HOLIDAYS HOMEWORK (2026-27)

CLASS-10

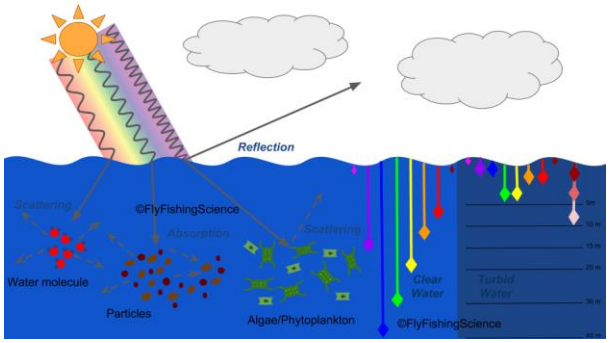
1. Revise all the chapters completed before the summer vacation.

2. Interdisciplinary project-

Project Title: Optics of the Ocean

Theme: Exploring Refraction and Total Internal Reflection in the Andaman Sea.

Total Internal Reflection



Study the following examples and explain the science behind each of the examples. Also, draw ray diagrams wherever necessary.

1. Refraction and the "Bending" of the Sea Floor

When you look at the clear turquoise waters of Havelock Island, the sea floor often appears much closer to the surface than it actually is.

2. Total Internal Reflection (TIR) in Scuba Diving

The Andaman Islands are famous for scuba diving. Divers experience a phenomenon called "Snell's Window."

3. Scattering of Light: Why is the Andaman Sea Blue?

4. Mirrors in Lighthouses: The Cellular Jail & Ross Island

Lighthouses in Port Blair use powerful optical systems to guide ships.

5. Practical Activity: The Glass Slab Experiment

In your project, you can relate the "Lateral Displacement" experiment from the NCERT lab manual to how light passes through the thick glass of a glass-bottom boat used for coral viewing.

The Andaman and Nicobar Islands are a living laboratory for Optics. Whether it is the apparent depth of the lagoons, the mirages seen on the hot sands, or the scattering of light in the deep ocean, the principles of reflection and refraction are constantly at work.

Note- Do this work on A4 sheets and arrange it in a folder.

3) Art Integrated Activity-

To strengthen the linkages between education and culture, you are required to make a Science-toon on A3 size sheet on -

- **Water conservation and management (Roll no- 1 to 10)**
- **Green energy (Roll no- 11 to 20)**
- **Watse management and alternatives to plastic (Roll no- 21 to 30)**
- **Emerging technologies (Roll no- 31 onwards)**

4) PRACTICE ASSIGNMENT (Do assignments in your respective registers)

CH- LIGHT:REFLECTION AND REFRACTION

Q.1 What is meant by power of a lens? Find the power of a concave lens of focal length 2m.
Q.2 With respect to air, the refractive index of ice is 1.31 and that of rock salt is 1.54. Calculate the refractive index of rock salt with respect to ice?

Q.3 "A ray of light incident on a rectangular glass slab immersed in any medium emerges parallel to itself." Draw labelled ray diagram to justify the statement."

Q.4 (a) Water has a refractive index of 1.33 and alcohol has a refractive index of 1.36. Which of the two mediums is optically denser? Give a reason for your answer.
(b) Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.
(c) State the relationship between angle of incidence and angle of refraction in the above case.

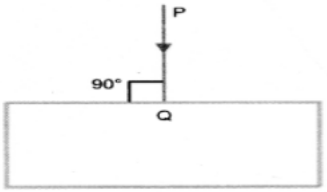
Q.5 State the laws of refraction of light. Explain the term absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum.

Q.6 An object of height 6 cm is placed perpendicular to the principal axis of a concave lens of focal length 5 cm. Use lens formula to determine the position, size, and nature of the image if the distance of the object from the lens is 10 cm.

Q.7 Draw a ray diagram in each of the following cases to show the formation of image, when the object is placed:
(i) between optical center and principal focus of a convex lens.
(ii) anywhere in front of a concave lens.
(iii) at 2F of a convex lens.

Q.8 A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find the position, nature and size of the image formed. Draw a labelled ray diagram showing object distance, image distance and focal length in the above case.

Q.9 A ray of light PQ is incident on a glass slab as shown. Write the values of angle of incidence and angle of refraction for this ray of light.



Q.10 Absolute refractive Index of some of material is tabulated below

Material	Rock salt	Kerosene	Water	Diamond
Refractive	1.54	1.44	1.33	2.42

i) In which of these does light travel fastest and why?
ii) arrange these materials in ascending order of their optical densities.

Chemistry Assignment-

Which of the following is a chemical change?
a) Melting of ice
b) Boiling of water
c) Burning of magnesium ribbon
d) Dissolving sugar in water

What type of reaction is:
$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
a) Combination
b) Decomposition
c) Displacement
d) Double displacement

Which gas is evolved when zinc reacts with dilute acid?
a) Oxygen
b) Hydrogen

c) Carbon dioxide
d) Nitrogen

Which of the following is a decomposition reaction?
a) $CaO + H_2O \rightarrow Ca(OH)_2$
b) $2H_2 + O_2 \rightarrow 2H_2O$
c) $CaCO_3 \rightarrow CaO + CO_2$
d) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

Rusting of iron is an example of:
a) Combination reaction
b) Oxidation
c) Reduction
d) Neutralization

What is a chemical reaction?

