

# Vijayanagara Sri Krishnadevaraya University

PG Centre Nandihalli-Sandur

Department of Mineral processing

Syllabus for

PhD Entrance Test (Effective from 2022-23)

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## Part-A : Research Methodology

**Unit-I :** Introduction to research methodology: Definition, Problem, Objectives and Scope. Nature of research, motivation and creativity in research. Research plan and design. Different types and styles of research in sciences. Scientific temperament, Critical and positive thinking.

Types of research methods – quantitative and qualitative. Research techniques and tools – questionnaire, interview, observation, scheduled, check- list, records and reports.

Collection of literature- print, electronic and selection, sources of information in mineral processing INSDOC service. Classification systems used in libraries.

**Unit-II :** Data analysis and interpretation : Data analysis in statistical methods, data analysis in computer processing. Interpretation and presentation of results.

Recent trends of report writing : Presentation of research report for various publications. Presentation of illustrations, reprography services and thesis writing. Recent trends – e-patashala, IINFLIBNET, INTERNET. Use of computers in research. Online citation tools – EasyLib, Biblio, Endnote etc, Impact factors and Citation index, i10 index, h-index. IPR, Plagiarism tools-Turnitin , Authenticat, Urkund and ethical values in research.

## Part-B :

### Unit-I Geology :

Study of minerals, Properties of minerals- Physical and Optical, Crystallography, Elements of crystals, Symmetry, Crystal classes and systems, Brief study of rock forming minerals, Ore microscopy and importance of ore microscopy in mineral processing, preparation of thin section for ore microscopic studies , Optical properties of ore minerals (Qualitative and Quantitative) etch- test, micro indentation hardness, micro chemical techniques, modal analysis and texture of ore minerals.

Study of rocks : Igneous, Sedimentary and Metamorphic rocks.

Economic mineral deposits : Origin of ore deposits, Mineral resources of India- Metallic minerals, Non-Metallic minerals, Nuclear and other minerals.

### Unit-II Mineral processing:

Definition of ore and minerals, sampling methods, comminution laws and application, crushing, grinding, screening, classification methods and application, concentration Techniques- gravity magnetic, electrostatic, flotation and physic- chemical methods and simple problems on recovery, efficiency and yield.

### Unit-III Extractive Metallurgy

Introduction : Pyrometallurgy- Drying, Calcinations, Roasting, Smelting, Refining methods and application.

Hydro metallurgy: Leaching, types of leaching, recovery of metal by precipitation, Ion exchange and solvent extraction methods from solution.


Electro metallurgy : Electrolysis of aqueous solution and fused salts, laws of electrolysis.

Extraction and refining of Lead, Copper, Zinc, Uranium, Gold, Silver, Magnesium, Aluminium.

Iron making and steel making.

## Note:

1. Ph.D entrance test is for 100 marks (1 marks each) and MCQ type
2. Research methodology (Part-A) carries 40 marks and core subject (part-B) carries 60 marks.

Approved by BOS  
  
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