Assignment Science
CLASS X Date : 27-07-2018
TOPIC : REFLECTION AND REFRACTION OF LIGHT

VSA TYPE QUESTIONS (1 MARK QUESTIONS)
Q1. Name the point on the lens through which a ray of light passes undeviated ?
Q2. What kind of mirror can give a magnification of +1/2 ?
Q3. What is the angle of incidence for the normal incidence of light on mirror?
Q4. What is the focal length of a plane mirror?

SA TYPE –I QUESTIONS (2 MARKS QUESTIONS)
Q1.List four characteristics of the image formed by plane mirror.(2015,2011)
Q2. List four characteristics of the image formed by a concave mirror when an object is placed between focus and pole of the mirror.(2012)
Q3. A concave mirror of focal length 15 cm can form a magnified erect as well as inverted image of an object placed in front of it. Justify this statement stating the position of the object w.r.t the pole of the mirror in both the cases for obtaining the images.(2014,2017)
Q4. Draw a ray diagram to show the paths of the reflected ray corresponding to an incident ray of light to the parallel to the principal axis of a convex and show the angle of incidence and angle of reflection.(2015)
Q5. An object is placed at a distance of 15 cm from a concave lens of focal length 30 cm .List the four characteristics of the image formed by the lens.(2017)
Q6. 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 labeled ray diagram to support your answer.

SA TYPE –II QUESTIONS (3 MARKS QUESTIONS)
Q1. At what distance should an object be placed from a convex lens of focal length 18 cm to obtain an image at 24cm from it on the other side.What will be the magnification produced in this case?(2010)
Q2. An object is placed between infinity and the pole of a convex mirror.Draw a ray diagram and also state the position ,the relative size and nature of the image formed(2011)
Q3. What is the principle of reversibility of light?Show that the incident ray of light is parallel to the emergent ray of light when falls obliquely on a side of a rectangular glass slab.(2011,2013)
Q4. State the type of mirror preferred as- (i)rear view mirror in vehicles (ii) shaving mirror.Justify your answer (2012,2013)
Q5.The image of a candle flame placed at a distance of 36 cm from a spherical lens is formed on a screen placed at a distance of 72cm from the lens.Identify the lens and calculate its focal length.If the height of the flame is 2.5cm.Find the height of the image.(2012)
Q6. An object of height 5cm is placed perpendicularly to the principal axis of a convex lens of focal length 10cm.Use lens formula to determine the position size and natureof the image if the distance of the object from the lens is 20cm.(2013,2015)
Q7. Draw a ray diagram to show the path of the refracted ray in each of the following cases.Aray of light incident on a concave lens is (i)passing through optical centre (ii) parallel to the principal axis (iii) directed towards its principal focus.
Q8. The image formed by a spherical mirror is real inverted and is of magnification -2.If the image is at a distance of 30cm 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.(2016)

LA TYPE QUESTIONS (5 MARKS QUESTIONS)
Q1. (a)Define focal length of a divergent lens.
  (b)A divergent lens of focal length 30cm forms the image of an object of size 6cm on the same side of the object at a distance of 15cm from its optical centre.Use lens formula to determine the

distance of the object from the lens and size of the image formed.Draw the corresponding ray diagram.(2016)

Q2. What is meant by power of lens.Define its S.I unit .You have two lenses A and B of focal lengths +10cm and -10cm respectively.State the nature and power of each lens .Which lens will you prefer to form virtual and magnified image of an object placed 8cm from the lens .Draw a ray diagram. (2015,2018)

Q3. State the law of refraction of light which defines refractive index of a medium with respect to the other.Express it mathematically .How is refractive index of any medium A w.r.t a medium B related to the speed of propagation of light in two media A and B.State the name of this constant when one medium is vacuum or air.The refractive indices of glass and water with respect to vacuum are 3/2 and 4/3 respectively.If the speed of light in glass is 2×10^8m/s.Find the speed of light in (a)vacuum (b) water.

