibacterium diptheriea	Throat
5.Pertusis(Whooping cough)	Bordutella pertusis	Lungs
6.Tetanus	Clastredium tetani	Muscular/Nerrvous
7.Tuberculosis	Mycobacterium tuberculi	Lungs/Skin/Brain
8.Leprocy(Hansen disease)	Mycobacterium leprey	Peripheral nervous system/Skin



9.Anthrax	Basillus anthrasis	Peripheral nervous system/Skin
10Plague	Pasturella pestis	Skin/Digestive/Circulatory
11.Meningitis	Nissera meningitis	Brain
12.Gonorrhea	Neisseria gonorrhoeae	Reproductive system
13.Syphilis	Treponema pallidum	Reproductive system

Fungal diseases

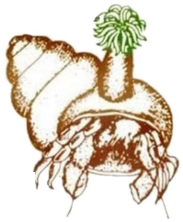
Disease	Causing Fungi	Affected organs/Systems
1.Ringworm	Microsporum	Skin
2.Athlete's foot	Trichophyton/Epidermo phyton	Foot toes skin
3.Madurafoot(Eumycetoma)	Madurella mycetomatis	Skin and Foot skin
4.Candidiasis	Candida	Skin

Pathogenic Protozoans

Disease	Causing Protozoan	Affected organs/Systems
1.African Sleeping sickness	Trypanosoma gambiense	Circulatory systems/Nervous system
2.Chagas disease	Trypanosoma cruzi	Circulatory systems/Nervous system
3.Kala azar/Dum dum fever/Visceral leishmaniasis	Leishmania donavani	Circulatory system
4.Oriental sores/Delhi boils/Tashkent ulcers	Leishmania tropica	Skin
5.Leucorrhoea	Trichomonas vaginalis	Female reproductive system

Pathogenic Helminthes

Disease	Causing Helminth	Affected organs/Systems
1.Fasciolosis (Liver rot)	Fasciola hepatica(Liver fluke)	Liver
2.Schistosomiasis	Schistosoma (Blood fluke)	Circulatory system
3.Cystecercosis/Taeniasis	Taenia solium(Pork tapeworm,Taenia saginata(Beeftapeworm)	Digestive system/Brain
4.Ancylostomiasis	Ancylostoma (Hook worm)	Digestive system
5.Trichinosis	Trichinella (Pork worm)	Digestive/Muscular system
6.Dracanculiasis (Narikurupu)	Dracanculus	Sub cutaneous skin



MULTIPLE CHOICE QUESTIONS

LEVEL-1

1. A parasite that lives exclusively on the surface of the host's body ( )

A. Ecto parasite. B. Endo parasite

C.Hyper parasite D.Digenetic parasite

2. A parsite that lives in/on the body of another parasite ( )

A. Ecto parasite. B. Endo parasite

C.Hyper parasite D.Digenetic parasite

3. Parasite living in the gut of the host are called ( )

A.Cytozoic parasite B.Histozoic parasite

C.Enterozoic parasite D. None of the above

4. This is a hyper parasite ( )

A. Plasmodium B.Wuchereria

C.Ascaris D.Nosema notabilis

5. The host in which the parasite undergoes sexual reproduction called as ( )

A. Secondary host B.Primary host

C.Reservoir host D.None of the above

6. When the main host is not available, the parasite lives in the host in which the parasite neither undergoes development nor causes any disease called as ( )

A. Secondary host B.Primary host

C.Reservoir host D.None of the above

7. The vector which transfers the infective stages of a parasite from one host to another but no part of the parasitic development takes place in it. ( )

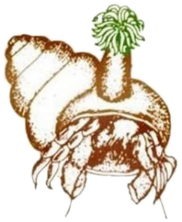
A.Mechanical vector B. Biological vector

C.Reservoir host D. None of the above

8. Some parasites cause the degeneration of gonads of the host,making sterile,this effect is called ( )

A.Neo plasia B. Gigantism

C.Parasitic castration D. None of the above



9. Some parasites cause an abnormal growth of the host cells in a tissue to form new structures this effect is called ( )

A.Neo plasia B. Gigantism

C.Parasitic castration D. None of the above

10.Some parasites cause an abnormal increase in the volume/size of the host cell ( )

A.Neo plasia B. Gigantism

C.Parasitic castration D.Hyper trophy

11. Some parasites cause an abnormal increase in size of the host, this effect is called ( )

A.Neo plasia B. Gigantism

C.Parasitic castration D. None of the above

12.African sleeping sickness disease caused by ( )

A.Trypanosoma gambiense B.Trypanosoma cruzi

C.Leishmania donavani D. Leishmania tropica

13.Chagas disease caused by ( )

A.Trypanosoma gambiense B.Trypanosoma cruzi

C.Leishmania donavani D. Leishmania tropica

14. Kala azar disease caused by ( )

A.Trypanosoma gambiense B.Trypanosoma cruzi

C.Leishmania donavani D. Leishmania tropica

15. Tashkent ulcers disease caused by ( )

A.Trypanosoma gambiense B.Trypanosoma cruzi

C.Leishmania donavani D. Leishmania tropica

16. Amoebic dysentery disease caused by ( )

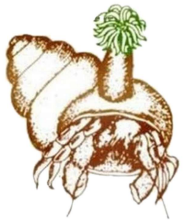
A.Trypanosoma gambiense B.Trypanosoma cruzi

C.Entamoeba D. Leishmania tropica

17.Benign tertian malaria disease caused by ( )

A.Plasmodium vivax B.Plasmodium falciparum

C.Plasmodium ovale D.Plasmodium malariae



18.Malignant tertian malaria disease caused by ( )

A.Plasmodium vivax B.Plasmodium falciparum

C.Plasmodium ovale D.Plasmodium malariae

19.Mild tertian malaria disease caused by ( )

A.Plasmodium vivax B.Plasmodium falciparum

C.Plasmodium ovale D.Plasmodium malariae

20. Quartan malaria disease caused by ( )

A.Plasmodium vivax B.Plasmodium falciparum

C.Plasmodium ovale D.Plasmodium malariae

21.Hepatic Schizogony discovered by ( )

A.Charles Laveran B. Short & Garnham

C. Camillo Golgi D.Ronald Ross

22.Ascaris lumbricoides commonly called as ( )

A.Common round worm B.Hook worm

C.Pin worm D.Eye worm

23.Elephantiasis caused by ( )

A. .Ascaris lumbricoides B. Plasmodium ovale

C.Wucheraria D.Loa loa

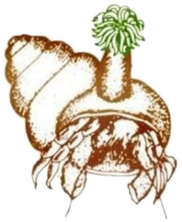
24.Morphine extracted from dried latex of the ( )

A. Pod of poppy plant B.Leaves of Cannabis

C.Leaves of Coca D.None of the above

25Cocaine extracted from ( )

A. Pod of poppy plant B.Leaves of Cannabis C.Leaves of Coca D.None of the above



MULTIPLE CHOICE QUESTIONS
LEVEL- II

1. The below parasite have developed Protective cuticle to withstand the action of the digestive enzymes of the host. ( )

A.Plasmodium B.Giardia C Ascaris D.Entomoeba

2. The below parasite produce anti enzymes to neutralize the effect of hosts digestive enzymes ( )

A.Plasmodium B.Giardia C Ascaris D.Taenia solium

3.This parasite is a facultative anaerobe ( )

A.Plasmodium B.Giardia C Ascaris D.Trypanosoma

4.Parasitic castration seen in ( )

A.Carcinus maenas B.Thenus C. Paeneus D.Belanus

5.Following is a Non infectious disease ( )

A.Nyctolopea B.Osteo malacia C. Amoebic dysentery D. A&B

6.Lobopodium seen in which stage in Entamoeba ( )

A.Cystic stage B.Pre cysticstage C. Trophozoite stage D.None

7.Histolycin an enzyme produced by Entamoeba is a ( )

A.Proteolytic enzyme B.Lipolytic enzyme 3

C.Amylase D.None

8.Which stage is the non feeding and non pathogenic stage in Entamoeba life cycle

A.Trophozoit stage B Pre cystic stage

C.both A&B D.None

9.Chromatoid bars are made up by ( )

A.Carbohydrates B.Lipids

C.Ribonucleo protein D.Cellulose

10.The infective stage of Entamoeba to new human host ( )

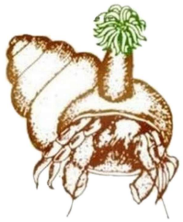
A.Trophozoit stage B.Precystic stage

C.Tetranucleate cystic stage D.None

11.The length of the sporozoite of plasmodium approximately ( )

A. 20 microns B. 25 microns

C.10 microns D.15 microns



12.Pre erythrocytic&Exo erythrocytic cycles of Plasmodium takes place at ( )

