

LAQ HIT LIST**TOP 10 LAQ**Ans-Page
Index★★ STRUCTURAL ORGANIZATION[8 MARKS] ★★

- LAQ 1. Classify and describe the epithelial tissues on the basis of structural modification of cells with examples.

[GP 12(1)]

- LAQ 2. Compare and contrast the three types of muscular tissues.

[GP 13(2)]

- LAQ 3. Give an account of the 'formed elements' of Blood.

[GP 14(3)]

★★★ BIOLOGY IN HUMAN WELFARE[8 MARKS] ★★★

- LAQ 4. Explain the structure and life cycle of Entamoeba histolytica with the help of neat labelled diagrams.

[GP 16(4)]

- LAQ 5. Describe the life cycle of Plasmodium vivax in man.

[GP 18(5)]

- LAQ 6. Describe the life cycle of Plasmodium vivax in mosquito.

[GP 20(6)]

- LAQ 7. Describe the structure and life cycle of Ascaris lumbricoides with the help of a neat labelled diagram.

[GP 22(7)]

★★★ ECOLOGY & ENVIRONMENT [8 MARKS] ★★★

- LAQ 8. Write an essay on temperature as an ecological factor.

[GP 25(9)]

- LAQ 9. Write an essay on water as an ecological factor.

[GP 27(10)]

- LAQ 10. Give an account of various types of interactions among the animal species of an ecosystem.

[GP 28(11)]

SAQ HIT LIST**TOP 30 SAQ**

Ans-Page

★★★ DIVERSITY OF LIVING WORLD[4 MARKS] ★★★

- SAQ 1. Define species. Explain the various aspects of 'species'.

[GP 30(12)]

- SAQ 2. What is the 'evil quartet'?

[GP 30(13)]

- SAQ 3. Explain 'Rivet Popper' hypothesis.

[GP 31(14)]

- SAQ 4. What are the reasons for greater biodiversity in the tropics?

[GP 31(15)]

★★★ STRUCTURAL ORGANIZATION[4 MARKS] ★★★

- SAQ 5. Explain Haversian system.

[GP 32(17)]

- SAQ 6. Describe the structure of a skeletal muscle.

[GP 32(18)]

- SAQ 7. Describe the three types of cartilage.

[GP 33(19)]

- SAQ 8. Describe the structure of a cardiac muscle.

[GP 33(20)]

★★★ ANIMAL DIVERSITY-I[4 MARKS] ★★★

- SAQ 9. Write short notes on the salient features of the anthozoans.

[GP 34(21)]

- SAQ 10. What are the salient features exhibited by polychaetes?

[GP 34(22)]

- SAQ 11. What are the chief characters of the crustaceans?

[GP 34(23)]

- SAQ 12. Mention the salient features of Holothuroidea.

[GP 35(25)]

★★★ ANIMAL DIVERSITY-II[4 + 4 MARKS] ★★

- SAQ 13. Name the four 'hallmarks' of chordates and explain the principal function.

[GP 36(27)]

- SAQ 14. Compare and contrast cartilaginous and bony fishes.

[GP 36(28)]

- SAQ 15. What are the modifications that are observed in birds that help them in flight?

[GP 37(29)]

- SAQ 16. Describe the structure of the heart of frog.

[GP 37(30)]

- SAQ 17. List out the extant orders of the Class Reptilia. Give two examples for each order.

[GP 38(31)]

- SAQ 18. List out eight characteristics that help distinguish a fish from the other vertebrates.

[GP 38(32)]

- SAQ 19. Write eight salient features of the class Amphibia.

[GP 38(33)]

- SAQ 20. What are the features peculiar to ratite birds? Give two examples of ratite birds.

[GP 60(149)]

★★★ LOCOMOTION & REPRODUCTION [4 +4 MARKS] ★★★

- SAQ 21. Describe the process of transverse binary fission in Paramecium.

[GP 39(34)]

- SAQ 22. Describe the process of longitudinal binary fission in Euglena.

[GP 39(35)]

- SAQ 23. What are lateral appendages? Based on their presence and absence, write the various types of flagella giving at least one example for each type.

[GP 40(36)]

- SAQ 24. Given an account of pseudopodia.

[GP 40(37)]

- SAQ 25. Draw a neat labelled diagram of Euglena.

[GP 41(38)]

- SAQ 26. Draw a neat diagram of Paramecium and label its important structures/components.

[GP 41(39)]

★★★ BIOLOGY IN HUMAN WELFARE [4 MARKS] ★★★

- SAQ 27. What are the adverse effects of tobacco?

[GP 42(40)]

- SAQ 28. Why in adolescence is considered vulnerable phase?

[GP 42(41)]

- SAQ 29. 'Prevention is better than cure'. Justify with regard to TDA abuse.

[GP 42(42)]

- SAQ 30. Distinguish between hypertrophy and hyperplasia with an example for each.

[GP 43(43)]

VSAQ HIT LIST**TOP 50 VSAQ****★★★ DIVERSITY OF LIVING WORLD [2 + 2 MARKS]★★★**

- VSAQ 1. What does ICZN stand for?
 VSAQ 2. What is biogenesis?
 VSAQ 3. What is trinomial nomenclature? Give an example.
 VSAQ 4. What is meant by tautonymy? Give two examples.
 VSAQ 5. Differentiate between Protostomia and Deuterostomia.
 VSAQ 6. Define species richness.
 VSAQ 7. List out any four sacred groves in India.
 VSAQ 8. Write the full form of IUCN. In which book threatened species are enlisted.
 VSAQ 9. Define the term metabolism. Give any one example.
 VSAQ 10. 'Zoos are tools for classification' Explain.

Ans-Page

- [GP 45(47)]
 [GP 45(48)]
 [GP 45(50)]
 [GP 45(51)]
 [GP 45(52)]
 [GP 46(54)]
 [GP 46(55)]
 [GP 46(56)]
 [GP 46(57)]
 [GP 46(59)]

★★★ STRUCTURAL ORGANISATION IN ANIMALS[2 +2 MARKS]★★★

- VSAQ 11. What is cephalization? How is it useful to its possessors?
 VSAQ 12. Mention the animals that exhibited a 'tube -within-a-tube' organisation for the first time? Name their body cavity.
 VSAQ 13. Why is the true coelom considered a secondary body cavity?
 VSAQ 14. What are retroperitoneal organs?
 VSAQ 15. What is Enterocoelom? Name the enterocoelomate phyla in the animal kingdom?
 VSAQ 16. Distinguish between endocrine and exocrine glands with examples.
 VSAQ 17. Mention any two substances secreted by mast cells and their functions.
 VSAQ 18. Distinguish between a ligament and a tendon
 VSAQ 19. What is the strongest cartilage? In which regions of the human body, do you find it?
 VSAQ 20. Define osteon.

- [GP 47(61)]
 [GP 47(62)]
 [GP 47(63)]
 [GP 47(64)]
 [GP 47(65)]
 [GP 47(66)]
 [GP 47(67)]
 [GP 48(68)]
 [GP 48(69)]
 [GP 48(70)]

★★★ ANIMAL DIVERSITY-I [2 +2 MARKS]★★★

- VSAQ 21. What are the functions of canal system of sponges?
 VSAQ 22. What is metagenesis? Animals belonging to which phylum exhibit metagenesis?
 VSAQ 23. Distinguish between amphids and phasmids.
 VSAQ 24. What is botryoidal tissue?
 VSAQ 25. Which arthropod, is called a 'living fossil'? Name its respiratory organs?

- [GP 49(77)]
 [GP 49(78)]
 [GP 49(80)]
 [GP 49(81)]
 [GP 49(82)]

- VSAQ 26. What is the function of radula? Give the name of the group of molluscs which do not possess a radula?

[GP 49(83)]

- VSAQ 27. What is Aristotle's lantern? Give one example of an animal possessing it?

[GP 49(84)]

- VSAQ 28. What is the essential difference between the larvae and adults of echinoderms, symmetry

[GP 49(85)]

- VSAQ 29. What are the two chief morphological 'body forms' of cnidarians?
 What are their chief functions?

[GP 50(86)]

- VSAQ 30. What are the respiratory structures of Limulus and Palamnaeus respectively?

[GP 50(88)]

★★ LOCOMOTION & REPRODUCTION [2 MARKS]★★

- VSAQ 31. Draw a labelled diagram of T.S. of flagellum.

[GP 51(95)]

- VSAQ 32. List any two differences between a flagellum and cilium.

[GP 51(96)]

- VSAQ 33. What is a kinety?

[GP 51(97)]

- VSAQ 34. Distinguish between proter and opisthe.

[GP 51(99)]

- VSAQ 35. Distinguish between lobopodium and filopodium. Give an example to each of them.

[GP 51(100)]

- VSAQ 36. Define conjugation with reference to ciliates. Give two examples.

[GP 51(101)]

★★ BIOLOGY IN HUMAN WELFARE[2 +2 MARKS] ★★

- VSAQ 37. Define parasitism and justify this term.

[GP 52(102)]

- VSAQ 38. What is a hyper-parasite? Mention the name of one hyper-parasite.

[GP 52(103)]

- VSAQ 39. What do you mean by parasitic castration? Give one example.

[GP 52(104)]

- VSAQ 40. Define prepatent period. What is its duration in the life cycle of plasmodium vivax?

[GP 52(107)]

- VSAQ 41. Define incubation period. What is its duration in the life cycle of plasmodium vivax?

[GP 52(108)]

- VSAQ 42. The eggs of Ascaris are called 'mammillated eggs'. Justify.

[GP 52(109)]

- VSAQ 43. Distinguish between lymphadenitis and lymphangitis?

[GP 53(111)]

- VSAQ 44. In which way does tobacco affect the respiration? Name the alkaloid found in tobacco.

[GP 53(112)]

- VSAQ 45. From which substances 'Smack' and 'Coke' are obtained?

[GP 53(114)]

★★★ ECOLOGY AND ENVIRONMENT [2 MARKS]★★★

- VSAQ 46. What are circadian rhythms?

[GP 54(121)]

- VSAQ 47. Mention the advantages of some UV rays to us.

[GP 54(123)]

- VSAQ 48. What is cyclomorphosis? Explain its importance in Daphnia.

[GP 54(124)]

- VSAQ 49. Define commensalism. Give one example.

[GP 54(125)]

- VSAQ 50. What is meant by osmotrophic nutrition?

[GP 55(127)]

Hi JUNIORS!

How are you? By the way, I am your favourite BULLET BABY BOOK.

I like you very much and I was born only for you!

Now, I am 5 years old. I always wish you get Good marks in IPE!

"Every Page in me is set beautifully so as to make you Read and write easily"

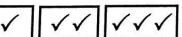
"Every answer is written in Simple steps for your Pleasure reading".

THE 5 STEP REVISION PROGRAM

- STEP 1:** LAQ Section [P 12 to P 28]: Infact, LAQ might be your Most Favourite Section. Practice each and every Problem of LAQ Section. Finish one after another, by taking as much time as you require. Later finish the LAQ Hit List (P 6) without seeing answers.
- STEP 2:** SAQ Section [P 30 to P 43]: Some SAQs are really very easy!. They save you when the paper is Tough. You should have grip on some Easy & Important SAQs. Do as many as you can from SAQ Hit list (P 7). If you do this, you are in 'Safe Zone'.
- STEP 3:** VSAQ section[P 45 to P 55]: Cute simple VSAQs are very easy to learn and remember. They are 'True marks Gainers'. Do all the VSAQs in Hit list (P 8 to P 9). If you do this, you are in 'Super Safe Zone'.
- STEP 4:** Bullet Model Paper [P 62 to P 67]: Now, its turn to do your most favourite 'Bullet Model Paper'. You can take 2 to 3 days to finish each section. Within 10 days you should complete this Task. This keeps you in 'Safe Pass Zone'.
- STEP 5:** Guess Papers [P 68 to P 72]: Finally, practice all the 5 Model Guess Papers. Answer each paper separately on white sheets as if it's like in Public Exam. That's it!. You did a wonderful job! No one can stop you from scoring 'Super Marks in IPE'.



'THE TICK BOXES' TECHNIQUE



Very 'powerful and successful method' for 'Effective Revision' - Tick Box Technique

How to use the Tick Boxes?

- Put one Tick (✓) in the first box, when you can write the answer 'without seeing it'.
ಒక ಸ್ವಾಧಾನಾನ್ನಿ ಬಾಗು ತ್ರಾಕ್ಕೆನ್ನ ಹೇಳಿ, ದಾನಿನಿ ಚೂಡಲು ಪ್ರಾಯಗೆ ನಿರ್ವಹಿಸುವುದು ಮುಂದಿ ಬಾಕ್ಕಿಲ್ಲೋ 'ಒಂಟೆ ತೀಕ್ಕೆ' ಪಟ್ಟಂಡಿ.
- Put two Ticks (✓✓) when you are able to write the answer 'without any mistake'.
ಒಟ್ಟು ಮಾತ್ರ ಕೂಡಾ ಲೇಪುಂಡಾ ಜವಾಬು ಪ್ರಾಯಗೆ ನಿರ್ವಹಿಸುವುದು ರೆಂಡೆವ ಬಾಕ್ಕಿಲ್ಲೋ 'ರೆಂಡು ತೀಕ್ಕೆ' ಪಟ್ಟಂಡಿ.
- Put Three Ticks (✓✓✓) when you write 'as it is - Ditto Answers' with 100% Confidence.
ಪೂರ್ತಿ ಕಾಣಿದೆಂಬೀರು, '100% ಪಟ್ಟಾಗ, ದೀಕ್ಕೆ ಪ್ರಿಂತೆ ವಿಳಿಸಿಕೊಂಡು' ಜವಾಬು ಪ್ರಾಯಗೆ ನಿರ್ವಹಿಸುವುದು ಮುಂದವ ಬಾಕ್ಕಿಲ್ಲೋ 'ಮೂರು ತೀಕ್ಕೆ' ಪಟ್ಟಂಡಿ.
- Just try this Technique and you see how MIRACLES happen in your Revision programme.

Be Honest in putting the Tick Marks.



ALL THE BEST IN IPE



YOUR MOST FAVOURITE SECTION

LAQ SECTION-C

LAQ CHAPTERS

16 MARKS

★★ 1.	STRUCTURAL ORGANISATION	(8 Marks)	12- 15
★★★ 2.	BIOLOGY IN HUMAN WELFARE	(8 Marks)	16- 24
★★★ 3.	ECOLOGY & ENVIRONMENT	(8 Marks)	25- 28

☞ Easy Chapter : Biology in Human Welfare.

Imp Chapter : Ecology & Environment

☞ Thorough preparation of all these LAQs helps to you cover SAQ & VSAQ as well.

☞ After finishing LAQ Section, revising VSAQ Section is a Good idea!

HOW TO MAKE ZOOLOGY AS EASY AS BOTANY?

- Keep focus on Side Headings & Key words [Bold/ colour Font words in this material]
- In LAQ Answers, some sub points may be skipped to save time.
- Rigorous practice of diagrams really saves time in the Exam.
- Select the 'less length answer questions' to save time.
- Try to finish Zoology LAQ Answers within 25 minutes.
- LAQs are three types:
 - 1) LAQ without diagrams
 - 2) LAQ with Single Page Answer
 - 3) LAQ with Two Page Answer

So, be wise in selecting the right LAQ in IPE .

★★ 1. STRUCTURAL ORGANISATION ★★

8 MARKS

- 1.** Classify and describe the epithelial tissues on the basis of structural modification of cells with examples.

A: **Types of Epithelia:** I) Simple epithelium II) Compound epithelium III) Glandular epithelium

I) **Simple Epithelium:** It is composed of single layer of cells. It lines the body cavity, ducts and vessels. It helps in diffusion, absorption filtration and secretion of substances.

It is again divided into three types based on the shape of the cells.

1) **Simple squamous epithelium:** It has single layer of flat tile like cells with a central oval nucleus. **Ex:** Endothelium of blood vessels, Mesothelium, Wall of Bowman's capsule, lining of alveoli of lungs.

2) **Simple Cuboidal epithelium:** It is formed of single layer of cuboid cells with a central nucleus. **Ex:** Germinal epithelium, epithelium of proximal and distal convoluted tubules.

3) **Simple Columnar epithelium:** It is composed of single layer of tall cells with nucleus at the base. Mucus secreting goblets cells may be present. It is of two types.

i) **Ciliated Columnar epithelium:** Columnar cells have cilia at their free surface.

Ex: Fallopian tubules, ventricles of brain, central canal of spinal cord, bronchioles etc.

ii) **Non-ciliated columnar epithelium:** Columnar cells do not bear cilia.

Ex: Lining of stomach and intestine

II) **Compound Epithelium:** It is formed of more than one layer of cells.

Its main function is to provide protection against chemical and mechanical stress.

Compound epithelium is divided into the following types:

(1) **Stratified keratinized squamous epithelium:** Keratin is present in these cells. It covers the dry surface of the skin.

(2) **Stratified non-keratinized squamous epithelium:** Keratin is absent in these cells.

It covers wet surface such as Buccal cavity, pharynx, oesophagus and vagina.

(3) **Stratified cuboidal epithelium:** It forms inner lining of ducts of sweat glands, pancreas.

(4) **Transitional Epithelium:** It forms the wall of the urinary bladder.

III) Glandular Epithelium(G.E): It is a tissue responsible for formation of glands. It forms the covering of all major glands.

1) **Function:** Secretion is the main function of G.E. Based on the secretions G.E are two types

i) **Exocrine glands:** They are glands with ducts. **Ex:** Salivary glands, Mammary glands.

ii) **Endocrine glands:** They are ductless glands. **Ex:** Pituitary, Thyroid

2) Based on the combination of cells G.E are two types

i) Unicellular glands are isolated glandular cells. **Ex:** Goblet cells of gut.

ii) Multicellular glands consist of clusters of cells. **Ex:** Salivary glands.

- 2.** Compare and contrast the three types of muscular tissues.

A: Comparison of three types of muscles skeletal, visceral and cardiac muscles, is done under the following headings:

I) Attachment:

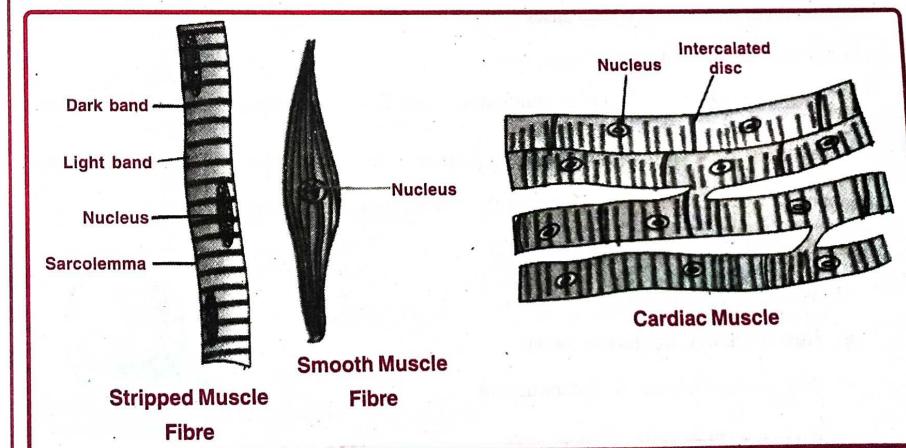
- 1) Skeletal muscles are attached to skeleton by tendons.
- 2) Visceral muscles are present in walls of the visceral organs. They are arranged in sheets.
- 3) Cardiac muscles are present in myocardium of the heart attached to septa and lateral walls of the heart.

II) Cell structure:

- 1) Skeletal muscle cell is long, cylindrical and unbranched.
It is multinucleate (syncytium).
The myofibrils have alternate dark and light bands.
- 2) Visceral myocyte is spindle shaped.
It is uninucleate.
The myofibrils have no dark and light bands.
- 3) Cardiac muscle is cylindrical, uni or binucleate and branched.
Alternate dark and light bands are present.
Intercalated discs of cardiac muscle helps in quick transport of electrical impulse.

III) Nature of action and control:

- 1) Skeletal muscles are voluntary under the control of somatic nervous system.
They contract quickly and fatigue quickly.
- 2) Visceral muscles are involuntary under the control of Autonomic nervous system(ANS).
Their contractions are slow and prolonged and no fatigue.
- 3) Cardiac muscles are involuntary under the control of pace maker or SAN, ANS, Hormones.
The muscle is highly resistant to fatigue.



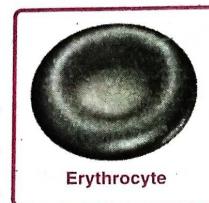
3. Give an account of the 'formed elements' of Blood.

