



ST. LAWRENCE HIGH SCHOOL



A JESUIT CHRISTIAN MINORITY INSTITUTION

- Subject :Physical science _____ Answers of Worksheet-4 Class 7
- Date 14.05.2020
- Chapter: Light
- Answer the following questions (MCQ) : (1×15)

1. An object is placed at a distance of 0.25 m in front of a plane mirror. The distance between the object and image will be

- (a) 0.25 m
- (b) 1.0 m
- (c) 0.5 m
- (d) 0.125 m

Answer/Explanation

Answer: c

Explanation:

(c) Distance between object and image = $0.25 + 0.25 = 0.5$ m

Question 2. The angle of incidence for a ray of light having zero reflection angle is

- (a) 0
- (b) 30°
- (c) 45°
- (d) 90°

Answer/Explanation

Answer: a

Explanation:

(a) For reflecting surface $\angle i = \angle r$

Question 3. For a real object, which of the following can produce a real image?

- (a) Plane mirror
- (b) Concave mirror

- (c) Concave lens
- (d) Convex mirror

Answer/Explanation

Answer: b

Explanation:

(b) Only concave mirror can produce a real image for any position of object between its focus and infinity.

Question 4. Which of the following mirror is used by a dentist to examine a small cavity?

- (a) Convex mirror
- (b) Plane mirror
- (c) Concave mirror
- (d) Combination of convex and concave mirror

Answer/Explanation

Answer: c

Explanation:

(c) Concave mirror forms erect and enlarged image when held close to the cavity.

Question 5. An object at a distance of 30 cm from a concave mirror gets its image at the same point. The focal length of the mirror is

- (a) - 30 cm
- (b) 30 cm
- (c) - 15 cm
- (d) +15 cm

Answer/Explanation

Answer: c

Explanation:

(c) When object is placed at $2F$, the image formed by concave mirror is also at $2F$.
So $2F = -30$ or $F = -15$ cm.

Question 6. An object at a distance of + 15 cm is slowly moved towards the pole of a convex mirror. The image will get

- (a) shortened and real
- (b) enlarged and real
- (c) enlarge and virtual
- (d) diminished and virtual

Answer/Explanation

Answer: d

Explanation:

(d) Convex mirror always formed virtual and diminished image.

Question 7. A concave mirror of radius 30 cm is placed in water. It's focal length in air and water differ by

- (a) 15
- (b) 20
- (c) 30
- (d) 0

Answer/Explanation

Answer: d

Explanation:

(d) The focal length of spherical mirror does not depends on the surrounding medium.

Question 8. A concave mirror of focal length 20 cm forms an image having twice the size of object. For the virtual position of object, the position of object will be at

- (a) 25 cm
- (b) 40 cm
- (c) 10 cm
- (d) At infinity

Answer/Explanation

Answer: c

Explanation:

(c) For virtual image,

$$m = -\frac{v}{u} = +2 \Rightarrow v = -2u$$

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

$$\therefore \frac{1}{u} + \frac{1}{-2u} = \frac{1}{-20}$$

$$\Rightarrow \frac{1}{2u} = \frac{1}{-20}$$

$$\Rightarrow u = -10 \text{ cm}$$

Question 9. The image formed by concave mirror is real, inverted and of the same size as that of the object. The position of object should be

- (a) at the focus
- (b) at the centre of curvature
- (c) between focus and centre of curvature
- (d) beyond centre of curvature

Answer/Explanation

Answer: c

Explanation:

(c) When object lies at C of a concave mirror, image is also formed at 'C' and having same size real and inverted.

Question 10. The nature of the image formed by concave mirror when the object is placed between the focus (F) and centre of curvature (C) of the mirror observed by us is

- (a) real, inverted and diminished
- (b) virtual, erect and smaller in size
- (c) real, inverted and enlarged
- (d) virtual, upright and enlarged

Answer/Explanation

Answer:

Explanation:

(c) When object lies between C and F, the real, inverted and enlarged image is formed beyond C.

Question 11. The nature of image formed by a convex mirror when the object distance from the mirror is less than the distance between pole and focal point (F) of the mirror would be

- (a) real, inverted and diminished in size
- (b) real, inverted and enlarged in size
- (c) virtual, upright and diminished in size
- (d) virtual, upright and enlarged in size

Answer/Explanation

Answer:

Explanation:

(c) Convex mirror always forms a virtual, erect diminished image irrespective of the position of object in front of it.

Question 12. If a man's face is 25 cm in front of concave shaving mirror producing erect image 1.5 times the size of face, focal length of the mirror would be

- (a) 75 cm
- (b) 25 cm

- (c) 15 cm
- (d) 60 cm

Answer/Explanation

Answer: a

Explanation:

(a) In concave shaving mirror, virtual erect and large size image, behind the mirror is obtained, using

$$m = -\frac{v}{u} \Rightarrow 1.5 = -\frac{v}{-25}$$

$$\Rightarrow v = \frac{75}{2} \text{ cm}$$

Now, from mirror formula,

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u} = \frac{1}{75/2} + \frac{1}{-25} = -\frac{1}{75}$$

$$\therefore f = -75 \text{ cm}$$

Hence, focal length of concave mirror is 75 cm.

Question 13. As light travels from a rarer to a denser medium it will have

- (a) increased velocity
- (b) decreased velocity
- (c) decreased wavelength
- (d) both (b) and (c)

Answer/Explanation

Question 14. The angle of incidence i and refraction r are equal in a transparent slab when the value of i is

- (a) 0°
- (b) 45°
- (c) 90°
- (d) depend on the material of the slab

Answer/Explanation

Question 15. The refractive index of transparent medium is greater than one because

- (a) Speed of light in vacuum < speed of light in transparent medium
- (b) Speed of light in vacuum > speed of light in transparent medium
- (c) Speed of light in vacuum = speed of light in transparent medium
- (d) Frequency of light wave changes when it moves from rarer to denser medium

Answer/Explanation

Answer: b

Explanation:

$$(b) \mu = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in medium}}$$

As $c > v$ so, $\mu > 1$.

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