A. RBC B.WBC C.Hepatocytes D.Spermatocytes

13.Schizogany is a ( )

A.Sexual reproduction B.Asexual reproduction

C.Encystment D. None

14. The interval between the first entry of Plasmodium in to the blood in the form of sprozoites and the second entry of Plasmodium in to the blood in the form of Cryptozoites is called. ( )

A.Incubation period B.Sedentary period

C.Prepatent period D.Latent period

15.The period between the entry of plasmodium in to the blood in the form of Sporozoite and the first appearance of symptoms of malaria in man is called ( )

A.Incubation period B.Sedentary period

C.Prepatent period D.Latent period

16.Pineal spicules seen in ( )

A.Male Ascaris B.Male Wucheraria

C.Female Ascaris D.A&B

17. The Infective stage of Ascaris lumbricoides to the new Human ( )

A.1st stage rhabditiform B.2nd stage rhabditiform

C.Sausage larva D.None

18.The infective stage of Wuchereria ( )

A. .Sausage larva B.2nd stage microfilaria

C.3rd stage microfilaria D.None

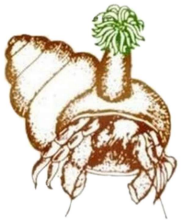
19.Typhoid fever confirmed by ( )

A.Lipid profile test B.Widal test

C.Bile pigment test D.Popsmear test

20 Pneumonia affects ( )

A.Brain B.Kidneys C.Liver D.Lungs



21.Nicotine stimulates the adrenal gland to release Adrenalin and Nor adrenalin which causes ( )

A. Hyper tension & Tachycardia B.Hypo glycemia

C.Hyper glycemia D.Anaemia

22.Heroin chemically known as ( )

A.Diacetyl morphine B.Diethyl morphine

C.Diacetyl cocaine D.None

23.Barbiturates used for ( )

A.Sleeping B.Sleeplessness

C. Hypo glycemia D. Hyper glycemia

24.Amphitamines causes ( )

A.Sleeping B.Sleeplessness

C. Hypo glycemia D. Hyper glycemia

25.Crack or coke obtained from which plant ( )

A.Cannabis sativa B.Papaver somniferum

C.Erythroxylum D.Datura

MULTIPLE CHOICE QUESTIONS
LEVEL- III

1.Which are Digenetic parasites ( )

A.Entamoeba&Ascaris B.Plasmodium&Wuchereria

C.Entamoeba&Giardia D.None

2.Primary host or Definitive host of plasmodium ( )

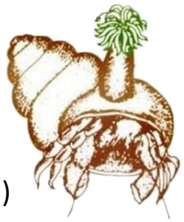
A.Female Anapheles B.Male Anapheles

C.Female culex D.Man

3.Secondaryhost or Intermediate host of Wuchereria ( )

A.Female Anapheles B.Male Anapheles

C.Female culex D.Man



4.The reservoir host of African sleeping sickness causing protozoan ( )

A.Rhesus monkey B. Gnu C.Ostrich D.Chimpanzee

5.Obligatory anaerobe parasites ( )

A.Entamoeba&Taenia B.Ascaris&Enterobius

C. Entamoeba& Enterobius D.None

6.Faculatative anaerobe ( )

A.Entamoeba&Taenia B.Ascaris&Enterobius

C. Entamoeba& Enterobius D.None

7.W.H.O defines Health as ( )

A. a state of complete physical,mental and social well being and not merely absence of any disease or absence of physical fitness

B. a state of complete psychological and not merely absence of any disease or absence of physical fitness

C.The state of being sound physically

D.Ability to respond against stress

8.The trophozoit of Entamoeba lives in ( )

A. Mucosa and sub mucosa of Duodenum

B. Mucosa and sub mucosa of Ilium

C. Mucosa and sub mucosa of Colon

D. Mucosa and sub mucosa of Stomach

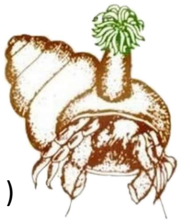
9.Tetranucleate cysts of Entamoeba infects new human and its cyst was ruptured by the action of enzyme-------- at small intestine. ( )

A.Amylase B.Rennin C.Trypsin D.Lipase

10 Schizogony is a----------occurs in schizont ( )

A.Binary fission B.Plasmotomy

C.Multiple fission D.Encystment



11Stages of Plasmodium in order in Pre erythrocytic cycle ( )

A.Sporozoits--Trophozoits—Schizont—Cryptozoites

B. Sporozoits--Trophozoits—Cryptozoites--Schizont

C. Sporozoits—Schizont— Trophozoits--Cryptozoites

D. Cryptozoites--Trophozoits—Schizont—Cryptozoites

12.Signet ring stage of plasmodium transformed in to-------- ( )

A.Trophozoit stage B. Amoeboid stage

C.Shizont stage D.Cryptozoit stage

13. Haemozoin (malarial pigment) is formed from ( )

A. Soluble haem into an insoluble crystalline form

B. Insoluble haem into an insoluble crystalline form

C. Soluble haem into an soluble crystalline form

D Insoluble haem into an soluble crystalline form

14.Exflagellation process is associated with ( )

A.Formation of micro gametes B.Formation of Macrogamets

C.Formation of Ookinet D.Formation of Sporozoites

15. Relapse of malaria caused by ( )

A.Trophozoites B Schizont C.Cryptozoites D.Hypnozoites

16.The path of Extra intestinal migration of Ascaris lumbricoides is as followsFrom alimentary canal to liver through ---------- from liver to heart through---------From heart to lungs through---------- ( )

A. Post caval vein, Hepatic portal vein,Pulmonary vein

B. Hepatic portal vein,Pulmonary vein,Post caval vein

C. Hepatic portal vein Post caval vein,Pulmonary arteries

D. Post caval vein, Hepatic portal vein,Pulmonary arteries

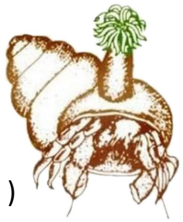
17.Lymphangitis caused by Wuchereria is ( )

A.Inflammation in Lymph nodes

B.Inflammation in Lymph Vessels

C.inflammation in Fore limbs blood vessels

D. inflammation in Hind limbs blood vessels



18.Infective stage of Entamoeba has ( )

A.One nucleus with four Chromatids

B.One nucleus with two chromatids

C.Four nuclei

D.Two nuclei

19The sexual phase of the life cycle of plasmodium is completed in ( )

A.Liver of the Man

B.Blood of Man

C.Saliverglands of female Anopheles

D.Crop of female Anopheles

20.Which of the following matches correctly ( )

A.Plasmodium-Anopheles,Entamoeba-Culex,Wucheraria-Tse Tsefly

B.Entamoeba-Contamination,Plasmodium-Anopheles,Wucheraria-Housefly

C.Wucheraria-Culex,Plasmodium-Anopheles,Entamoeba-Contamination

D.Plasmodium-Contamination,Wucheraria-Anapheles,Entamoeba-Culex

21. Which one of the following sets includes the viral disease ( )

1.Covid-19,Aids,Chickenpox,Polio,SARS

2.Cold,Cancer,Measles,Chickengunaya,Tuberculosis

3.Mumps,Dengue,Rabies,Hepatitis,Japanese encephalitis

4.Flu,Diptheria,Tetanus,Leprocy,Anthrox

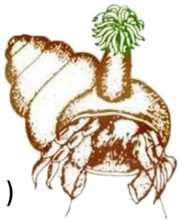
A.1&2 B.1&3 C.1&4 D3&4

22. Which one of the following pairs are incorrect ( )

1. Opiods-Morphine, Heroin 2.Cannabinoids-Ganja

3. Cocaalkaloid-Smack 4.Amphetamines-Sleeping pills

A.1&2 B. 3&4 C.1&4 D.3 only



23. Choose the right one ( )

Disease	**Pathogen**
1Diptheria	a.Clostridium
2.Typhoid	b.Variola
3.Common cold	c.Salmonella
4.Smallpox	d.Corynebacterium
5.Tetanus	e.Varicella
	f.Rhino virus

A.1d,2c,3f,4e,5a. B. 1d,2c,3f,4b,5a

C.1e,2c,3f,4d,5a D. 1e,2c,3f,4b,5a

24.Choose the right one ( )

Disease	**Mode of infection**
1.Chickengunya	a. Inoculation of Anopheles mosquito
2.Dysentery	b.Inoculation of Culex mosquito
3.Plague	c.Inoculation of Aedes mosquito
4.Malaria	d.Inoculation of Xenopsylla flea
5.Elephantiasis	e.Inoculation of Tse Tse fly
	f.Contamination

