CLASS X

LIGHT- REFLECTION AND REFRACTION

Assignment - 4

SECTION A

CONCEPTUAL QUESTION

S.NO	QUESTIONS	MARKS
1	The refractive index of carbon disulphide is 1.63. What is the meaning of this statement?	(1)
2	A person wants to see the full length image of tall building in a small mirror. Which type of mirror should be used by him?	(1)
3	Distinguish between real and virtual images.	(2)
4	A ray of light travelling in air enters obliquely into water. Does the light ray bend towards or away from the normal? Why?	(2)
5	What is lateral displacement of light? State the factors affecting it	(2)
6	Name the type of mirror used in the following situations: (i) Head light of a car (ii) Rear-view mirror of vehicles (iii) Solar furnace	(3) SA2(2012, 2013)
7	Under what condition will a glass lens placed in a transparent liquid becomes invisible?	(1)
8	Draw a ray diagram and also state the nature of the image formed by concave mirror when the object is placed at the centre of curvature.	(2)
9	Draw a diagram to show dispersion of white light by a glass prism. Label the coloures that appear at the two ends of the colour band. State the reason why different coloured rays deviate differentially in the prism.	(3) SA2(2013)
10	With a help of a ray diagram, state the meaning of refraction of light. State Snell's law of refraction of light and also express it mathematically.	(2) SA2(2013)
11	Given below are the refractive indices of a few media. Identify the media in which the speed of light will be highest and lowest respectively. medium: Diamond — Refractive Index: 2.42	(2)

		glass	1.5		
		water	1.3		
		Kerocene oil	1.4		
12	Identify the nature of spherical mirror or of lens in the following cases, and draw ray diagrams for each case. (a) When object is placed between mirror and its focus, image formed is erect, enlarged and behind it. (b) When object is placed at 2F of the lens image formed is diminished, erect, and the same side of the lens as that of the object.				(3)
13	Can refractive index of a medium be less than unity? What is the value of refractive index of vacuum?				(1)
14	Why does a light ray incident on a rectangular glass slab immersed in any medium emerges parallel to itself? Explain using a diagram.				(3) SA 2(2013)
15	For a concave mirror draw ray diagram to show the reflected ray when ray of light incident obliquely on the pole of the mirror.				(2) SA 2(2015)
	Section B **Numerical problems**				
16	Speed of light in glass is $2X10^8$m/s and its refractive index is 1.5. What is the speed of light in medium whose refractive index is 4/3.				(2)
17	The image of a candle flame placed at a distance of 45cm from a spherical lens is formed on a screen placed at a distance of 90cm from the lens. Identify the type of lens and calculate its focal length. Identify the type of lens and calculate its focal length. If the height of the flame is 2cm, find the height of its image.				(3) SA2 (2013)
18	At what distance should an object be placed from a convex lens of focal length 18cm to obtain an image at 24cm from it on the other side. What will be the magnification produced in this case?				(3)
19	An object of height 6cm is placed perpendicular to the principal axis of a concave lens of focal length 5cm. Determine the position, size and nature of the image if the distance of the object from the lens is 10cm.				(3)
20	An object is kept at a distance of 18cm, 20cm 22cm and 30cm from a lens of power +5D. (a) In which case or cases would you get magnified image? (b) Which of the magnified image can be got on a screen?				(3)
21	An object is placed at a distance of 60cm from a convex mirror where the magnification produced is 1/2. Where the object should be placed to get a				

	magnification of 1/3?	
22	A spherical mirror produces an image of magnification -1 on a screen placed at a distance of 50cm 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? (d) Draw the diagram to show the image formation in this case.	(5) SA 2 2014
23	A student has focused the image of a candle flame on a white screen using a concave mirror. The situation is as given below: Length of the flame= 1.5cm Focal length of the mirror = 12cm Distance of flame from the mirror= 18cm Calculate the following: (a) Distance of the image from the mirror (b) Length of the image (c) If the distance between the mirror and the flame is reduced to 10cm, then what would be observed on the screen? Draw ray diagram to justify your answer for this situation.	(5) SA2 (2015)
24	(a) A concave mirror produces 3 times enlarged image of an object placed at 10cm in front of it. Calculate the focal length of the mirror. (b) Show the formation of the image with the help of a ray diagram when an object is placed 6cm away from the pole of the mirror.	(3)
25	The refractive index of a dense flint glass is 1.65 and for alcohol it is 1.36 with respect to air. Find the refractive index of dense flint glass with respect to alcohol.	(2)