"Dissemination of Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Zoology

Academic Year 2024-25

Date- 08/02/2025

NOTICE

All the students of B.Sc. III are hereby informed that the Assignment will serve as the Continuous Internal Examination (CIE) for 15 Marks. The assignments will be evaluated based on the topics covered during the semester.

Important Details:

Date of Submission: 27/02/2025

Marks for CIE (Home Assignment): 15 for each paper

Attendance: Compulsory for all students to ensure timely submission and evaluation.

Instructions:

1. Collect the assignment writing pages from the department (Mr. Ganesh Mane) between 22nd and 24th February 2025
2. Questions for the assignment will be sent by a separate notice on 22nd February 2025.
3. Students who fail to submit their assignments within the given dates will be responsible for any academic loss incurred. Ensure that you are prepared and submit your assignments on time.

Prepare well and submit your assignments as required.

Dr. G. K. Sontakke
HEAD
DEPARTMENT OF ZOOLOGY
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

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Vivekanand College, Kolhapur

(An Empowered Autonomous Institute)

Department of Zoology

Academic Year 2024-25

B.Sc. III- CIE Attendance

Date: 27/02/2025

Sr. No.	Roll No.	Name of Student	DSC1008F1	DSC1008F2	DSC1008F3	DSC1008F4
1.	8341	Abrange Vaishnavi Vinod	V.V.Abrange	V.V.Abrange	V.V.Abrange	V.V.Abrange
2.	8342	Chougule Shraddha Shivaji	Shraddha	Shraddha	Shraddha	Shraddha
3.	8343	Dindayal Prabodhini Raju	P.R.Dindayal	P.R.Dindayal	P.R.Dindayal	P.R.Dindayal
4.	8344	Jadhav Suyash Kuber	SKJ	SKJ	SKJ	SKJ
5.	8345	Kamble Rutuja Vishal	RKamble	RKamble	RKamble	RKamble
6.	8346	Katkar Siddhi Sanjay	[illegible]	[illegible]	[illegible]	[illegible]
7.	8347	Kukade Priyanka Sandeep	PSK	PSK	PSK	PSK
8.	8348	Mansuri Sahida Allauddin	M.Sahida	M.Sahida	M.Sahida	M.Sahida
9.	8349	Mishra Shambhavi Mukesh Kumar	Shambhavi	Shambhavi	Shambhavi	Shambhavi
10.	8350	Mitake Komal Anil	[illegible]	[illegible]	[illegible]	[illegible]
11.	8351	Mulla Mahamadkaif Shahanul	[illegible]	[illegible]	[illegible]	[illegible]
12.	8352	Nayakavadi Ashiya Riyaj	ARNayakwadi	ARNayakwadi	ARNayakwadi	ARNayakwadi
13.	8353	Patil Pradnya Rajendra	Patil	Patil	Patil	Patil
14.	8354	Raje Shruti Sudarshan	Raje	Raje	Raje	Raje
15.	8355	Rathod Sonali Ramesh	Rathod	Rathod	Rathod	Rathod
16.	8356	Sayyad Afroja Aslam	Sayyad	Sayyad	Sayyad	Sayyad
17.	8357	Shaikh Ayesha Aslam	Shaikh	Shaikh	Shaikh	Shaikh
18.	8358	Singh Priya Gopal	Priya	Priya	Priya	Priya
19.	8359	Ustad Rifat Nasirkhan	Ustad	Ustad	Ustad	Ustad

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14/15

प्र. क्र.
Q. No.

Home Assignment

Name : Vaishnavi Vinod Abrange
Class: BSc TY Zoology
Paper : XIII : Immunology - I
Roll no: 8341

Q1 What is antibody ? Describe its types in detail.

→ • Antibodies are specialized glycoproteins that are formed in resp to antigen and reacts with it.
• Immunoglobulins are mainly found in vascular fluids, exoce secretion and on surface of lymphocytes.
• Each antibody is produced by a specific B-lymphocytes or B-cell.
• Antibody are Y shaped structure.
Peptides : Two heavy chains and two light chains.
Each antibody types has a different amino acid sequence at the tips of the "Y". This gives each antibody a different sh
There are five main types of antibodies :

1] IgG : (gamma) - Immune defense and passive immunity.
2] Ig A : (alpha) - ~~Early~~ Mucosal protection and neonatal defen
3] Ig M : (mu) - Early response and complement activation.
4] Ig D : (delta) - B and T cell regulation.
5] Ig E : (epsilon) - Allergies and parasite defense.