A.1d,2c,3f,4a,5e. B. 1d,2c,3f,4b,5a

C.1c,2f,3d,4a,5b D. 1e,2f,3d,4b,5a

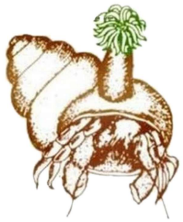
25.Expand the LSD in connection with medicine to treat mental illness ( )

A.Leathergic acid diethyl amides

B.Lipolic acid diethyl adenosine

C.Lysergic acid diethyl amides

D.Livocine serotonin diethane



FILL IN THE BLANKS

1.A parasite that lives on the surface of the hosts body is called----------

2.Coelozoic parasite which is lives in the hosts alimentary canal called----------

3.The type of pseudopodium present in the Trophozoit stage of Entamoeba is----------

4.The cytoplasm of precystic stage of Entamoeba stores--------- & ---------as reserve food

5.In Entamoeba the process of development of cyst wall is called----------

6.Benign tertian malaria caused by----------

7.Malignant tertian malaria caused by----------

8.Mild tertian malaria caused by----------

9.Quartan malaria caused by----------

10.World Malaria day or World mosquito day celebrated on----------

11.Gametogony of the plasmodium occurs in----------

12.In plasmodium the gametes are dissimilar in size hence the fertilization called----------

13.Okinet becomes----------and forms the Sporozoits by----------

14.Some of the stages of Plasmodium dormant in liver of human called as----------

15.Malarial drug Quinine is an ----------extracted from the bark of plant----------

16.Eggs of Ascaris have a protien coat with rippled surface hence they are called----------

17.The microfilaria larvae move to the peripheral blood ciruculation during the night time between----------and---------,this tendency is referred as----------

18.In wucheraria lifecycle the ex-sheathed microfilaria reaches ----------of mosquito from there,it reaches the----------and transforms in to----------larva

19Typhoid fever can be confirmed by ----------test

20.The study of Vaccines/Immunity----------

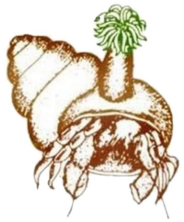
21.Heroin chemically called as----------

22. Heroin commonly called as----------

23.Marijuana,Hashish,Charas are produced by extracts from----------plant.

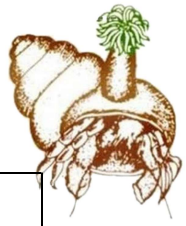
24.Crack was obtained from the leaves of ----------plant.

25.The age between 12 to 18 years is considered as ----------period.

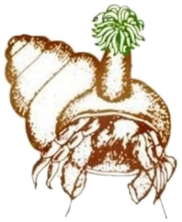


TRUE OR FALSE

Sl.no	Statement	True/False
1	Sphaerospora polymorpha is a parasite which lives in the urinary bladder of toad fish	
2	Nosema notabilis is a cnidosporan parasite which lives in Sphaerospora polymorpha	
3	Sphaerospora polymorpha is a Hyper parasite	
4	Entamoeba,Ascaris,are examples of Monogenetic parasites	
5	Plasmodium,Wucheraria are both belongs to same phylum	
6	Human being is Primary host/Definitive host for Plasmodium	
7	Culex mosquito is secondary/Intermediate host for Wucheraria	
8	Entamoeba is a facultative anerobe	
9	Faciola hepatica commonly called as Sheep liverfluke	
10	Faciola hepatica casuses Hyperplasia in bileducts of sheep	
11	Oriental sores skin disease caused by Leishmania donavanii	
12	Presence of RBC in food vacuoles and cartwheel shaped nucleus are the characteristic features of Trophozoit stage of Entamoeba	
13	Chromatoid bars of Entamoeba made up with Ribonucleo protein	
14	Sexual reproduction of Plasmodium takes place in Human	
15	Prepatent period of Plasmodium in human around 10 to 14 days	
16	Schuffner's dots appear in the Exo-erythrocytic cycle of Plasmodium	



17	Ookinete of Plasmodium is in Haploid state	
18	Gambusia is a larvivorous fish which is used in biological control for eradication of mosquitoes	
19	Hypnozoits causes the relapse of Malaria	
20	Third stage of microfilaria larvae of Wucheraria is the infective stage to man	
21	Emphysema is a disease related to Alimentary canal	
22	Taking Coke or crack which is a coca alkaloid increases the transport of neurotransmitter 'Dopamine'	
23	Those who take drugs intravenously are more prone to infections such as HIV and HBV	
24	The TDA abuse leads to addiction and dependence	
25	Hepatitis disease mostly effects the Liver	



ANSWERS KEY

MULTIPLE CHOICE QUESTIONS

LEVEL-I

1. A	2.C	3.C	4.D	5.B
6.C	7.A	8.C	9.A	10.D
11.B	12.A	13.B	14.C	15.D
16.C	17.A	18.B	19.C	20.D
21.B	22.A	23.C	24.A	25.C

MULTIPLE CHOICE QUESTIONS

LEVEL-II

1.C	2.D	3.C	4.A	5.D
6.C	7.A	8.B	9.C	10.C
11.D	12.C	13.B	14.C	15.A
16.A	17.B	18.C	19.B	20.D
21.A	22.A	23.A	24.B	25.C

MULTIPLE CHOICE QUESTIONS

LEVEL-III

1.B	2.A	3.C	4.B	5.A
6.B	7.A	8.C	9.C	10.C
11.A	12.B	13.A	14.A	15.D
16.C	17.B	18.C	19.D	20.C
21.B	22.B	23.B	24.C	25.C

FILL IN THE BLANKS

1.ECTO PARASITE

2.ENTEROZOIC PARASITE

3.LOBOPODIUM

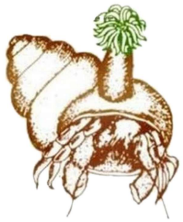
4.GLYCOGEN GRANULES , AND CHROMATID BARS

5.ENCYSTATION

6.PLASMODIUM VIVAX

7.PLASMODIUM FALCIFERUM

8.PLASMODIUM OVALE



9.PLASMODIUM MALARIAE

10. 20TH AUGUST

11..LUMEN OF THE CROP OF MOSQUITO

12.ANISOGAMY

13..OOCYST, SPOROGANY

14..HYPNOZOITES

15.ALKALOID, CINCHONA OFFICINALIS

16..MAMMILLATED EGGS

17.10PM ,4 AM, NOCTURNAL PERIODICITY

18.HAEMOCOEL, THORACIC MUSCLES, SAUSAGE SHAPED LARVA

19.WIDAL TEST

20.IMMUNOLOGY.

21.DIACETYL MORPHINE

22.SMACK

23.CANNABIS SATIVA

24.ERYTHROXYLUM COCA

25.ADOLESCENCE PERIOD.

TRUE OR FALSE

1	TRUE
2	TRUE
3	FALSE
4	TRUE
5	FALSE
6	FALSE
7	TRUE
8	FALSE
9	TRUE
10	TRUE
11	FALSE
12	TRUE
13	TRUE

14	FALSE
15	FALSE
16	FALSE
17	FALSE
18	TRUE
19	TRUE
20	TRUE
21	FALSE
22	TRUE
23	TRUE
24	TRUE
25	TRUE

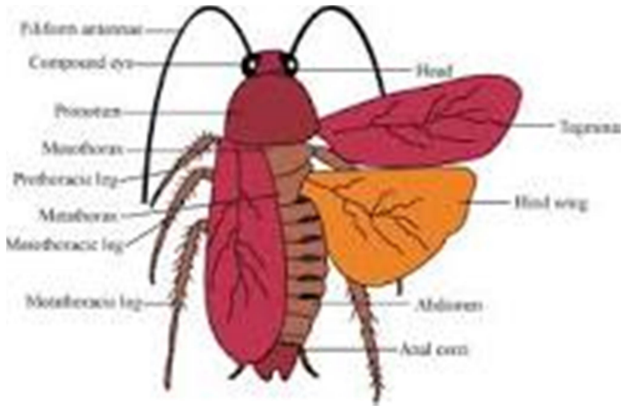
UNIT VII
PERIPLANETA AMERICANA (Cockroach)

Learning objects:

- **Students will be able to learn the stucture and function of systems in cockroach.**
- **students learn the spreading of diseases by insects and how to prevent them.**

LEARNING OUT COMES:

- **Be able to know functiong of various systems in cockroachs.**
- **Be able to know prevention of insects and diseases spread by it.**



Cockroach **body** is divided into three segments: **head, thorax and abdomen**. Cockroaches have a long pair of antennae that help them to pick up smells and vibrations. The antennae are connected to the **head**, which also includes the brain, strong mouthparts for scraping and chewing food and **compound eyes**. Three pairs of **jointed** legs two pairs of wings.

Cockroaches found across the **globe.** Cockroaches were able to survive the **mass extinction of dinosaurs** millions of years ago because of their **ability to adapt to changes**, and they continuously resist any **eradication** efforts from humans.

