**Dr. M.K.K. ARYA MODEL SCHOOL, M.T , PANIPAT**
**CLASS-X (PHYSICS)**
**HOLIDAY HOMEWORK**

Q1. An object is situated at 8cm from a convex lens of focal length 10cm. find the position and nature of image.Draw ray diagram to illustrate the formation of image (not to scale). **[ Ans: 40cm]**

Q2. Draw a labelled ray diagram to locate the image of an object formed by a convex lens of focal length 20cm when the object is placed 30cm away from the lens.

Q3. (A) List four characteristics of the image formed by a convex lens when an object is placed between the optical centre and principal focus.
(B) Size of the image of an object by a concave lens of focal length 20cm is observed to be reduced to $1/3^{rd}$ of its size. Find the distance of the object from the lens. **[Ans: -40cm]**

Q4. An object is placed at a distance of 60cm from a concave lens of focal length 30cm.
(i) use lens formula to find the distance of the image from the lens.
(ii) List four characteristics of the image (nature, position ,size ,erect/inverted) formed by the lens in this case. **[ Ans: -20cm]**

Q5. A Student focused the image of a candle flame on a white screen using a convex lens. He noted down the position of the candle ,screen and the lens as under:
Position of candle: 12cm
Position of convex lens: 50cm
Position of the screen : 88cm
(i) what is the focal length of the convex lens?
(ii) where will the image be formed if he shifts the candle towards the lens at a position of 31.0cm ?
(iii) what will be the nature of the image formed if he further shifts the candle towards the lens?

Q6. (A)Water has refractive index 1.33 and alcohol has refractive index 1.36. which of the two medium is optically denser? Give reason for your answer. Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.
(B) The absolute refractive index of diamond is 2.42. and the absolute refractive index of glass is 1.50 Find the refractive index of diamond with respect to glass. **[ Ans: 1.61]**

Q7. The refractive index of water is 4/3 and for glass is 3/2 with respect to water. What is the refractive index of glass with respect to water and refractive index of water with respect to glass? **[Ans: 9/8 ,8/9]**

Q8. The absolute refractive index of glass and water are 4/3 and 3/2 respectively. If the speed of light in glass is $2 \times 10^8$ $ms^{-1}$, calculate the speed of light in (i) vaccum, (ii) water.

Q9. One half of a convex lens of focal length 10cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30cm from the lens? Draw a ray diagram to justify your answer. **[Ans: -60cm]**

Q10. Define Power of a lens. What is its unit? One student uses a lens of focal length 50cm and another of -50cm. what is the nature of the lens and its power used by each of them? **[Ans: -2D]**