A: **Formed elements of blood:** Blood is composed of plasma and formed elements. Blood cells are formed from yolk sac mesoderm in the embryos. In adults, red bone marrow produces blood cells. The formed elements are

- (I) Red blood cells (II) White blood cells (III) Platelets

I) Red blood cells (Erythrocytes):

- 1) Erythrocytes of mammals are circular, enucleate, biconcave discs.
- 2) Biconcave shape increases the surface area for exchange of gases.
- 3) The number of RBC per cubic millimeter of blood is about 5 million in man and 4.5 million in a woman.
- 4) The reduction in number of RBC, leads to anaemia.
- 5) Life span of human RBC is 120 days.
- 6) RBC are destroyed in spleen and liver. They are formed in bone marrow.



Erythrocyte

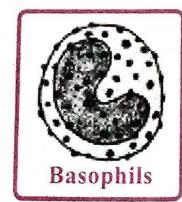
II) White blood cells (Leucocytes):

- 1) White blood cells are either round or irregular (amoeboid) in shape.
- 2) They exhibit diapedesis.
- 3) Their number is 6000 to 10000 per cubic mm of blood.
- 4) Formation of WBC is Leucopoiesis.
- 5) Increase in number of WBC is leucocytosis. It takes place during infections and allergy.
- 6) Abnormal increase of WBC causes Leukemia (blood cancer)
- 7) Fall in count of WBC is leucocytopenia.
- 8) WBC are of two types based on cytoplasmic granules A) Granulocytes B) Agranulocytes.

A) Granulocytes: Cytoplasm of WBC has granules. Nucleus is lobed and hence called polymorph - nuclear leucocytes. These are three types based on staining properties.

1) Basophils:

- i) They take up basic stains.
- ii) Their Nucleus is irregularly lobed.
- iii) They produce heparin & histamine and function as mast cells when necessary.



Basophils

2) Eosinophils:

- i) They take up acid stains.
- ii) Their Nucleus is bilobed.
- iii) They remove antigen - antibody complexes.



Eosinophil



Neutrophil

3) Neutrophils: They are most common WBC.

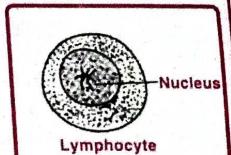
- i) Their Nucleus is many lobed.
- ii) They are microscopic policemen because of active phagocytosis.

B) Agranulocytes: Cytoplasmic granules are absent. Their Nucleus is not lobed.

There are 2 types of agranulocytes. (1) Lymphocytes (2) Monocytes.

1) Lymphocytes:

- i) Small spherical cell with large round nucleus and small amount of cytoplasm.
- ii) B-lymphocytes produce antibodies.
- iii) T lymphocytes play a role in immunological reactions.

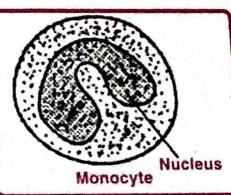


Nucleus

Lymphocyte

2) Monocytes:

- i) The nucleus is kidney shaped.
- ii) They are large and motile.
- iii) They engulf bacteria and cell wastes.
- iv) They become macrophages in connective tissue.

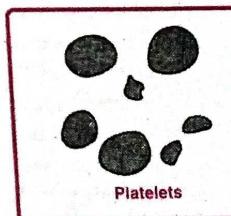


Monocyte

Nucleus

III) Platelets (Thrombocytes):

- 1) They are colourless, enucleated, round or oval discs.
- 2) Their count is 2,50,000 to 4,50,000 per cubic mm.
- 3) They are formed from megakaryocytes by fragmentation.
- 4) Their life span is 5-9 days.
- 5) They secrete Thromboplastin that helps in blood clotting.



Platelets

★★★ 2.BIOLOGY & HUMAN WELFARE ★★★

8 MARKS

4. Explain the structure and life cycle of *Entamoeba histolytica* with the help of neat labelled diagrams. [TS M-19][AP M-15,18]

A: ***Entamoeba histolytica*:** Phylum- Protozoa; Class- Rhizopoda

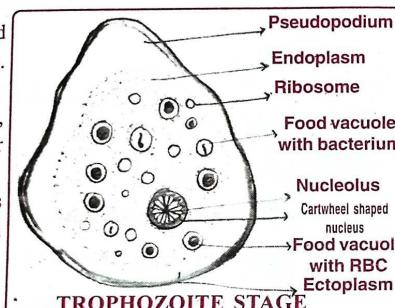
It is a monogenetic histozoic parasite.

It lives in the large intestine of man. It causes amoebic dysentery

I) Structure of *E histolytica* consists of 3 stages.

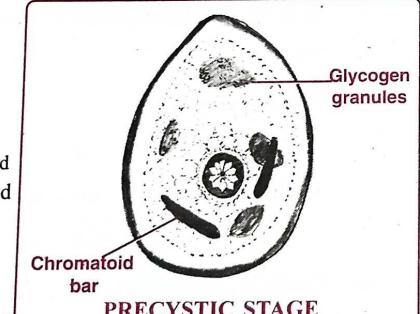
1) Trophozoite stage:

- In this stage, it lives in mucous and submucous layers of large intestine of man.
- Its body is surrounded by plasmalemma.
- Its cytoplasm is differentiated into an outer, non-granular ectoplasm and the inner granular endoplasm.
- Endoplasm contains ribosomes, food vacuoles with bacterium and food vacuoles with RBC, a cart wheel shaped nucleus.
- It produces the proteolytic enzyme called histolysin (tissue digesting enzyme).
- This is the most active, motile, feeding and pathogenic stage.



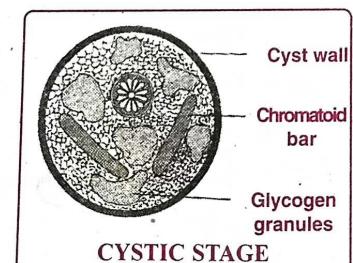
2) Precystic stage:

- It finds in the lumen of large intestine.
- It becomes small and oval at this stage.
- Its cytoplasm consists of glycogen granules and chromatoid bars. They act as reserve food.
- It is the non-feeding, non-motile and non-pathogenic stage.

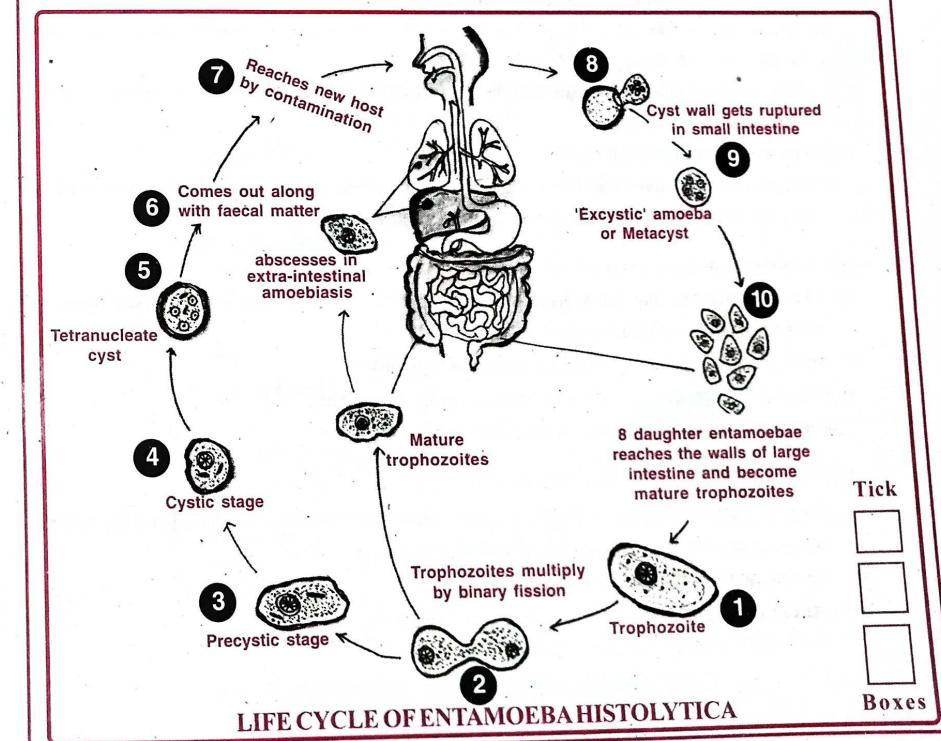


3) Cystic stage:

- It is round in shape.
- It finds in the lumen of large intestine.
- Formation of a thin, delicate highly resistant cyst wall takes place.
- The nucleus undergoes two mitotic divisions and four nuclei are formed. Hence it is called tetranucleate cyst. This is the infective stage to man.
- These cysts pass through faeces and wait until they reach a healthy person.

II) Life Cycle of *E histolytica*:

- E histolytica* in trophozoite stage undergo binary fissions and produce a number of daughter entamoeba.
- They feed upon the bacteria and host's tissues. They grow in size and multiply by binary fissions.
- Some of these, enter the lumen of the large intestine and transform into 'precystic stage'.
- Here, the precystic stage transforms into 'cystic stage'.
- There they in turn develop into tetranucleate cysts. This entire process is completed within a few hours.
- These tetranucleate cysts come out along with the faecal matter. They can remain alive for about 10 days.
- These cysts then reach new host through contaminated food and water.
- The cyst wall gets ruptured by enzyme trypsin in the small intestine of a new human host.
- There it releases the tetranucleate amoebae. These are called metacysts.
- Here, four nuclei of the metacysts undergo mitotic divisions and produce eight daughter nuclei. Each nucleus gets a bit of cytoplasm and thus eight daughter entamoebae are produced.
- They reach the wall of large intestine and become mature trophozoites causing amoebic dysentery.
- Extra intestinal amoebiasis:** Sometimes, the trophozoites reach the liver and cause 'abscesses' (secondary amoebiasis). From there they may go to lungs, heart, brain and kidneys. There they cause abscesses in those parts leading to severe pathological conditions.



5. Describe the life cycle of *Plasmodium vivax* in man.

[AP M-17] [TS May-17]

Super Second 'Q'

A. '*Plasmodium vivax*': Phylum- Protozoa; Class - Telosporea

It is the malarial parasite of man.

It is digenetic intra cellular parasite that lives in the liver cells and RBC of man.

Life cycle of *Plasmodium* in man (Human phase):

In man, plasmodium reproduces by asexual reproduction called schizogony.

It is of two types:

(I) Hepatic schizogony (occurs in liver cells)

II) Erythrocytic schizogony (occurs in RBC)

⊗ Malarial Parasite 'Q'

☺ Don't Leave this!

☺ Don't miss 'Golgi'

(I) Hepatic Schizogony: It was discovered by Shortt and Garnham.

When an infected mosquito bites a healthy person, the sporozoites enter the blood of man. Within half an hour they reach liver cells. In liver cells, the parasites increase their number in two cycles. They are 1) Pre-erythrocytic and 2) Exo-erythrocytic cycles.

(1) Pre-erythrocytic cycle:

- The sporozoites enter liver cells and transform into trophozoites.
- They become round and grow in size and are called schizonts.
- The nucleus divides several times. It is followed by the cytoplasm divisions, producing 12,000 cryptozoites (or first generation merozoites).
- They enter the sinusoids of the liver by rupturing the cell membrane of the schizont and the liver cells.
- The duration of pre-erythrocytic cycle is 8 days.
- The cryptozoites may enter into either fresh liver cells to continue exo-erythrocytic cycle or they can enter into RBC to continue erythrocytic cycle.

(2) Exo-erythrocytic cycle:

- The cryptozoites that enter liver cells undergo schizogony and produce two types of metacryptozoites within two days.
 - Some are small called micro meta cryptozoites (male).
 - Others are large and called macro meta cryptozoites (female).
- The macro meta cryptozoites continue hepatic schizogony.

Prepatent period (No clinical symptoms):

- The interval between the first entry of plasmodium (sporozoites) into blood and the second entry of plasmodium (cryptozoite) is called prepatent period.
- No clinical symptoms are observed.
- It takes generally 8 days.

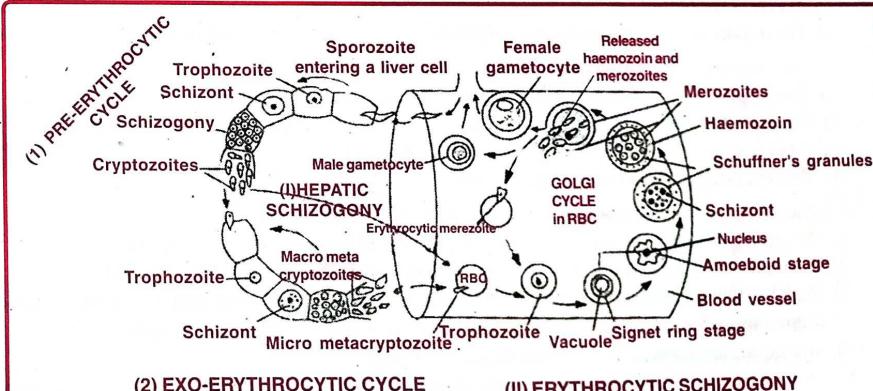
(II) Erythrocytic schizogony:

- Golgi cycle: It was described by Golgi.
- The cryptozoites or micro meta cryptozoites enter into the fresh RBC.
- They transform into trophozoites.
- A small vacuole appears in trophozoite.
- It enlarges by pushing the cytoplasm and nucleus to one side.
- The parasite looks like a ring and hence it is called signet ring stage.
- Here, the vacuole disappears, Pseudopodia develop and the parasite changes to amoeboid stage.
- At this stage parasite exhibits hypertrophy condition (RBC grows almost double the size).
- It feeds on globin part of haemoglobin and grows in size.
- It converts the soluble haem into insoluble haemozoin called malaria pigment.
- Small red colour dots appear in the cytoplasm of RBC called Schuffner's dots.
- It becomes a round schizont.
- It undergoes schizogony and produces 12 to 24 erythrocytic merozoites.
- Finally the erythrocyte bursts and releases merozoites and haemozoin into the blood.
- The release of haemozoin causes chill, fever.
- They attack fresh RBC and continue the erythrocytic cycle.
- The duration of erythrocytic cycle is 48 hours.

xvii) Incubation period: The period between the entry of plasmodium (sporozoite) and the first appearance of symptoms of Malaria is called incubation period. Its duration is 10 to 14 days.

2) Formation of Gametocytes:

- After several erythrocytic schizogonies, some merozoites enter the RBC and transform into gametocytes instead of continuing the erythrocytic cycle.
- There are two types of gametocytes. (a) Female gametocyte (b) Male gametocyte.
- The gametocytes do not develop further in man. They have to reach female Anopheles.
- They die if they do not reach the mosquito within a week.



(2) EXO-ERYTHROCYTIC CYCLE

(II) ERYTHROCYTIC SCHIZOGONY

ASEXUAL LIFE CYCLE OF PLASMODIUM IN MAN

6. Describe the life cycle of Plasmodium vivax in mosquito. [AP, TS M-16,17][IPE-14]

A: Life cycle of Plasmodium in Mosquito(Mosquito Phase)- Ross Cycle: [AP Mar-19]

Gametocytes of Plasmodium are formed in man and their further development takes place in female Anopheles mosquito.

When a female Anopheles mosquito bites and sucks the blood of a malaria patient, the gametocytes along with the other stages of the erythrocytic cycle reach the crop of mosquito. Here all the stages are digested except the gametocytes.

Further part of the life cycle consists of four phases.

I) Gametogony II) Fertilization III) Formation of Ookinete & Oocysts IV) Sporogony

I) Gametogony: The formation of male and female gametes from the gametocytes is called gametogony. It occurs in the lumen of the crop of mosquito.

(1) Formation of male gametes:

- During this process, the nucleus of microgametocyte divides into eight daughter nuclei.
- The eight daughter nuclei pass into eight flagella like structures and form male gametes.
- Then the flagella like structures begin lashing movements and get separated from the flagellated body. This process is called exflagellation.

(2) Formation of female gamete:

- The female gametocyte undergoes a few changes and transforms into a female gamete. This process is called maturation.
- The nucleus moves towards the periphery, and the cytoplasm forms a projection called fertilization cone.

II) Fertilization: The fusion of male and female gametes is called fertilization.

- One of the active male gamete comes in contact with the 'fertilization cone' of the female gamete and enters into it.
- The pronuclei and cytoplasm of these two gametes fuse with each other. As a result the zygote is formed.
- These gametes are dissimilar in size and hence the process is called anisogamy.

III) Formation of Ookinete & Oocysts:

- The zygote elongates and becomes motile and is called ookinete within 18 to 24 hours.
- It pierces the wall of the crop and settles beneath the basement membrane.
- It becomes round and secretes a cyst around its body.
- This encysted ookinete is now called oocyst.

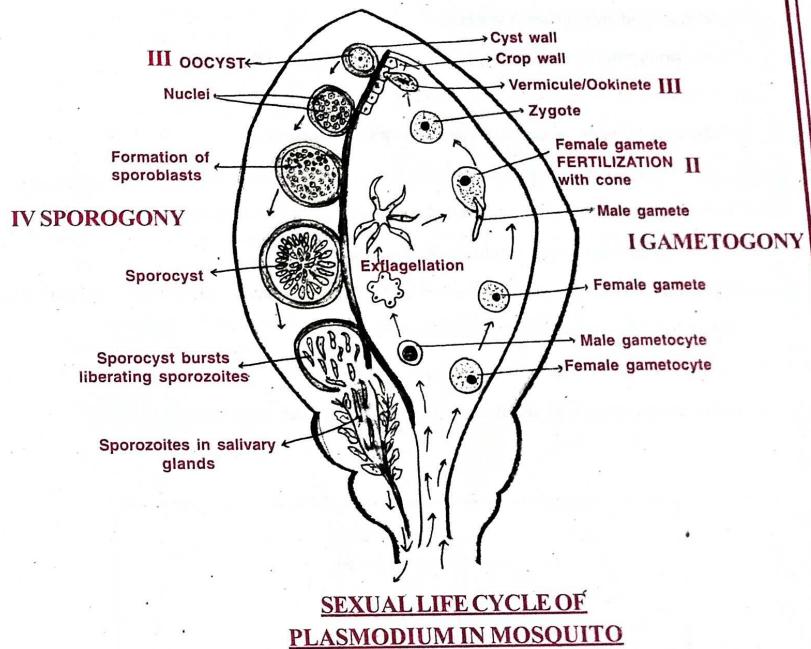
IV) Sporogony: The oocyst enlarges in size and begins sporogony.

- According to Bano, the nucleus of the oocyst first undergoes reduction division.
- Then the nucleus divides repeatedly by mitosis and produces a number of nuclei.
- Each bit of nucleus is surrounded by a little bit of the cytoplasm and it transforms into a sickle shaped sporozoite. Oocyst with such sporozoites (about 10,000) is called sporocyst.
- Sporocysts are formed into spindle shaped sporozoites.
- From there, they travel into the salivary glands and become ready for infection of a healthy person.

Tick Boxes

- The life cycle of plasmodium in mosquito is completed in about 10 to 24 days.

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7. Describe the structure and life cycle of *Ascaris lumbricoides* with the help of a neat labelled diagram.
[TS May-19][AP May-17,19][TS M-15][AP-18]

A: • *Ascaris lumbricoides*:

Phylum- Nematoda; **Class-** Phasmidia

It is commonly called the 'common round worm'.

It reaches the intestine of children through contaminated water, food and causes Ascariasis.

It is dimorphic, monogenetic pseudocoelomate, enterozoic parasite.

(శూడనికి చిన్న పిల్లల 'Q'
రాయడానికి పెద్ద పిల్లల 'Q'

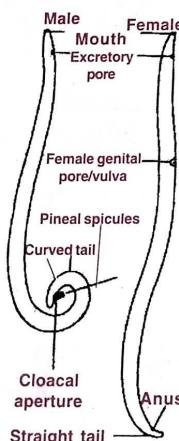
I) Structure of *Ascaris lumbricoides*:

- 1) Sexes are separate and the sexual dimorphism is distinct.
- 2) In both males and females, the body is elongated and cylindrical.
- 3) In both forms mouth is at the anterior end surrounded by Chitinous lips.
- 4) Excretory pore is present ventrally close to the mouth.

A) Male: It is short with posterior curved end. There is cloaca in the curved end bearing equal sized a pair of copulatory spicules or pineal spicules.

B) Female: The body is long with a straight posterior end.

