WORKSHEET – 1
Unit – RAY OPTICS

Class: XII **Max. Marks: 25**

General Instructions:

(i) Answer all the questions.
(ii) Marks for each question are indicated against it.
(iii) Question nos. 1 to 5 are very short answer questions, carrying 1 mark each.
(vi) Question nos. 6 to 8 are short answer questions each carrying 2 marks.
(v) Question nos. 9 to 11 are also short questions each carrying 3 marks.
(vi) Question no. 12 is long answer question carrying 5 marks.

1. How does the power of a convex lens vary, if the incident red light is replaced by violet light? (1
2. Define critical angle for total internal reflection. (1
3. You are provided with four lenses of focal lengths 1cm, 3cm, 10cm and 100cm. Which two would you prefer for a microscope and which two for a telescope? (1
4. An object is placed at the focus of concave lens. Where will its image be formed? (1
5. A ray of light is normally incident on one face of an equilateral prism. Trace the course of the ray through the prism and emerging from it. (1
6. State the factors on which dispersive power of a prism depends. (2
7. An object is placed at a distance of 36cm from a convex mirror. A plane mirror is placed in between so that the two virtual images so formed coincide. If the plane mirror is at a distance of 24cm from the object, find the radius of curvature of the convex mirror. (2
8. Draw a ray diagram to show the formation of the image of an object by a compound microscope. (2
9. Derive an expression for the magnifying power of the telescope in normal adjustment. (3
10. The far point of a myopic person is 80cm in front of the eye. What is the power of the lens required to enable him to see very distant objects clearly? (3
11. Obtain an expression for the effective focal length of two thin lenses placed in contact coaxially with each other. (3
12. Derive the relation between distance of object, distance of image and radius of curvature of a Convex spherical surface, when refraction takes place from a rater medium of refractive index to a denser medium of refractive index and the image produced is real. State assumptions and convention of signs used. (5

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WORKSHEET – 2

Unit - WAVE OPTICS

Class: XII **Max. Marks: 25**

General Instructions:

(iii) Answer all the questions.
(iv) Marks for each question are indicated against it.
(iii) Question nos. 1 to 5 are very short answer questions, carrying 1 mark each.
(vii) Question nos. 6 to 8 are short answer questions each carrying 2 marks.
(vii) Question nos. 9 to 11 are also short questions each carrying 3 marks.
(viii) Question no. 12 is long answer question carrying 5 marks.

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1. What are coherent sources of light? (1
2. Two slits in Young's double slit experiment have widths in the ratio 81:1. What is the ratio of the amplitudes of light waves from them? (1
3. How much is the distance in terms of fringe width β between central bright and fourth dark fringe? (1
4. Define resolving power of a telescope. (1
5. What is the condition for first minimum in case of diffraction due to a single slit? (1
6. A polarizer and an analyser are so oriented that intensity of transmitted light is maximum. If the analyser is rotated through 60°, what fraction of the maximum light is transmitted? (2
7. Draw a diffraction pattern due to a single slit illuminated by a monochromatic source of light. (2
8. Differentiate between polarized and unpolarised lights. How are these represented? (2
9. Using Huygens' principle, show that, for a parallel beam incident on a reflecting surface, the angle of reflection is equal to the angle of incidence. (3
10. A slit of width'd' is illuminated by red light of wavelength 6500Å. For what value of 'd' will
    i) The first minimum fall at an angle of diffraction of 30° and
    ii) The first maximum fall at an angle of diffraction of 30°. (3
11. Define polarizing angle. Derive the relation connecting polarizing angle and the refractive index of a medium. (3
12. Derive a mathematical expression for the width of interference fringes obtained in Young's double slit experiment with the help of a suitable diagram. (5

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