**Karan Arora** **R.L. Institute M: 9416974837**

**Max Time : 1 hr** **Class = 10th Science Test**  **Max Marks : 25**

**Spherical lens**

1. Multiple choice questions : [ 1 X 5 = 5 ]
2. Where should an object be placed in front of an convex lens to get a real image of the size of the object?
3. At the principle focus of the lens.
4. At twice the focal length.
5. At infinity.
6. Between the optical center of the lens and its principal focus.
7. A spherical mirror and a thin spherical lens have each a focal length of – 15 cm. The mirror and lens are likely to be :

|  |  |
| --- | --- |
| a) Both concave | b) Both convex |
| c) The mirror is concave and lens is convex | d) The mirror is convex and lens is concave |

1. The power of lens of focal length 25 cm in diopter is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.25 D | b) 2.5 D | c) 4 D | d) 0.4 D |

1. If the magnification of a lens has a positive value, the image is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Real | b) Virtual and erect | c) Inverted | d) None of these |

1. Two lenses of power +2.5 D and – 3.75 D are combined to form a compound lens. Its focal length in cm will be :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 40 | b) – 40 | c) 80 | d) – 80 |

1. What is the cause of refraction of light? [ 1 ]
2. What is meant by power of a lens? [ 1 ]
3. Give the SI unit of power of lens. State whether the power of a converging lens is positive or negative.

[ 1 ]

1. Name the component of white light that has the greatest wavelength. [ 1 ]
2. Name the part of a lens through which a ray of light passes without suffering any deviation. [ 1 ]
3. A jar 15 cm long is filled with a transparent liquid. When viewed from the top, its bottom appears to be 12 cm below. What is the refractive index of the liquid ? [ 2 ]
4. A concave lens of focal length 25 cm and a convex lens of focal length 20 cm are placed in contact with each other. What is the power of this combination? Also, calculate focal length of the combination. [ 2 ]
5. The image obtained with a convex lens is erect and its length is 4 times the length of the object. If the focal length of the lens is 20 cm, calculate the object and image distances. [ 2 ]
6. (a) Draw a labelled ray diagram to show the path of a ray of light incident obliquely on one face of a glass slab. [ 3 ]

(b) Calculate the refractive index of the material of a glass slab. Give that the speed of light through the glass slab is 2 x 108 m/s and in air is 3 x 108 m/s.

1. A lens produces a magnification of – 0.5 . Is this a converging or diverging lens? If the focal length of the lens is 6 cm, draw a ray diagram showing the image formation in this case. [ 3 ]
2. Distinguish between a convex lens and a concave lens. [ 3 ]