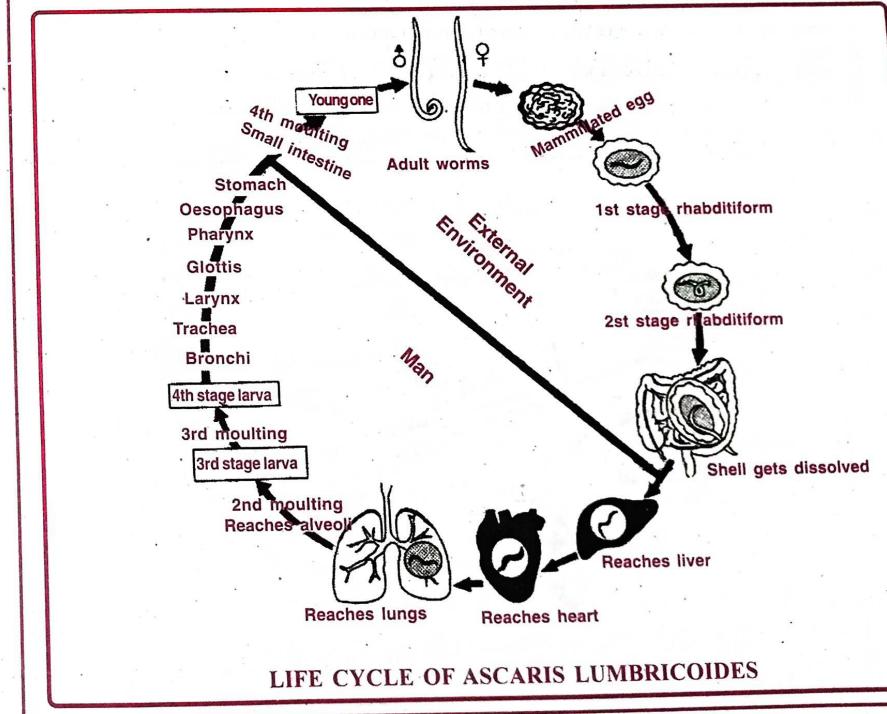
Female genital pore is at about one third the length from anterior end.



STRUCTURE OF ASCARIS LUMBRICOIDES

II) Life cycle of *Ascaris lumbricoides*:

- 1) After copulation in the small intestine the female releases about two lakh eggs daily.
- 2) Each egg is surrounded by a rippled protein coat and hence it is called 'mammillated egg'.
- 3) These eggs are passed out along with faecal matter.
- 4) In the moist soil, development takes place inside the eggs and 'first stage rhabditiform larva' is produced.
- 5) It undergoes first moulting and 'second stage rhabditiform larva' is formed. This second stage larva is the infective stage to man.
- 6) These eggs reach a new host through contaminated food and water.
- 7) In the small intestine, the shell gets dissolved and larva is released. Here larva undertakes extra intestinal migration.
- 8) It reaches the liver through hepatic portal vein.
- 9) Then it goes to heart through post caval vein.
- 10) It reaches lungs through pulmonary arteries.
- 11) The second moulting take place in alveoli of lungs and 'third stage larvae' are formed.
- 12) The third moulting take place in alveoli of lungs and 'fourth stage larvae' are formed.
- 13) It reaches the small intestine through bronchi, trachea, larynx, glottis, pharynx, oesophagus and stomach.
- 14) Fourth moulting (final moulting) takes place in small intestine and then becomes young round worm.
- 15) It attains sexual maturity in 8 to 10 weeks.
- 16) **Pathogenicity:** Ascaris causes ascariasis. When the infection is heavy it can cause Nutritional deficiency, severe abdominal pain and stunted growth in children.



8. Describe the life cycle of *Wuchereria bancrofti* with a neat diagram. [TS-18]

A. • *Wuchereria bancrofti*: Phylum- Nematoda; Class- Phasmidia

It is called commonly called the filaria worm.

It is digenetic, dimorphic, histozoic, pseudocoelomate parasite.

It lives in lymph vessels of man. Its secondary host is mosquito.

I) **Structure:**

- 1) Sexes are separate and the sexual dimorphism is distinct.
- 2) The body is long and filiform. The anterior end is blunt and posterior end is pointed.
- 3) Mouth is anterior without any lips.
- 4) Male: It has posterior curved end with cloaca and a pair of unequal copulatory spicules.
- 5) Female: It has anus at the posterior straight end. Female genital pore is about one third the length from the mouth. It is ovoviparous.

II) **Life cycle:** *Wuchereria* completes its life cycle in two hosts. Man and female culex mosquito.

1) **In man:** Male and female worms remain coiled in lymph vessels.

- i) After copulation the female releases ensheathed microfilaria larva.
- ii) It is surrounded by loose cuticular sheath. It lives in deep blood vessels during day time and comes to periphery during night between 10 PM and 4 AM. This is called nocturnal periodicity.
- iii) The larva can live for 70 days, before which, it has to enter a mosquito.

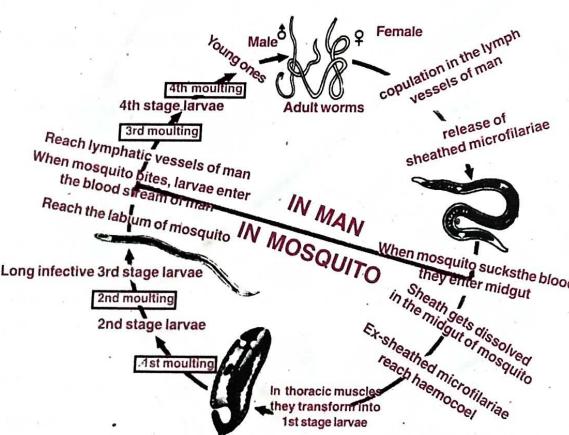
2) **In Mosquito:**

- i) When female culex bites the infected person, the micro filarial enter the mid gut of mosquito.
- ii) The sheath is dissolved in midgut.
- iii) The larva penetrates the gut wall and reach the thoracic muscles.
- iv) In two days, it becomes first stage microfilaria.
- v) It undergoes two moults to become long slender infective, third stage microfilaria.
- vi) The 3rd stage goes to the labium of mosquito and waits to enter man.

3) **In man after infection:** When infected mosquito bites a healthy person, the 3rd stage larva enter blood circulation and finally reach the lymphatic vessels.

- i) It undergoes third and fourth moults to become young filarial worm.
- ii) They attain maturity in 5 to 18 months.

4) **Pathogenicity:** Light infection causes filarial fever. Heavy infection causes inflammation of lymph vessels and lymph glands. The final condition is Elephantiasis.



LIFE CYCLE OF WUCHERERIA BANCROFTI

★★★ 3.ECOLOGY & ENVIRONMENT ★★★

8 MARKS

9. Write an essay on temperature as an ecological factor.

A: **Temperature as an ecological factor:**

Temperature is a measure of intensity of heat. Temperatures vary greatly on land from equator to poles and sea level to high altitudes. Temperatures in water vary very little.

1) **Thermal stratification in temperature and lakes:** Temperature variations are more observed in temperate lakes.

2) **Summer Stratification:**

- i) During summer the temperature of surface water reaches upto 25°C.
- ii) The upper layer is called epilimnion.
- iii) The middle layer is thermocline or metalimnion.
- iv) The temperature decreases at the rate of 1°C per meter down the depth.
- v) The bottom layer is hypolimnion. The water is cool, stagnant with low oxygen.

3) **Autumn over turn:**

- i) During autumn epilimnion cools down to 4°C as water has maximum density at 4°C.
- ii) Surface water becomes heavy and sinks to the bottom. The bottom water comes up.
- iii) This circulation is called autumn or fall, over turn.

4) **Winter Stratification:**

- i) During winter the surface temperature reaches 0°C and water freezes.
- ii) Below the surface, water is present.
- iii) In this condition organisms survive by reducing their metabolic rate and oxygen consumption.

5) **Spring Overturn:**

- i) In the following spring the surface warms upto 4°C. The heavy water goes down bringing up nutrient water. This overturn is spring over turn.
- ii) Circulation of oxygen and nutrients takes place in lakes. The lakes which show overturns twice a year are called dimictic lake.

6) **Biological effects:**

- i) **Eury thermal:** These animals withstand wide range of temperature.
Ex: Birds & Mammals.
- ii) **Stenothermal:** These animals cannot withstand fluctuations in temperature.
Ex: Fishes & Corals.

7) **Metabolism:**

- i) Temperature changes the activity of enzymes.
- ii) Optimum temperature is the temperature at which the activity of animal is at peak.
- iii) Minimum effective temperature, below which animal cannot survive and undergoes Chill coma.
- iv) Maximum effective temperature, above which animal undergoes heat coma.

- 8) **Van't Hoff's rule:** For every increase of 10°C the metabolic rate doubles.
 i) Temperature coefficient $Q_{10} = X - (X - 10^{\circ}\text{C})$.
 ii) If the value of Q_{10} is 2.0 then it means that the rate of metabolism is doubled.
- 9) **Cyclomorphosis:** Temperature through seasonal changes bring about morphological changes in animals like Daphnia (water flea).
 i) In winter head of Daphnia is round.
 ii) During spring a helmet begins to grow
 iii) In summer the helmet becomes large.
 iv) In autumn the helmet gradually decreases.
 v) By winter the head becomes round.
 vi) The density of water changes with temperature.
 vii) Cyclomorphosis is an adaptation to changing densities so that the animal can float freely.
- 10) **Adaptations Behaviour:** The reptiles bask in sunlight during cold days. They burrow in soil and hide during summer.
- 11) **Morphological adaptations:** Animal living in colder climates and cold water have a thick layer of fat below the skin (blubber). Ex: Seal
- 12) **Bergman's rule:** Animals of colder regions have larger bodies than their counter parts in warmer region. Large sized animals have less surface area. Hence heat loss is less.
- 13) **Allen's rule:** Mammals in colder region have small ear lobes. Their counterparts in warmer region have large ear lobes. Temperature loss is less in small ear lobes. Ex: Fox.
- 14) **Physiological adaptations:** All the animals try to maintain constant body temperature and constant inner fluid concentration.
- 15) **Regulators:** Birds and mammals maintain homeostasis i.e., thermoregulation and osmoregulation. Ex: Sweating in summer, Closure of sweat pore in winter and shivering.
- 16) **Conformers:** In many animals the body temperature vary to certain extent according to outside temperature. Ex: Invertebrates, Fishes, Frogs and reptiles. Camel is a partial regulator.
- 17) **Migration:** Animals move from one place to another to escape from severe climate in search of food and reproduction. Ex: Birds of Siberia.
- 18) **Suspension of life activity:** Thick walled spores are formed to tide over unfavourable conditions. Higher forms undergo aestivation in summer and hibernation in winter to escape severe temperature. Ex: Bacteria, fungi and lower plants.
- 19) **Diapause:** Certain organisms delay their development in unfavourable conditions. Ex: Insect and embryos of fish.

10. Write an essay on water as an ecological factor.
- A: **Water as an ecological factor:**
- 1) **Water:** Water is an important ecological factor that influences the life of organisms. Salt concentration is high in sea water and very low in fresh water.
- 2) **Eury haline:** These organisms can tolerate wide fluctuations of salinity.
 Ex: Estuarine animals.
- 3) **Steno haline:** These organisms cannot tolerate fluctuations in salinity.
 Ex: Fresh water fishes & Marine fishes.
- 4) **Adaptations of fresh water animals:** The salt concentration of body fluids is much higher than surrounding fresh water. So endosmosis takes place to send out excess water.
 (i) Protozoans have contractile vacuoles.
 (ii) Fresh water fishes have large glomerular kidneys. Along with water, salts are also lost.
 (iii) Fishes have salt absorbing chloride cells in gills which absorb salts from surrounding water.
 (v) Ponds dry up during summer. So, to survive in summer,
 a) Protozoans undergo encystment.
 b) Sponges produce gemmules.
 c) Fishes like protoperus aestivate.
- 5) **Adaptations of Sea water animals:** Salt concentration sea of water is more than that of body fluids. So exosmosis takes place and to prevent dehydration.
 (i) Fishes have aglomerular kidneys with few nephrons.
 (ii) They drink water. So salts accumulate inside the body.
 (iii) Excess salts are sent out through salt secreting chloride cells in gills.
 (iv) Sea gulls and penguins secrete salt drops through nose.
 (v) Turtles and crocodiles have salt secreting glands near eyes.
 (vi) Sharks maintain salt concentration by having urea and TMO in their blood.
- 6) **Adaptations of Brackish water:** Animals of estuaries are euryhaline. Salmon and Hilsa are anadromous & Anguilla is catadromous. They can adjust their kidneys according to changing salinity. The chloride cells either absorb or secrete salt according to situation.
- 7) **Terrestrial adaptations:** Deserts have very less amount of water. Kangaroo rat utilizes its metabolic water for its water needs. It releases concentrated urine to prevent water loss.

11. Give an account of various types of interactions among the animal species of an ecosystem.

A: Types of interactions among the animal species:

I) **Inter-specific Interaction:** It arises from population of two different species.

It is divided into four types. (i) mutualism, (ii)commensalism, (iii)parasitism & (iv) amensalism.

(i) **Mutualism :** Both the species get benefited with each other.

(ii) **Commensalism :** One gets benefited and the other one is neither benefited nor harmed.

(iii) **Parasitism :** In both of these only one species benefits and the other one is harmed.

(iv) **Amensalism :** One species is harmed and the other one is unaffected.

II) **Predation:** Predation is a feeding strategy, between two different species in which predator gets benefited at the cost of the prey. Ex : Lion (Predator) & Deer(Prey).

Important functions of Predation:

(i) **Energy transfer:** Predators take the basic role of **energy transfer** in trophic level.

(ii) **Biological Control:** The ability of the Predators regulate the population of the prey.

(iii) **Species diversity:** Predators reduce the intensity of competition among the prey species.

(iv) **Predators are prudent:** If a predator is too efficient and overexploits its prey, then the prey might become extinct and following it, the predator will also become extinct due to lack of food. This is the reason why predators in nature are prudent.

(v) Preys develop defensive mechanism to avoid their predators.

III) **Inter specific competition** is the competition between different species for the same resource.

Ex: Flamingos and fishes. Both of them compete for the same food, zoo plankton.

Types of Competition:

(i) **Competition among unrelated species:** It is a process in which the fitness of one species is significantly lower in the presence of another species.

(ii) **Competitive exclusion :** Gause explained that when sources are limited, superior species will eliminate the other species. Ex :Greater browsing efficiency of the goats in Galaspagos Islands eliminates the Abingdon tortoise.

(iii) **Competitive release:** It occurs when one of the two competing species is removed from an area, thereby releasing the remaining species from one of the factors that limited its population size.

(iv) **Coexistence:**Gausse's principle of exclusion states that two closely related species competing for the same resource, could avoid competition by choosing, for instance, different times for feeding (or) food collecting patterns.

IV) **Parasitism :** It is the interaction between two organisms of different species, in which one gets benefited and the other gets harmed.

Ex : Plasmodium vivax (Malaria parasite) in the body of a man.

Types of Parasites:

(i) **Ectoparasites:** They feed outside the body of the host. Ex : Ticks on dogs, lice on humans.

(ii) **Endoparasites:** They live inside the body of the host. Ex : Malaria parasite.

(iii) **Brood parasites:** During breeding season cuckoo (koel) lays its eggs in the host (crow) for incubation.

V) **Commensalism :** It is the interaction in which one species benefits and the other neither harmed nor benefited.

Ex : Barnacles growing on the back of a whale benefit while the whale is not benefited.

(VI) **Mutualism :** In this interaction both species get benefited.

Ex : Plants and animals.

Plants need the help of animals for pollination & seed dispersals whereas animals get nectar & juicy and nutrients from fruits.

SAQ

MIDDLE SECTION WITH MID RANGE ANSWERS

SECTION-B

SAQ CHAPTERS

24 MARKS

★★★ 4.	DIVERSITY OF LIVING WORLD (4 Marks)	30 - 31
★★★ 5.	STRUCTURAL ORGANISATION (4 Marks)	32 - 33
★★★ 6.	ANIMAL DIVERSITY-I (4 Marks)	34 - 35
★★ 7.	ANIMAL DIVERSITY-II (4+4 Marks)	36 - 38
★★★ 8.	LOCOMOTION & REPRODUCTION (4+4 Marks)	39 - 41
★★★ 9.	BIOLOGY IN HUMAN WELFARE (4 Marks)	42 - 43

☞ **Easy Chapters:** Diversity of Living World, Structural Organisation,

Biology In Human Welfare

Scoring Chapters: Animal Diversity-II, Locomotion & Reproduction

★★★ 4.DIVERSITY OF LIVING WORLD ★★★

4 MARKS

12. Define species. Explain the various aspects of 'species'. [TS M-16,17][IPE-14]

A: I) Species:

- 1) It is the basic unit of classification of living organisms.
- 2) John Ray described species on the basis of common descent(ancestors)
- 3) **Buffon's def:** Species is an interbreeding groups of similar individuals, sharing a common gene pool and producing fertile offspring.

Tick

II) Various aspects of Species:

- 1) Species is a breeding unit, as it isolates reproductivity of individuals.
- 2) Species is an ecological unit, as its shares the same ecological niche
- 3) Species is a genetic unit, as it shows similarity in the karyotype.
- 4) Species is an evolutionary unit, as it exhibits similar structural and functional characters.
- 5) Species is dynamic, as it reflects continuous tendency for change.

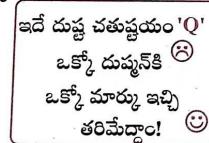
Boxes

13. What is the 'evil quartet'?

[AP, TS M-15][AP M-16,18]

A: The 'evil quartet' refers to 'four major threats' of biodiversity. They are

- 1) Habitat loss and fragmentation
- 2) Over exploitation.
- 3) Invasion of Alien species
- 4) Co-extinctions



1) **Habitat loss and fragmentation:**

- i) Deforestation leads to habitat loss for many species.
- ii) Conversion of forest land to agriculture land also leads to habitat loss.
- iii) Pollution degrades habitat because it changes the quality of land.
- iv) Defragmentation division of main land to small lands leads to population decline.

2) **Over Exploitation:** When need turns to greed, it leads to over exploitation.

Ex: Steller's sea cow and passenger pigeons are extinct due to over exploitation by man.

3) **Invasion of Alien Species:** When alien species are introduced into a habitat, they turn invasive and establish themselves at the cost of native species.

Ex: Nile perch introduced into lake Victoria

4) **Co-extinction:** It is an obligate association between a plant and an animal.

If a plant becomes extinct, the animal also becomes extinct.

Ex: Host and parasite, plant and pollinator.

Tick Boxes

14. Explain 'Rivet Popper' hypothesis.

[TS M-19][AP Mar, May-17] [TS May-17,19]

A: 1) 'Rivet Popper hypothesis' explains the consequences that happen when some species are lost in an ecosystem.

Rivet Popper

⌚ What a Comparison! ⌚
Rivet Vs Species
Plane Vs Ecosystem

2) **Rivet Popper Hypothesis:**

3) An aeroplane is taken as an example for ecosystem.

4) Various rivets of the plane are considered as various species.

5) Removing a rivet (species) from a seat (minor important part) may not damage the plane, but removal of rivet from a wing (critical part) can result into a crash.

6) So, removal of one rivet of various parts can slowly damage the Plane.

7) Likewise, removal of 'Critical Species' may affect entire community which affects the entire ecosystem.

Tick Boxes

15. What are the reasons for greater biodiversity in the tropics?

[TS M-18]

A: 1) Tropics are the regions on either side of equator.

[AP May-19]

2) Tropical latitudes remained undisturbed for millions of years.

3) Tropics had long undisturbed evolutionary time.

4) This long duration helped speciation and species diversity.

5) Tropical climate are more constant which promoted niche speciation and greater biodiversity.

6) Solar energy and water are abundant in nature. Hence food production also leads to greater biodiversity.

16. Explain in brief 'Biodiversity Hot Spots'.

[AP M-19]

A: 1) The concept of 'Biodiversity Hotspot' was proposed by Norman Myers.

2) Biodiversity hot spot is a 'Biogeographic region' with a significant reservoir of biodiversity that is under threat of extinction from humans.

3) They are the earths biologically richest and most threatened terrestrial Ecoregions.

4) There are about 34 biodiversity hotspots in the world.

Ex: Western ghats and Srilanka, Indo-Burma and Himalayas.

5) Ecologically unique and biodiversity rich regions are legally protected in

(i) Biosphere Reserves (ii) National parks (iii) Sanctuaries (iv) sacred groves.

