PRINT

Qn No. 1 *Chapter Name:4 .prakasaprethipathanam*

Qn.Write down two uses of convex lens.

Hint.
Rear view mirror

reflectors in street light

or any other correct answer

Marks :(2)

Hide Answer

Qn No. 2 *Chapter Name:4 .prakasaprethipathanam*

Qn.Why convex mirror is used as rear view mirror?

Hint.Large field of view ***Marks :(2)***

Hide Answer

Qn No. 3 *Chapter Name:4 .prakasaprethipathanam*

Qn.

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Which mirror have least field of view?
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Hint.Concave mirror ***Marks :(1)***

Hide Answer

Qn No. 4 *Chapter Name:4 .prakasaprethipathanam*

Qn.
A motorbike rider sees the image of a car in the rear view mirror diminished 1/6 of its original size. If the real distance between the car and bike is 30cm. Calculate it's radius of curvature.

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Marks :(2)

Hint.

u= - 30m, V=?, |R =?

$m = \frac{-v}{u}$

v = -mu

$v = \frac{-1}{6}$ x -30 m

v =5 m

$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

$\frac{1}{f} = \frac{1}{5m} + \frac{1}{-30}$

$\frac{1}{f} = \frac{1x6}{5m\,x6} + \frac{1}{-30}$

$\frac{1}{f} = \frac{6-1}{30\,m}$

$\frac{1}{f} = \frac{5}{30\,m}$

$f = \frac{30m}{5}$

f= 6 m

R=2f

R=2 x 6 m

R= 12 m

Hide Answer

Qn No. 5 *Chapter Name:4 .prakasaprethipathanam*

Qn.
An object is placed 30cm away from a spherical mirror. It's magnification is found to be -1.

a) Write the peculiarities of the image.

b) Which mirror is used here?

c)If the object is placed 10cm away from the mirror, what change will occur to the nature of image formed?

d) Justify your conclusions.

Hint.
Hints:-

a)Real inverted, same size of the object.

b)Concave mirror

c) Image is erect, Virtual and diminished.

d)Since the magnification is one object is at C. So r = 30cm, f = 15cm

If the object is 20cm away, it will be between f and P. So an erect, large, real image will be formed on the other side of the mirror.

Marks :(4)

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Hide Answer

Qn No. 6 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Image is not visible on a rough wooden block. But when the surface is polished an image can be seen. Why?

Hint.
Hints: Irregular reflection occurs on a rough surface. So no image can be seen. On a polished surface regular reflection takes place. So image is visible.

Marks :(1)

Hide Answer

Qn No. 7 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Find out the relation between the given pair and complete the second pair.

M = - V/ u

1/f : .....

Hint.
Hints: 1/f = 1/u + 1/V

Marks :(1)

Hide Answer

Qn No. 8 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Curved surface of a rubber ball of diameter 24cm is converted to a reflecting surface by completely covering using an aluminium foil.

a) Where will the image be formed if the object is placed at a distance of 24cm away form the centre r of the ball.

b) Is the image real or virtual?

Hint.
u= 24 cm -12 cm = - 12 cm The object distance is negative

.

R = +12 cm

R =2f

f=R/2

f= 12 cm / 2

= 6cm

v=?

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{-25} - \frac{1}{-12\,cm}$$

$$\frac{1}{v} = \frac{1 \times 2}{6\,cm \times 2} - \frac{1}{-12\,cm}$$

$$= \frac{2}{12\,cm} - \frac{1}{12\,cm}$$

$$= \frac{2+1}{12}$$

$$\frac{1}{v} = \frac{3}{12\,cm}$$

$$v = \frac{12}{3}$$

v = 4 cm

കൊൺവെക്സ് ദർപ്പണം ഉണ്ടാക്കുന്ന പ്രതിബിംബം മിഥ്യയായിരിക്കും.

Virtual image is formed in the convex mirror

Marks :(4)

Hide Answer

Qn No. 9 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
3) A spherical mirror forms a real image at the same position of the object placed at a distance of 20cm in front of the mirror.

a) What type of mirror is this?

b) What is the magnification? Justify your answer.

c) Find out the focal length and radius of curvature of the mirror.