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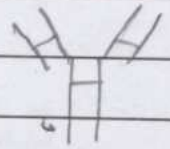
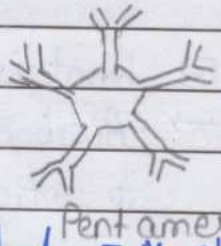
Each type has a different function and is distributed differently in the body.

1] IgG - (gamma) Immunoglobulin G



- Most abundant class of Ig in serum.
- Constituents 80% of total immunoglobulin.
- Present in blood, plasma and tissue fluids.
- Contains less carbohydrates than other immunoglobulins.
- It has a half life of 23 days; the longest of all of the Ig type
- IgG is the only immunoglobulin that can cross the placenta transfer the mother's immunity to the developing fetus.
- IgG triggers foreign cell destruction mediated by complem system (classical pathway).

2] Ig M - (mu).



- Accounts for 5-10% of total serum proteins.
- Mainly found on the surface of B-cell and blood.
- IgM is the largest immunoglobulin composed of 5 Y-shap units (IgG type) held together by a J polypeptide chain.
- Thus IgM is a pentamer. Due to its large size, IgM can transverse blood vessels, hence its is restricted to the blood stre
- Ig M is the 1st antibody to be produced in response to an anti and is the most effective against invading microorganisms.
- It forms an umbrella like defense mechanism against bacte
- Activates complement system by classical pathway.

3] Ig A - (alpha)

- Constituents 10-15% of total immunoglobulins.
- Present in milk, saliva, tears, mucous of respiratory tract, digestive tract & urinogenital tract.

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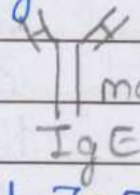
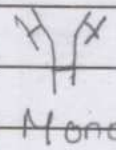
- H serum exist as monomer. In external secretions exist as dim called secretory Immunoglobulin.
- IgA has 'J' chain and secretory piece. Half life :- 6-8 days.
- Promotes phagocytosis and intracellular killing of microorgan
- Activates complement system by alternative pathway.

4] IgE - (epsilon).



- IgE is a single Y-shaped monomer similar to IgG (structure).
- It is normally present in minute concentration in blood. IgE lev are elevated in individuals with allergies as it is associated the body's allergic responses
- The IgE molecules tightly bind with mast cells which secre histamine and cause allergy.

5] IgD - (delta).



- IgD is primarily B cell receptor composed of single Y-shaped unit and is present in a low concentration in the circulation.
- IgD molecules are present on the surface of B cells. Their functi however, is not known for certain, some workers believe that IgD may function as B-cell receptor.
- 1st observed in myeloma cell constitute 0.2% total Ig.

Q2] Cells of Immune System.

→ Immune system is specialized cells and organs that prot the human body from various infectious agents.

- The cells of the immune system include white blood cells (WBCs) such as lymphocytes, neutrophils and monocytes as well as basophils, eosinophils and mast cells.

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- These cells work together to protect the body from foreign invaders like bacteria, viruses and parasites.
- These cells originates in the bone marrow, where many of th also matures. They then circulate in the blood and in the lym tic system.

Lymphocytes: These cells help the body remember and destroy invaders. They include B cells, T cells and natural Killer ce

Neutrophils: These cells are the most common innate immun cells and patrol the blood stream for bacteria. Most abunc (60-65%) cells of total WBCs.

Monocytes and Macrophages: These cells are phagocytes that consume invading organisms. These are largest WBCs (Mon These enlarge to form macrophages. These functions as antigen presenting cells and phagocytosis.

Basophils: These cells are important for host defense agains parasites and are involved in allergic reactions. These sec Histamine (vasodilator), Serotonin (vasoconstrictor), Hepa (anticoagulant).

Eosinophils: These cells contain toxic proteins that kill the bacteria and parasites. ~~(blood flukes)~~. They help fight infecti or cause inflammation. Also called acidophils. They are effective against large-sized parasites (blood flukes).

Mast cells: These cells contain granules rich in histamine heparin. Mast cell release histamin and help to get rid of allergens.