[Few More SAQ are in Page 57]

★★★ 5.STRUCTURAL ORGANISATION ★★★

4 MARKS

17. Explain Haversian system.

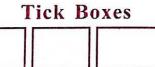
[AP, TS May-17] [AP M-16][IPE-14]

- A: • In a dense bone, a Haversian canal and the surrounding lamellae and lacunae are collectively called Osteon or Haversian system. It works as transport system. It is a unit of compact bone.

Parts of Haversian System:

- 1) **Haversian canal:** This canal runs parallel to marrow cavity of bone.
It contains an artery, a vein and a lymph vessel.
- 2) **Concentric Lamellae:** There are concentric rings of bone lamellae around the haversian canal.
- 3) **Lacunae:** Small fluid filled spaces called lacunae are present in between lamellae. These spaces enclose osteocytes (inactive)
- 4) **Canalliculi:** They are minute canal connecting various lacunae and haversian canal. The protoplasmic processes of osteocytes present canalliculi
- 5) **Volkman's canals:** They connect haversian canal to marrow cavity.

Osteon 'Q'
So Strong
as Bone! ☺



18. Describe the structure of a Skeletal Muscle.

[AP M-18] [TS M-15]

A: I) Structure of Muscle:

[AP May-19]

- 1) The muscles which are attached to skeletal structures are called skeletal muscles.
- 2) Skeletal muscles are attached to bones by tendons.
- 3) A skeletal muscle consists of many long cylindrical unbranched muscle fibres.
- 4) Skeletal muscle fibre is surrounded by thin connective tissue sheath, the endomysium.
- 5) A bundle of muscle fibres is called fascicle.
- 6) Each fascicle is surrounded by connective tissue sheath called perimysium.
- 7) A group of perimysia form a muscle.
- 8) Muscle is surrounded by connective tissue sheath called epimysium.
- 9) The connective tissue layers form a tendon by which muscle is attached to skeleton.

II) Structure of Skeletal muscle fibre:

- 1) A skeletal muscle fibre is a long, cylindrical unbranched cell.
- 2) It is multinucleated (syncytium) and nuclei are peripheral.
- 3) The protoplasm is sarcoplasm and has many myofibrils.
- 4) Each myofibril has alternate dark and light bands, hence called striped muscle.
- 5) Skeletal muscles contract quickly and fatigue quickly.

Tick



Boxes

19. Describe the three types of cartilage.

A: I) Cartilage:

- 1) It is a solid flexible connective tissue.
- 2) It has collagen fibres, elastic fibres, chondroblasts enclosed in lacunae and surrounded by perichondrium.
- 3) Cartilage has no blood supply.
- 4) Growth and regeneration of cartilage takes place by the activity of perichondrial cells.
- 5) Perichondrium has blood capillaries.

II) Types of Cartilage: There are three types of cartilage.

1) Hyaline cartilage:

- i) Bluish white, translucent cartilage.
- ii) It has delicate collagen fibres.
- iii) It is the weakest and most common cartilage.
- iv) Ex: Walls of nose, costal cartilage, trachea, bronchus and larynx.

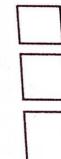
2) Elastic cartilage:

- i) It is yellow.
- ii) It has elastic fibres in addition to collagen fibres.
- iii) It provides strength and elasticity.
- iv) Ex: Pinna, Eustachian tube and epiglottis.

3) Fibrous cartilage:

- i) Matrix has bundles of collagen.
- ii) It is strongest cartilage.
- iii) Perichondrium is absent.
- iv) Ex: Intervertebral discs and pubic symphysis.

Tick



Heart ☺
Touching 'Q'

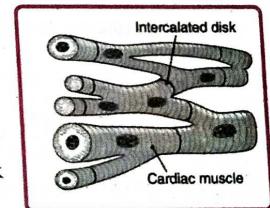
Boxes

20. Describe the structure of a cardiac muscle.

[TS M-16,19]

A: Structure of cardiac muscle:

- 1) Cardiac muscle is the heart muscle(myocardium)
- 2) The myocardial cells are short, cylindrical, mononucleate and striated.
- 3) The muscle fibres are branched.
- 4) The muscle cells are connected by gap junctions for quick conduction of electrical impulses.
- 5) There are dark lines called intercalated discs which are characteristic of heart muscle.
- 6) These discs help in rapid conduction of electrical impulses, resulting in heart beat.
- 7) Heart beat (contraction of muscle) is involuntary and carried on by pace maker.
- 8) The rate of heart beat is under the control of nervous systems and adrenalin.
- 9) The cardiac muscle is highly resistant to fatigue.
- 10) The cardiac muscle is a functional syncytium.



Few More SAQ are in Page 58,59]

★★★ 6.ANIMAL DIVERSITY-I ★★★

4 MARKS

21. Write short notes on the salient features of the anthozoans. [AP M-16][TS-18]

A: Salient features of the Anthozoans:

- 1) Anthozoans are commonly called as sea anemones.
- 2) They are sedentary marine animals.
- 3) There is only polyp form in life cycle.
- 4) Medusa stage is absent.
- 5) Cnidocytes occur both in the ectoderm and endoderm.
- 6) Mesoglea contains connective tissue.
- 7) Germ cells are formed in endoderm.
- 8) They are advanced cnidarians.
- 9) Ex: *Adamsia* (sea anemone), *Corallium rubrum* (Coral), *Pennatula* (sea pen)

☺Anthozoans ☺
Flower like Animals
Sea anemones, Corals

Tick Boxes

22. What are the salient features exhibited by polychaetes? [TS M-16, 19AP-18]

A: Salient features of Polychaetes:

- 1) Polychaetes are marine annelids.
- 2) They are commonly bristle worms or clam worms.
- 3) Many are free moving forms. Others live in tubes.
- 4) Distinct head with sense organs like eyes, tentacles and palps are present.
- 5) Parapodia are locomotor organs.
- 6) Parapodia serve respiration in addition to gills.
- 7) Clitellum and Gonoducts are absent.
- 8) They are bisexual.
- 9) Sex cells are released into coelom and pass out through nephridiopores.
- 10) Fertilisation is external.
- 11) Larva is Trochophore.
- 12) Ex: *Nereis* (sandworm), *Aphrodite* (sea mouse), *Arenicola* (lugworm)

Poly
Means
Many!



Tick Boxes

23. What are the chief characters of the crustaceans? [AP May-17] [TS M-15,17]

A: Chief characters of Crustaceans: [TS May-19]

- 1) Crustaceans are aquatic mandibulate arthropods.
- 2) Their exoskeleton is made of calcium carbonate.
- 3) Head and thorax are fused to form cephalothorax.
- 4) Head region (cephalic) has five pairs of appendages
 - (i) antennules
 - (ii) antennae
 - (iii) mandibles
 - (iv) first pair of maxillae
 - (v) second pair of maxillae
- 5) Thoracic and abdominal appendages are biramous.
- 6) Respiratory organs are gills (branchiae).
- 7) Excretory glands are green glands or antennal glands.
- 8) Sense organs are antennae, compound eyes and statocysts.
- 9) Development is indirect having several larval stages.
- 10) Ex: *Palaemon* (fresh water prawn), *Cancer* (crab), *Daphnia* (Water flea).

Crust means Skeleton
☺Crabs, Prawns ☺

[AP M-17,19]

Echinoid Means Globular
☺Aristotle's lantern ☺
VSAQ ↗ IMP 'Q'!

24. What are the salient features of the echinoids?

A: Salient features of Echinoids:

- 1) Echinoidea is a class of phylum echinodermata.
- 2) Their body form is either semiglobular or disc like.
- 3) The spines over the body are movable.
- 4) Arms are absent.
- 5) The calcareous ossicles unite to form a strong test (corona or case).
- 6) Madreporite and Anus are Aboral.
- 7) Ambulacrual grooves are Closed.
- 8) Pedicellaria have Three jaws.
- 9) Aristotle's lantern is a five jawed masticatory apparatus present in mouth of sea urchins and absent in heart urchin.
- 10) Larva is Echinopluteus.
- 11) Ex: *Echinus* (sea urchin), *Echinocardium* (heart urchin), *Echinodiscus* (sand dollar).

[MAA]

[AC]

[PT]

Tick Boxes

25. Mention the salient features of Holothuroidea.

[AP M-15]

A: Salient features of Holothuroidea :

- 1) Holothroids are soft cucumber like echinoderms.
- 2) Their body is elongated in the oro-aboral axis.
- 3) Skin is leathery containing dermal spicules.
- 4) Arms, spines and pedicellaria are absent.
- 5) Mouth is surrounded by retractile tentacles.
- 6) Ambulacrual grooves are closed.
- 7) Tube feet helps in locomotion.
- 8) Madreporite is Internal (coelom)
- 9) Respiratory trees are respiratory organs.
- 10) Larva is Auricularia. Ex: *Holothuria*, *Synapta*, *Thyone*

Holothuroidea are

☺Sea Cucumbers ☺

Not meant for Eating

[ASAP]

[MRT]

[AC]

[MI]

26. Mention the general characters of Arachnida.

[AP May-19]

A: General characters of Arachnida:

- 1) Arachnida are terrestrial chelicerate arthropods.
- 2) Their body can be divided into prosoma and opisthosoma.
- 3) Prosoma has six pairs of appendages.
 - (a) a pair of chelicerae (b) a pair of pedipalps (c) 4 pairs of walking legs.
- 4) Spinnerets of spider secrete spider silk. Spinnerets are modified abdominal appendages.
- 5) Respiratory organs are book lungs (scorpion) and tracheae (some spiders).
- 6) Respiratory pigment is haemocyanin contains copper.
- 7) Excretory organs are malpighian tubules and coxal glands.
- 8) Development is direct. No larval stage.
- 9) Scorpions are Viviparous. Ex: *Palamnaeus* (scorpion), *Aranea* (spider), *Sarcopeltis* (itch mite)

★★ 7. ANIMAL DIVERSITY-II ★★

4 +4=8 MARKS

27. Name the four 'hallmarks' of chordates and explain the principal function of each of them. [TS M-16] [AP M-18]

A: 'Hallmark' characters of chordates:

- 1) **Notochord:** It is present in all chordates at some stage of life. It is rod like structure located above the alimentary canal and below the nerve cord. It is supportive in function. It is mesodermal in origin.
- 2) **Nerve cord:** There is a dorsal tubular fluid, filled nerve cord present above the notochord. In vertebrates the anterior end becomes the brain and the rest of the cord becomes spinal chord. It coordinates various functions of the body. It is ectodermal in origin.
- 3) **Pharyngeal gill slits:** The pharynx is perforated on either side which become gill slits. They are well developed in aquatic lower vertebrates and lower chordates. They are reduced and non functional in higher vertebrates. They help in exchange of gases (respiration). They are ecto-endodermal in origin.
- 4) **Postanal tail:** Part of the body that projects beyond the anus is tail. Generally it has vertebral colum, blood vessel and muscles. It helps in locomotion, balancing, prehensile (5th leg) and defence organ.

28. Compare and contrast cartilaginous and bony fishes. [TS May-19][AP M-16][AP May-17]

A: Comparison between cartilaginous and bony fishes:

Cartilaginous fishes	Bony fishes
1) Cartilaginous fishes are mostly marine.	1) Bony fishes are found in all aquatic habitats.
2) Endoskeleton is made up of cartilage.	2) Endoskeleton is made up of bones.
3) Mouth is ventral.	3) Mouth is terminal.
4) Scales are placoid.	4) Scales are cycloid, ctenoid, ganoid or cosmoid.
5) Air bladder is absent.	5) Air bladder is present.
6) Excretion is ureotelic.	6) Excretion is ammonotelic.
7) Caudal fin is heterocercal.	7) Caudal fin is homocercal or diphycercal.
8) Claspers are present in males.	8) Claspers are absent in males.
9) Mostly Viviparous.	9) Mostly Oviparous.
10) Ex: Scoliodon(dog fish), Torpedo	10) Ex: Exocoetus (flying fish), Catla

29. What are the modifications that are observed in birds that help them in flight?

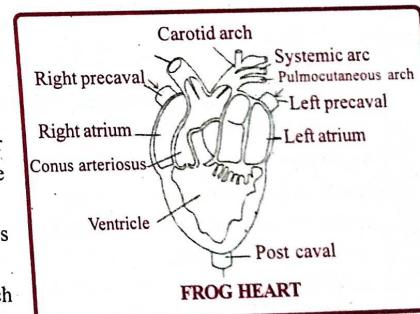
A: Birds are masters of air. Almost every part of their body is suited for flight. [AP,TS M-15,17]
Flight adaptations of Birds:

- 1) Body of birds is boat shaped with reduced tail.
- 2) Exoskeleton consists of feathers.
- 3) Feathers are light in weight and provide support in air.
- 4) Eyes are large with sclerotic plates and comb like pecten.
- 5) Skin is dry without glands, except preen gland in the tail.
- 6) Forelimbs are modified into wings.
- 7) Bones are pneumatic (weight reduction) with extensions of air sacs.
- 8) All modern flying birds are provided with powerful breast muscles.
- 9) Air sacs, attached to lungs, provide continuous oxygenation.
- 10) Syrinx is voice box.
- 11) Olfactory lobes are reduced in brain.
- 12) Posterior caudal vertebrae are fused to form pygostyle which helps in movement of tail feathers.
- 13) Inter clavicles are fused with clavicles to form furcula .
- 14) Sternum is large and gives attachment surface to large flight muscles.
- 15) Loss of urinary bladder is an adaptation to reduce body weight.

30. Describe the structure of the heart of frog. [TS M-19]

A: Structure of heart of frog:

- 1) Frogs heart is a muscular pump located in upper part of the body cavity.
- 2) Frogs heart is three chambered.
- 3) There are two auricles and one ventricle.
- 4) Double layered pericardium surrounds the heart and protects it from mechanical shocks.
- 5) **Sinus venosus** is a triangular chamber opening into right atrium (auricle) on the dorsal side of the heart.
- 6) The **ventricle** opens into conus arteriosus on the ventral side of heart.
- 7) **Conus arteriosus** bifurcates and each branch give rise to three aortic arches namely carotid, systemic and pulmocutaneous.
- 8) Blood from the heart goes to various parts through aortic arches.
- 9) Three major veins collect blood and joins sinus venosus.
- 10) Circulation of frog is described as incomplete double circulation.



31. List out the extant orders of the Class Reptilia. Give two examples for each order.

A: Living orders of reptilia with examples:

- 1) **Chelonia**: Chelone (marine green turtle), Testudo (land tortoise), Trionyx (fresh water)
- 2) **Rhynchocephalia (beak headed reptiles)**: Sphenodon (living fossil restricted to New Zealand).
- 3) **Crocodylia**: Crocodylus palustris (Indian crocodile), Alligator, Gavialis gangeticus (gharial)
- 4) **Squamata**: Scaly reptiles. It has two groups.
 - i) **Lizards**: Hemidactylus (wall lizard), Chameleon, Draco (flying lizard).
 - ii) **Snakes**: a) **Non-poisonous**: Pytas (Rat snake), Tropidonotus (pond snake).
 - b) **Poisonous**: Naja naja (cobra), Ophiophagus (King cobra), Bungarus (krait), Vipera russelli (chained viper)

32. List out eight characteristics that help distinguish a fish from the other vertebrates.

A: Exclusive characters of fishes:

[AP M-19]

- 1) Fishes are aquatic, ectothermal, scaly vertebrates.
- 2) The scales are mesodermal: In some fishes they are modified into shields or spines.
- 3) Vertebrae are amphicoelous (cavity on each side of centrum)
- 4) Fins are present for locomotion.
- 5) The fins are paired (pectoral and pelvic) and median (dorsal, caudal and anal)
- 6) Gill are respiratory organs.
- 7) Gill slits are open in cartilaginous fishes and enclosed by operculum in bony fishes.
- 8) The heart is ventral and two chambered, it is also called Branchial heart and Venous heart.

33. Write eight salient features of the class Amphibia. [TS M-20] [AP M-19]

A: Salient features of Amphibia:

- 1) Amphibians are first tetrapods.
- 2) They live both on land and in water.
- 3) The body is divided into distinct head, trunk and tail (present or absent).
- 4) Skin is moist, glandular and without scales.
- 5) Limbs are pentadactyle.
- 6) Skull is dicondylic.
- 7) Vertebrae are generally procoelous, amphicoelous and opisthocoelous.
- 8) Sternum appeared first time in amphibia.
- 9) Respiration is pulmonary, cutaneous and buco pharyngeal.
- 10) Heart is three chambered.
- 11) Sinus venosus and conus arteriosus are present.
- 12) Kidneys are mesonephric
- 13) Amphibians are ureotelic.
- 14) Meninges are two: piamater and duramater.
- 15) Middle ear has columell auris that connects tympanum with internal ear.
- 16) Lacrimal and harderian glands are present in the eye.
- 17) Sexes are separate. Fertilisation is external, larva is tadpole.
- 18) Ex: Bufo (toad), Rana (frog), Hyla (free frog), Rhacophorus (flying frog).

[Few More SAQ are in Page 60]

★★★ 8.LOCOMOTION & REPRODUCTION ★★★

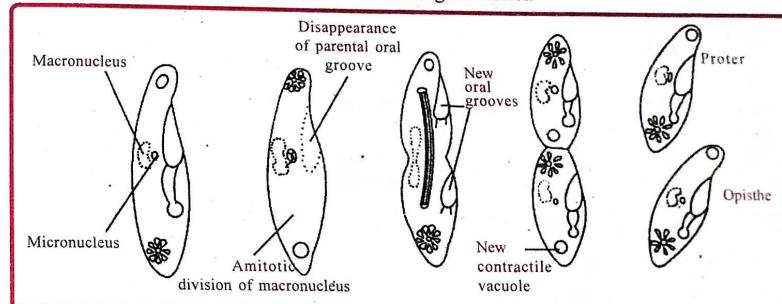
4+4=8 MARKS

34. Describe the process of transverse binary fission in Paramecium. [AP May-19]

A: Binary fission in Paramecium:

[AP M-16,17] [TS May-17][TS M-19]

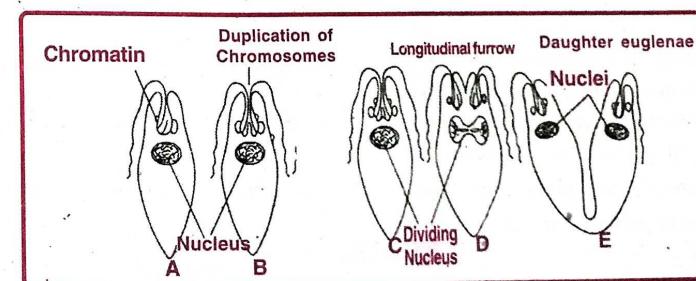
- 1) Paramecium undergoes transverse binary fission during favourable conditions.
- 2) Before binary fission, it stops feeding and the oral groove disappears.
- 3) The macro nucleus divides into two by mitosis.
- 4) The macro nucleus divides into two by amitosis.
- 5) A transverse constriction appears in the middle.
- 6) It deepens and divides the parent into two daughter individuals.
- 7) The anterior is called **proter** and posterior is **opisthe**.
- 8) Each daughter gets one contractile vacuole of the parent and a second vacuole is newly formed in both.
- 9) Opisthe receives the posterior contractile vacuoles along with macro and micro nuclei.
- 10) The missing organelles are newly developed by both.
- 11) Binary fission is completed in two hours.
- 12) In a day, the paramecium can produce 4 generations of offspring.
- 13) The transverse binary fission is called homothetogenic fission



35. Describe the process of longitudinal binary fission in Euglena. [TS M-16][IPE-14]

A: Binary fission in Euglena:

- 1) Euglena undergoes longitudinal binary fission during favourable conditions.
- 2) During this process the stigma, paraflagellar body and contractile vacuoles disappear.
- 3) Nucleus, basal granules, chromatophores and cytoplasm undergo division.
- 4) A longitudinal groove appears in the central part of anterior end.
- 5) It gradually extends to posterior and divides the organism into two.
- 6) One daughter Euglena retains parental flagella, the other daughter develops new flagella.
- 7) As daughter forms look like mirror images, the fission is called 'symmetrogenic division'.
- 8) Stigma, paraflagellar body and contractile vacuole develop freshly in new individuals.