I. EXPLAIN THE FOLLOWING WORDS

1. Antenna.
2. Arolium.
3. Cursorial.
4. Paurometabolic.
5. Podomere.
6. Tagma.
7. Tergum
8. Dioptric region.
9. Germarium.
10. Unisexual.

II. Find out the true or false of the following statements

1	Cockroach is an Omnivorous .	TRUE	FALSE
2	The Head of Cockroach is Hypognathous.	TRUE	FALSE
3	The mouthparts of Cockroach are of Biting and Chewing type.	TRUE	FALSE
4	The coelom of Cockroach is Haemocoel.	TRUE	FALSE
5	Cockroach is called Uricotelic animal.	TRUE	FALSE
6	10 pairs of spiracles are functional in Holopneustic.	TRUE	FALSE
7	The two ventral nerve cords are solid and ganglionated in Cockroach .	TRUE	FALSE
8	The 6th abdominal ganglion is the largest of all the abdominal ganglia.	TRUE	FALSE
9	Each Compound Eye is composed of 2000 ommatidia.	TRUE	FALSE
10	superposition image is formed in nocturnal insects like cockroachs.	TRUE	FALSE

III. FILL IN THE FOLLOWING BLANKS

1. The Cockroach exhibits _____symmetry.
2. Both the second maxillae fuse to form a broad plate like _____.
3. Labrum having _____ on its inner surface to taste the Food.
4. _____and _____ muscles help in the movement of the mandibles.
5. Each first maxilla is _____ and consists of three parts.
6. _____ is formed by 7^{th},8^{th} , and 9^{th} abdominal sterna of female Cockroach.
7. _____keep the tracheae always open and prevent it from collapsing.
8. _____and _____muscles are helpful in Cockroach respiration.
9. The phenomenon of discontinuous ventilation is exhibited by _____, _____and _____.
10. Malpighian tubules are useful in excretion of nitrogenous wastes and_____ absorption.
11. The corpora adiposa cells absorb and store uric acid throughout life .it is called _____.
12. Cockroach Brain having three lobes that are _____,_____and _____.
13. Cockroach having three thoracic ganglia and_____ abdominal ganglia.
14. Frontal ganglion is connected to the hypocerebral ganglion by a _____nerve.
15. Corneogen cells of Ommatidia secretes and forms _____.
16. The region containing the cornea and crystalline cone constitute the _____.
17. Rhabdomeres fuse along the axis of the ommatidium to form _____.
18. Diurnal insects like houseflies forms _____images.
19. The fertile female certain substances to attract the males for copulation are _____.
20. The nymph is become an adult after several changes this process is called_____.
21. Cockroackes and House flies spreads_____ diseases.
22. A soft hairy pad between claws _____ , _____
23. Which tubule of an ovary containing developing eggs _____.
24. Tubular hollow network of the wing of a cockroach_____.

IV. Multiple Choise Questions

LEVEL-I

1.The study of insects is known as

A. Batracology B. entamology

C. mammology D .Serpentology.

2.The largest division in Animalia kingdom

A. Insecta B. amphibia C. pises D. reptilia

3.The name periplanata Americana is proposed by the sceintist.

A. Lamark B.Bermister C.Odam D.Darwin.

4.The fat bodies are similar to the liver vertebrates present in the cockroach haemocoel.

A.trophocytes B.copora adiposa C.oenocytes D.Urate cells.

5.The organs useful to cockroaches to move on smooth surfaces.

A.plantulae B.claws C.arolium D.pulvilli.

6.The tubules are helful in digestion and absorption of the digested food materials in cockroach.

A.Gizzard B.Salivary glands C.Hepatic D.caecae

7.which enzymes present in saliva to digest starch.

A.Maltase B.Lipase C.Amylase D.Invertase.

8. which is secreted by the microorganisms presernt yhe hindgut of cockroach.

A .cellulase B.Lipase C.Sucrase D.Maltase.

9.The Heart of cockroach having howmany chambers.

A. 6 Chambers. B.9 Chambers

C. 13 Chambers D. 26 Chambers.

10.The excretion in cockroach is performed by

A.coxal glands B.Parotid gland C.malpighian tubules D.nephridia.

11.ootheca in cockroach is secreted by these glands.

A.Conglobate gland B.Mushroom gland

C.Colleterial glands D.phallic gland

12.The coelome of cockroach is called as

A Pseudocoel. B.Coelome C.Haemocoel. D.Hydrocoel.

13.which cells secretes wax located at the outer surface of body wall.

A.Trophocytes B.Oenocytes C.trichogen. D.Mycetocytes.

14.Hepatic caeca in cockroach are derived from:

A. Crop B. Gizzard C. Midgut D. proctodaeum.

15. Salivary glands of cockroach open on :

A. Maxilla B.Hypopharynx C. Labium D.Labrum.

16. The inner layer of gizzard of cockroach is covered by:

A. By cuticle B .By mucous membrane

C. By endoepithelium D. By peritrophic membrane

17. oxygen is carried to the tissues of cockroach by which organ

A. Skin B.Trachea C. plasma D. Respiratory pigment.

18. CO_2 tension in haemolymph and Oxygen tension in the tracheae are influences the opening and Closing of.

A. Trachea B. spiracles. C. Nucleus D.atrium.

19 . During inspiration which spiracles are opened.

A. Abdominal B. cuticle C. thoracic D.longitudinal

20. During expiration which spiracles are opened.

A. Abdominal B. cuticle C. thoracic D.longitudinal

21.Conservation of water is very important to these animals.

A. aquatic B. terrestrial C. aerial D. amphibians.

22. Refractive region of Ommatidium.

A Cornea B. Retinulae. C. vitrellae. D. Ocelli.

23. Seminal vesicles stores sperms in form of

A. Spermatospores. B. Ovarioles. C. eggs. D. Pheromones.

24. Shedding of exoskeleton is called.

A. Nymph B. ecdysis C. ootheca. D.Papilla.

25. The male cockroach deposits a spermatophore on the spermathecal papilla of female with help of

A. Gynatrium. B. Vasa deferens. C. Phallomeres. D.ejaculatory duct.

26.The longest segment of the leg of cockroach is

A. Tibia B. Trochanter C. Femaur D. Tarsus

27. Conglobate glands are also called as

A. Phallic glands B. Mushroom glands C.Collateral glands D.Utricular glands

28. In a tripod of cockroach the ' pivot' is

A. Absent B.Foreleg C. Middle leg D. Hindleg

29. The three thoracic segments are covered by relatively thicker and larger tergites called

A.Coxa B. Nota C.Femur D. Tibia

30. The wall of rectum is provided with How many rectal papillae.

A. Four B. Five C. Six D.seven

31. Male cockroach can be identified by the presence of

A. Collateral glands B. Green glands C. Broad abdomen D. Anal style

32. Newly hatched young cockroaches are called as

A. Larva B. Nymph C. Imago D. Wriggler

33. Short interval between systole phase and diastole phase is called as

A. diastasis B.diaphram C.dioptrical D. denticles

34. .Ganglion located above the oesophagus of cockroach is

A. Frontal ganglion B. Occipital ganglion

C. Visceral ganglion D.Ingluvial ganglion

35. Brain of cockroach is mainly

A. Sensory B. Endocrine C. Both A&B D. Motor

LEVEL- 2

1 .Mouth parts of periplaneta are consist of ……. Different types of articulations.

A. four B.eight C. six D. three

2. Which of the following chardotonal organ is sensitive to ground vibrations?

A. Tympanal organs B. Johnston organ C. Subgenual organ D. A&B.

3. Common feature in earth worm and cockroach is

A .Cuticle B. Solid, ventral nerve cord C. Nephridia D. Malpigian tubules.

4. The Schizocoelom in cockroach in restricted to the spaces around the …….

A. Reproductive organs B. Complete Alimentary canal

C.Nerve cord D.Only Gut.

5. Period between two moults in insects is termed as

A.Stadium B.Nymph C.Notum D. Tegmina

6.The gland which is degenerate after metamorphosis

A. Phallic gland B.Prothoracic gland

C. Mushroom gland D.Corpora Allata

7.Glossae and para glossae together constitute the ……

A. Ligula B. Lingua C. Protopodite D. Exopodite

8. Scolopidia are the units of

A. Photo receptors B.Mechanoreceptors

C. Rheo-receptors D. Olfactory receptors

9.Among the following which region of Malphigian tubule is absorption in function ?