Define a balanced chemical equation.

What is a combination reaction? Give one example.

What is corrosion?

Explain different types of chemical reactions with examples.

Write steps to balance a chemical equation with one example.

Explain oxidation and reduction with examples.

Case 1: Burning Magnesium Ribbon 🔥

A student burns a magnesium ribbon in air. A bright white light is produced, and a white powder is formed.

Questions:
13. What type of reaction is this?
14. Write the balanced chemical equation.
15. What is the white powder formed?

Case 2: Electrolysis of Water ⚡

Water is broken down into hydrogen and oxygen gases using electricity.

Questions:
16. What type of reaction is this?
17. Write the balanced chemical equation.
18. Which gas is collected at the cathode?

Case 3: Iron Rusting 🌧️

An iron gate left outside during rainy season develops a reddish-brown layer.

Questions:

19. What is this process called?
20. Which substances are required for this reaction?
21. How can this be prevented?

Why should a magnesium ribbon be cleaned before burning?

A student says, "All combination reactions are exothermic." Do you agree? Justify your answer.

Why do we apply paint or grease on iron objects? Explain scientifically.

Biology Assignment

Chapter- Life Processes

Q 1 Bile juice does not contain any digestive enzymes, yet it is essential for digestion, why so? Explain. What is the significance of emulsification of fats?

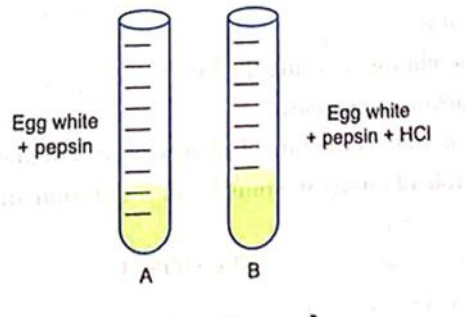
Q 2 Why is the small intestine in herbivores longer than in carnivores?

Q 3 Leaves of a healthy potted plant were coated with Vaseline to block the stomata. Will this plant remain healthy for long? State three reasons for your answers.

Q 4 Name the glands associated with digestion of starch in human digestive tract and mention their role.

Q 5 How is the required pH maintained in the stomach and small intestine?

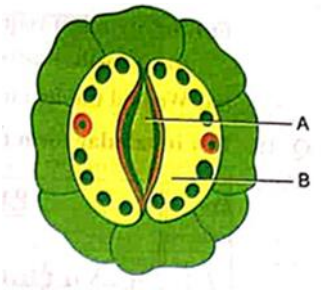
Q 6 A student sets up an experiment to study the role of enzymes in digestion of food in which test tube the digestion of protein will occur and why?



Q 7 If one holds his breath after expiration for about 30 seconds. Would there still be any exchange of respiratory gases in the lungs during the period? Explain.

Q 8 Mention the components of the transport system in highly organized plants. State the functions of these components.

Q9. Study the given diagram name the parts A and B and state one function of each



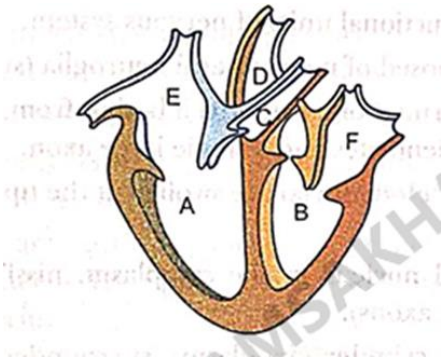
Q10. Explain the mode of nutrition in fungi like bread mould, yeast and mushrooms.

Q11. What makes the R.B.Cs red and what is its function?

Q12. Explain the structure of nephron with the help of a labeled diagram.

Q13. i) Identify any two parts from the diagram which carry oxygenated and deoxygenated blood

ii) explain the process of double circulation with the help of a flowchart



Q14. Write down the differences between

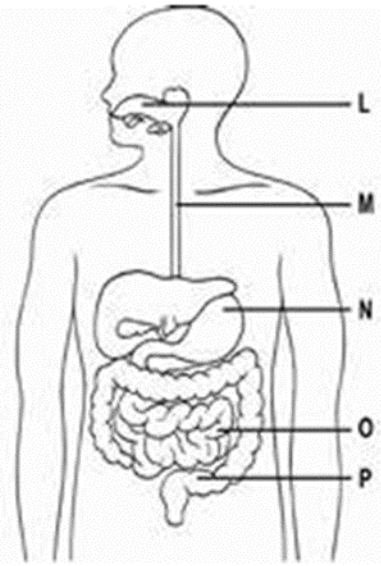
i) Blood and lymph?

ii) Respiration and photosynthesis?

Q15. Set up an experiment to prove that chlorophyll is necessary for photosynthesis. Write down the precautions required.

Q16. What is glycolysis? How will you prove that CO2 is produced during alcoholic fermentation?

17. Refer to the diagram of the human alimentary canal to answer the questions that follow.



i) A person consumes a diet rich in proteins. In which part of the alimentary canal (labelled N, O, P) does the digestion of protein begin? Name the enzyme that initiates this process.

ii) List two functions of the hydrochloric acid secreted in the part labelled 'N' (stomach). Iii) What is the role of the part labelled 'O' (small intestine) in the digestion of fats? Explain the process of emulsification.