Hint.
Hints:

a) Concave mirror

b) -1(Object at C, Height of the object and the image is same)

c)Focal length is 10cm, Radius of curvature 20cm

Marks :(4)

Hide Answer

Qn No. 10 ***Chapter Name:4 .prakasaprethipathanam***

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Qn.
If the height of image is given with negative sign as per new cartesian sign convention, what all peculiarities of object can be identified?

Hint.

Hints: Real and inverted image

Marks :(1)

Hide Answer

Qn No. 11 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
What are the peculiarities of the image formed by a plane mirror?

Hint.
Hints: Virtual, Erect, Same size

Marks :(1)

Hide Answer

Qn No. 12 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Which mirror forms an erect and diminished image?

Hint.In convex mirror ***Marks :(1)***

Hide Answer

Qn No. 13 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Which mirror forms an erect and large image?

Hint.concave mirror ***Marks :(1)***

Hide Answer

Qn No. 14 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
A lighted candle is kept at a distance of 40cm from a concave mirror of focal length 25cm. It's image is formed on a screen.

a) How far from the mirror the clear image is formed?

b)Find out the magnification.

c) Draw the ray diagram of the image formation and mark the values in the diagram

Marks :(4)

Hint.

b) $m = \frac{-v}{u}$

$= \frac{\frac{-200\,cm}{3}}{-40\,cm}$

$m = \frac{-200\,cm}{3x - 40\,cm}$

m= - 1.666

= -1.7

Hide Answer

Qn No. 15 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
An object is kept at a distance of 40cm from a concave mirror of focal length 80cm

a) Calculate the distance to the image from the mirror.

b) Mark 'U', 'V', and 'f' after drawing the ray diagram of the image formation

Hint.
Image is formed at a distance of 80cm behind the mirror

.

a) f= - 80 cm

Marks :(4)

u =- 40 cm

v =?

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{-80} - \frac{1}{-40}$$

$$= \frac{1}{-80} - \frac{1x2}{-40x2}$$

$$= \frac{-1+2}{80}$$

$$\frac{1}{v} = \frac{1}{80}$$

v= 80 cm

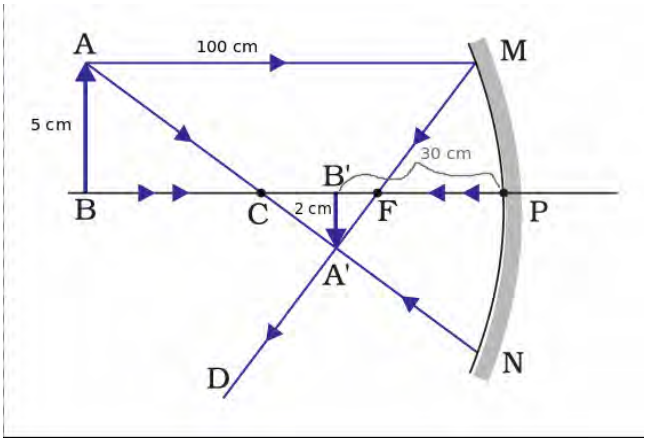
Hide Answer

Qn No. 16

Chapter Name:4 .prakasaprethipathanam

Qn.

Observe the diagram and complete the following using new cartesian sign convention.



a) Height of image .....

b)Height of object .....

c) Distance from the pole to the object .....

d) Distance from the pole to the image .....

Hint.

Answer

a) – 2 cm

b) 5 cm

.

c) – 100 cm

d) – 30 cm

Marks :(2)

Hide Answer

Qn No. 17 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
An object is placed 20cm away in front of a concave mirror. A real image is formed at a distance of 32cm from the mirror.

a) What is the magnification in this experiment?

b) Calculate the focal length of the mirror.

Hint.
V = - 32cm (Real, Inverted)

Focal length f = 12.3cm

Marks :(4)

Hide Answer

Qn No. 18 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
When an object is placed at a distance of 1.25m from the pole of concave mirror real image is formed at a distance of 6.25m

a) Find out the focal length of the concave mirror.

b) Draw the diagram and mark the measurements.

