

**B.Sc. (CBCS) Geology - I Year**  
**Semester - II : Theory Paper - II**  
**Mineralogy and Optical Mineralogy**

(4 hrs/week)

**Credits-4**  
**(60 hours)**

**UNIT – I**

**Mineralogy:** Definition of mineral – classification of minerals into rock forming and ore minerals. Physical properties of minerals – colour, streak, play of colours, opalescence, asterism, transparency, lustre, luminescence, specific gravity, magnetic properties, Electrical properties, pyro and piezo electricity.

**Chemical properties of minerals** – Isomorphism, solid solution, polymorphism, allotropy, pseudomorphism, radioactivity; silicate structures.

**Modes of Formation of Minerals:** Occurrence and association of Minerals.

**UNIT - II**

**Descriptive Mineralogy:** Study of physical properties, chemical properties and mode of occurrence of the following mineral groups.

<b>Nesosilicate</b>	Olivine, Garnet, Aluminum silicates
<b>Sorosilicate</b>	Epidote
<b>Cyclosilicate</b>	Beryl

**UNIT III**

**Descriptive Mineralogy:** Study of physical properties, chemical properties and mode of occurrence of the following mineral groups.

<b>Inosilicate</b>	Pyroxene; Amphibole
<b>Phyllosilicate</b>	Mica, Hydrous magnesium silicate
<b>Tectosilicate</b>	Feldspars, Feldspathoids and Silica group

**Miscellaneous:** Staurolite, Tourmaline, zircon, Calcite, Corundum, Apatite.

Unit IV

**Optical Mineralogy:** Petrological microscope (polarizing) its mechanical and optical parts. Double Refraction, Refractive Index, Construction of Nicol Prism.

Behavior of isotropic and anisotropic minerals between crossed nicols – extinction, pleochroism, interference colours. Definition of Uniaxial and Biaxial minerals.

**Practicals : (3 hrs/week)**

**45 hrs (Credits:1)**

1. Study of physical properties and diagnostic features of the following minerals.

Quartz, Jasper, Agate, Chalcedony, Amethyst, Flint, Chert, Orthoclase, Microcline, Plagioclase, Labradorite, Augite, Hornblende, Tremolite, Asbestos, Muscovite, Biotite, Phlogopite, Olivine, Epidote, Garnet, Kyanite, Sillimanite, Andalusite, Beryl, Zircon, Apatite, Corundum, Talc, Gypsum, Calcite, Serpentine.

2. Study of optical properties of the following minerals: Quartz, Orthoclase, Microcline, Plagioclase, Augite, Hornblende, Hypersthene, Muscovite, Biotite, Garnet, Olivine, Kyanite, Sillimanite, Leucite, Calcite.

**Text Books:**

1. Rutleys elements of mineralogy - H.H.Reed.
2. Manual of mineralogy – C. S.Hurlbut and C.Klein.
3. Mineralogy for students - M.H.Batey.

**References Books:**

1. An introduction to rock forming minerals - Deer, Howie, and zussman.
2. Elements of mineralogy - Mason and Berry.
3. Optical Crytstallography - Wahlstorm.
4. Elements of optical mineralogy; an introduction to microscopic petrography by Winchell, N. H. and A.N.Wichell (Newton Horace), Part-1.
5. Manual of optical mineralogy - Shelley.

**FACULTY OF SCIENCE**  
**B.Sc. (CBCS) - I Year Examination**  
**GEOLOGY**  
**Semester-II : Paper II**  
**(Mineralogy and Optical Mineralogy)**

Time: 2 Hours

Credits : 4  
Max.Marks:40

Section-A (Marks: 4 x 2 = 8)  
Write short notes on any four of the following:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Note: Two short answer type questions from each unit.

Section-B (Marks: 4 x 8 =32)  
(Essay questions)

1. a)  
    or  
    b)
- 2.a)  
    or  
    b)
- 3.a)  
    or  
    b)
- 4.a)  
    or  
    b)

Note: Two essay type questions from each unit with internal choice.

**FACULTY OF SCIENCE**  
**B.Sc. (CBCS) - I Year Practical Examination**  
**GEOLOGY**  
**Semester-II : Paper II**  
**(Mineralogy and Optical Mineralogy)**

Time: 2½ Hours

Credits : 1  
Max.Marks:25

**Practical Model Paper**

- 1) Identify the given rock forming minerals 1-7 and write their physical properties chemical composition and crystal system. (7x2=14)
- 2) Write the optical properties of minerals in thin sections 6-10 under the polarizing microscope and indentify them. (5x2=10)
- 3) Record & Viva (6 M)

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