A. Proximal B.Middle C.Distal D. Both B&C

10.Endoskelrton of head is called

A. cervicum B.Sternum C.fenestra D.tentorium

11. The hormone which regulates development and functioning of reproductive organs.

A. gonadotropic hormone B. ecdysone C. Both A&B D. Motar

12. Sockets of the movable bristles of the body wall are formed by

A. Trichogen cells B. Tormogen cells C. Both A&B D. Oenocytes

13. The Pulse rate of Cockroach heart

A. 40 times/min B. 30 times/min C. 50 times/min D. 20times/min

14. Number of moults occurs in nymph of cockroach to became adult is

A.4 B.10 C.12 D.13

15. Food locating olfactory sensillae are present on

A. Antenna B.Labial palps C.Maxillary palp D. In all these three

Level- 3

1. Head of cockroach is formed by the fusion ……segments.

A. Six B. four C. two D. eight

2. How many segments are present in an abdomen of the Cockroach ?

A. Eight B. Ten C. Seven D. Nine

3. In Cockroach which segment has female genital opening?

A. Sventh B. Ninth C. Tenth D. Eighth

4.Number of eggs in each Ootheca of cockroach

A.8-10 B. 14-16 C.1 or 2 D. only 8

5.The level of tracheolar fluid in the tracheoles of cockroach is

A. Always constant B. Decreases when the insect is active

C. Increases when the insect is active D. Decreases when the insect is inactive

6. Each walking leg of periplaneta is made up of ……segments.

A. Five B. Four C. six D. nine

7. Why head of the Cockroach can move easily in all the directions ?

A. In Cockroach head and thorax fuse to form Cephalo thorax.

B. Anatomy of mouthparts are so arranged that head can move easily in all the directions.

C. Head is attached to thorax through a flexible neck.

D. Abdomen of cockroach is made of three segments.

8. On the lateral side of alimentary canal of cockroach……glands are found.

A. Acid secreting B. salivary C. digestive D. Reproductive

9. In cockroach which Tergum possess a median groove

A. Tenth B. First C. Ninth D. Third

10. Which number of sternum is boat shaped in the Cockroach?

A. Fifth B. Sixth C. Seventh D. Tenth

11. Endocrine glands of cockroach which secrets gondotrophic hormone.

A. corpora allata C. prothoracic glands

B. Corpora cardiaca D. inter cerebral glands

12. Digestive enzymes in grosshoper and cockroches are secreted from

A. Fore gut B. Mid gut C Hindgut D. Hepatic caecae

13. Pericardial space in cockroach regularly altered by muscles.

A. Ciliary B. Alary C. Circular D. longitudinal

14. Number of crushing teeth present in the gizzard of Cockroach is

A. Two B Three C. Four D. Six

15. Which of the following is the characteristic of Cockroach

A. 13- Chambered heart B. Reduced wings

C. Cocoon formation D. Segmented body

V. MATCH THE FOLLOWING

1. Match the following with reference to cockroach and choose the correct option.

(A) Phallomeres.	(i) Chain of developing ova
(B) Gonopore	(ii) Bundles of sperm
(C) Spermatophore	(iii) opening of ejaculatory duct
(D) Ovarioles	(IV) the external genitalia

A. A-(III), B-(iv), C-(ii), D-(i)

B. A-(iv), B-(iii), C-(ii), D-(i)

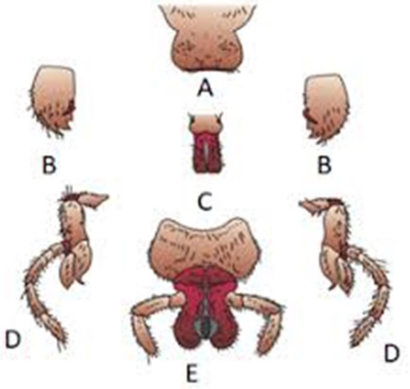
C. A-(iv), B-(ii), C-(iii), D-(i)

D. A-(ii), B-(iv), C-(iii), D-(i)

2. Match the following with reference to cockroach and choose the correct option.

A)Gizzard	( )	1.rectal papillae
B)Mesenteron	( )	2.chitin teeth
C)Rectum	( )	3.peritreme
D}Spiracle	( )	4.absorption of digested food

3. Match the following



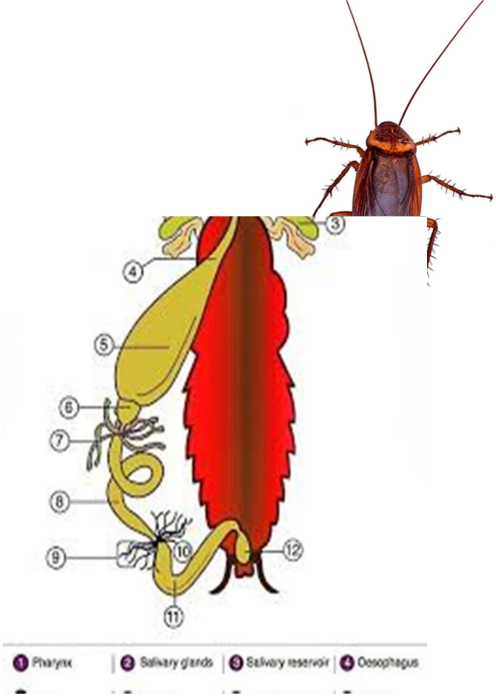
( ) 1. Labium

( ) 2. Hypo pharynx

( ) 3. First maxilla

( ) 4. Mandibles

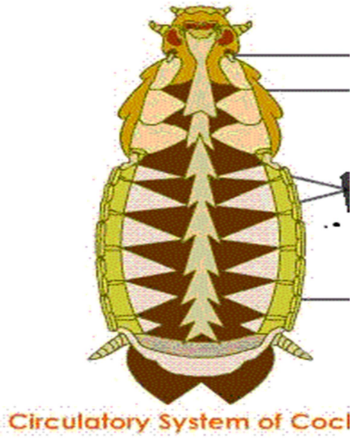
( ) 5. Labrum



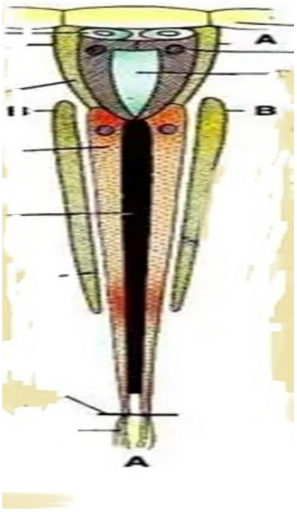
VI. LABELL THE FOLLOWING PARTS

1.	2.
3.	4.
5.	6.
7.	8.
9.	10.
11.	12.

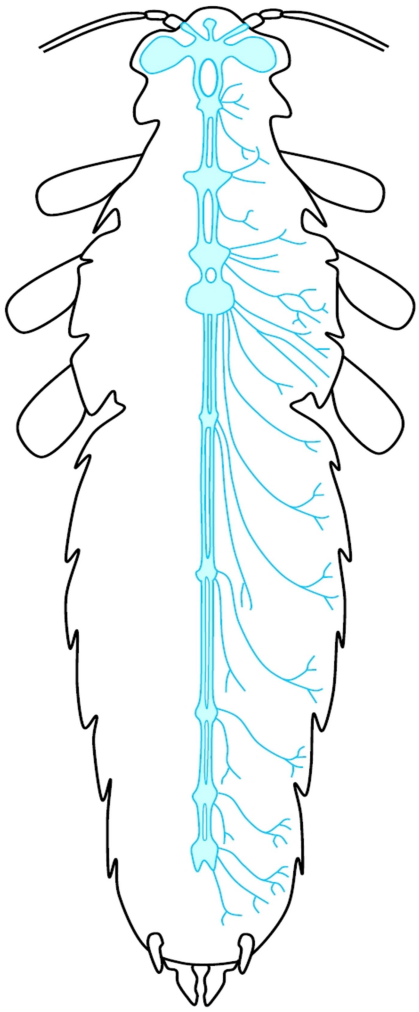
VII. LABELL THE SYSTEM



VIII. LABELL THIS DIAGRAM.

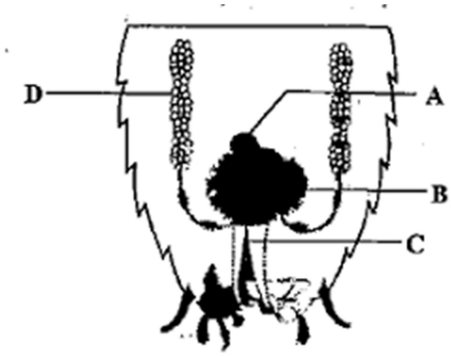


IX. IDENTIFY THE SYSTEM AND LABELL IT.

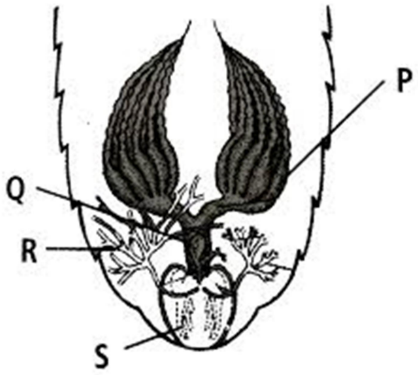


X. IDENTIFY THE SYSTEMS AND LABELL IT.

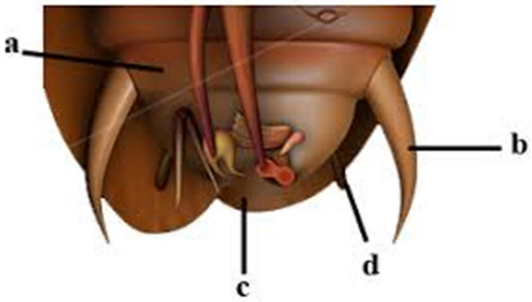
A)



B)



C)



XI. Assignments:

I. Long Answer Type Questions:

1 Describe the digestive system of cockroach with the help of a neat labelled diagram?

2.Describe the blood circulatory system of periplaneta in detail and draw a neat and labelled diagram of it.?