These cells are produced from haematopoietic stem cells. generate antibodies that bind to pathogens and foreign substan T cells - help fight germs & protect from disease. Cytotoxic T cells cells infected with viruses. NK cells that lacks an antigen specific re

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प्र. क्र.
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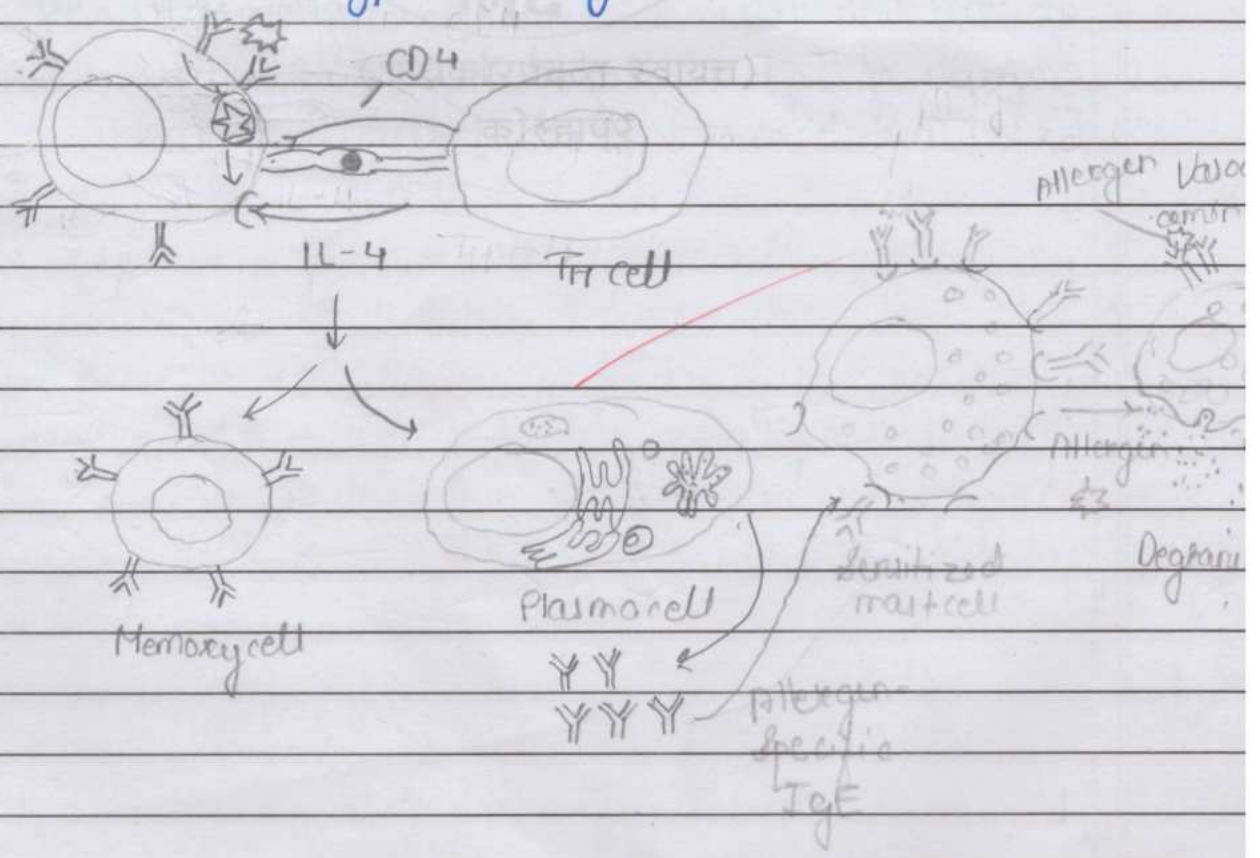
Home Assignment

Name: Vaishnavi Vinod Akange
Class: BSc TY
Paper: XIV - Immunology-II
Roll no: 8341