.

Marks :(4)

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{f} = \frac{1}{-6.25m} + \frac{1}{-1.25m}$$

$$\frac{1}{f} = \frac{1x100}{-6.25m\,x\,100} + \frac{1x100}{-1.25m\,x\,100}$$

$$\frac{1}{f} = \frac{100}{-625m} + \frac{100x5}{-125m\,x\,5}$$

Hint. $\frac{1}{f} = \frac{100}{-625m} - \frac{500}{625m}$

$$\frac{1}{f} = \frac{-100-500}{-625m}$$

$$\frac{1}{f} = \frac{-600}{-625m}$$

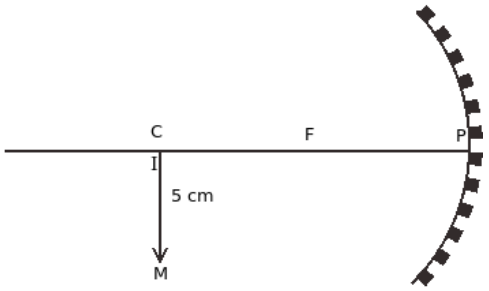
$$f = \frac{-625}{-600m}$$

$$f = 0.96\ m$$

Hide Answer

Qn No. 19 *Chapter Name:4 .prakasaprethipathanam*

Qn.
An image formed by a concave mirror is shown below.



a) Where is the position of object?

b) Find out the height of object.

c) Write the peculiarities of the image.

Hint.
Hints:

OB = 5cm

(To form image at C, the object must be at C, size of the object and image are equal)

at C, same size of the object, inverted and real.

Marks :(1)

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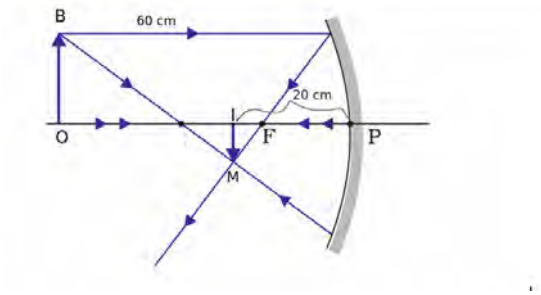
Hide Answer

Qn No. 20 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Observe the diagram and find out the focal length of the mirror



Hint.
u= -60 cm

v= -20 cm

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{f} = \frac{1}{-20\,cm} + \frac{1}{-60\,cm}$$

$$\frac{1}{f} = \frac{1x3}{-20\,cm\,x3} + \frac{1}{-60\,cm}$$

f=?

$$\frac{1}{f} = \frac{3}{-60} + \frac{1}{60}$$

$$\frac{1}{f} = \frac{-3-1}{60\,cm}$$

$$\frac{1}{f} = \frac{-4}{60\,cm}$$

$$f = \frac{-60}{4}\ cm$$

f = -15cm

Marks :(2)

Hide Answer

Qn No. 21 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Vijay and Kiran forms the image of an object on the screen using a concave mirror of focal length 40cm.

a) Vijay places the object at a distance of 80cm and conduct the experiment. How far the screen be placed to get a clear image?

b) Kiran places the object at a distance of 10cm and conduct the experiment. Then how far the screen be placed to get a clear image?

a)Screen must be placed 80cm away from the pole of the mirror.

b) Screen must be placed 60cm away from the pole of the mirror.

Hint.
a) Vijay

f = -40cm

u = -80cm

v = ?

1/v+1/u =1/f

1/v = 1/f-1/u

1/v = 1/-40 - 1/-80

= -80cm

സ്ക്രീൻ ദർപ്പണത്തിന്റെ പോളിൽ നിന്നും 80cm അകലെ വയ്ക്കണം .

(b) കിരൺ

f = -40cm

u = -120cm

v = ?

1/v+1/u =1/f

1/v = 1/f-1/u

1/v = 1/-40 - 1/-120

= -60cm

Marks :(4)

Hide Answer

Qn No. 22 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Why plane mirrors are used to see the image of face?

