Light - Reflection and Refraction : Previous Years Questions

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1. The image distance from the eye lens in the normal eye when we increase the distance of an object from the eye
   1. increases
   2. decreases
   3. remains unchanged
   4. depends on the size of the eyeball **[1 mark] [CBSE 2020]**
2. List in proper sequence the steps of the experiment for determining the approximate focal length of a given concave mirror by obtaining the image of a distant object. **[2 marks] [CBSE 2019]**
3. A student has to trace the path of a ray of light passing through a rectangular glass slab for four different values of angle of incidence.
   1. Write two important precautions for this experiment.
   2. List two conclusions the student will draw based on his experiment. **[2 marks] [CBSE 2019]**
4. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it? Draw a labelled ray diagram. **[2 marks] [CBSE 2018]**
5. An object of height 4.0 cm is placed at a distance of 30 cm from the optical centre 'O' of a convex lens of focal length 20 cm. Draw a ray diagram to find the position and size of the image formed. Mark optical centre 'O' and principal focus 'F' on the diagram. Also find the approximate ratio of size of the image to the size of the object. **[2 marks] [CBSE 2018]**
6. 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 vaccum. **[3 marks] [CBSE 2018]**
7. What is meant by power of lens? Write its S.I. unit. A student uses a lens of focal length 40 cm and another of -20 cm. Write the nature and power of each lens. **[3 marks] [CBSE 2018]**
8. .
   1. List four characteristics of the image formed by a concave lens of focal length 20 cm when the object is placed at a distance of 40 cm from its optical centre.
   2. The size of image of an object by a convex lens of focal length 20 cm is observed to be reduced to 1/3rd of its size. Find the distance of the object from the optical centre of the lens. **[5 marks] [CBSE 2019]**

9. .
    1. List four characteristics of the images formed by plane mirrors.
    2. A 5 cm tall object is placed at a distance of 20 cm from a concave mirror of focal length 30 cm. Use mirror formula to determine the position and size of the image formed. **[5 marks] [CBSE 2019]**

10. .
    1. Draw a labelled ray diagram to show the path of a ray of light incident obliquely on one face of a glass slab.
    2. Calculate the refractive index of the material of a glass slab. Given that the speed of light through the glass slab is 2 x 10^8 m/s and in air is 3 x 10^8 m/s.
    3. Calculate the focal length of a lens, if its power is -2.5 D. **[5 marks] [CBSE 2020].**

11. Draw ray diagram in each of the following cases to show what happens after reflection to the incident ray when
    1. it is parallel to the principal axis & falling on a convex mirror.
    2. it is falling on a concave mirror while passing through its principal focus.
    3. it is coming oblique to the principal axis & falling on the pole of a convex mirror. **[3 Marks] [CBSE 2020]**

12. .
    1. Complete the following ray diagram:
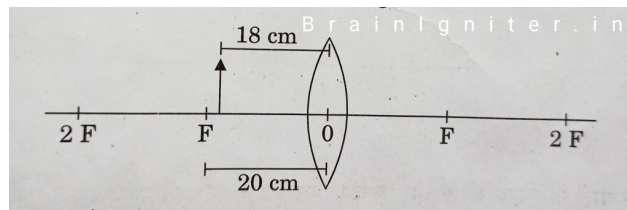
    2. Find the nature, position and size of the image formed.
    3. Use lens formula to determine the magnification in this case. **[5 marks] [CBSE 2020]**