THE VILLAGE
INTERNATIONAL SCHOOL

Question Bank - Grade10

Physics

Chapter 10 – Light

Answer the following:

1) What are the laws of reflection?

2) What are the properties of the image formed by a plane mirror?

3) Define the following terms:

   a) Pole

   b) Centre of curvature

   c) Radius of curvature

   d) Principal axis

   e) Principal focus

   f) Aperture

4) What is the relation between R and F

5) Draw ray diagrams to show the image formation by a concave mirror and a convex mirror for different positions of the object. Write the nature, position and relative size of the image formed in each case.

6) Write the uses of concave and convex mirrors.

7) Describe the new cartesian sign convention.

8) Write the mirror formula and the formula for magnification.

9) Find the focal length of a concave mirror whose radius of curvature is 40 cm?

10) What is refraction of light?

11) A coin placed at the bottom of a tank appears to be raised when water is poured into it.Explain.

12) What are the laws of refraction of light?

13) Draw ray diagram to show the refraction of light through a glass slab and mark angle of incidence and angle of emergence.

14) What is refractive index? Write the formula to find the refractive index.

15) Draw ray diagrams to show the image formation by a concave lens and a convex lens for different positions of the object. Write the nature, position and relative size of the image formed in each case.

16) Write the lens formula and the formula to find the magnification.

17) What is meant by power of a lens? Write the formula to find the power of a lens.

18) A concave mirror produces three times magnified real image of an object placed at 10 cm infront of it. Where is the image located?

19) State two positions in which a concave mirror produces a magnified image of a given object.List two differences between the two images.

20) A ray of light travelling in air enters obliquely into water. Does the light ray bend towards or away from the normal? Why? Draw a ray diagram to show the refractionof light in this situation.

21) Define one dioptre.

22) A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror?Also calculate the size of the image formed.

23) The image of a candle flame placed at a distance of 30 cm from a spherical lens is formedon a screen placed at a distance of 60 cm from the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 2.4 cm, find the height of its image.

24) If the image formed by a lens for all positions of an object placed in front of it is always erect and diminished, what is the nature of this lens? Draw a ray diagram to justify your answer. If the numerical value of the power of this lens is 10 D, what is its focal length in theCartesian system?

25) A concave mirror is use for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10cm from the pole of a concave mirror of focal length 15 cm? (A) Position of the image (B)Size of the image (C) Nature of the image Draw a labelled ray diagram to justify your inferences.

26) The image formed by a spherical mirror is real, inverted and its magnification is - 2. If the image is at a distance of 30 cm from the mirror, where is the object placed? Find the focallength of the mirror. List two characteristics of the image formed if the object is moved 10cm towards the mirror.

27) 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 imageif the distance of the object from the lens is 10 cm.

28) Light enters from air to glass having refractive index 1.50. What is the speed of light in theglass? The speed of light in vacuum is 3×108m/s3×108m/s

29) Rohit placed a pencil perpendicular to principal axis in front of a converging mirror of focal length 30 cm. The image formed is twice the size of the pencil. Calculate the distance of the object from the mirror.

30) A converging lens has a focal length of 250 mm. Calculate its power and express it according to sign convention.

31) If the image formed by a lens for all positions of the object placed in front of it is always virtual, erect and diminished, state the type of the lens. Draw a ray diagram in support of your answer. If the numerical value of focal length of such a lens is 20cm, find its power in new cartesian sign conventions.

32) The image formed by a spherical mirror is real, inverted and its magnification is -2. If the image is at a distance of 30 cm from the mirror, where is the object placed? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10cm towards the mirror.

33) A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror? Also calculate the size of the image formed.

34) A concave mirror is use for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10cm from the pole of a concave mirror of focal length 15 cm? (A) Position of the image (B) Size of the image (C) Nature of the image Draw a labelled ray diagram to justify your inferences.

35) A concave mirror produces three times magnified real image of an object placed at 10 cm infront of it. Where is the image located?