Q4. List the sign conventions for reflection of light by spherical mirror.Draw a ray diagram and apply these conventions in the determinations of focal length of a spherical mirror which forms 3 times magnified real image of an object placed 16cm in front of it.(2012)

Q5. One half of a convex lens of focal length 10cm is covered with a black paper.Can such a lens produce a complete image of an object placed at a distance of 30cm from the lens?Draw a ray diagram to justify your answer.(2015)

Q6. A student wants to project the image of a candle flame on a screen 90cm in front of a mirror by keeping the flame at a distance of 15cm from its pole.(a)Suggest the type of mirror he should use. (b)Determine the linear magnification in this case.(c)Find the distance between object and its image (d)Draw a ray diagram to show the image formation.(2014)

HOT AND EXTRA QUESTIONS

Q1.Calculate Ɵ in the given ray diagram.
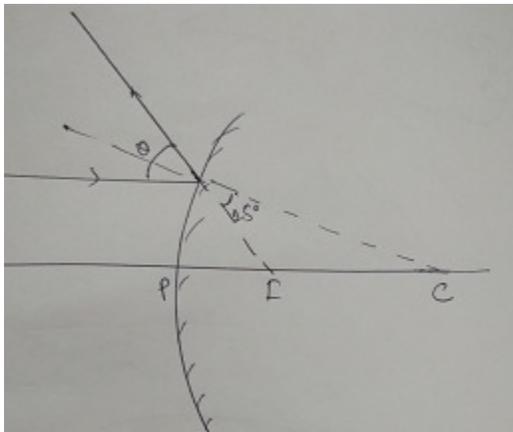
Q2.Show that mirror formula holds good for plane mirror also.

Q3.For the same angle of incidence in media P,Q,R the angles of refraction are $45^\circ,35^\circ$ and 15° respectively .In which medium will the velocity of light be minimum?Give reason.

Q4. Study the diagrams carefully and answer the following questions with proper reason.
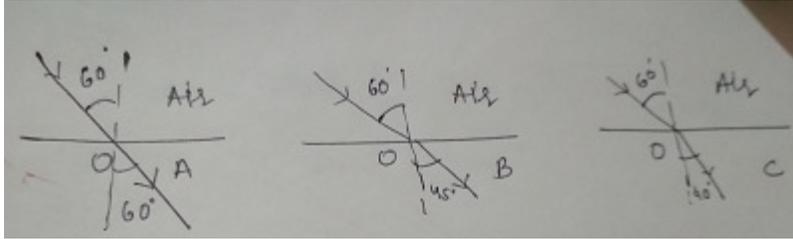
(i)Which of the three media A,B,C has maximum optical density?

(ii)In which of the three media speed of light is maximum?

(iii)Will the refractive index of B relative to C be more or less than unity?

(iv)For which ray of light incident on any of the three media ,will these media show identical behavior?

(v)If the angle of incidence is increased ,what will be the change in angle of refraction?

Q5.State the condition in which convex lens behaves like a diverging lens.

Q6.How should two converging lenses be placed so that a parallel beam becomes parallel after passing through the two lenses?

Q7.A concave mirror and a concave lens are held in water.What change if any do you expect to find in the focal length of either of them.

Q8.Light having a free space wavelength λ =500nm passes from vacuum into diamond having refractive iIndex 2.4.What would be the wavelength of light in the diamond?

Q9.Under what condition does a convex lens when placed in a medium behave as an ordinary glass slab?

Q10.For a real image in a convex lens of focal length f,what is the minimum distance between the object and image?

Q11.The refractive index of a dense flint glass is 1.65and for alcohol it is 1.36 with respect to air.Find the refractive index of dense flint glass with respect to alcohol?

Q12.A student was doing experiment by a convex lens of power +4D .Without any calculation identify the wrong observation.

Observations	A	B	C	D	D
U(cm)	30	40	50	60	70
v(cm)	20	60	50	70	30

Q13.How can you distinguish between the three mirrors without touching them?