

## **ECONOMIC GEOLOGY, MINERAL ECONOMICS AND ORE MICROSCOPY**

### **UNIT 1**

**Economic geology:** Processes of formation of mineral deposits – Magmatic, sublimation, contact metasomatic, Hydrothermal (Cavity, filling and replacement) Sedimentation, evaporation, residual and mechanical concentration, Oxidation and supergene enrichment and metamorphism.

### **UNIT 2**

Classification of Mineral deposits, controls of Ore localisation – structural stratigraphic, physical and chemical; Metallogenetic epochs and provinces – Plate tectonics and Ore genesis -Geologic thermometry- Geobarometry, stable and radiogenic isotopes of ores and the host rocks – Geological and Geochemical modeling of ore deposits.

### **UNIT 3**

Study of the following ore deposits with regard to their mode of occurrence, distribution in India, Origin and uses; Asbestos, Barite, Bauxite, Chromite, Copper, Gold, Iron, Lead and Zinc, Magnesium, Manganese.

### **UNIT 4**

**Mineral Economics:** Definition and scope – Significance of minerals in National economy, peculiarities inherent in mineral industry, Tenor, grade and specifications for minerals. Mines and Minerals legislation of India. India's national mineral policy. Strategic, Critical and essential minerals with reference to India. Mineral conservation and substitution.

### **UNIT 5**

**Ore Microscopy:** Construction of ore Microscope. Polishing and mounting of ores, Physical properties of Ore minerals, Determination of micro hardness; Factors affecting microhardness.

Study of optical properties – Colour, reflectivity, bi-reflectance, Isotropism, natstotropism, Polarisation Colours, Rotation properties, Internal reflections and relation sense. Instrumentation and methods of determination of reflectivity, Polarisation figures of Isotropic and anisotropic Ore minerals, Micro – chemical techniques, ore textures and paragenesis, application of Ore Microscopy.

#### **Text Books:**

1. Bateman, A.M. – 1995 – Economic Mineral Deposits, Wiley.
2. Lindgren, W – 1993 – Mineral Deposits, McGraw Hill.
3. Cameron, E.N. – 1961 – Ore Microscopy, Wiley.
4. Sinha, R.K. & Sharma, N.L. – 1976 – Mineral Economics Oxford and IBH.
5. Graig, J.R. – Ore Microscopy and Ore Petrography.

**Reference books :**

1. Coggin, B & Dey, A.K. – 1995 – India's Mineral Wealth, OUP.
  2. Park, C.F. & Macdiarmid, R.A. 1970 – Ore deposits, Freeman.
  3. Deb, S, 1980 – Industrial Minerals and rocks of India, Allied.
  4. Gokhale; K.V.G.K. & Rao, T.C. – 1978 – Ore deposits of India, their distribution and Processing, Thomson Press.
- Stanton, R.L. 1972 – Ore Petrology, McGraw Hill.