INDIAN SCHOOL DARSAIT
DEPARTMENT OF PHYSICS

Subject : Physics	Topic : Ray optics	Worksheet No. 1
Resource Person : Mrs. Jayalakshmi Ratish		Date : 03.05.18
Name of the Student :_____	Class & Division : XI A/B	Roll Number : __

1   A converging and diverging lens of equal focal lengths are placed coaxially in contact. Find the focal length and power of the combination?   1

2   The refractive index of a material of a convex lens is n_1. It is immersed in a medium of refractive index n_2. A parallel beam of light is incident on the lens. Trace the path of the emergent rays when $n_2 > n_1$.   1

3   In a telescope the focal length of the objective and the eye piece are 60cm and 5cm respectively. What is (a) Its magnification power (b) Tube length   1

4   Lower half of concave mirror is painted black. How will this affect the image?   1

5   An air bubble is formed inside water. Does it act as converging lens or diverging lens?   1

6   Thin prism of angle 60° gives a deviation of 30°. What is the refractive index of material of the prism?   2

7   How much should be filled in a container 25 cm in height, so that it appears half filled when viewed from the top of the container?   2

8   A bird flying high in the air appears to be higher than in reality. Explain why?   2

9   How does the magnification of a magnifying glass differ from its magnifying power?   2

10   You are given prisms made of crown glass and flint glass with a wide variety of angles. Suggest a combination of prisms which will
(a) deviate a pencil of white light without much dispersion,
(b) disperse (and displace) a pencil of white light without much deviation.   2

11   List the advantages of a reflecting telescope.   3

12   A small telescope has an objective lens of focal length 140 cm and an eyepiece of focal length 5.0 cm. What is the magnifying power of the telescope for viewing distant objects when the telescope is in normal adjustment (i.e., when the final image is at infinity)?   3

13   What is the apparent position of an object below a rectangular block of glass 6 cm thick, if a layer of water 4 cm thick is on top of glass? $n_{ga} = 1.5$, $n_{wa} = 1.33$.   3

14 A convex lens of focal length 6.25 cm is used as a magnifying glass. If the near point of   3
the observer is 25 cm from the eye and the lens is held close to the eye, calculate
(i) the distance of object and the lens
(ii) angular magnification
Also find the angular magnification when the final image is formed at infinity.

15 Complete the ray diagram in the following figures –   3
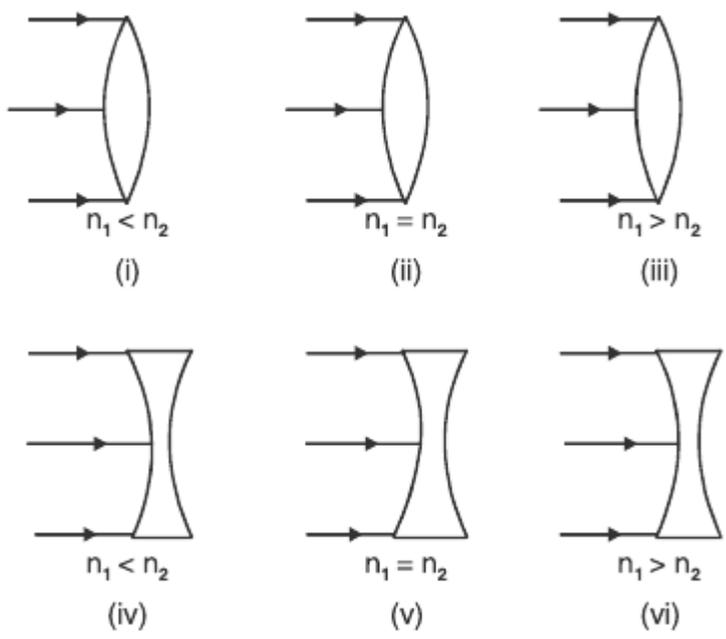
16 An optical instrument used for angular magnification has a 25 D objective and a 20 D   3
eyepiece. The tube length is 25 cm when the eye is least strained.
(a) whether it is a microscope or a telescope
(b) what is the angular magnification produced?

17 Write a short note on: 3
a) Compound Microscope
b) Telescope
c) Formation of rainbow

18 Find size of image in the situation shown in figure -   3