3.Describe the respiratory system of cockroach with the help of neat and labelled diagrams?

4.Describe the reproductive system of periplaneta and draw neat and labelled diagram of it.

II.Short Answer Type Questions:

1.Draw a neat labelled diagram of the mouth parts of cockroach ?

2.Draw a neat labelled diagram of the salivary apparatus of cockroach?

3.Describe the structure of an ommatidium and label its parts.

4.How can you identify the male and female cockroaches, explain it discribe the chief features of the extenal and internal genitalia.

III.Very Short Answer Type Questions:

1.why the head in cockroach called hypognathous?

2.How is a tripod formed with reference to locomotion in cockroach?

3.what are alary muscles?

4.what are trichomes?write their functions.

5.What is intima?

6.Name the protein that lines the tracheole of the cockroach?

7.How does the cuticle of a cockroach help in excretion?

8. distinguish between apposition image and superposition image.

9. what is paurometabolous development?

10 what are phallomeres. ?

11. what is haemocoel?

12. Howmany spiracles are present in cockroach? Mention their locations.

13. which factors regulate the opening of the spiracles?

14. which of the abdominal ganglia is the largest and why?

15.In which part of the gut of cockroach water is reabsorbed?

16. Why does not the blood of periplaneta help in respiration?

17.What is the function of mushroom gland in cockroach?

18.How are the fat bodies similar to the liver of the

KEY

II. Find out the true or false of the following statements

1 to 10 true

III. FILL IN THE FOLLOWING BLANKS

1 Bilateral symmetry.
2. Labium
3. gustatory sensillae
4.adductor and abductor
5.Biramous
6.ootheca
7.taenidia
8.dorsoventral muscles and ventral longitudinal muscles
9.cockroaches,grasshoppers and beetles.
10. water
11.storage excretion
12. Protocerbrum, deutocerebrum and tritocerebrum.
13. six
14.recurrent
15.cornea
16.dioptrical
17.rhabdome
18.Apposition image
19.pheromones
20.paurometabolous.
21.Bacterial
22.pulvillus,Arollium
23.Ovariole
24.Nervures.

IV. Multiple Choise Questions

LEVEL-I

1. B 2.A 3.B 4.B 5.A 6.C 7.C 8.A 9.C 10. C 11. C
12.C 13.B 14. C 15.B 16.D 17. B 18.B 19.C 20.A 21. B 22.A
23. A 24.B 25.C 26. A 27.A 28.C 29.B 30.C 31.D 32.B 33.A
34.B 35.C

LEVEL:2

1. A 2.C 3.B 4.A 5.A 6.B 7.A 8.B 9.A 10.D 11.A 12.B
13.C 14.D 15.D

Level: 3

1.A 2.B 3.A 4.B 5.B 6.A 7.C 8.B 9.A 10. C 11.C
12.D 13. B 14. D 15. A

V. MATCH THE FOLLOWING:

1.3

UNIT-08
ECOLOGY – ENVIRONMENT

INTRODUCTION

Learning Objectives

What we learn in the Ecosystem – Environment?

- What is ecology- Ecology is the study of the relationship between living organisms and their environment.
- Ecology provides new knowledge of the Independence between people and the nature that is vital for food production maintain clear air water, and sustaining Biodiversity in a changing climate.
- To understand the effect of physical- chemical factors like temperature, water, soil, pressure on organisms.
- To know the population interactions between different population to study the relationship between prey, predator, other interactions like competition, parasitism, commensalism, mutualism etc.
- To know the different ecosystems like natural ecosystems, aquatic ecosystems, Terrestrial ecosystems, artificial ecosystems and understand the exchange of energy and nutrients in the food chain.
- To know the Food Chain and Food Web, Productivity, Energy flow and ecological pyramids to understand the connections within a food chain as well as how producers, consumers interact for energy flow through an ecosystem.
- To know the nutrient cycle to understand the nutrient cycle keep the ecosystem in equilibrium and help in storing nutrients for future uptake.
- To know the population attributes, population growth and the life history variations to understand the changes populations undergo. It also helped them product potential future for the population.
- To know how to pollute air, water, soil will severely damage to the environment. Reducing pollutants is important for human health and the environment.

8.1 Organisms and Environment 8.2 Ecosystem – Elementary Aspects

I. Define the following terms

1. Autecology :-
2. Synecology :-
3. Community :-
4. Habitat :-
5. Medium :-
6. Niche :-
7. Phototaxis :-
8. Photokinesis :-
9. Diurnal animals :-
10. Nocturnal animals :-
11. Circadian rhythms :-
12. Circannular rhythms :-
13. Photo period :-
14. Photoperiodism :-
15. Critical photoperiod :-
16. Bioluminescence :-
17. Ultraviolet rays :-
18. Thermal Stratification :-
19. Epilimnion :-
20. Metalimnion :-
21. Thermocline :-
22. Hypolimnion :-
23. Dimictic lakes :-
24. Eurythermal animals :-
25. Stenothermal animals :-
26. Chill Coma :-

27. Heat Coma :-

28. Temperature coefficient :-

29. Van't Hoff's rule :-

30. Cyclomorphosis :-

31. Blubber :-

32. Bergmann's rule :-

33. Allen's rule :-

34. Conformers :-

35. Partial regulators :-

36. Diapause :-

37. Chloride cells :-

38. Gemmules :-

39. Euryhaline :-

40. Stenohaline :-

41.Anadromous fishes :-

42. Catadromous fishes :-

43.Altitude sickness :-

44. Encystment. :-

Observe the given below statements and find out the true or False.

S.No.	Statements	True/False
1	Our gut has been described as a unique habitat for hundreds of microbes.	
2	We assume that over a period of time, organisms not evolved adaptations for survival and reproduction in their habitats through natural selection.	
3	Population in a group of organisms of the different autotrophs and heterotrophs, living in a specific area.	
4	A `biome' a large community of plant and animals that occupies a vast region	

5	According to Haeckel, an organism's habitat is its address and its ecological niche is its profession	
6	Example of effect of light on pigmentation is a cave dwelling amphibian, Proteus anguinus.	
7	Light is important in that they use the diural and seasonal variations in the intensity and duration of light, as cues migration activities called photoperiod.	
8	Compare to UV-A rays, UV-B- and UV-C rays more harmful to organisms.	
9	The rate of metabolic Activities double for every 20°C raise in temperature according to van't Hoff's rule.	
10	Some cartilaginous fishes retain Urea and trimethyl amine oxide (TMO) in their body to keep the body fluid isotonic to the sea water.	

III. Fill in the blanks given below

1. All the habitable zone on the earth constitute the _____.
2. Chaetopterus, Squids, Pyrosoma like organisms produces light is called _____.
3. Wave length of ultraviolet-B rays is _____.
4. Water is relatively cool, stagnant and with low Oxygen Content in _____ Layer of lacks.
5. The effect of temperature on the rate of a reaction is expressed in terms of temperature coefficient/ Q_{10}. In the living systems Q_{10} value is_____.
6. Cyclomorphosis has been demonstrated by cocker in the sub group of crustacea is_____.
7. Large earlobes and long limbs increase the surface area without Changing the body volume is known as _____ phenomenon.
8. In bacteria, Fungi and lower plants, various kinds of thick walled_____ are formed which help in them Survive unfavourable conditions.
9. Certain organisms show delay in development, during period of unfavourable environmental condition are Called _____.
10. Marine birds like seagulls and penguins eliminate salts in the form of Salty fluid that drips through their_____.
11. Some fishes migrate from the sea to Fresh water for breeding is known as_____.

12. In the absence of an external source of water, the Kangaroo rat of the North American deserts is capable of meeting all its water requirements through_____.