Q1 Describe Type I hypersensitivity.
→



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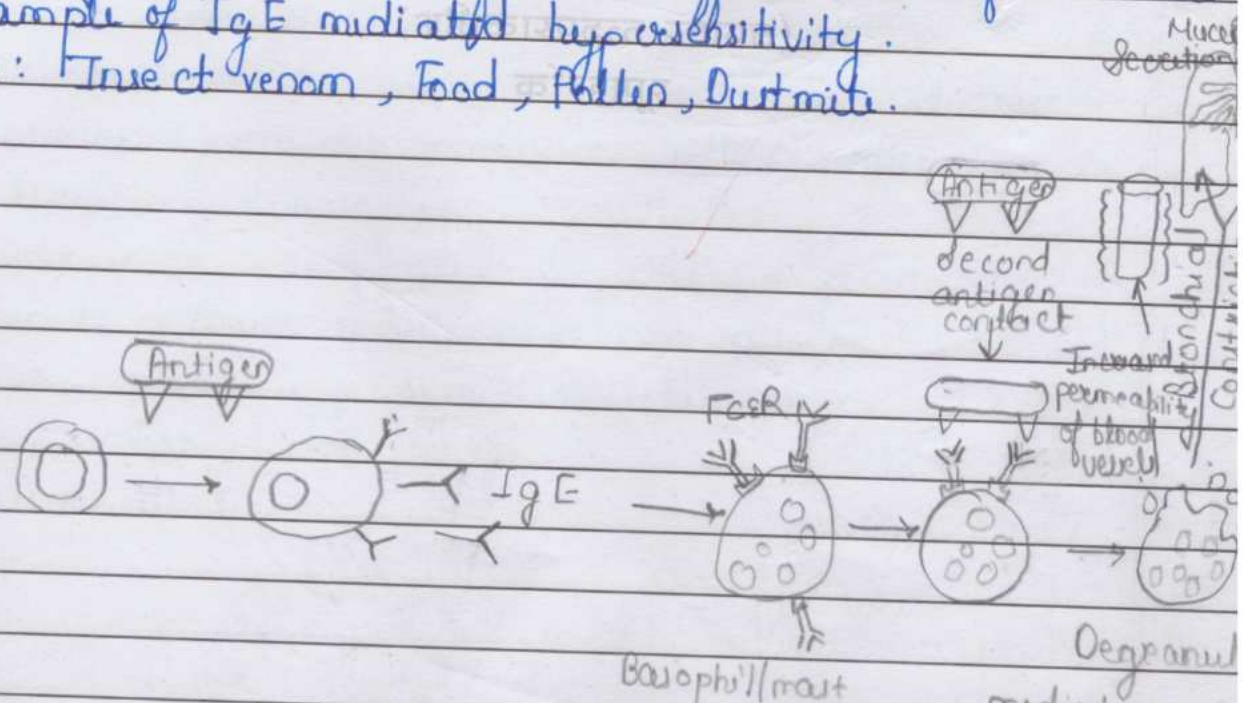
A type I hypersensitivity reaction induced by some antigens r
as allergens, such as insect venom, foods, pollen, and dust
can induce the formation of IgE antibodies in response to al
specific TH2 cells in individuals with a corresponding predisp
The IgE antibodies bind with Fc receptors to mast cells and b
basophils. Mast cells and basophils coated by IgE said to
sensitized. If the individual is re-exposed to the allergen, cro
linkage of the membrane-bound IgE on sensitized mast
cells and basophils, causing degranulation of these cells
This results in the immediate release of mediators (e.g.,
histamine, kininogen), which induce vasodilation, smooth-m
contraction, mucus secretion, edema, and/or skin blisters.
allergens are small proteins that can easily diffuse through t
skin or mucosa. They are frequently proteases and are ac
at very low doses. IL-4 favours differentiation of TH2 cells.
example of IgE mediated hypersensitivity.
Ex: Insect venom, Food, Pollen, Dustmite.



Type I: Immediate hypersensitivity

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Q2] Live attenuated vaccine.

→ • Live attenuated vaccines contain a version of the living virus that has been weakened so that it does not cause serious disea in people with healthy immune system.

• Steps: Live attenuated vaccines can be made is several different ways. The most common methods involve passing the disease-cau virus through a series of cell cultures or animal embryos (typicall chick embryo.

• Viruses are often attenuated by growing them in cells that they c not normally grow in for many generations. With each passage, the virus becomes better at replicating in new cells but loses its ability to replicate in human cells.

• Eventually, the attenuated virus will be less able to live in human and can be used in a vaccine.

• This method selects mutants that are more suitable for growth u abnormal culture conditions and ~~it~~ therefore less suitable for grow in natural hosts. Therefore, when attenuated viruses are given to a human, they are not able to replicate enough to cause illness lik they would naturally but will still increase an immune respon that can protect against future infection.

• Albert Sabin's oral polio vaccine and measles, rubella, mumps, varicella vaccines are all achieved by in vitro cell culture pass selection ~~dates~~.

• The polioviruses used in the Sabin vaccine is attenuated by the gr of monkey kidney epithelial cells.

• The measles vaccine contains a strain of rubella virus that gr to duck embryo cells and later grows in human cell lines.