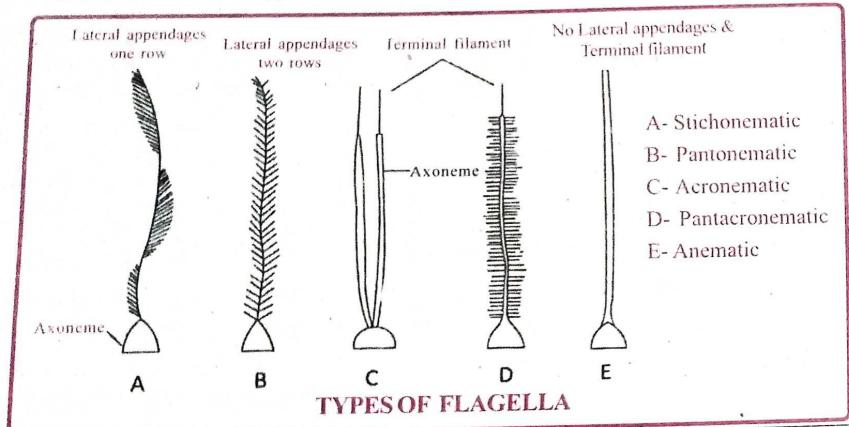


36. What are lateral appendages? Based on their presence and absence, write the various types of flagella giving at least one example for each type. [AP, TS M-15, 17]

A: Lateral appendages : One or two or many rows of short, lateral hair like fibrils found on some flagella are called lateral appendages or mastigonemes.

There are 5 types of flagella based on the arrangement of mastigonemes .

- 1) **Stichonematic:** This flagellum bears one row of mastigonemes. Ex: Euglena, Astasia.
- 2) **Pantonematic:** The flagellum has two or more rows of mastigonemes Ex: Peranema, Monas
- 3) **Acronematic:** There are no mastigonemes on this flagellum. The tip of axoneme is naked without any sheath Ex: Chlamydomonas and polytoma
- 4) **Pantacronematic:** The flagellum has two or more rows of mastigonemes and a naked terminal filament Ex: Urceolus
- 5) **Anematic (simple) :** Mastigonemes are absent. There are no terminal filaments.
Ex: Chilomonas and cryptomonas



37. Give an account of pseudopodia.

[TS May-19] [AP Mar-19]

A: I) **Pseudopodia:** Pseudopodia means false feet. They are temporarily formed for locomotion and food collection in Rhizopods . They are extensions of cytoplasm in the direction of movement.

II) Types of Pseudopodia:

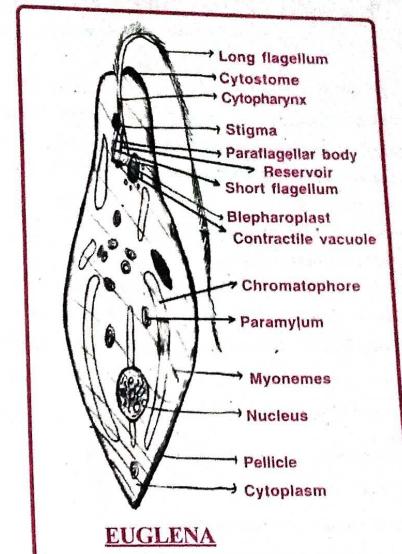
- (1) **Lobopodia** - Blunt, finger like pseudopodia. Ex: Amoeba and Entamoeba
- (2) **Filopodia** - Filamentous pseudopodia. Ex: Euglypha
- (3) **Reticulopodia** - Network like pseudopodia. Ex: Elphidium
- (4) **Axopodia or Heliopodia** - Ray like pseudopodia Ex: Actinophrys

III) Process of formation:

- 1) Pseudopodium is formed by conversion of gel cytoplasm to sol cytoplasm and vice versa (Sol to gel)
- 2) Sol-gel theory is the most accepted theory.
- 3) Allen's theory 'Front contraction' or 'fountain zone' theory is more appropriate.
- 4) Actin and myosin molecules also have a role.
- 5) Pseudopodial movement or amoeboid movement is performed by Amoeba, Entamoeba macrophages, neutrophils etc.

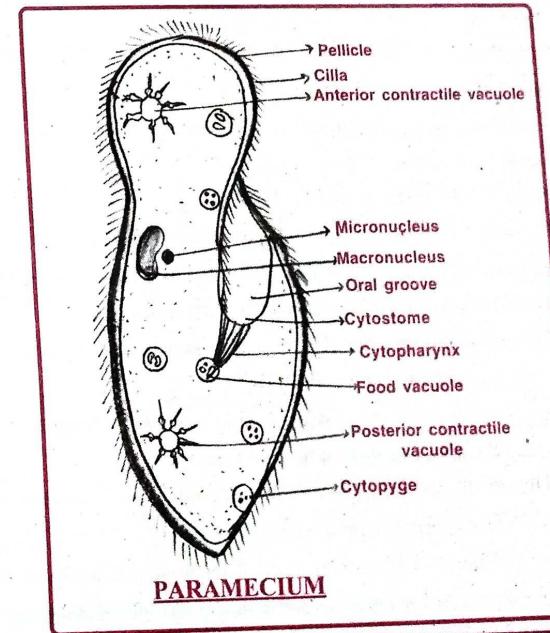
38. Draw a neat labelled diagram of Euglena.

A:



39. Draw a neat diagram of Paramecium and label its important structures/components.

A:



★★★ 9.BIOLOGY IN HUMAN WELFARE ★★★

4 MARKS

40. What are the adverse effects of tobacco? [TS May-17,19] [AP M-16][IPE-14]

A: Adverse effects of Tobacco: [AP Mar, May-19]

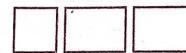
- Tobacco is smoked, chewed as gutkha or snuffed.
- Smoking increases carbon monoxide level in blood and reduces oxygen level.
- Tobacco contains Nicotine, an alkaloid.
- Nicotine stimulates adrenal gland.
- The hormones adrenaline and non-adrenaline increase blood pressure and heart rate.
- It causes bronchitis, emphysema, coronary heart disease and gastric ulcers.
- It increases the incidence of cancer of throat, lungs and urinary bladder.

నా పేరు ముక్కేష...
గుర్తుండ్రందా?
సినిమా త్రిలం 'Q'!

41. Why in adolescence is considered vulnerable phase?

[AP M-15,18]

- Adolescence is the teenage between 12 to 18 years.
- It is a bridge between childhood and adulthood.
- During this period a child becomes mature.
- Several biological and behavioural changes take place during this period.
- So Adolescence is said to be a vulnerable phase of mental and psychological development of an individual.



42. 'Prevention is better than cure'. Justify with regard to TDA abuse. [AP, TS M-18]

A: TDA means Tobacco, Drugs, Alcohol.

The proverb, 'Prevention is better than cure' holds true in case of TDA abuse.

Measures useful for prevention:

- Avoid undue parental pressure:** All children have their own choices, capacities and personalities. The parents should not force their children to perform beyond their capacity. They should not compare them with others in studies, games etc.
- Responsibility of parents and teachers:** They have to advise, counsel and help the children who are likely to get into the trap of TDA.
- Seeking help from peers:** If classmates find some one getting into trap of TDA, it should be brought to the notice of their parents or teachers.
- Education and counselling:** There must be a continuous process of educating the children regarding TDA, at every level in the form of lessons.
- Seeking professional and medical help:** A lot of help is available in the form of highly qualified psychologists, psychiatrists and de-addiction and rehabilitation programmers.

TEENAGERS
BEWARE OF
(@) TDA'Q'!

43. Distinguish between hypertrophy and hyperplasia with an example for each.

A: 1) **Hypertrophy:** Some parasites cause abnormal increase in the size of the host cell which finally ruptures.

Ex: Plasmodium causes increase in the size of RBC which finally bursts. [AP, TS M-20]

2) **Hyperplasia:** Some Parasites cause increase in the size of the organ by increasing the number of cells. This causes inconvenience or death to the host.
Ex: Fasciola hepatica lives in bile ducts of sheep. It blocks the passage of bile duct by increasing the cells.

44. Write short notes on Opioids.

A: **Opioids** are drugs obtained from poppy plant *papaver somniferum*. These drugs bind to specific receptors of CNS and alimentary canal.**Types of Opioids:**1) **Morphine:**

- It is produced from dried latex or unripe fruits of poppy plant.
- It is in the form of colourless crystals or white crystalline powder.
- It is taken orally or by injection.
- It is an effective sedative and pain killer.
- It is useful for surgery patients and who suffer from painful ailments.

2) **Heroin:**

- It is produced from morphine by acetylation.
- It is a white bitter powder.
- Chemically it is diacetyl morphine.
- It is also called 'smack'.
- It is taken in by snorting and injection.
- Heroin causes depression and slows down the body functions.

45. Write short notes on Cannabinoids.

A: **Cannabinoids:** These drugs are obtained from Indian hemp plant *Cannabis sativa* (ganja mokka)

- The flower tips, leaves and resin of these plant are used in various combination to produce marijuana, hashish, charas and ganja.
- These drugs are used by sports person to enhance their performance.
- These drugs are taken in either orally or inhalation.
- Cardio vascular system is effected.

46. Write a short note on the pathogenicity of *Entamoeba histolytica*.A: **Pathogenicity of Entamoeba:**

- Entamoeba* causes ulcers in large intestine.
- The ulcers ooze blood cells, cellular debris and bacteria.
- Ultimately there will be blood and mucus motions. It is called intestinal amoebiasis or amoebic dysentery.
- Sometimes the trophozoites enter the blood stream and reach lungs, heart, kidneys and brain causing abscesses in those organs leading to severe pathological conditions. It is called extra intestinal amoebiasis.
- Some people do not exhibit symptoms such people are called carriers or asymptomatic cyst passers as their stool contains the tetranucleate cysts. [Few More SAQ are in Page 61]

VSAQ SECTION-A

VERY EASY & CUTE SECTION WITH MANY MINI ANSWERS

VSAQ CHAPTERS

20 MARKS

★★★ 10.	DIVERSITY OF LIVING WORLD	(2 +2 Marks)	45- 46
★★★ 11.	STRUCTURAL ORGANISATION	(2 +2 Marks)	47- 48
★★★ 12.	ANIMAL DIVERSITY-I	(2 +2 Marks)	49- 50
★★ 13.	LOCOMOTION & REPRODUCTION	(2 Marks)	51
★★ 14.	BIOLOGY IN HUMAN WELFARE	(2 +2 Marks)	52 - 53
★★★ 15.	ECOLOGY & ENVIRONMENT	(2 Marks)	54 - 55

☞ **Easy Chapters:** Diversity of Living World, Locomotion

Imp Chapters: Animal Diversity -I, Biology in Human Welfare

★★★ 10. DIVERSITY OF LIVING ★★★

2+2=4 MARKS

[AP,TS May-19][TS M-15]

47. What does ICZN stand for?

- A: 1) ICZN stands for International Code of Zoological Nomenclature.
2) It is used to name an identified organism.

[AP M-18]

48. What is biogenesis?

- A: 1) Biogenesis is a theory of evolution which says 'life begets life'.
2) Thus living beings are produced from living beings only but not from non-living matter.

[AP M-19, 15]

49. Define the term histology. What is it otherwise called?

- A: 1) **Histology:** Histology is the study of microscopic structure of different tissues.
2) It is also known as Microanatomy.

[AP M-15][TS M-16]

50. What is trinomial nomenclature? Give an example.

- A: 1) **Trinomial nomenclature:** Naming an organism with three words, for genus, species and subspecies is called trinomial nomenclature. It is used to name the subspecies of an organism.
2) Ex: Homo sapiens sapiens

51. What is meant by tautonomy? Give two examples. [AP M-16,17][IPE-14][TS May-17]

- A: 1) The practice of naming the animals in which the generic name and specific name are the same is called tautonomy.
2) Ex-1: Naja naja- The Indian cobra Ex-2: Axis axis- Spotted deer

[TS M-17,18]

52. Differentiate between Protostomia and Deuterostomia.

A:	Protostomia	Deuterostomia
	1) Protostomia are eumetazoans in which the blastopore develops into mouth. 2) Ex: Annelida, Arthropoda, Mollusca	1) Deuterostomia are eumetazoans in which anus is formed from or near the blastopore. 2) Ex:Echinodermata,Hemichordata, Chordata

53. What is ecological diversity? Mention the different types of ecological diversities.

- A: 1) Ecological diversity is diversity at the level of Ecosystems.

Ex: Deserts, Rain forests, Mangroves.

2) Types of Ecological diversities:

- i) Alpha diversity - based on number of species or taxa.
- ii) Beta diversity - based on endemic species between two adjacent ecosystems.
- c) Gamma diversity- overall diversity of various ecosystems in an ecological region with natural boundaries.

54. Define species richness.

A: 1) **Species richness:** It is the number of species per unit area.
More number of species indicate more species richness.

2) **Formula:** $\log S = \log C + Z \log A$

Here, S= Species richness, A= Area, Z= Slope of the line, C= Y-intercept

55. List out any four sacred groves in India.

A: Sacred groves are small group of trees in an area venerated by local people.

- | | |
|----------------------------|-------------------------|
| 1) Khasi and Jaintia hills | - Meghalaya |
| 2) Aravalli hills | - Rajasthan and Gujarat |
| 3) Sarguja, Bastar | - Chattisgarh |
| 4) Chanda | - Madhyapradesh |

56. Write the full form of IUCN. In which book threatened species are enlisted.

[APM-20][TS M-19]

A: 1) IUCN stands for International Union for Conservation of Nature and natural resources.
2v Threatened species are enlisted in 'Red Data Book' of IUCN.

57. Define the term metabolism. Give any one example.

A: 1) All the chemical reactions that take place in the body of an organism are collectively called metabolism. Metabolism is the distinctive character of living beings.
2) **Ex:** Digestion, Assimilation, Respiration, Photosynthesis etc.,

58. How do you differentiate between growth in a living organism and non-living object?

A: Increase in size is called growth.
1) In living beings, growth takes place by increase in number of cells from inside the body. Hence it is growth from inside. In animals growth is limited whereas in plants it is unlimited.
2) In non-living objects, growth takes place by the accretion of matter from outside.

59. 'Zoos are tools for classification' Explain.

A: 1) Zoo is place where wild animals and birds are kept under the care of man with restricted movement.
2) It helps to study external characters, feeding habits, behaviour of the animals. It helps to determine their systematic position in animal kingdom. Hence zoos are tools for classification.

60. Where and how do we preserve skeletons of animals, dry specimens etc?

A: 1) Skeletons and dry specimens are kept in museum.
2) The skeletons are cleaned, bleached and articulated, whereas the specimens are stuffed (Taxidermy) before exhibition.

[Few More VSAQ are in Page 56]

★★★ 11. STRUCTURAL ORGANISATION ★★★

2+2=4 MARKS

61. What is cephalization? How is it useful to its possessors? [TS M-15][AP May-17]

A: 1) **Cephalization** is the formation of nerve and sensory cells at the anterior part of the body.
2) Animals with cephalization can sense the new environment and move efficient than the other animals in seeking food, locating mates and in avoiding or escaping from predators.

62. Mention the animals that exhibited a 'tube-within-a-tube' organisation for the first time? Name their body cavity.

A: 1) 'Tube-within-a-tube' organisation is first formed in Nematoda.
2) The body cavity in Nematodes is Pseudocoelom.

☺ 2 Lines
☺ 2 Marks!

63. Why is the true coelom considered a secondary body cavity? [AP M-16][TS M-15]

A: 1) In eucoelomate animals, blastocoel is the primary cavity during development. [IPE-14]
2) Later the blastocoel(primary body cavity) is replaced by true coelom(secondary body cavity) derived from mesoderm.
3) Hence the body cavity of eucoelomates is considered as the secondary body cavity.

64. What are retroperitoneal organs?

[TS M-16,19] [AP 18]

A: 1) The organs like kidneys in vertebrates are covered by the parietal peritoneum only on the ventral side.
2) Such a peritoneum is called retroperitoneum and the organs lined by it are called retroperitoneal organs. .

65. What is Enterocoelom? Name the enterocoelomate phyla in the animal kingdom? [TS M-15]

A: 1) **Enterocoelom** is a type of true coelom that arises by mesodermal out pouching of the archenteron.
2) Enterocoelomate phyla in kingdom Animalia are Echinoderms, Hemichordates, Chordates.

66. Distinguish between endocrine and exocrine glands with examples. [AP M-18] [TS M-15]

A.	Endocrine glands	Exocrine glands
	1) Endocrine glands are ductless glands. 2) They secrete hormones which are directly released into blood. 3) Ex: Pituitary gland, Thyroid gland	1) Exocrine glands are glands with ducts. 2) They secrete saliva, mucus, ear wax, oil, milk and digestive juices. 3) Ex: Salivary glands, Mucus glands

67. Mention any two substances secreted by mast cells and their functions. [AP, TS M-16]

A: 1) Heparin, histamine, bradykinin and serotonin are secreted by Mast cells.
2) **Heparin** is an anticoagulant.
3) **Histamine** and **Bradykinin** are vasodilators.
4) **Serotonin** is vasoconstrictor

68. Distinguish between a ligament and a tendon. [AP May-17] [AP M-15,17,19]

- A: 1) Ligaments connect one bone with another bone.
They contain collagen fibres along with few elastic fibres.
2) Tendons connect skeletal muscles to the bone. They contain only collagen fibres.

69. What is the strongest cartilage? In which regions of the human body, do you find it? [TS May-19][AP M-16][TS M-15]

- A: 1) 'Fibrous cartilage' is the strongest cartilage.
2) It is present in intervertebral discs and pubic symphysis of pelvis.



[AP M-15]

70. Define osteon.

A: Osteon: In a dense bone, a Haversian canal and the surrounding lamellae and lacunae are collectively called Osteon or Haversian system. It works as transport system.

71. What is a Sesamoid bone? Give an example. [TS M-17,18]

- A: 1) Sesamoid bone is a tendon bone. It is formed by ossification in tendon.
2) Ex: Patella (knee cap).

72. What is lymph? How does it differ from plasma?

- A: 1) Lymph is the interstitial colourless fluid which passes through the lymphatic vessels.
2) Lymph differs from plasma because it lacks RBC, Platelets and large plasma proteins.

73. What is the haematocrit value? [AP Mar-19] [AP Mar, May-17][TS May-19]

- A: 1) The percentage of volume of RBC in total volume of blood is Haematocrit value.
2) It is also called packed cell volume.

74. What are intercalated discs? What is their significance?

- A: 1) Intercalated discs: The dark lines across the cardiac muscle are called intercalated discs.
2) Significance: They have gap junctions which help in quick transport of electrical impulses necessary for the heart beat.

75. "Cardiac muscle is highly resistant to fatigue". Justify. [TS May-17]

- A: Cardiac muscle is highly resistant to fatigue because it has numerous sarcosomes, many molecules of myoglobin and rich supply of blood for continuous aerobic respiration.

76. Distinguish between white matter and grey matter of 'CNS'. [TS M-16]

- A: In central nervous system the nerve matter appears in two colours.

White matter	Grey matter
1) White colour is due to myelin.	1) Grey colour is due to nissl bodies.
2) White matter consists of myelinated nerve fibres.	2) Grey matter consists of non-myelinated nerve fibres, dendrites and cytons.

[Few More VSAQ are in Page 56]

★★★ 12. ANIMAL DIVERSITY-I ★★★

2+2=4 MARKS

77. What are the functions of canal system of sponges?

- A: Functions of the canal system in sponges :
(i) Collection of food(nutrition) (ii) Respiratory exchange of gases (respiration)
(ii) Removal of wastes (excretion).

78. What is metagenesis? Animals belonging to which phylum exhibit metagenesis?

- A: 1) Occurrence of sexual and asexual phases alternately in the life cycle is called metagenesis.
2) Animals belonging to phylum Cnidaeria exhibit metagenesis [AP M-18]

79. What are the excretory cells of flatworms called? What is the other important function of these specialized cells?

- A: 1) The excretory cells of flatworms are called flame cells (or) protonephridia.
2) Another important function is osmoregulation.

80. Distinguish between amphids and phasmids. [TS May-19] [AP Mar-19]

- A: 1) Amphids are cuticular depressions around the mouth of nematodes. They are chemoreceptors.
2) Phasmids are posterior unicellular glands of some nematodes. They are glandulo sensory.

81. What is botryoidal tissue?

- A: 1) Botryoidal tissue is a characteristic tissue of leeches.
2) It is present in coelom and occupies entire coelom and looks like bunch of grapes.
3) Its functions are excretion, storage of Iron, Calcium and revascularization in areas of injury.