IV. choose the correct answer from given below are multiple choice questions with four answers.

1.Ecology is "the study of the relationship of organisms with their environment"was defined by [ ]

A) Odum B) Huxley c) Aristotle D) Darwin

2._____is a group of organisms of the same species living in a specific area at a specific time [ ]

A) community B) Ecosystem C) population D) Biome

3. The intensity of light influences the velocity of the movement of the organism seen in the larvae of _____.

[ ]

A) Salmon B) Daphnia C) Anguilla D) Pinnotheres macculatus

4. Which of the following animal migrates from the river to sea for breeding

[ ]

A) Anguilla B) Hilsa C) Protopterus D) Hilsa

5. The `African lung fish' ___burrows into the mud and forms a " gelatinous cocoon" around it

[ ].

A) Anguilla B) Salmon C) Protopterus D) HilSa

6. Freshwater sponges escape and survive from the adverse Summer conditions & desiccation by

[ ]

A) Gemmules B) Gemma cups C) Budding D) Spores

V. Match List -I with List –II

i.

I		II
1.Population	[ ]	A. All the habitable zone on the earth
2.Community	[ ]	B. Large community of plants & animals
3. Ecosystem	[ ]	C. Land Containing different ecosystem surrounded by natural boundaries
4.Landscape	[ ]	D. Functional unit of biosphere
5. Biome	[ ]	E. Group of organisms of the same species living in a specific area
6. Biosphere/ Ecosphere	[ ]	F. Sum total of abiotic and biotic factors present around the organism

ii.

I		II
1.Proteus anguinus	[ ]	A. Negative phototaxis
2. Euglena	[ ]	B. Nocturnal animals
3.Pinnotheres maculates	[ ]	C. Phototropism
4.Cockroaches	[ ]	D. Example of light Influences the colour of the Skin
5. Bending of plants	[ ]	E. Positive phototaxis
6.Birds	[ ]	F. Photo kinesis
7.Earthwarms	[ ]	G. Asexual Gemmules
8. Daphnia	[ ]	H. Anadromous migration
9. Protista	[ ]	I. Diurnal animals
10. Fresh water sponge	[ ]	J. Cyclomorphosis
11.Salmon fish	[ ]	K. Ensystment
12.Anguilla bengalensis	[ ]	L. Retain of urea, TMO in their blood
13.Cartilaginous fishes	[ ]	M. Bioluminescence
14. Chaetopterus	[ ]	N. Catadromous migration

VI. Assertion and Reason Questions

Instructions :-

1. Both A & R are true and R explains A.

2. Both A & R are true but R does not explain A .

3. A is true R is false

4. A and R both are false.

1. (A) Factor in the environment affects an organism is called the environmental factor.

(R) Edaphic factors are related to soil. Impact on the life of organisms.

2. (A) The temperature differences on Earth are large (more) Compared to the temperature in the water area.

(R) Move from the equator to the poles, go up the mountain Peaks, the temperature gradually decreases

3. (A) During winter the surface of the lake water freezes, the water below this layer is 4^{o}c.

(R) At lower temperatures the activity of bacteria and the rate of oxygen consumption by aquatic animals decrease. Hence, organisms can survive below the frozen upper water without being subjected to `hypoxia'.

4. (A) If you had ever been to any high attitude place (73500m) Rontang pass near Manali and Manasarovar, in Tibet must have experience what is called altitude sickness.

(R)Due to the very low atmospheric pressure at high altitudes lack of available Oxygen to the body, which can gradually overcome by weather adaptation.

Home Work:

VII. Answer the following questions in very short answer type [2 marks questions]

1. Define ecology and its branches?

2. Define the term ecology?

3. What is meant by ecosphere?

4. How does your body solve the problem of altitude sickness, when your ascend tall mountains?

6. What is photoperiodism?

7. Mention advantages of some UV rays to us?

8. What is Cyclomorphosis? Explain its importance in Daphnia?

9. What are regulators?

10. What are conformers?

II. Answer the following questions in short answer **[4 marks questions]**

1. What is summer stratification in lakes? Explain?

2. What is the significance of stratification in lakes?

3. Explain van' t Hoff rule.

4. How do terrestrial animals protect themselves from the danger of dehydration of bodies?

5. Distinguish between euryhaline and stenohaline animals?

6. Many tribes living in high altitude of Himalayas normally have higher red blood count or total haemoglobin than the people living in the plains. Explain?

III. Answer In following question in Long answer type **[8 marks questions]**

1. Write an essay on temperature as an ecological factor.

2. Write an essay on water as an ecological factor.

8.3. Population Interactions

8.4. Ecosystems and their components

8.5. Food chains, food web, Productivity and energy flow

8.6 Nutritive cycles

8.7 Population

8.8 Environmental Issues

I. Define the following terms

1. Mutualism

2. Commensalism

3. Parasitism

4. Ectoparasites

5. Endoparasites

6. Brood parasitism

7. Lentic ecosystem

8. Lotic ecosystem
9. Limnetic forms
10. Neuston
11. Benthos
12. Detritus
13. Fragmentation
14. Humus
15. Saprotrophs
16. Law of thermodynamics
17. Entropy
18. Standing Crop
19. Primary productivity
20. Nitrogen fixation
21. Ammonification
22. Nitrification
23. Age Pyramids
24. Carrying capacity
25. Verhulst – Pearl Logistic Growth
26. Peroxyacetyl Nitrate
27. Catalytic converters
28- Biomagnification
29. Eutrophication
30. Accelerated eutrophication
31. Jhum/Podu
32. Chipko movement.

II. Fill in the blanks given below

1. Calotropis plant produces highly poisonous _____.
2. Competitive exclusion is relatively easy to demonstrate in laboratory experiments by _____Ecologist.

3. Connell's field experiments shared that on the rocky sea Coast of Scotland, the large and Competitively superior_____ dominates in Intertidal area, and excludes the smaller barnacle_____ from that zone.

4. The human liver fluke depends on two _____hosts to complete its life cycle.

5. The Mediterranean orchid ophrys employs _____to get Pollination done by a specific species of bee .

6. _____is the open water zone away from the shore it extends up to the effective light penetration level.

7. The organisms living in lentic habitat, which live at the bottom of the lake is _____.

8. _____is the example for hot type of desert. Cold type dessert is seen in _____.

9. Bacterial and fungal enzymes degrade detritus into simple inorganic substances. This process called _____.

10. In Particular climatic condition, decomposition rate is slower if detritus is rich in _____ & __

11. If the NPP in the 100KJ the organic substance converted into body mass of the herbivore which feeds on it is _____only.

12. On average about _____ percent of GPP is used for the catabolic (respiration) activity.

13. Denitrification is carried out by bacteria such as_____-.

14. _____ bacteria help to further oxidised nitrites to nitrates.

15. The waste products and the dead organisms are decomposed by _____ releasing phosphorus.

16. To control SO_2 pollution, the emission are filtered through _____.

17. _____ pollution also results in acid rains and formation of photochemical smog.

18. According to the central pollution control board (CPCB) particles _____ or less in the diameter are highly harmful to man and other air breathing organisms.

19. Fitting `catalytic converters' to the automobiles having expensive metals namely _____, _____, _____ as catalysts which reduce emission of poisonous gases.

20 The aquatic plants _____is also called `Terror of Bengal'.

21. High concentration of _____ disturb calcium metabolism in birds.

22. Natural ageing of a lake by nutrient enrichment of its water is known as _____.

23. The use of_____ is essential for disposal of hospital waste.

24. _____and _____ are commonly known as greenhouse gases.

25. The thickness / columnar of the ozone in a column of air is measured in terms of____ units.

26. National Forest Policy (1988) of India has recommended _____ percent forest cover for the plain and_____ percent for the hills as ideal or desirable.

III. Match List- 1 with List –II

i

I		II
1. Amphibious plant	[ ]	A. Water flea
2. Phytoplankton	[ ]	B. Hydra
3. Zooplankton	[ ]	C. Euglenoids
4. Epineuston	[ ]	D. Beetles
5. Periphyton	[ ]	E. Diatonus
6. Self sustaining Phytoplankton	[ ]	F. Cattails
7. Benthos	[ ]	G. Red annelids

II.

