



Class X /Assignment 1

30 March 2020

PHYSICS:

Refraction by Spherical Lenses

- A Spherical lens is a piece of transparent glass bound by two spherical surfaces.
- There are two types of Spherical Lenses
 1. A convex lens bulges outward and is thick at the center and thinner at the edges. Convex lens converges the light rays as shown below in the figure 1(a).

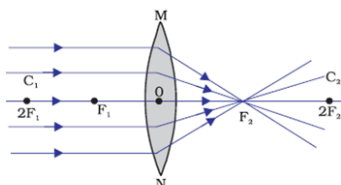


Figure 1(a) Converging action of convex lens

Hence convex lenses are called converging lenses.

2. A concave lens bulges inward and is thinner in the middle and thicker at the edges. Such lenses diverge light rays as shown in Figure 1(b)

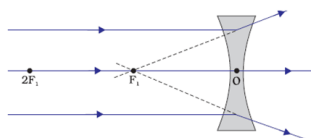


Figure 1(b) Diverging action of concave lens

Such lenses are called diverging lenses.

- A lens, whether it is a convex lens or a concave lens, has two spherical surfaces which form a part of a sphere. The centers of these spheres are called centers of curvature of the lens usually represented by the letter C.
- Since there are two centers of curvature, we may represent them as C_1 and C_2 .
- The central point of a lens is its optical centre. It is usually represented by the letter O.
- A ray of light through the optical centre of a lens passes without suffering any deviation.
- In figure 1 (a) you can see several rays of light parallel to the principal axis are falling on a convex lens. These rays, after refraction from the lens, are converging to a point on the principal axis. This point on the principal axis is called the principal focus of the lens.
- Letter F is usually used to represent principal focus. A lens has two principal foci.
- Similarly in figure 1 (b) several rays of light parallel to the principal axis are falling on a concave lens. These rays, after refraction from the lens, are appearing to diverge from a point on the principal axis. This point on the principal axis is called the principal focus of the concave lens.
- The distance of the principal focus from the optical centre of a lens is called its focal length represented by letter f .
- **Image Formation in Lenses Using Ray Diagrams**
 - Ray diagram helps us to study the nature, position and relative size of the image formed by lenses.



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- For drawing ray diagrams we first consider how light rays falling on both concave and convex lens in three different ways get refracted.

	Light ray from object is	Ray diagram	How it appears after refraction
1	parallel to the principal axis		After refraction from a convex lens, passes through the principal focus on the other side of the lens
2	Passing through a principal focus		After refraction from a convex lens, will emerge parallel to the principal axis
3	Passing through the optical centre of a lens		After refraction from a convex lens will emerge without any deviation

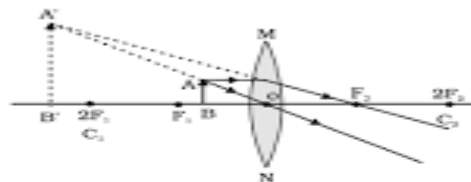
- Secondly consider the case for concave lens

	Light ray from object is	Ray diagram	How it appears after refraction
1	parallel to the principal axis		After refraction from a concave lens, the ray appears to diverge from the principal focus located on the same side of the lens
2	passing through a principal focus		After refraction from a concave lens, will emerge parallel to the principal axis
3	passing through the optical center of a lens		After refraction from a concave lens will emerge without any deviation

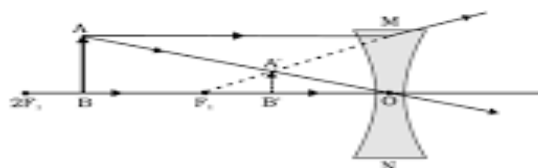
Ray diagram showing image formation by convex lens

Position of object : between focus (f) and optical centre
 Position of image : same side as object
 Nature of image : virtual and erect
 Size of image : magnified

(b) Convex lens is used.



(c) Concave lens is used.



Ray diagram showing image formation by concave lens

Position of object : between focus (f) and optical centre.
 Position of image : same side as object
 Nature of image : virtual and erect



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EXERCISE

Qs. Using the above information draw the ray diagrams for the convex lens for the following positions of the object on the principal axis:

1. Infinity
2. Beyond $2F_1$
3. At $2F_1$
4. Between F_1 and $2F_1$
5. At focus F_1
6. Between focus F_1 and optical center O

State the position of image, nature and size of the image in each case.

Qs. Draw a ray diagram to show the diverging action of a concave lens.

Qs. With the help of a ray diagram show that a concave lens always forms a virtual image of the object placed anywhere on the principal axis.

CHEMISTRY:

Chapter - Language of chemistry.

Question 1:

a) Explain the meaning of the following periodic properties:

1. Atomic radius
2. Ionisation potential
3. Electron affinity.
4. Electro negativity
5. Non metallic and Metallic character.

b) State the factors which affect the above periodic properties.

c) The trend of the following above properties on moving down the group and across the period and why?

Question 2

Do the Board questions of last 3 years given on page 17 of this chapter.

Question 3

Name or state the following with reference to the elements of the modern periodic table question 29 (a) page number 18.

Question 4

Fill in the blanks with the appropriate word/s in each case question 29(b) page no 19.

Question 5

Complete the unit test paper 1-periodic [table.page](#) 20



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BIOLOGY:

Chapter 16:- Pollution- A Rising Environmental Problem

- 1) Define the following
 - a. Waste
 - b. Biodegradable waste
 - c. Non-biodegradable waste
 - d. Pollution
 - e. Pollutants
 - f. Air pollution
 - g. Water pollution
- 2) Write (no explanation required) the sources of the following (with two examples)
 - a. Air pollution
 - b. Water pollution
- 3) What is SMOG? (Blue box page no.202 of this chapter)
- 4) Name the gases released from the following
 - a. Vehicular air pollution
 - b. Industrial air pollution
 - c. Burning garbage
- 5) Name the type of pollutants with examples.

NOTES-

- Pollution Is A General Topic And You Are Familiar With It As You Have Studied It In Previous Classes.
- Do The Given Assignment In Biology Register.
- Worksheet Will Be Given Later.

HISTORY:

Ch -1 The first war of Independence (pg no. B-95-100)

Read the following topics thoroughly

1. Political causes
2. Religious and social causes
3. Economic causes
4. Military causes

GEOGRAPHY:

1. Study the printed Maps, In the map booklet:
 - A) Practice MAP 1: Label and color all the rivers and surrounding water bodies.
 - B) Practice MAP 2: In the political Map, label all the states and their capitals.
2. Read Chapter 'Soils of India' and solve the objective question answer exercise given at the end of the lesson in your geography register.



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COMPUTER:

- Q1. The concept class and object (page 2 from computer application book by Sumita Arora)
- Q2. Revise the terms data abstraction, encapsulation, modularity, inheritance, polymorphism.
- Q3. What is a bytecode?
- Q4. Revise Java fundamentals (character set, keywords, literals, identifier comma variables, constants).
- Q5. Revise and learn about arithmetic operators, relational operators and logical operators.
- Q6. Write a program to enter 10 numbers and print the sum of their Square.