82. Which arthropod, is called a 'living fossil'? Name its respiratory organs?

- A: 1) Limulus(king crab) is the living fossil arthropod.
2) The respiratory organs are book gills. [AP M-15,16,18]

83. What is the function of radula? Give the name of the group of molluscs which do not possess a radula? [AP May-19][IPE-14]

- A: 1) Radula is a rasping organ of molluscs used for feeding.
2) Radula is absent in Bivalvia or pelecypoda.

84. What is Aristotle's lantern? Give one example of an animal possessing it? [AP, TS M-17]

- A: 1) Aristotle's lantern is a complex 5 jawed masticatory apparatus present in buccal cavity of sea urchins.
2) Ex: Echinus (Sea urchin)

Aristotle's lantern ↔ Echinoid

85. What is the essential difference between the larvae and adults of echinoderms, symmetry wise? [TS M-16]

- A: 1) The larvae of echinoderms exhibit bilateral symmetry.
2) The adult echinoderms exhibit pentamerous radial symmetry.

86. What are the two chief morphological 'body forms' of cnidarians? What are their chief functions? [AP M-19]

- A: 1) The chief morphological body forms of cnidarians are (i) Medusa form (ii) Polyp form
2) Chief function of medusoid form is reproduction and polypoid form is nutrition.

87. What do you call the locomotor structures of Nereis? Why is Nereis called a polychaete?

- A: 1) The locomotor organs of nereis are called paropodia.
2) Nereis is called polychaeta, because each parapodium contains many setae (poly-many, cheta-setae)

88. What do you call the first and second pairs of cephalic appendages of a scorpion?

- A: 1) The first pair of cephalic appendages of scorpion are chelicerae.
2) The second pair of cephalic appendages of scorpion are pedipalps.

89. What are the respiratory structures of Limulus and Palamnaeus respectively?

- A: 1) The respiratory organs of limulus are book - gills (aquatic). [TS M-19]
2) The respiratory organs of palamnaeus (Scorpion) are book lungs (aerial).

90. What are antennae? What is the arthropod group without antennae?

- A: 1) Antennae are tactile sense organs.
2) Subphylum chelicerata do not possess antennae.

91. What is the other name for the gill of a mollusc? What is the function of osphradium?

- A: 1) The gill of mollusc is also called Ctenidium.
2) Osphradium is a water testing organ present in bivalves and gastropods.

92. What are spermathecae on the body of pheretima?

- A: 1) Spermathecae of pheretima are sperm storing organs. There are 4 pair of spermathecae.
2) One pair in each of 6th, 7th, 8th and 9th segments. They receive sperms during copulation.

93. What do you call the perivisceral cavity of an arthropod? Where from is it derived during development?

- A: 1) Perivisceral cavity of an arthropod is called haemocoel. It is not completely a true coelom.
2) Most of it is derived from blastocoel and filled with blood.

94. What are blood glands in Pheretima?

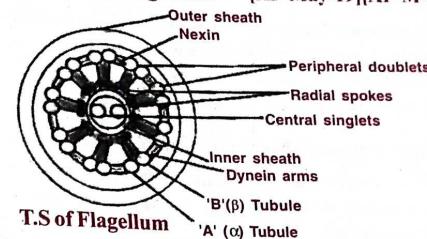
- A: 1) Blood glands in pheretima are present in 4th, 5th and 6th segments of pheretima.
2) They produce blood cells and haemoglobin which is dissolved in plasma.

★★ 13. LOCOMOTION & REPRODUCTION ★★

2 MARKS

95. Draw a labelled diagram of T.S of flagellum. [AP May-19][AP M-18, TS May-17]

A:



96. List any two differences between a flagellum and cilium. [APM-17,19] [TS M-16,18]

A:

Flagellum	Cilium
1) Flagellum is long whip like locomotor organelle .	1) Cilium is small hair like structure.
2) Flagellum performs undular movement.	2) Cilium performs pendular movement.
3) Flagellum helps in locomotion	3) Cilium helps in locomotion, food collection, movement of materials and also sensory.

97. What is a kinety? [AP May-19][TS M-19][TS May-17][AP, TS M-16] [IPE-14]

- A: 1) A longitudinal row of kinetosomes and their inter connecting kinetodesmata are collectively called kinety.
2) Kinety is a part of infra ciliary system of ciliates.

98. Distinguish between synchronous and metachronous movements.

- A: There are two different types of movements of cilia.
1) **Synchronous movement:** The cilia in transverse row beat once at a time in one direction.
2) **Metachronous movement:** The cilia in a longitudinal row beat one after another.
It looks like winds passing over paddy field producing waves

99. Distinguish between proter and opisthe.[TS May-19] [APM-18] [AP,TS M-15,17]

- A: 1) The proter is the anterior individual. It receives anterior contractile vacuole, cytopharynx and cytostome of parent.
2) The opisthe is the posterior individual. It receives posterior contractile vacuoles and develop other organelle.

100. Distinguish between lobopodium and filopodium. Give an example to each of them.

- A: 1) Blunt finger like pseudopodia are called Lobopodia. Ex: Amoeba, Entamoeba. [APM-15,16,17]
2) Long and fibre like pseudopodia are called Filopodia. Ex: Euglypha [TS M-17]

101. Define conjugation with reference to ciliates. Give two examples. [AP,TS-18][TS M-15]

- A: 1) Conjugation is a temporary union between two senile ciliates, that belong to different mating types, for the exchange of nuclear material and reorganization, to restore vigour and vitality.
2) Ex: Paramecium and Vorticella.

[Few More VSAQ are in Page 56]

★★ 14. BIOLOGY IN HUMAN WELFARE ★★

2+2=4 MARKS

[AP M-18]

102. Define parasitism and justify this term.

- A: 1) Parasitism is intimate association of two individuals of which one is benefited (parasite) and the other is harmed (host).
 2) Ex: Plasmodium lives as a parasite in humans (Host). Then Plasmodium is benefited and human is harmed.

Parasitism means
 ☺ one eating at
 another one table. ☺

[IPE-14]

103. What is a hyper-parasite? Mention the name of one hyper-parasite.

- A: 1) A parasite which lives on the body of the another parasite is called hyper-parasite.
 2) Ex: Nosema notabilis is parasite on sphaerospora polymorpha which is a parasite in the urinary bladder of toad fish.

104. What do you mean by parasitic castration? Give one example. [APM-17] [TS M-16]

- A: 1) Degeneration of gonads (testis) of the host due to presence of a parasite is called parasitic castration.
 2) Ex: Sacculina (a crustacean parasite) causes degeneration of ovaries in the crabs.

[AP May-19]

105. Define neoplasia. Give one example.

- A: 1) Abnormal increase in size of the cell of the host due to presence of parasite is called neoplasia. Some times it leads to cancer.
 2) Ex: Carcinoma caused by virus.

106. A person is suffering from bowel irregularity, abdominal pain, blood and mucus in stool, etc., Based on these symptoms, name the disease and its causative organism. [TS M-15]

- A: 1) The disease showing the given symptoms is amoebic dysentery.
 2) The causative organism is Entamoeba histolytica.

107. Define prepatent period. What is its duration in the life cycle of plasmodium vivax?

- A: 1) Prepatent period: The duration between first entry of sporozoites into blood and second entry in the form of cryptozoites is called prepatent period.
 2) The duration of life cycle of plasmodium vivax is nearly 8 days.

108. Define incubation period. What is its duration in the life cycle of plasmodium vivax?

- A: 1) Incubation period: The period between the entry of sporozoites into blood of a man and appearance of clinical symptoms of malaria is called incubation period. [AP M-18]
 2) Its duration is about 10-14 days.

109. The eggs of Ascaris are called 'mammillated eggs'. Justify. [AP Mar-19] [TS M-18,19]

- A: The eggs of Ascaris have a protein outer coat which has papillae hence looks rippled. So it is called mammillated egg.

110. What is meant by nocturnal periodicity with reference to the life history of a nematode parasite you have studied? [TS Mar, May-17] [AP M-15]

- A: Migration of sheathed microfilaria larva from deeper vessels to peripheral blood vessels during night sleeping time between 10.00 PM and 4 AM is referred to as nocturnal periodicity.

111. Distinguish between lymphadenitis and lymphangitis?

- A: 1) Inflammation of lymph vessels is known as Lymphangitis.
 2) Inflammation of lymph glands is Lymphadenitis.

**112. In which way does tobacco affect the respiration?
 Name the alkaloid found in tobacco.**

[AP May-17]

- A: 1) Tobacco effects the respiration because when tobacco is smoked then smoking increases the carbon monoxide level and reduces the oxygen level in the blood.
 2) Alkaloid found in tobacco is Nicotine.

113. Define drug abuse.

- A: 1) Drug abuse is taking of a drug in excess for a purpose other than its medicinal use.
 2) It leads to physical, psychological disturbances. Sometimes irreparable damage to the body.

114. From which substances 'Smack' and 'Coke' are obtained?

[AP M-16]

- A: 1) Smack (Heroin) is obtained by the acetylation of morphine.
 2) Coke (Crack) is obtained from Cocaine.

115. 'Entamoeba histolytica is an obligatory anaerobe'. Justify.

- A: Entamoeba histolytica is an intestinal parasite causing amoebic dysentery. Mitochondria are not present in their body. Oxygen is not available in intestine of man, so they are obligate anaerobes.

116. What are haemozoin granules? What is their significance?

- A: 1) The malaria parasite digests the globin part of the ingested haemoglobin and converts the soluble haem into an insoluble crystalline haemozoin granules.
 2) When erythrocyte bursts, haemozoin is released into blood, it causes malaria fever.

117. What is exflagellation and what are the resultant products called?

- A: 1) Exflagellation: The process of liberation of male gametes from the cytoplasm of microgametocyte by exhibiting lashing movements like flagella is called exflagellation.
 2) The resultant products are called male gametes.

118. Why is the syngamy found in Plasmodium called anisogamy?

- A: 1) In plasmodium, the male and female gametes are dissimilar in size.
 2) Hence, the process of fusion is called Anisogamy. [**Few More VSAQ are in Page 58**]

★★★ 15. ECOLOGY & ENVIRONMENT ★★★

2 MARKS

119. What is the primordial source of energy for all organisms?

- A: 1)'Sun light' is the primordial source of energy for all organisms.
2)It is also transferred from one trophic level to another trophic level.

120. What are biological rhythms?

- A: 1)**Biological Rhythms:** The behavioural activities which repeat at regular intervals in the bodies of organisms are called Biological rhythms.
2)**Ex:** Circadian rhythms - Like **sleep wake cycle** which occurs in the interval of 24 hours.

121. What are circadian rhythms?

[TS M-15].

- A: 1) The **biological rhythms** that occur in a time period of 24 hours are called Circadian rhythms.
2) Biological rhythms are behavior activities that are repeated at regular intervals.

122. What is Photoperiodism?

- A: 1)Response shown by the organisms for the photoperiod is called **Photoperiodism**.
2)**Ex:** Migration of birds. During winter, Siberian birds migrate southward to get more sunlight because the day time is short in Siberia for breeding and feeding.

123. Mention the advantages of some UV rays to us.

[TS M-16][IPE-14]

- A: 1) UV rays kill micro organisms on the body surface of animals.
2) UV rays convert the sterols in the skin to vitamin D.

124. What is cyclomorphosis? Explain its importance in Daphnia. [AP Mar-19][TS May-17]

- A: 1) **Cyclomorphosis:** It is the cyclic seasonal morphological changes of organisms
Ex: Daphnia (water flea).

2)**Importance:** In Daphnia, it is an adaptation for the changing densities of water.
In winter its head is round. In spring season, a hood starts developing.
In summer, a prominent hood is formed. In autumn the hood starts receding.
By the winter, the head becomes round again.

125. Define commensalism. Give one example.

[AP May-17]

- A: 1) **Commensalism** is a type of interaction between different species in which one is benefited and the other is neither benefited nor harmed.
Ex: Barnacles growing on the back of a whale benefit, while the whale derives no noticeable benefit.

126. Define mutualism. Give one example.

[AP M-15][TS M-17]

- A: 1) **Mutualism** is a type of interaction between different species in which both are benefited.
Ex: Bees and flowering plant. Bees get nectar, pollen and plants get pollinated

127. What is meant by osmotrophic nutrition?

[AP M-17]

- A: Osmotrophic Nutrition is the mode of nutrition in which organisms take pre-digested food through their body wall from the surrounding medium.
2) **Ex:** Fungi secrete enzymes and breakdown dead and waste materials and absorb the digested material.

128. Define parasitism. Give one example.

- A: 1) **Parasitism:** It is the interaction between two organisms of different species, in which one gets benefited and the other gets harmed.
2) **Ex :** Plasmodium vivax (Malarial parasite) in the body of a man.

129. What is optimum temperature?

- A: 1) **Optimum temperature:** The temperature at which the metabolic activities occur at the 'greatest level' is called the optimum temperature.
2) The optimum temperature of human body is 98.4F (or) 37°C.

130. Distinguish between photoperiod and critical photoperiod.

- A: 1) **Photoperiod** is the duration of light hours in a day.
2) **Critical Photoperiod** is the specific day length that is essential for initiation of seasonal events.

131. What is PAR?

- A: 1) PAR is Photosynthetically Active Radiation. Plants capture only 2-10% of PAR.
2) PAR is less than 50% of incident solar radiation available on earth.

132. What is the percentage of PAR, in the incident solar radiation.

- A: PAR is less than 50% of incident solar radiation available on earth.

133. What is camouflage? Give its significance.

[AP M-19]

- A: 1) **Camouflage** is the phenomenon exhibited by some animals and insects which change colours according to the surrounding. Some are naturally coloured which suit their surroundings.
Ex: Chameleon, leaf insect, stick insect.

2) **Significance:** Then animals exhibiting **camouflage** can hide from their predators.

134. What is Gause's principle? When does it applicable?

- A: 1) **Gause's principle:** Two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior one will be eliminated in due course of time.
2) It is applicable only when the resources are limited.

135. What is predation? Give an example.

- A: 1) Predation is a feeding strategy, between two different species in which predator gets benefited at the cost of the prey.
2) **Ex :** Lion (Predator) & Deer(Prey).

★ ★ ★ STAR QUESTIONS PLUS ★ ★ ★

VSAQDIVERSITY OF LIVING WORLD

136. Mention any two products of medicinal importance obtained from Nature.

- A: 1) **Reserpine**- from Rauwolfia - used to treat high Blood Pressure.
 2) **Quinine**- from bark of Cinchona - used to treat Malaria.
 3) **Vinblastin**- from Vinca rosea- Anti cancer drug.

137. Invasion of an Alien species leads to extinction of native species. Justify this with two examples.
 A: 1) Introduction of Nile perch in 'lake Victoria' caused the extinction of 200 species of cichlid fishes.
 2) Introduction of 'African catfish' reduced the number of indigenous cat fish.
 The cichlid fishes and indigenous cat fishes could not stand in the competition of alien species.

STRUCTURAL ORGANISATION

138. What are microglia and what is their origin and add a note on their function.

- A: 1) Microglia are neuroglia cells. [AP May-19][TS M-19]
 2) They are non conducting cells of nervous system.
 3) They are phagocytic and combat infection or injury of the nervous system.
 4) They are mesodermal in origin.

LOCOMOTION

139. What are dynein arms? What is their significance? [TS M-19]

- A: 1) Dynein arms are present in flagella and cilia.
 2) The 'A' tubule of each peripheral doublet bears paired arms along its length called dynein arms.
 3) The dynein arms of A tubule face the B tubules of adjacent doublet.
 4) They are arranged clockwise.
 5) They are made up of protein dynein.

140. Why do we refer to the offspring, formed by asexual method of reproduction, a clone? [AP Mar-19][TS Mar-17]

- A: 1) The term clone is used to describe morphologically and genetically similar individuals which are exact copies of their parent.
 2) Lower organism produce offspring by asexual reproduction.
 3) The offspring show 'uniparental inheritance' without any genetic variation, hence they are called a clone.

BIOLOGY IN HUMAN WELFARE

141. Why are cannabinoids and anabolic steroids banned in sports and games?

- A: 1) Cannabinoid and anabolic drugs are called steroid drugs.
 2) They mimic the effect of testosterone and dihydro testosterone. They increase protein synthesis which develop muscular tissue enhancing the performance of sportsmen. So they are banned.

SAQDIVERSITY OF LIVING WORLD

142. Explain the hierarchy of classification.

- A:
- 1) Classification is grouping of similar living organisms.
 - 2) Hierarchical classification is introduced by Carolus Linnaeus.
 - 3) Taxonomy Hierarchy consists of 7 categories. They are
 - (i) Kingdom
 - (ii) Phylum
 - (iii) Class
 - (iv) Order
 - (v) Family
 - (vi) Genus
 - (vii) Species
 - 4) **Kingdom** includes all multicellular, heterotrophs.
 - 5) **Phylum** includes one or more related classes.
 - 6) **Class** includes one or more related orders.
 - 7) **Order** includes one or more related families.
 - 8) **Family** includes one or more related genera.
 - 9) **Genus** includes one or more related species.
 - 10) **Species** is the basic unit of classification which includes similar type of interbreeding animals.
 - 11) **Domain** is a category above the level of kingdom.
 - 12) There are some other inter categories like sub-family, sub-class etc.,

143. What is meant by classification? Explain the need for classification.

- A:
- 1) **Classification** is arrangement of related living forms in groups for convenience of study.
 - 2) These groups are called **Taxa**. The process of grouping into Taxa is **Taxonomy**.
 - 3) **Basic processes of Taxonomy:** Characterization, identification, nomenclature, classification.
 - 4) **Essential criteria for classification:** External form, internal organization, cell structure developmental processes and ecological information of the living forms.
 - 5) **Need for classification:**
 - (i) There are millions of organisms and it is impossible to study them as they are.
 - (ii) So, they are grouped into convenient categories based on similar characters.

144. What is genetic diversity and what are the different types of genetic diversity?

- A:
- 1) It is the diversity of genes within a species. [TS M-20]
 - 2) A species may show a high genetic diversity when it is distributed over wide range of areas.

Ex-1: The rice we eat show genetic diversity with more than 50,000 different strains.

Ex-2: Rauwolfia Vomitoria is a medicinal plant, which grow in Himalayas. They produce reserpine which is used in the treatment of high blood pressure. The potency and concentration of reserpine change variously in different regions.
 - 3) **Types of genetic diversity** depend upon
 - (i) wide range of areas causing gene variation
 - (ii) Number of different alleles in the genes of a species
 - (iii) Frequency in which they appear.

STRUCTURAL ORGANISATION

145. Describe the structure of a multipolar neuron.

A: Multipolar neurons are the common neurons of the body. They consist of
 (1) Dendrites (2) Cell body (3) Axon.

1) Dendrites:

- i) They are short branched processes which arise from cell body.
- ii) They contain Nissl granules and neurofibrils.
- iii) They conduct nerve impulse towards the cell body (afferent)

2) Cell body :

- i) It is also called cyton or soma or perikaryon.
- ii) It includes nissl granules (RER) for protein synthesis.
- iii) It contains larger spherical nucleus, Neurofibrils & Lipofuscin granules.

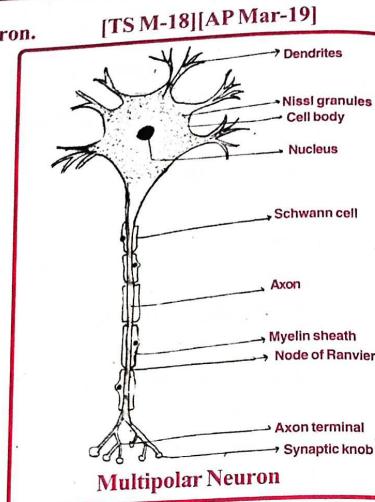
3) Axon:

- i) It is a long cylindrical thread like structure which arises from cell body.
- ii) The junction between cell body and axon is called Axon hillock
- iii) The plasma lemma is called axolemma.
- iv) The cytoplasm is called axoplasm.
- v) Microfibrils are present. Nissl bodies are absent.
- vi) The terminal part of axon is branched into small filaments called telodendria.
- vii) Telodendria have knob like endings called synaptic knobs or terminal boutons.
- viii) Synaptic knobs contain neuro transmitters (acetyl choline).
- ix) Axon carries nerve impulse from the cell body to the next neuron (efferent).

