Geometrical Optics BVOCOP-203

**Unit-1:**

What is light- dual nature- particle & wave nature, speed, wave length & frequency of light.

**Unit-2:**

Fermats’ principle- laws of relation & refraction at a plane surface using Fermats’ principle.

**Unit-3:**

Snells’ law, relative and absolute refractive indices, total internal reflection and Critical angle, refraction by plane parallel slab of glass; molecular basis of reflectively (basic index).

**Unit-4:**

Geometrical path length & optical path length of rays, Concept of wave fronts & rays, concept of divergence and convergence.

**Unit-5:**

Refraction by spherical surfaces- convex & concave, Derivation of vergence equation, focal points, deportee power, image point, lateral & axial magnification, simple numerical.

**Unit-6:**

Thin Lens- shapes, derivation of lens makers’ formula, thin lens vergece equation, equivalent focal length of two thin lenses separated by a distance & placed in contact, lateral magnification of thin lenses in contact, simple numerical, concept of reduced systems.

**Unit-7:**

Thick Lens- Cardinal points & planes, front & back vertex power, matrix theory in paraxial Optics to locate positions of cardinal planes. Different types of aberrations & their effects.

**Unit-8:**

Prism- Dispersion of prism, reflecting prisms, prisms diopters.

**Unit-9:**

Geometrical theory of optical fibers. Uses of optical fibers.

**Textbooks:**

1. Subrahmanyan.N, BrijLal, A Textbook of Optics, S.Chand.Co Ltd, New Delhi, India,2003. **Reference** **Books**: 2. Keating NM. P, Geometric, Physical and Visual Optics, Butterworth- Heinemann,

Massachusetts, USA, 2002.

3. Loshin D. S. The Geometric Optics Workbook, Butterworth-Heinemann, Boston, USA, 1991.

4. Schwartz S. H. Geometrical and Visual Optics: A Clinical Introduction, McGraw-Hill, New York, USA, 2002