

O P JINDAL SCHOOL, SAVITRINAGAR

ASSIGNMENT

CLASS X PHYSICS

- 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

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

- 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

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

$$m = -\frac{v}{u} \Rightarrow 1.5 = -\frac{v}{-25}$$
$$\Rightarrow v = \frac{75}{2} \text{ cm}$$

Now, from mirror formula,

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

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

Hence, focal length of concave mirror is 75 cm.

- 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)

ANS: (d) When light ray travel from rarer to denser medium, its velocity and wavelength both decrease as $v = v\lambda$.

- 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

ANS: (a) When the incident ray falls normally on the glass slab, it will refracted without deviation, i.e. along the normal in the glass slab. So, $\angle i = \angle r = 0$

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

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

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

16 The refractive index of water is 1.33. The speed of light in water will be

- (a) 1.33×10^8 m/s
- (b) 3×10^8 m/s
- (c) 2.26×10^8 m/s
- (d) 2.66×10^8 m/s

$$(c) \text{ As } \mu = \frac{c}{v} \Rightarrow v = \frac{c}{\mu} = \frac{3 \times 10^8}{1.33} = 2.26 \times 10^8 \text{ m/s}$$

ANS:

17 You are given three media A, B and C of refractive index 1.33, 1.65 and 1.46. The medium in which

the light will travel fastest is

- (a) A
- (b) B
- (c) C
- (d) equal in all three media

$$(a) \text{ As, } \mu_m = \frac{v_a}{v_m} \text{ or } v_m = \frac{v_a}{\mu_m}$$

ANS:

So, the light will travel faster in a medium having lower refractive index.

18 Light from the Sun falling on a convex lens will converge at a point called

- (a) centre of curvature

- (b) focus
- (c) radius of curvature
- (d) optical centre

ANS: (b) The parallel ray coming from the sun, after refraction through the convex lens converge at its focus.

19 Large number of thin stripes of black paint are made on the surface of a convex lens of focal length

20 cm to catch the image of a white horse. The image will be

- (a) a zebra of black stripes
- (b) a horse of black stripes
- (c) a horse of less brightness
- (d) a zebra of less brightness

ANS: (c) Complete image of the white horse is formed but of less intensity, the light falling on the curved portion will not reach at the image position.

20 A divergent lens will produce

- (a) always real image
- (b) always virtual image
- (c) both real and virtual image
- (d) none of these

ANS: (b) Diverging (concave) lens will always forms a virtual, erect and diminished image.