I		II
1. CO	[ ]	A. Soil pollution
2. CO_2	[ ]	B. Biomagnification factor
3. SO_2	[ ]	C. Included in air pollution
4. NO_2	[ ]	D. Catalytic converters.
5. Fly ash	[ ]	E. The main factor for Global warming
6. Palladium	[ ]	F. Cause of acid rains
7. 120 dB sound	[ ]	G. vehicle smoke
8. Mercury	[ ]	H. Photochemical smog
9. Pesticides	[ ]	I. Aerosols factor

IV. Choose correct answer from given below Multiple choice questions with four answers.

1. Type of interaction in which one species benefits and the other is neither harmed or benefited [ ]

A. Mutualism B. Commensalism C. Parasitism D. Ammensalism

2. Sparrows pick up nuts and eat any of the following [ ]

A. Predation B. Ammensalism C. parasitism D. Commensalism

3. In some shallow south American lakes visiting Flamigos and resident fishes compete for their common food [ ]

A. Competitive exclusion B. Co existance, rather than exclusion

C. Competition among unrelated Species D. camouflage

4. Five closely related species of warblers living on the same tree was able to avoid competition and Co-exist due to behavioural difference in their foraging activities is [ ]

A. Competitive release B. Co existance, rather than exclusion

C. Competitive exclusion D. Competition among unrelated species

5. The 10 percent law for the transfer of energy from one trophic level to next was introduced by _____ [ ]

A. Gause B. Mac Arthur C. Lindeman D. Connell

6. Nitrates present in the soil are also reduced to nitrogen by the process of `denitrification' is carried Out by _____. [ ]

A.Thiobacillus B. Nitrosococcus c. Rhizobium D. Nitrobacter

7. The waste products and dead organisms are decomposed and releasing phosphorus by__ [ ]

A. Phosphate- Solubilising bacteria B. Nitrobacter

C. Thiobacillus bacteria D. Nitrosomonas bacteria

8. Percentage of Nitrogen, oxygen, CO_2, Argon gases in dry air is _____ [ ]

A.0.03%, 0.93%, 78.09%, 20.94%. B. 20.94%, 0.93, 0.03%, 78.09%

C. 78.09, 0.93%, 20.94%, 0.03% D. 78.09%, 20.94%, 0.03%, 0.93%

9. What is the main air pollutant for the formation of peroxyacetyl nitrate. [ ]

A. Nitrogen oxide B. Sulphur Dioxide C. Carbon monoxide

D. Nitrogen oxide and volatile organic compounds.

10. Incinerators are used to remove which waste_____ [ ]

A. Electronic waste B. Solid waste such as rubber, leather

C. Hospital waste D. polystyrene and plastic

11. Which of the following is a greenhouse gases [ ]

A. Carbondioxide , Methane B.Carbonmonoxide, Carbondioxide

C. Carbondioxide, Sulphur dioxide D. Carbonmonoxide, Methane

12. Ecological Pyramids were first represented by_____ [ ]

A. Gause B. Elton C. Mal Arthur D. Connell.

V. Observe the given below statements and find out the True or False

S.no	Statements	True/False
1	Monarch butterfly is highly distasteful to its Predators (Birds) because it acquires special Chemical by feeding on a poisonous weed during its caterpiller stage	
2	The Abingdon tortoise in Galapagos Island became extinct within a decade after goats were introduced on the island	
3	An orchid growing as an epiphyte on a mango branch is an example of commensalism	
4	The study of fresh water ecosystem is called autecology	
5	The sun is the source of energy in all ecosystem except the deep ocean ecosystem.	
6	Irrigation without proper drainage of water leads to water logging in the soil. Water logging draws Salt to the surface of the soil (salinisation of the top soil). Water-logging and soil salinity are some of the problem that have come in the wake of the Green revolution.	

VI. Assertion and Reason questions type

The following questions Consists Assertion (A) and reason (R) identify the correct answer from the below given choices

1. Both (A) and (R) are true and (R) is the correct explanation of A
2. Both (A) and (R) are true and (R) is not correct explanation of (A)
3. (A) is true but (R) is false
4. (A) False but (R) is true.

1.(A) Nitrogen oxide is not only harmful to humans and animals, but also dangerous to plants

(R) Nitrogen oxide pollution also result in acid rains and formation of photochemical smog.

2.(A) Each population has their own unique characterstics. In a population these rates refer to per capita births and deaths respectively,

(R) 4 individuals in a labaratory population of 40 fruit flies died during a specific time interval, say a week the death rate in the population is 4/40=0.1.

3. (A) Parasites have evolved Special adaptations to meet Successful life in the host.

(R) The human liver fluke depends on two intermediate hosts (Snail and a fish) to complete its life cycle

4. (A) The Prickly pear cactus introduced into Australia In the early 1920 caused havoc by spreading rapidly into millions of hectares of rangeland

(R) Biological control methods adopted in agricultural pest control are based on the ability of the Predators to regulate prey populations

5. (A) If a predator is too efficient and over exploits its prey, thein the Prey might become extinct.

(R) Prey Species have evolved various defenses to lessen the impact of predation.

VII Project Work

1. Examine lake or ecosystem closest to where you live Identify the animals and plant species that live there

   Eg: Kolleru lake, pulicat Lake,coringa bird sanctuary (Kakirada)
2. Take a chart and prepare grazing food chain, parasitic food chain, Detritus food chain

3. Visit the industry near you. Identify air pollutants or water pollutants emitted by the industry. Write the details how the treatment plant is pollution free without releasing the pollutants directly into the environment.
4. Why it is necessary to grow plants? Explain the benefit of tree planting plant your college, apartment surroundings, roadside plants celebrate earth day. Establish a College minimum one record eco club with students and Conduct eco friendly programme and make a record.

VIII. Home Work

i. Answer the following questions in very short answer type- (2 Mark Questions)

1. What is Camouflage? give its significance?
2. What is periphyton?
3. Explain the process of 'leaching'?
4. Explain the terms GPP,NPP?
5. What is BOD?
6. What is Biological magnification?

II. Answer the following questions in short answer (4 Mark Questions)

1. What is summer stratifications ? Explain
2. How do marine animals adapt to hypertonic Sea water?
3. What is the biological principle behind the biological control method of managing pest insects?
4. Explain the terms saprotrophs, detrivores, and mineralizers?
5. Define ecological pyramids and describe with examples Pyramid of number and biomass?
6. What are the deleterious effect of depletion of Ozone in the Stratosphere?
7. Describe "Green House Effects"?
8. Write critical notes on the following.

A) Eutrophilation B) Biological magnification C)Ground water depletion and ways for its replenishment.

III Answer the following questions in Long answer type. (8 Mark Questions)

1. Describe lake as an ecosystem giving examples for the various zones and the biotic components in it.
2. Describe different types of food chains that exist in an ecosystem
3. Give an account of flow of energy in an ecosystem
4. List out the major air pollutants and describe their effects on human beings?
5. What are the causes of water pollution and suggest measures for control of water pollution?

KEY

ECOLOGY – ENVIRONMENT

8.1 Organisms and Environment 8.2 Ecosystem – Elementary Aspects

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II. Observe the given below statements and find out the true or False.

1. True
2. False
3. False
4. True
5. False
6. True
7. True
8. True
9. False
10. True

III. Fill in the blanks given below

1. Ecosphere / Biosphere
2. Bioluminescence
3. 280 nm to 320 nm
4. Hypolimnion (bottom layer)
5. 2.0
6. Daphnia (water flea)
7. Allen's
8. Spores
9. Diapause

10. Nostrils
11. Anadromous migration
12. Oxidation of its internal fat

IV. **Choose the correct answer from given below are multiple choice questions with four answers.**

1. B
2. C
3. D
4. A
5. C
6. A

V. Match List -I with List –II

I.

1	2	3	4	5	6	7
E	G	D	C	B	A	F

II.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
D	E	F	A	C	I	B	J	K	G	H	N	L	M

VI. Assertion and Reason Questions

1. 1
2. 2
3. 1
4. 1

8.3. Population Interactions

8.4. Ecosystems and their components

8.5. Food chains, food web, Productivity and energy flow

8.6 Nutritive cycles

8.9 Population

8.10 8.8 Environmental Issues

II. Fill in the blanks given below

1. Cardiac glycoside
2. Gause
3. Balanus, Chathamalus
4. Intermediate
5. Sexual deceit

6. Limnetic zone
7. Pedonic form
8. Thar Desert, Ladakh
9. Catabolism
10. Lignin, chitin
11. 10KJ
12. 20-25
13. Pseudomonas, thiobacillus
14. Nitrobacter
15. Phosphate solubilising bacteria
16. Scrubbers
17. Nitrogen oxide
18. 2.5 micrometre
19. Platinum, Rhodium, Palladium
20. Eichornia crassipes(Carmen water hyacinth
21. DDT
22. Eutrophication
23. Incinerators
24. CO_2, Methane
25. Dobson
26. 33,67

III. Match List- 1 with List –II

I.	**1**	**2**	**3**	**4**	**5**	**6**	**7**		
	F	E	A	D	B	C	G		
II.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	G	E	F	H	I	D	C	B	A

IV. Choose correct answer from given below Multiple choice questions with four answers.

1. B
2. A
3. C
4. B
5. C
6. A
7. A
8. D
9. D
10. C
11. A
12. B

V. Observe the given below statements and find out the True or False

1. True

2. True
3. True
4. False
5. True
6. True

VI. Assertion and Reason questions type

1. 1
2. 1
3. 1
4. 1
5. 1

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