146. Give an account of glandular epithelium.

[TS May-19] [AP M-15]

- A:
- 1) Glandular Epithelium (G.E) is a tissue responsible for formation of glands.
 - 2) **Location:** G.E forms the covering of all major glands.
 - 3) Based on the combination of cells G.E are two types (i) Unicellular (ii) Multicellular
 - 4) Unicellular glands are isolated glandular cells. Ex: Goblet cells of gut.
 - 5) Multicellular glands consist of clusters of cells. Ex: Salivary glands.
 - 6) **Function:** Secretion is the main function of G.E.
 - 7) Based on the secretions G.E are two types (i) Exocrine glands (ii) Endocrine glands.
 - 8) **Exocrine glands:** They are glands with ducts. Ex: Salivary glands, Mammary glands.
 - 9) **Endocrine glands:** They are ductless glands. Ex: Pituitary, Thyroid



147. Write short notes on lymph.

- A:
- 1) Lymph is a colourless fluid.
 - 2) The interstitial fluid that passes through lymphatic system is called lymph.
 - 3) Lymph contains plasma and lymphocytes.
 - 4) It contains less amount of nutrients and oxygen but has more CO₂ and other metabolites.
 - 5) Lymph is formed in interstitial space. When blood passes through capillaries then nutrients, oxygen and other materials diffuse into interstitial space, due to hydrostatic pressure.
 - 6) Most of the fluid in interstitial space enters blood. But a small portion reach the lymph vessels and becomes lymph.
 - 7) Finally, lymph reaches the blood through subclavian veins, near heart.
 - 8) Lymphatic system provides an 'accessory route' by which interstitial fluid flows back to blood.

148. Write short notes on (a) Platelets and (b) Synapse.

A: (a) **Platelets:**

- 1) Platelets are also called thrombocytes.
- 2) They are a kind of formed elements.
- 3) Blood platelets are non nucleated, round or oval biconvex discs.
- 4) Their number range from 2,50,000 to 5,00,000 per cubic mm.
- 5) Platelets are fragments of mega karyocytes.
- 6) Their average life span is 5 to 9 days.
- 7) They secrete thromboplastin which is important for blood clotting.
- 8) They clump at the damaged part of the blood vessel and form a plug preventing blood loss.

(b) **Synapse:**

- 1) Synapse is a junction between two adjacent neurons.
- 2) It plays an important role in nerve transmission.
- 3) It consists of synaptic knob of preceding neuron, a gap or functional bridge and dendrites of succeeding neuron.
- 4) During transmission of nerve impulse the neurotransmitters of synaptic knob is released into gap.
- 5) It functions as temporary bridge for transmission.
- 6) After transmission the neuro transmitter breaks and recombines in synaptic knob.

ANIMAL DIVERSITY-II

149. What are the features peculiar to ratite birds? Give two examples of ratite birds.

[TS-18]

A: Peculiar features of ratite birds:

- 1) They are modern flightless running birds.
- 2) They are characterised by the presence of reduced wings, a flat like sternum without keel.
- 3) Feathers are without interlocking mechanism.
- 4) Syrinx is absent.
- 5) Preen gland is absent.
- 6) Males have copulatory organ.
- 7) Pygostyle is rudimentary or absent.
- 8) Clavicles are absent.
- 9) Young ones are precocial.
- 10) They exhibit discontinuous distribution.
- 11) Ex: Rhea (American ostrich) in South America, Struthio (African ostrich) in Africa, Dromaeus, Casuarius in Australia, Kiwi in New Zealand.

[PM PC absent]

150. Compare and contrast sea squirts and lancelets.

A: Comparison of sea squirt and lancelet.

- 1) Both are marine.
- 2) Perforated pharynx, endostyle and ectoderm lined atrium are common to both.

Contrast between Sea squirts and lancelets:

- 1(a) Sea squirt (Ascidian) belongs to subphylum urochordata.
- 1(b) Lancelet (Amphioxus) belongs to the subphylum cephalochordata.
- 2(a) Sea squirts body is unsegmented and sac-like.
- 2(b) Lancelet body is like a fish with segments.
- 3(a) Sea squirt has a protective test and sessile.
- 3(b) Lancelet has no test. It is a burrowing form.
- 4(a) Circulatory system is open type in ascidian
- 4(b) Circulatory system is closed type in amphioxus.
- 5(a) In ascidian Larva is tadpole.
- 5(b) In amphioxus larva is lancelet.
- 6(a) In adult sea squirt, they are absent. But they are present in larva.
- 6(b) In lancelet, a well developed tubular nerve chord and notochord are present.
- 7(a) Ex: Ascidia is a sea squirt.
- 7(b) Ex: Branchiostoma is a Lancelet.

BIOLOGY IN HUMAN WELFARE

151. What is the need for parasites to develop special adaptations? Mention some special adaptations developed by the parasites.

[TS M-19]

A:

Parasites depend on hosts for their survival. The hosts tend to reject and resist the parasites. So parasites have evolved adaptations to counteract and neutralise host's defence system. The adaptations are loss of unnecessary sense organs, development of organs of attachment, high reproductive capacity etc.

Special Parasitic adaptations:

- 1) In order to live in the host, some parasites develop attachment organs like Hooks, suckers, rostellum etc.
- 2) Some parasites develop protective covering like tough 'cuticle' tegument to withstand digestive juices.
Ex: Ascaris, Fasciola.
- 3) Some parasites produce large number of eggs.
Ex: Taenia has 700-900 proglottids, each producing 3500 eggs.
- 4) Some parasites produce anti enzymes to neutralise host's digestive juices. Ex: Taenia.
- 5) Some parasites develop complex life cycles with many larval stages. Ex: Fasciola.
- 6) Some parasites show development of cysts. Ex: Entamoeba.
- 7) Some parasites change the surface antigens to escape from vaccines. Ex: Plasmodium, HIV

152. Distinguish between addiction and dependence.

[TS M-17]

A: **Addiction:**

- 1) It is a psychological attachment to certain effects such as euphoria.
- 2) The inherent addictive nature of alcohol, drugs and tobacco force the people to use them.
- 3) Repeated use of these drugs increases the tolerance level of the receptors in the human body. As a result, receptors respond only to higher doses leading to greater intake of these drugs and addiction.
- 4) It should be clearly borne in mind that use of TDA even once, can be a fore-runner to addiction.
- 5) Addictive potential of tobacco, drugs, alcohol pull the users into a vicious circle leading to their regular use (Abuse) from which they may not be able to get out.
- 6) In the absence of any guidance (or) counselling, people get addicted and become dependent on them.

Dependence:

- 1) It is the tendency of the body to manifest characteristic and unpleasant condition (with withdrawal syndrome), if the regular dose of drugs (or) alcohol is abruptly discontinued.
- 2) The withdrawal syndrome is characterised by anxiety, shakiness, (tremors), nausea and sweating which may be relieved when the regular use is resumed again.
- 3) Dependence leads to patient to ignore all social norms.

THE ZOOLOGY BULLET MODEL PAPER

A 'MULTI QUESTION PAPER' WITH 'BULLET ANSWERS'

VSAQ SECTION-A

Q1, Q2 .DIVERSITY OF LIVING WORLD

- What does ICZN stand for?
A: 1) ICZN stands for International Code of Zoological Nomenclature.
2) It is used to name the identified organism.
- What is biogenesis?
A: 1) Biogenesis is a theory of evolution which says 'life begets life'.
2) Thus living beings are produced from living beings only but not from non-living matter.
- Define the term histology. What is it otherwise called?
A: 1) Histology: Histology is the study of microscopic structure of different tissues.
2) It is also known as Microanatomy.
- What is meant by tautonomy? Give two examples.
A: 1) Naming the animals in which the generic name and specific name are the same is called tautonomy.
2) Ex-1: Naja naja- The Indian cobra
Ex-2: Axis axis- Spotted deer
- Define species richness.
A: 1) Species richness: It is the number of species per unit area. More number of species indicate more species richness.
- Formula: $\log S = \log C + Z \log A$
- List out any four sacred groves in India.
A: Sacred groves are small group of trees in an area venerated by local people.
 - 1) Khasi and Jaintia hills - Meghalaya
 - 2) Aravalli hills - Rajasthan and Gujarat
 - 3) Sarguja, Bastar- Chattisgarh
 - 4) Chanda - Madhya Pradesh
- Write the full form of IUCN. In which book threatened species are enlisted.
A: 1. IUCN stands for International Union for Conservation of Nature and natural resources.
2. Threatened species are enlisted in 'Red Data Book' of IUCN.

Q3&4.STRUCTURAL ORGANISATION IN ANIMALS

- What is cephalization? How is it useful to its possessors?
A: 1) Cephalization is the formation of nerve and sensory cells at the anterior part of the body.
2) Animals with cephalization can sense the new environment and more efficient than the other animals in seeking food, locating mates and in escaping from predators.

JR.ZOOLOGY-BULLET MODEL PAPER

- What is the function of radula? Give the name of the group of molluscs which do not possess a radula?
A: 1) Radula is a rasping organ of molluscs used for feeding.
2) Radula is absent in Bivalvia or pelecypoda.
- What is Aristotle's lantern? Give one example of an animal possessing it?
A: 1) Aristotle's lantern is a complex '5 jawed masticatory apparatus' present in buccal cavity of sea urchins.
2) Ex: Echinus (Sea urchin)
- What is the essential difference between the larvae and adults of echinoderms, symmetry wise?
A: 1) The larvae of echinoderms exhibit bilateral symmetry.
2) The adult echinoderms exhibit pentamorous radial symmetry.
- What are the two chief morphological 'body forms' of cnidarians? What are their chief functions?
A: 1) The chief morphological body forms of cnidarians are
 - (i) Medusa form
 - (ii) Polyp form
2) Chief function of medusoid form is reproduction and polypoid form is nutrition.

Q7 :LOCOMOTION & REPRODUCTION

- What is a kinety?
A: 1) A longitudinal row of kinetosomes and their inter connecting kinetodesmata are collectively called kinety.
2) Kinety is a part of infra ciliary system of ciliates.
- Distinguish between proter and opisthe.
A: 1) The proter is the anterior individual. It receives anterior contractile vacuole, cytopharynx and cytostome of parent.
2) The opisthe is the posterior individual. It receives posterior contractile vacuoles and develops other organelle.
- Distinguish between lobopodium and filopodium. Give an example to each of them.
A: 1) Blunt finger like pseudopodia are called Lobopodia.
Ex: Amoeba, Entamoeba.
2) Long, fibre like pseudopodia are called Filopodia.
Ex: Euglypha

Q5, Q6 : ANIMAL DIVERSITY-I

- Distinguish between amphids and phasmids.
- A: 1) Amphids are cuticular depressions around the mouth of nematodes. They are chemoreceptors.
2) Phasmids are posterior unicellular glands of some nematodes. They are glandulo sensory.
- Which arthropod, is called a 'living fossil'? Name its respiratory organs?
A: 1) Limulus(king crab) is the living fossil arthropod.
2) The respiratory organs are book gills.

Q8, Q9: BIOLOGY IN HUMAN WELFARE

- What is a hyper-parasite? Mention the name of one hyper-parasite.
A: 1) A parasite which lives on the body of another parasite is called hyper- parasite.
2) Ex: Nosema notabilis is a hyper parasite. It is a parasite for sphaerospora polymorpha .

Q10: ECOLOGY & ENVIRONMENT

- What are circadian rhythms?
A: 1) The biological rhythms that occur in a time period of 24 hours are called Circadian rhythms.
2) Biological rhythms are behavior activities that are repeated at regular intervals.
- Mention the advantages of some UV rays to us.
A: 1) UV rays kill micro organisms on the body surface of animals.
2) UV rays convert the sterols in the skin to vitamin D.
- Define commensalism. Give one example.
A: 1) Commensalism is a type of interaction between different species. Here one is benefited and the other is neither benefited nor harmed.
2) Ex: Barnacles growing on the back of a whale benefit, while the whale derives no noticeable benefit.
- Define mutualism. Give one example.
A: 1) Mutualism is a type of interaction between different species in which both are benefited.
2) Ex: Bees and flowering plant. Bees get nectar and plants get pollinated

SAQ SECTION - B**Q11: DIVERSITY OF LIVING WORLD**

- Define species. Explain the various aspects of 'species'.
 - A:** 1) Species: It is the basic unit of classification of living organisms. 2) John Ray described species on the basis of common descent (ancestors)
 - 3) **Buffon's def:** Species is an interbreeding group of similar individuals, sharing a common gene pool and producing fertile offspring.
 - II) **Various aspects of Species:**
 - 1) Species is a breeding unit, as it isolates reproductivity of individuals,
 - 2) Species is an ecological unit, as it shares the same ecological niche
 - What is the 'evil quartet'?
 - A:** The 'evil quartet' refers to 'four major threats' of biodiversity. They are
 - i) **Habitat loss and fragmentation:**
 - i) Deforestation leads to habitat loss for many species.
 - ii) Conversion of forest land to agriculture land also leads to habitat loss.
 - iii) Pollution degrades habitat because it changes the quality of land.
 - iv) Defragmentation division of main land to small lands leads to population decline.
 - 2) **Over Exploitation:** When need turns to greed, it leads to over exploitation. **Ex:** Steller's sea cow and passenger pigeons are extinct due to over exploitation by man.
 - 3) **Invasion of Alien Species:** When alien species are introduced into a habitat, they turn invasive and establish themselves at the cost of native species.
Ex: Nile perch introduced into lake Victoria
 - 4) **Co-extinction:** It is an obligate association between a plant and an animal.

Q12: STRUCTURAL ORGANISATION

- Explain Haversian system.
 - A:** In a dense bone, a Haversian canal and the surrounding lamellae and lacunae are collectively called Osteon or Haversian system. It works as transport system. It is a unit of compact bone.
- Parts of Haversian System:
 - 1) **Haversian canal:** This canal runs parallel to marrow cavity of bone. It contains an artery, a vein and a lymph vessel.
 - 2) **Concentric Lamellae:** There are concentric rings of bone lamellae around the haversian canal.
 - 3) **Lacunae:** Small fluid filled spaces called lacunae are present in between lamellae. These spaces enclose osteocytes (inactive).
 - 4) **Canaliculari:** They are minute canal connecting various lacunae and haversian canal. The protoplasmic processes of osteocytes present canaliculari
 - 5) **Volkman's canals:** They connect haversian canal to marrow cavity.

Q14, Q 15 : ANIMAL DIVERSITY-II

- Name the four 'hallmarks' of chordates and explain the principal function of each of them.
- A:** 'Hallmark' characters of chordates:
 - 1) **Notochord:** It is present in all chordates at some stage of life. It is rod like structure located above the alimentary canal and below the nerve cord. It is supportive in function. It is mesodermal in origin.
 - 2) **Nerve cord:** There is a dorsal tubular fluid, filled nerve cord present above the notochord. In vertebrates the anterior end becomes the brain and the rest of the cord becomes spinal chord. It coordinates various functions of the body. It is ectodermal in origin.

- 3) **Pharyngeal gill slits:** The pharynx is perforated on either side which become gill slits. They are well developed in aquatic lower vertebrates and lower chordates. They are ecto-endodermal in origin.
- 4) **Postanal tail:** Part of the body that projects beyond the anus is tail. Generally it has vertebral column, blood vessel and muscles. It helps in locomotion.
- Compare and contrast cartilaginous and bony fishes.
 - A:** A) **Cartilaginous fishes:**
 - 1) Cartilaginous fishes are mostly marine.
 - 2) Endoskeleton is made up of cartilage. Mouth is ventral.
 - 3) Scales are placoid.
 - 4) Excretion is ureotelic. **Ex:** Scyliorhinus (dog fish)
 - B) **Bony fishes:**
 - 1) Bony fishes are found in all aquatic habitats.
 - 2) Endoskeleton is made up of bones.
 - 3) Mouth is terminal. Scales are cycloid, ctenoid, ganoid or cosmoid. Air bladder is present.
 - 4) Excretion is ammonotelic. **Ex:** Exocoetus (flying fish)
- What are the modifications that are observed in birds that help them in flight?
 - A:** Flight adaptations of Birds:
 - Birds are masters of air. Almost every part of their body is suited for flight.
 - Flight adaptations of Birds:
 - 1) Body of birds is boat shaped with reduced tail.
 - 2) Exoskeleton consists of feathers.
 - 3) Feathers are light in weight and provide support in air.
 - 4) Eyes are large with sclerotic plates and comb like pecten.
 - 5) Skin is dry without glands, except preen gland in the tail.
 - 6) Forelimbs are modified into wings.
 - 7) Bones are pneumatic (weight reduction) with extensions of air sacs.
 - 8) All modern flying birds are provided with powerful breast muscles.
 - 9) Air sacs, attached to lungs, provide continuous oxygenation.
 - 10) Syrinx is voice box.

Q16, Q 17: LOCOMOTION AND REPRODUCTION

- What are lateral appendages? Based on their presence and absence, write the various types of flagella giving at least one example for each type.
 - A:** Lateral appendages: One or two or many rows of short, lateral hair like fibrils found on some flagella are called lateral appendages or mastigonemes.
- Types of Flagella:
 - 1) **Stichonematic:** This flagellum bears one row of mastigonemes. **Ex:** Euglena, Astasia.
 - 2) **Pantonematic:** The flagellum has two or more rows of mastigonemes. **Ex:** Peranema and Monas.
 - 3) **Acronematic:** There are no mastigonemes on this flagellum. The tip of axoneme is naked without any sheath. **Ex:** Chlamydomonas and polytoma.
 - 4) **Pantacronematic:** The flagellum has two or more rows of mastigonemes and a naked terminal filament.
 - 5) **Anematic:** Mastigonemes are absent. There are no terminal filaments. **Ex:** Chilomonas & cryptomonas

- Describe the process of transverse binary fission in Paramecium.
 - A:** Binary fission in Paramecium:
 - 1) Paramecium undergoes transverse binary fission during favourable conditions.
 - 2) Before binary fission, it stops feeding and the oral groove disappears.
 - 3) The micro nucleus divides in to two by 'mitosis'.
 - 4) The macro nucleus divides into two by 'amitosis'. A transverse constriction appears in the middle. It deepens and divides the parent into two daughter individuals.
 - 5) The anterior is called proter and posterior is opisthe.
- Describe the process of longitudinal binary fission in Euglena.
 - A:** Binary fission in Euglena:
 - 1) Euglena undergoes longitudinal binary fission during favourable conditions.
 - 2) During this process the stigma, paraflagellar body and contractile vacuoles disappear.
 - 3) Nucleus, basal granules, chromatophores and cytoplasm undergo division.
 - 4) A longitudinal groove appears in the central part of anterior end.
 - 5) It gradually extends to posterior and divides the organism into two.
 - 6) One daughter Euglena retains parental flagella, the other daughter develops new flagella.
 - 7) As daughter forms look like mirror images, the fission is called 'symmetrogenic division'.
 - 8) Stigma, paraflagellar body and contractile vacuole develop freshly in new individuals.

Q18: BIOLOGY IN HUMAN WELFARE

- What are the adverse effects of tobacco?
- A:** Adverse effects of Tobacco:
 - 1) Smoking increases carbon monoxide level in blood and reduces oxygen level.
 - 2) Tobacco contains Nicotine, an alkaloid.
 - 3) Nicotine stimulates adrenal gland.
 - 4) The hormones adrenaline and nor-adrenaline increase blood pressure and heart rate. It causes bronchitis.
- 'Prevention is better than cure'. Justify with regard to TDA abuse.
 - A:** TDA stands for Teen Drug Abuse. 'Prevention is better than cure' holds true in case of TDA abuse.
- Measures useful for prevention:
 - 1) Avoid undue parental pressure: The parents should not force their children to perform beyond their capacity. They should not compare them with others.
 - 2) Responsibility of parents and teachers: They have to advise, counsel and help the children who are likely to get into the trap of TDA.
 - 3) Seeking help from peers: If classmates find some one getting into trap of TDA, it should be brought to the notice of their parents or teachers.
 - 4) Education and counselling: There must be a continuous process of educating the children regarding TDA, at every level in the form of lessons.

LAQ SECTION - C**Q19: STRUCTURAL ORGANIZATION**

- Classify and describe the epithelial tissues on the basis of structural modification of cells with examples.

A: Types of Epithelia:

i) **Simple Epithelium:** It is composed of single layer of cells. It helps in diffusion, absorption filtration and secretion of substances. It is again divided into three types based on the shape of the cells.

i) **Simple squamous epithelium:** It has single layer of flat tile like cells with a central oval nucleus.

Ex: Endothelium of blood vessels.

2) **Simple Cuboidal epithelium:** It is formed of single layer of cuboid cells with a central nucleus.

Ex: Germinal epithelium.

3) **Simple Columnar epithelium:** It is composed of single layer of tall cells with nucleus at the base.

II) Compound Epithelium: It is formed of more than one layer of cells. Its main function is to provide protection against chemical and mechanical stress.