• Another live vaccine that has ~~so~~ far only been used in the milit

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to prevent epidemic pneumonia includes adenoviruses 4 and
grown in human diploid cell lines and orally administered
replication in the intestine.

- Other live vaccines that are attenuated in cell culture passage are attenuated monovalent rotavirus vaccines in Vero cells and Japanese encephalitis virus strain SA14-14-2.
- Advantages of live attenuated vaccines:
- Live attenuated vaccines are ideal for teaching the immune system against specific viruses because they are closest to natural infections.
- They often require only a single immunization, eliminating the need for repeated boosters. And these vaccines are relatively easy to create for certain viruses.
- Disadvantages of Live attenuated vaccines:
- Virulent property can be reverse / revert back and can cause severe disease.
- Vaccine can't be administered to people with weakened immune system due to cancer, HIV or other immune system depressing diseases.
- Have to be refrigerated & protected from light.
- Can be difficult to ship these vaccines over as if used than places where there is lack of refrigerator.
- Can't mostly used for bacteria.

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प्र. क्र.
Q. No.

14/15

Home Assignment

Name: Vaishnavi Vinod Abrange Class: BS.C TY Zoolog
Paper: XV: Ecology & Toxicology Roll no: 8341

Q1] What is succission? Describe primary & secondary succiss
→ Ecological succission is the series of changes in an ecosystem when one community is replaced by another community as a result of changes in biotic and abiotic factors.

① Occurs in all types of ecosystem i.e. forests, ponds, coral reefs, et
② It is characterised by increased productivity, The shift of nutrien from the reservoir, Increased diversity of organisms with increase niche dwelopment, gradual increase in the complexity of food web
③ Ecological succission is caused by physical environment, Natura disturbance, Human disturbance, clearing land, climate chang Introduction of non-native species, Natural diasters such a volcanic, eruptions, forest fires, hurricanes and floods.
④ Ecological succission occurs because it is the process of life for plants, soil and other living organisms, because organisms alter soil structure, chemistry and microclimates, the spec

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Composition of ecological communities constantly changes over time.

(5) Succession will continue until the environment reaches it's fi stage - the climax community.

(6) There are two main types of succession.

(a) Primary succession (b) Secondary succession.

(a) Primary succession: The process of creating and developing an ecosystem in an area that was previously uninhabited eg of uninhabited areas are slides of volcanoes and sites of glacier recession.

The 1st organisms to appear are lichens.

Masses soon appear, and grasses take root in the thin layer of soil Eventually, tree sudings and shrubs sprout among the plant community.

Starts with arrival of living things such as lichens that do not need any soil to survive. They are called Pioneer species.

(b) Secondary succession: Secondary succession occurs on a surf where an ecosystem has previously existed. It is the process by which one community replaces another community which has been partially or totally distroyed, might be by natural process such as floods, earthquake, etc.

When an existing community has been cleared by any type of disturbance, such as fire, cyclone etc and the soil remai intact, the area begins to return to its natural community. Because these habitats previously supported life, secondary succession begins.

Because organisms alter soil structure and species communities constantly change over a period of time.

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Succession will continue until the environment reaches its final stage - the climax community.
Secondary succession is never ending process.
Eg:- 1. A stable deciduous forest community.
2. A disturbance, such as wild fire, destroys the forest.
3. The fire burns the forest to the ground.
4. The fire leaves behind empty, but not destroyed soil.
5. Small bushes and trees begins to colonize the area. The ecosystem is now back to a similar state to where it began.

Q2] Cadmium Toxicity :-
→ Cadmium (Cd) is a soft, bluish-white metal. Used as a corrosion-resistant plating on steel cadmium compounds are used as red, orange and yellow pigments, to colour glass, and to stabilize plastic. Has no known biological functions in higher organisms. Cd is hazardous both by inhalation and ingestion and can cause acute and chronic intoxications. It accumulate in liver and kidneys the transported to blood and then processed through liver and kidney.
The cd is eliminated through faecas and urine, as well as hair and breast milk.
Action: It binds to sulfhydryl groups, denature proteins or inactivating enzymes. It also interferes with calcium transport mechanisms leading to intracellular hypercalcemia and ultimately apoptosis.
Cadmium (2-7%) is absorbed through GIT and its absorption is enhanced when the diet is deficient in calcium, iron or protein

