O P JINDAL SCHOOL, SAVITRINAGAR

ASSIGNMENT

CLASS X PHYSICS

---

81 The image of an object formed by a mirror is real, inverted and is of magnification –1. If the image is at a distance of 40 cm from the mirror, where is the object placed? Where would the image be if the object is moved 20 cm towards the mirror? State reason and also draw ray diagram for the new position of the object to justify your answer. 3

82 A spherical mirror produces an image of magnification –1 on a screen placed at a distance of 50 cm from the mirror.
(a) Write the type of mirror.
(b) Find the distance of the image from the object.
(c) What is the focal length of the mirror?
(d) Draw the ray diagram to show the image formation in this case. 3

83 A student wants to project the image of a candle flame on a screen 80 cm in front of a mirror by keeping the candle flame at a distance of 20 cm from its pole.
(i) Which type of mirror should the student use?
(ii) Find the magnification of the image produced.
(iii) Find the distance between the object and its image.
(iv) Draw a ray diagram to show the image formation in this case and mark the distance between the object and its image. 3

84 A student wants to obtain an erect image of an object using a concave mirror of 12 cm focal length. What should be the range of distance of the object from the mirror? State the nature and size of the image he is likely to observe. Draw a ray diagram to justify your answer. 3

85 For the given data showing the focal lengths of three concave mirrors A, B and C, and the respective distances of different objects from these mirrors. 3

S.No.	Object distance (cm)	Focal length (cm)
A	45	20
B	30	15
C	20	30

Answer the following questions:
(i) In the given position of object from the mirrors, which mirror will form a diminished image of the object. Draw a ray diagram for image formation by this mirror.
(ii) Which mirror can be conveniently used as a make-up mirror? Draw a ray diagram to illustrate this function.

86 Name the type of mirror used (i) by dentists and (ii) shaving mirrors. Give two reasons why such mirrors are used in each case. 3

Draw a ray diagram to show the path of the reflected ray in each of the following cases. A ray of light incident on a convex mirror.

87 (a) strikes at its pole making an angle θ from the principal axis. 3
(b) is directed towards its principal focus.
(c) is parallel to its principal axis.

88 If the image formed by mirror for all positions of the object placed in front of it is always virtual and diminished, state the type of the mirror. Draw a ray diagram in support of your answer. Where are such mirrors commonly used and why? 3

89 A 4.5 cm needle is placed 12 cm away from a convex mirror of focal length 15 cm. Give the location of the image and magnification. Describe what happens as the needle is moved farther from the mirror? 3

90 (a) “The refractive index of diamond is 2.42”. What is the meaning of this statement?
(b) Name a liquid whose mass density is less than that of water but it is optically denser than water. 3