Compound epithelium is divided into the following types:

(1) Stratified keratinized squamous epithelium

(2) Stratified non-keratinized squamous epithelium

(3) Stratified cuboidal epithelium

(4) Transitional Epithelium

III) Glandular Epithelium(G.E): It is a tissue responsible for formation of glands. It forms the covering of all major glands.

• Compare and contrast the three types of muscular tissues.

A: Comparison of three types of muscles skeletal, visceral and cardiac muscles, is done under the following headings:

I) Attachment:

1) Skeletal muscles are attached to skeleton by tendons.

2) Visceral muscles are present in walls of the visceral organs. They are arranged in sheets.

3) Cardiac muscles are present in myocardium of the heart attached to septa and lateral walls of the heart.

II) Cell structure:

1) Skeletal muscle cell is long, cylindrical and unbranched. It is multinucleate (syncytium). The myofibrils have alternate dark and light bands.

2) Visceral myocyte is spindle shaped. It is uninucleate. The myofibrils have no dark and light bands.

3) Cardiac muscle is cylindrical, uni or binucleate and branched. Alternate dark and light bands are present.

Intercalated discs of cardiac muscle helps in quick transport of electrical impulse.

III) Nature of action and control:

1) Skeletal muscles are voluntary under the control of somatic nervous system. They contract quickly and fatigue quickly.

2) Visceral muscles are involuntary under the control of Autonomic nervous system(ANS). Their contractions are slow and prolonged and no fatigue.

3) Cardiac muscles are involuntary under the control of pace maker or SAN,ANS, Hormones. The muscle is highly resistant to fatigue.

Q20: BIOLOGY IN HUMAN WELFARE:

- Describe the life cycle of Plasmodium vivax in man.

A: 'Plasmodium vivax': Phylum- Protozoa; Class - Telosporea. It is the malarial parasite of man. It is digenetic intra cellular parasite that lives in the liver cells and RBC of man.

Life cycle of Plasmodium in man (Human phase): In man, plasmodium reproduces by asexual reproduction called schizogony. It is of two types:

(I) Hepatic Schizogony: It was discovered by Shortt and Garnham. When an infected mosquito bites a healthy person, the sporozoites enter the blood of man. Within half an hour they reach liver cells. In liver cells, the parasites increase their number in two cycles. They are

(1) Pre-erythrocytic cycle: i) The sporozoites enter liver cells and transform into trophozoites. ii) They become round and grow in size and are called schizonts. iii) The nucleus divides several times. It is followed by cytoplasm divisions, producing 12,000 cryptozoites (or first generation merozoites). iv) They enter the sinusoids of the liver by rupturing the cell membrane of the schizont and the liver cells. v) The duration of pre-erythrocytic cycle is 8 days.

vi) The cryptozoites may enter into either fresh liver cells to continue exo-erythrocytic cycle or they can enter into RBC to continue erythrocytic cycle.

(2) Exo-erythrocytic cycle: i) The cryptozoites that enter liver cells undergo schizogony and produce two types of metacryptozoites within two days.

ii) Some are small called micro meta cryptozoites (male). iii) Others are large and called macro meta cryptozoites. The macro meta cryptozoites continue hepatic Schizogony.

Prepatent period (No clinical symptoms): i) The interval between the first entry of plasmodium (sporozoites) into blood and the second entry of plasmodium (cryptozoite) is called prepatent period.

ii) No clinical symptoms are observed.

iii) It takes generally 8 days.

(II) Erythrocytic schizogony: i) **Golgi cycle:** It was described by Golgi.

ii) The cryptozoites or micro meta cryptozoites enter into the fresh RBC.

iii) They transform into trophozoites.

iv) A small vacuole appears in trophozoite.

v) It enlarges by pushing the cytoplasm and nucleus to one side.

v) The parasite looks like a ring and hence it is called signet ring stage.

vi) Here, the vacuole disappears, Pseudopodia develop and the parasite changes to amoeboid stage.

vii) At this stage parasite exhibits hypertrophy condition (RBC grows almost double the size).

viii) It feeds on globin part of haemoglobin and grows in size.

ix) It converts the soluble haem into insoluble haemozoin called malaria pigment.

x) Small red colour dots appear in the cytoplasm of RBC called Schuffner's dots.

xi) It becomes a round schizont.

xii) It undergoes schizogony and produces 12 to 24 erythrocytic merozoites.

xiii) Finally the erythrocyte bursts and releases merozoites and haemozoin into the blood.

xiv) The release of haemozoin causes chill, fever.

xv) They attack fresh RBC and continue the erythrocytic cycle.

xvi) The duration of erythrocytic cycle is 48 hours.

• Describe the life cycle of Plasmodium vivax in mosquito.

A: Life cycle of Plasmodium in Mosquito(Mosquito Phase)- Ross Cycle:

Gametocytes of Plasmodium are formed in man and their further development takes place in female Anopheles mosquito. When a female Anopheles mosquito bites and sucks the blood of a malaria patient, the gametocytes along with the other stages of the erythrocytic cycle reach the crop of mosquito. Here all the stages are digested except the gametocytes.

Further part of the life cycle consists of four phases.

I) Gametogony: The formation of male and female gametes from the gametocytes is called gametogony. It occurs in the lumen of the crop of mosquito.

(1) Formation of male gametes:

i) During this process, the nucleus of microgametocyte divides into eight daughter nuclei.

ii) The eight daughter nuclei pass into eight flagella like structures and form male gametes.

iii) Then the flagella like structures begin lashing movements and get separated from the flagellated body. This process is called exflagellation.

(2) Formation of female gamete:

i) The female gametocyte undergoes a few changes and transforms into a female gamete. This process is called maturation.

ii) The nucleus moves towards the periphery, and the cytoplasm forms a projection called fertilization cone.

II) Fertilization: The fusion of male and female gametes is called fertilization.

1) One of the active male gamete comes in contact with the 'fertilization cone' of the female gamete and enters into it. 2) The pronuclei and cytoplasm of these two gametes fuse with each other. As a result the zygote is formed. 3) These gametes are dissimilar in size and hence the process is called anisogamy.

III) Formation of Ookinete & Oocysts:

1) The zygote elongates and becomes motile and is called ookinete within 18 to 24 hours.

2) It pierces the wall of the crop and settles beneath the basement membrane.

IV) Sporogony: The oocyst enlarges in size and begins sporogony.

1) According to Bano, the nucleus of the oocyst first undergoes reduction division.

2) Then the nucleus divides repeatedly by mitosis and produces a number of nuclei.

Q21 : ECOLOGY AND ENVIRONMENT

• Write an essay on temperature as an ecological factor. A: Temperature as an ecological factor: Temperature is a measure of intensity of heat. Temperatures vary greatly on land from equator to poles and sea level to high altitudes. Temperatures in water vary very little.

1) Thermal stratification in temperature and lakes: Temperature variations are more observed in temperate lakes.

2) Summer Stratification:

i) During summer the temperature of surface water reaches upto 25°C. ii) The upper layer is called epilimnion.

iii) The middle layer is thermocline or metalimnion.

iv) The bottom layer is hypolimnion.

3) Autumn over turn:

i) During autumn epilimnion cools down to 4°C as water has maximum density at 4°C.

ii) Surface water becomes heavy and sinks to the bottom. The bottom water comes up.

4) Winter Stratification:

i) During winter the surface temperature reaches 0°C and water freezes. ii) Below the surface, water is present.

5) Spring Overturn: In the following spring the surface warms upto 4°C. The heavy water goes down bringing up nutrient water. This overturn is spring over turn.

6) Biological effects: i) Eury thermal ii) Stenothermal

7) Metabolism: i) Temperature changes the activity of enzymes. ii) Optimum temperature is the temperature at which the activity of animal is at peak.

8) Van't Hoff's rule: For every increase of 10°C the metabolic rate doubles.

i) Temperature coefficient $Q_{10} = X - (X - 10^{\circ}\text{C})$

• Write an essay on water as an ecological factor.

A: Water as an ecological factor:

1) Water: Water is an important ecological factor that influences the life of organisms. Salt concentration is high in sea water and very low in fresh water.

2) Eury haline: These organisms can tolerate wide fluctuations of salinity. Ex: Estuarine animals.

3) Steno haline: These organisms cannot tolerate fluctuations in salinity. Ex: Fresh water fishes

4) Adaptations of fresh water animals: The salt concentration of body fluids is much higher than surrounding fresh water. So endosmosis takes place to send out excess water.

(i) Protozoans have contractile vacuoles.

(ii) Fresh water fishes have large glomerular kidneys. Along with water, salts are also lost.

(iii) Fishes have salt absorbing chloride cells in gills which absorb salts from surrounding water.

5) Adaptations of Sea water animals: Salt concentration of sea water is more than that of body fluids. So exosmosis takes place and to prevent dehydration.

(i) Fishes have agglomerular kidneys with few nephrons.

(ii) They drink water. So salts accumulate inside the body.

(iii) Excess salts are sent out through salt secreting chloride cells in gills.

(iv) Sea gulls and penguins secrete salt drops through nose.

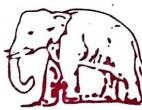
(v) Turtles and crocodiles have salt secreting glands near eyes.

GUESS PAPERS**MODEL PAPER-1****JR ZOOLOGY**

SECTION-A		Ans-Page Index
1. Answer ALL of the following VSAQ:	10 x 2=20	
1. What does ICZN stand for?		[GP 45(47)]
2. List out any four sacred groves in India.		[GP 46(55)]
3. What is cephalization? How is it useful to its possessors?		[GP 47(61)]
4. Define osteon.		[GP 48(70)]
5. Distinguish between amphids and phasmids.		[GP 49(80)]
6. What are the functions of canal system of sponges?		[GP 49(77)]
7. Draw a labelled diagram of T.S of flagellum.		[GP 51(95)]
8. Define parasitism and justify this term.		[GP 52(102)]
9. From which substances 'Smack' and 'Coke' are obtained?		[GP 53(114)]
10. What are circadian rhythms?		[GP 54(121)]
SECTION-B		
II. Answer any SIX of the following SAQ:	6 x 4=24	
11. Define species. Explain the various aspects of 'species'.		[GP 30(12)]
12. Describe the three types of cartilage.		[GP 33(19)]
13. What are the chief characters of the crustaceans?		[GP 34(23)]
14. Name the four 'hallmarks' of chordates and explain the principal function.		[GP 36(27)]
15. Describe the structure of the heart of frog.		[GP 37(30)]
16. Describe the process of transverse binary fission in Paramecium.		[GP 39(34)]
17. Describe the process of longitudinal binary fission in Euglena.		[GP 39(35)]
18. Prevention is better than cure'. Justify with regard to TDA abuse.		[GP 42(42)]
SECTION-C		
III. Answer any TWO of the following LAQ:	2 x 8=16	
19. Classify and describe the epithelial tissues on the basis of structural modification of cells with examples.		[GP 12(1)]
20. Explain the structure and life cycle of Entamoeba histolytica with the help of neat labelled diagrams.		[GP 16(4)]
21. Write an essay on temperature as an ecological factor.		[GP 25(9)]

GUESS PAPERS**MODEL PAPER-2****JR ZOOLOGY**

SECTION-A		Ans-Page Index
I. Answer ALL of the following VSAQ:	10 x 2=20	
1. What is biogenesis?		[GP 45(48)]
2. Define species richness.		[GP 46(54)]
3. Mention the animals that exhibited a 'tube -within-a-tube' organisation for the first time? Name their body cavity.		[GP 47(62)]
4. Distinguish between endocrine and exocrine glands with examples.		[GP 47(66)]
5. What are the respiratory structures of Limulus and Palamnaeus respectively?		[GP 50(89)]
6. What is the function of radula? Give the name of the group of molluscs which do not possess a radula?		[GP 49(83)]
7. List any two differences between a flagellum and cilium.		[GP 51(96)]
8. What is a hyper-parasite? Mention the name of one hyper-parasite.		[GP 52(103)]
9. The eggs of Ascaris are called 'mammillated eggs'. Justify.		[GP 52(109)]
10. Mention the advantages of some UV rays to us.		[GP 54(123)]
SECTION-B		
II. Answer any SIX of the following SAQ:	6 x 4=24	
11. What is the 'evil quartet'?		[GP 30(13)]
12. Explain Haversian system.		[GP 32(17)]
13. Write short notes on the salient features of the anthozoans.		[GP 34(21)]
14. Compare and contrast cartilaginous and bony fishes.		[GP 36(28)]
15. Write eight salient features of the class Amphibia.		[GP 38(33)]
16. What are lateral appendages? Based on their presence and absence, write the various types of flagella giving at least one example for each type.		[GP 40(36)]
17. Draw a neat diagram of Paramecium and label its important structures/components.		[GP 41(39)]
18. What are the adverse effects of tobacco?		[GP 42(40)]
SECTION-C		
III. Answer any TWO of the following LAQ:	2 x 8=16	
19. Compare and contrast the three types of muscular tissues.		[GP 13(2)]
20. Describe the life cycle of Plasmodium vivax in man.		[GP 18(5)]
21. Write an essay on water as an ecological factor.		[GP 27(10)]

GUESS PAPERS**MODEL PAPER-3****JR ZOOLOGY**

- I.** Answer ALL of the following VSAQ: 10 x 2=20

- What is trinomial nomenclature? Give an example.
- Write the full form of IUCN. In which book threatened species are enlisted.
- Why is the true coelom considered a secondary body cavity?
- Mention any two substances secreted by mast cells and their functions.
- What is metagenesis? Animals belonging to which phylum exhibit metagenesis?
- What is Aristotle's lantern? Give one example of an animal possessing it?
- What is kinety?
- What do you mean by parasitic castration? Give one example.
- Distinguish between lymphadenitis and lymphangitis?
- What is cyclomorphosis? Explain its importance in Daphnia.

Ans-Page Index

- [GP 45(50)]
[GP 46(56)]
[GP 47(63)]
[GP 47(67)]
[GP 49(78)]
[GP 49(84)]
[GP 50(97)]
[GP 52(104)]
[GP 53(111)]
[GP 54(124)]

SECTION-B

- II.** Answer any SIX of the following SAQ: 6 x 4=24

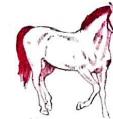
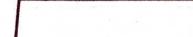
- Explain 'Rivet Popper' hypothesis.
- Describe the structure of a skeletal muscle.
- What are the salient features exhibited by polychaetes?
- What are the modifications that are observed in birds that help them in flight?
- What are the features peculiar to ratite birds? Give two examples of ratite birds.
- Given an account of pseudopodia.
- Describe the process of transverse binary fission in Paramecium.
- Why in adolescence is considered vulnerable phase?

SECTION-C

- III.** Answer any TWO of the following LAQ: 2 x 8=16

- Give an account of the 'formed elements' of Blood.
- Describe the life cycle of Plasmodium vivax in mosquito.
- Give an account of various types of interactions among the animal species of an ecosystem.

- [GP 31(14)]
[GP 32(18)]
[GP 34(22)]
[GP 37(29)]
[GP 60(149)]
[GP 40(37)]
[GP 39(34)]
[GP 42(41)]

**GUESS PAPERS****MODEL PAPER-4****JR ZOOLOGY****Ans-Page Index**

- I.** Answer ALL of the following VSAQ: 10 x 2=20
- What is meant by tautonymy? Give two examples.
 - Define the term metabolism. Give any one example.
 - What are retroperitoneal organs?
 - Distinguish between a ligament and a tendon
 - What is botryoidal tissue?
 - What is the essential difference between the larvae and adults of echinoderms, symmetry?
 - Distinguish between proter and opisthe.
 - Define prepatent period. What is its duration in the life cycle of plasmodium vivax?
 - In which way does tobacco affect the respiration? Name the alkaloid found in tobacco.
 - Define commensalism. Give one example.

Ans-Page Index

- [GP 45(51)]
[GP 46(57)]
[GP 47(64)]
[GP 48(68)]
[GP 49(81)]
[GP 49(85)]

[GP 51(99)]
[GP 52(107)]
[GP 53(112)]

[GP 54(125)]

SECTION-B

- II.** Answer any SIX of the following SAQ: 6 x 4=24

- What are the reasons for greater biodiversity in the tropics?
- Describe the structure of a cardiac muscle.
- What are the salient features of the echinoids?
- List out the extant orders of the Class Reptilia. Give two examples for each order.
- Compare and contrast cartilaginous and bony fishes.
- Draw a neat labelled diagram of Euglena.
- Describe the process of longitudinal binary fission in Euglena.
- Distinguish between hypertrophy and hyperplasia with an example for each.

- [GP 31(15)]
[GP 33(20)]
[GP 35(24)]
[GP 38(31)]
[GP 36(28)]
[GP 41(38)]
[GP 39(35)]
[GP 43(43)]

SECTION-C

- III.** Answer any TWO of the following LAQ: 2 x 8=16

- Classify and describe the epithelial tissues on the basis of structural modification of cells with examples.
- Describe the structure and life cycle of Ascaris lumbricoides with the help of a neat labelled diagram.
- Write an essay on water as an ecological factor.

- [GP 12(1)]
[GP 22(7)]

[GP 27(10)]

GUESS PAPERS

MODEL PAPER-5



JR ZOOLOGY

SECTION-A

10 x 2=20

I. Answer ALL of the following VSAQ:

- Differentiate between Protostomia and Deuterostomia.
- 'Zoos are tools for classification' Explain.
- What is Enterocoelom? Name the enterocoelomate phyla in the animal kingdom?
- What is the strongest cartilage? In which regions of the human body, do you find it?
- Which arthropod, is called a 'living fossil'? Name its respiratory organs?
- What are the two chief morphological 'body forms' of cnidarians? What are their chief functions?
- Distinguish between lobopodium and filopodium. Give an example to each of them.
- Define incubation period. What is its duration in the life cycle of plasmodium vivax?
- What is meant by nocturnal periodicity with reference to the life history of a nematode parasite you have studied?
- What is meant by osmotrophic nutrition?

Ans-Page Index

[GP 45(52)]

[GP 46(59)]

[GP 47(65)]

[GP 48(69)]

[GP 49(82)]

[GP 50(86)]

[GP 51(100)]

[GP 52(108)]

[GP 53(110)]

[GP 55(127)]

SECTION-B

6 x 4=24

II. Answer any SIX of the following SAQ:

- Explain in brief 'Biodiversity Hot Spots'.
- Give an account of glandular epithelium.
- Mention the salient features of Holothuroidea.
- List out eight characteristics that help distinguish a fish from the other vertebrates.
- Compare and contrast sea squirts and lancelets.
- Draw a neat diagram of Paramecium and label its important structures/components.
- What are lateral appendages? Based on their presence and absence, write the various types of flagella giving at least one example for each type.
- Write short notes on Opioids.

SECTION-C

III. Answer any TWO of the following LAQ:

2 x 8=16

- Compare and contrast the three types of muscular tissues.
- Describe the life cycle of Wuchereria bancrofti with a neat diagram.
- Give an account of various types of interactions among the animal species of an ecosystem.

[GP 31(16)]

[GP 58(146)]

[GP 35(25)]

[GP 38(32)]

[GP 60(150)]

[GP 41(39)]

[GP 40(36)]

[GP 43(44)]

[GP 13(2)]

[GP 24(8)]

[GP 28(11)]

Bullet-Q-Books లక్ష్మి

జానియర్ ఇంటర్ కార్సీలలో ఈ శాఖల ఉత్తీర్ణ లక్ష్మి (100% Pass) కోసం ప్రశ్నలు తయారు చేయబడిన పుస్కలు ఇవి Star Series Books దు Testimonial College అయిన STAR JUNIOR COLLEGEలో ఈ Bullet-Q-Books ఉపయోగించి 2019 Senior Inter ఫలితాలలో 100% ఉత్తీర్ణ సాధించడం వాలి "లక్ష్మి సాఫ్ట్వేర్స్"కు ఒక నిదర్శనం.



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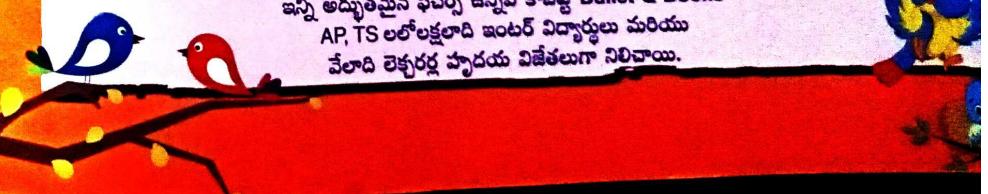
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Ph. 9247878964, 9246340888, 8686635666, 08672-223030
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