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Absorption through respiratory tract is more efficient, rangin from 15-50% of an inhaled dose.
It binds to RBCs, plasma albumin.
Impair vitamin D metabolism - affect absorption of Ca & P resu in osteomalacia and osteoporosis, also affect haematopoe cd also directly induces oxidative stress. Toxicity by inhalati is far greater than by ingestion.
On Inhalation :- Symptoms develop usually after 4-8 hrs. They are influenza - like. It is characterized by sneez sore throat, irritant cough, nausea, headache and cyanosis ("cadmium blues").
On Ingestion :- Symptoms occur in 1 hr. These are increasec salivation, nausea, vomiting, cramps in abdomen, diarrhe and rarely death.
Chronic exposure :- Yellowing of teeth (cadmium ring formati bone : pain, fractures with osteomalacia and chronic renal failure, Hypertension. Cadmium is said to be carcinogenic, and increased incidences of lung, prostate, pancreas, bladd carcinoma has been reported.
Cadmium poisoning occured in 1946 from the contaminatio of food and water by mining effluents in Japan resulting in outbreak of 'itai - itai' disease, so named as cadmium induced bone toxicity led to painful bone fractures.

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प्र. क्र.
Q. No.

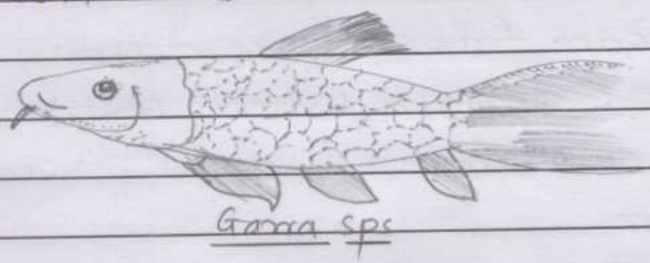
Home Assignment
Name : Shraddha Shivaji Chougule

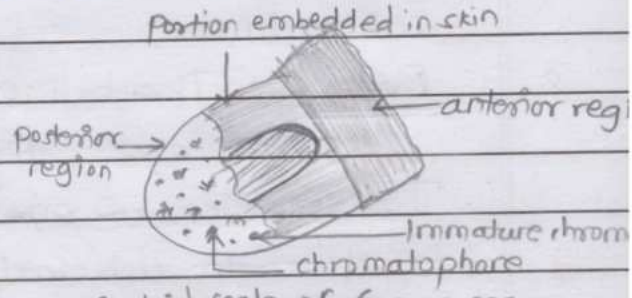
Paper - XVI : Aquatic Biol
Class : BSc TY 2001
Roll no : 8342

Que 1 Explain the adaptation of hill stream fishes.

⇒ The structural adaptation of the fishes inhabiting the rive and streams of the hills are as below

1. External features :- The size of the body is very small and hi flattened dorsoventrally, to enable easy movement in the fast flowing stream. Dorsoventrally flat body : Balitora, Garra, Glyptosternum. leaf like body : Glyptothorax Arched body on dorsal side : Garra sps.
The small size of the body enables them to hide under the s and rocks





cycloid scale of Garra sps

2 Scales : The small-sized scales are located on dorsal a lateral sides of skin of fish, while they are reduced o totally absent on ventral side. The smooth ventral surface help

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3. Paired fins :- The paired fins are large and adapted for adhesi to substratum. The outer fin rays are thick, flat and in number. The fishes of genus Gamra are provided with sucto disc, behind mouth. This organ helps to attach to substratum.

4. Caudal fin and its Peduncle :- The hill stream fishes posses elongated, narrow, caudal peduncle as an adaptation to survive in the rapid flowing waters. eg:- Glypthothorax, etc. The lobes of caudal fin are unequal, wherein upper lobe of caudal fin is smaller than the lower one.
In sisor, caudal fin in shape of whip-like tail

5. Mouth :- Is crescentic or semi-circular in shape and positi on the ventral side. Horny covering on jaws help to pull out th alga from the stones for feeding.

6. Lips :- lips of fishes form different types of suckers. The serve to dig out mud as well as for attachment to substratum

7. Barbels :- barbels are short and highly reduced, to enabl easy movement in fast flowing waters. In Nemachei the lips form a ring-like sucker. In Glyptosternum and Glyptothorax, the lips form a broad sucker for adherion substratum.

