

Vijayanagara Sri Krishnadevaraya University

Applied Geology Ph.D. Entrance Test Syllabus: 2023-24

PART – A: Research Methodology

Unit-1. 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.

Unit-2. Research Method in Geoscience: Types of research methods – quantitative and qualitative. Research techniques and tools – questionnaire, interview, observation, schedule, check-list, records and reports. Collection of literature-print, electronic and selection sources of information in Geoscience INSDOC service. Classification systems used in libraries.

Unit-3. Data Analysis and Interpretation: Data analysis in statistical methods, data analysis in computer processing. Interpretation and presentation of results.

Unit-4. Recent trends of report writing: Preparation and presentation of research report for various publications. Presentation of illustrations, reprography services and thesis writing. Recent trends – e-patashala, INFLIBNET, 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- Drillbit, Turnitin, Authenticat, Urkund and ethical values in research.

PART – B: Core Subject

Unit-5. Introduction of Earth System: Definition and scope of Earth System Science, Interconnected nature of Earth's components; Earth's Spheres; Earth's Climate; Plate Tectonics; Earth's History; Earth's Energy Balance; Natural Hazards; Human Impact on the Earth System; Earth Observing Systems.

Unit-6. Mineralogy: Definition and scope of mineralogy, Historical development of mineralogy; Crystallography; Chemical Bonding in Minerals; Crystal Chemistry; Physical Properties of Minerals; Systematic Mineralogy; Mineral Identification; Mineral Formation and Environments; Mineralogical Applications; Laboratory Techniques.

Unit-7. Petrology: Definition and scope of petrology; Relationships between mineralogy, petrology, and geology; Igneous Petrology; Textures and Structures in Igneous Rocks; Sedimentary Petrology; Metamorphic Petrology; Metamorphic Processes; Field Relationships; Geochemistry and Petrology; Petrogenesis; Applied Petrology; Laboratory Techniques.

Unit-8. Mineral Exploration and Economic Geology: Definition and scope of economic geology, Importance of economic geology in natural resource exploration; Mineral Resources and Reserves; Mineral Exploration Methods; Ore Deposits; Mineral Exploration Techniques; Mineralogy in Exploration; Geological Mapping and Interpretation; Environmental and Social Considerations; Economic Evaluation of Mineral Deposits; Regulatory Framework; Emerging Technologies in Exploration.

Unit-9. Hydrogeology and Environmental Geology: Definition and scope of hydrogeology, The hydrologic cycle and groundwater flow; Groundwater Properties; Hydrogeological Processes; Groundwater Exploration and Well Design; Groundwater Quality; Environmental Geology; Geological Aspects of Environmental Issues; Contaminant Transport in the Subsurface; Site Characterization and Remediation; Groundwater and Land Use Planning; Fieldwork and Laboratory Techniques; Regulatory Framework.

Unit-10. Remote Sensing and GIS: Definition and principles of remote sensing, Electromagnetic spectrum and interaction with Earth's surface; Remote Sensing Platforms and Sensors; Image Acquisition and Processing; Digital Image Analysis; Remote Sensing Applications; Geographic Information Systems (GIS) Basics; Spatial Data Acquisition; Spatial Data Management; Spatial Analysis in GIS; 3D GIS and Visualization; Integration of Remote Sensing and GIS; Web GIS and Mobile GIS; Remote Sensing and GIS in Environmental Management; Ethical and Legal Considerations.



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Reference Books

1. Research methodology: Methods & Techniques (Rev. Ed.), KOTHARI (C R), (2006) New Age International. New Delhi.
2. Avoiding plagiarism, self-plagiarism, and other questionable writing practices: ROIG (M). A guide to ethical writing, (2006).
3. Statistical methods for the information professional: VAUGHAN (L). A practical, painless approach to understanding, using and interpreting statistics (Ed. 2), (2004) Information Today, Medord.
4. Statistical methods and calculation skills (Ed. 3), WILLEMESSE (I). (2009) Juta. Cape Town.
5. Web services research for emerging applications: Discoveries and Trends, ZHANG (LIANG-JIE). (2010) Information Science Reference, Hiershe
6. Basic research methods, CONNAWAY (L S) & POWELL (R R). (2010) Libraries unlimited. California.
7. Research methodology, GLOOTENBERG (A). (2013) Uxbridge: Koros.
8. Design and Analysis of Experiments Montgomery, Douglas C. (2007) 5/e, (Wiley India).
9. Applied Statistics & probability for Engineers Montgomery, Douglas C. & Runger, George C. (2007) 3/e, (Wiley India).
10. Physical Geology by Arthur Holmes
11. Structural Geology by Billings
12. General Geology By P.K. Mukerjee
13. Physical Geology By Strahler
14. The geology of ore deposits - John M. Guilbert and Charles F. Park, Jr. W.H. Freeman and Co., New York. 1986.
15. Interpretation of ore textures - Bastin, E.S.
16. Economic Mineral deposits by Jenson and Bateman, A.M.
17. Ore microscopy - Cameron, E.N.
18. Textures of the ore minerals - Edwards, A.B.
19. India's mineral resources – Sinha and Krishnaswamy, S.
20. Metallic and Industrial minerals - Lamey Carl, A.
21. Introduction to India's economic minerals - Sharma, N.L. & Ram . K.S.
22. A treatise on industrial minerals of India-Sinha, R.L.
23. Mineral deposits of India, Mukerjee 1999: Allied publications.
24. Groundwater-C.F.Tolman
25. Groundwater Hydrology-D.K.Todd
26. Hydrology-S.N.Davis and R.J.M Dewiest
27. Groundwater studies-R.H.Brown and others
28. Groundwater Hydrology-Herman Bouver
29. Hydrology-C.W.Fetter
30. Environmental Geology – Peter TP Flawn
31. Environmental geosciences – Arthur H Strahler & Alan Strauler
32. Geology in Environmental planning- A.D. Howard & I.Ramson
33. Focus on Environmental Geology –R Turk
34. Text book of Remote sensing and geographical Information system, 1st & 2nd Ed. By M. Anjireddy, BS Publications, Hyderabad.
35. Remote sensing principles and Interpretations, 3rd edition, Floyd. F. Sabins
36. Applications of Remote sensing and GIS by H T Basavarajappa, Et. Al
37. Manual of colour aerial photography -Ed. Smith, J.T.Jr.
38. Manual of photogrammetry - Ed: Morrie M.Thompson.
39. Manual of Remote sensing - Ed: Robert G Reeves.
40. Theory of pattern recognition and modern forecasting - V.Karpin and Wright Pattern.
41. Remote sensing in Geology - Parry S. Siegal & Alan. R.Gillespie
42. Manual of photographic interpretation - Ed: Colwell, R.N.
43. Principles of Remote Sensing – Patel Singh; SP publication
44. Digital Remote Sensing – Pritivish Nag M Kudrat ; Concept publication
45. Principles of GIS for land and resources assessment, Burrough, P.A., 1986, Oxford.
46. Introductory cartography, Campbell, 1984, Prentice Hall
47. Map data processing, Freeman and Pieroni, 1980, Academic Press.
48. An introduction to Geographical information systems: Ian Heywood et. al.