Hint.
Hints: Erect, same size images are formed.

Marks :(1)

Hide Answer

Qn No. 23 ***Chapter Name:4 .prakasaprethipathanam***

Qn.

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Radha used three mirrors to look her face. She found the size of image different in three occasions. Identify the mirrors by understanding difference in the size of image formed.

a) Image of face is big.

b)Image of face is small

c) Image of same size

Hint.
a) Concave mirror

b)Convex mirror

c)Plane mirror

Marks :(3)

Hide Answer

Qn No. 24 *Chapter Name:4 .prakasaprethipathanam*

Qn.
What will be the nature of image when the magnification is positive in mirrors.

Show Answer

Qn No. 25 *Chapter Name:4 .prakasaprethipathanam*

Qn.
Find out the true statements from the following.

a) When the magnification is greater than one, the size of the image is less than object.

b) When the magnification is greater than one. The size of the image is greater than object.

c) When the magnification is positive, image will be real and inverted.

d)When the magnification is negative, image will be virtual and inverted.

Hint.
Hints:

b)When the magnification is greater than one the size of the image will be greater than object.

Marks :(1)

Hide Answer

Qn No. 26 *Chapter Name:4 .prakasaprethipathanam*

Qn.

An object of height 8cm is placed 40cm away from a concave mirror. Focal length of the mirror is 20cm.

a) Where is the image formed?

b) Write down the height of image using new cartesian sign convention.

Show Answer

Qn No. 27 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
An object of height 8cm is placed 40cm away from a concave mirror. Focal length of the mirror is 20cm.

a) Where is the image formed?

b) Write down the height of image using new cartesian sign convention.

Hint.
Hints:

a) at C

b) -8cm

Marks :(2)

Hide Answer

Qn No. 28 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
)An object of height 10cm is placed at a distance of 50cm from a concave mirror. Focal length of the mirror is 20cm. Which among the following could be the height of image?

(+10cm, -10cm, +7cm, -7cm)

Hint.-7 ***Marks :(1)***

Hide Answer

Qn No. 29 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Concave mirrors are used to construct solar furnaces. Convex mirrors are not used. Why?

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Hint.
Hints:

Light rays and heat rays coming parallel to the principal axis converges on a point on the principal axis in concave mirrors, convergence of heat radiations are used in solar furnace for heating.

But in convex mirrors rays coming parallel to the principal axis are diverging after reflection, not converging. So can not be used for constructing solar furnaces.

Marks :(2)

Hide Answer

Qn No. 30 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Two plane mirrors are arranged by joining their sides to form a particular angle between them. If the object is placed at the perpendicular bisector of the angle. Calculate the number of images formed for the following angles.

a) $\angle 90^0$

b) $\angle 60^0$

Hint.
a) n = (360/θ) – 1

θ = 90

n = 3

b) n = 5

Marks :(3)

Hide Answer

Qn No. 31 ***Chapter Name:4 .prakasaprethipathanam***

Qn.
Diagram of reflection of light rays from a plane mirror is shown below.

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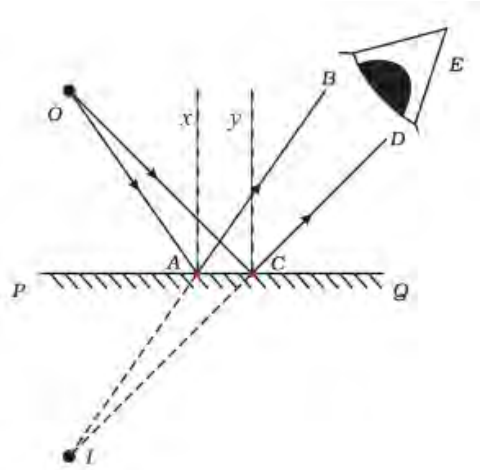

a) What type of image is formed at the point

b)What are the peculiarities of the image formed?

Hint.
Hints:

a) Virtual image

b)Erect, Virtual (Image which can not be projected on a screen)

Marks :(4)

Hide Answer

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