8. Eyes :- The hill stream fishes posses dorsally placed small eyes. Eg:- Balitora brucei, Glyptothorax, The location of eyes on dorsal side enables ventral su to attach to substratum

9. Gill opening and Branchiostegal Rays :- Gill openings a much reduced & lie on sides. They have important followi functions :- (i) exchange of gases (ii) regulation of ions (iii) regulation of acid-base balance (iv) elimination of nitrogen

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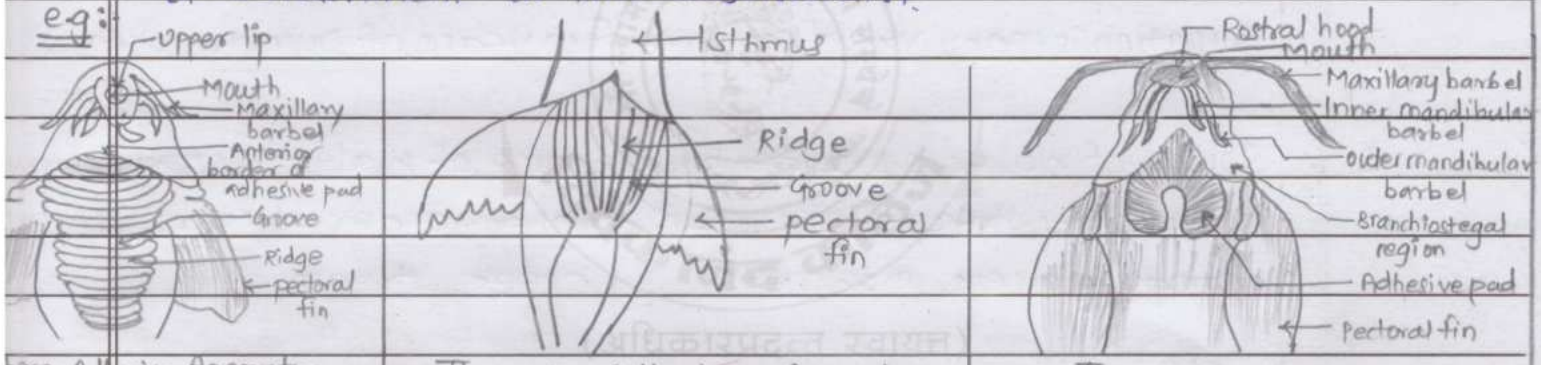
The main components of gills are Gill rackers, gill arch, gill filaments or primary lamellae and Gill-lamellae or secondary lamellae

10. Air Bladder :- Air bladder functions as a hydrostatic organ in fish. But in the case of hill stream fish the air bladder is very much reduced or degenerate type because it has no function as hydrostatic organ.

11. Adhesive Devices :- skin of the hill stream fishes are modified in various ways to form adhesive organs such as suckers, cushioned pads, grooves and ridges for the purpose of attachment to the substratum.

eg:-



horac Adhesive Apparatus of Pseudoecheneis | Thoracic Adhesive Apparatus of Glyptothorax | Thorac Adhesive Apparatus of Pseudoecheneis

Que 2: Difference between lotic and lentic ecosystem

	Lotic Ecosystem	Lentic Ecosystem
1.	It is running water. water flows in a specific direction. The uni-directional flow of water is along the slope in response to gravity.	It is standing water. water does not flow in any direction, but remains confined / stationary / static / still.
2.	Ex:- Rivers, creeks, brook, streams, springs, rivulets, channels	Ex:- Wetlands, bogs, seeps, tanks, ponds, ditches, swamps, lakes,

04 Section	Q. No.												
	Marks												

प्र. क्र. Q. No.	Lotic Ecosystem	Lentic Ecosystem
3	Flow of water present	Flow of water absent.
4	Size of waterbody is linear structure	size of waterbody is circu or nearly circular in shape
5.	Narrow width or Breadth	Broad width or Breadth.
6.	Depth of waterbody is shallow.	Depth of waterbody is very de
7	Duration is many yrs of existence	few years of Duration of exis
8.	Source of water is provided by lower-order streams, precipitat^n, springs, glaciers, snowmelts	source of water is provided higher-order streams, riv creek, stream.
9.	Water retention depends upon supply. It has more water after heavy rain & less water at time of drought	water retains for long duration.
10.	High dissolved oxygen content present	low oxygen content in deep layers
11.	Low salt content and low rate of speciation	High salt content due to evapor of water and High rate of spe
12.	High species diversity & Primary producers are photo-	low species diversity and i° producer Mesophytic plants or herbs, floating