

ADIKAVI NANNAYA UNIVERSIT
Department of Geo-sciences
Pre-Ph.D. Course work Syllabus (Mr. B. D. N. Kishore)
 (Common with Ms. K. Maneesha and Mrs. Gunda Swathi)

Paper-I: Recent Advances in Geological Sciences and Research Methodology

Unit 1: Types of research- Process of Research-Formulation of objectives. Hypothesis to theory - Geological example: Continental drift hypothesis to plate tectonics theory. Dos and Don'ts for selecting a research problem. Importance of problem in National and International scenario, how to conduct research survey (books, journals, electronic search engines like Google, SCOPUS, Wikipedia Research-gate, IGCP Project Data Base, etc.). Research plan and its components

Unit 2: Methods of research (Survey, observation, case studies, experimental, historical and comparative methods) Methods of Literature collection, Experimental design, planning and execution of investigation. Methods of sampling, and analytical techniques: Collection of air, water, soil and rock samples.

Preparation of samples for microscopic examination and chemical analysis, Analytical Techniques viz. AAS, XRF, SEM, ICP, EPMA, Mass Spectrometry and Portable analytical techniques.


Unit 3: Analysis of numerical data – Central tendencies, dispersion, testing significance of variations, analyzing correlation of variables. Regression analysis, Principal Component Analysis, Factor Analysis, and Cluster Analysis and its use in geological research. Application of Remote sensing & GIS in Geosciences.

Unit 4: Writing of Research proposal, Report and Research paper, Meaning and types – stages in preparation-characteristics-structure-documentation, foot notes and bibliography - Editing the final draft-Evaluating the final draft-checklist for a good proposal/reporter/research paper.

Unit 5: Research ethics – ethical issues, ethical committees; Publication Ethics, Scholarly publishing – IMRAD concept and design of research paper, citation and acknowledgement, plagiarism, reproducibility and accountability

Text books

1. Research Methodology_ Methods and Techniques-New Age Publications (Academic)- C.R. Kothari - (1985)
2. Statistics and Data Analysis in Geology (3rd edition)-Wiley - John C. Davis - (2002)
3. Research Methodology in Geology by Arnold Luwang Usham
4. Research Methodology, Pearson edition, New Delhi - Rajit Kumar, (2005)
5. Higher Education Research Methodology A Step-by-Step Guide to the Research Process (1st Ed), Ben Kei Daniel and Tony Harland, Routledge publishers, 2018.
6. Manual for Research and Publication Ethics in Science and Engineering, Eun Seong Hwang, Eun Hee Cho, Young-Mog Kim, Kibeom Park, Wha-Chul Son, Tae-Woong Yoon, Jeong Mook Lim, Korean Federation of Science and Technology Societies publication, 2016
7. How to get a Ph D, UBS publishers & Distributors, New Delhi - Philips E M & Pugh D.S., (1998)
8. Marketing Research, Text and Cases, Mc Graw Hill, Rajendra Naragundkar (2008)


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Model Question Paper
ADIKAVI NANNAYA UNIVERSITY
Department of Geo-Sciences

Model Question Paper

Paper-I: Recent Advances in Geological sciences and Research Methodology

Time: 3Hrs

Max. Marks: 100

Answer all the questions

1. Discuss in detail note on conducting research Survey?

OR

2. Write about types of research, research process and formulation of objectives?

3. Give in detail on methods of research and literature collection?

OR

4. Describe the microscopic examination and chemical analysis of rock samples?

5. Write about the Principal component analysis?

OR

6. Give a detail note on application of remote sensing and GIS in mineral exploration?

7. How do you write a research proposal and research paper?

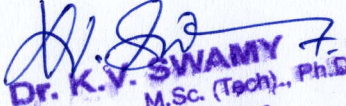
OR

8. Describe the methods used in correcting editing of the report/proposal in finalization?

9. Discuss the research ethical issues and publication Ethics?

OR

10. Give a detail note on importance of plagiarism in research?


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Adikavi Nannaya University
Department of Geo-Sciences
Pre-Ph.D. Course work Syllabus (Mr. B. D. N. Kishore)

Paper II: Structure and tectonics of EGMB in some Coastal districts of Andhra Pradesh:
A geophysical and remote sensing approach

Unit1:

Eastern Ghat Mobile Belt (EGMB): Geological evolution – relation with Southern Granulite Terrain (SGT), Zonation in EGMB, stratigraphy, major rock associations, evaluation of EGMB; Extensions - tectonic divisions within EGMB, extensions and limits of EGMB in India and outside India.

Unit 2:

Regional tectonic frame work of EGMB – shear zones in EGMB, magmatism in shear zones of EGMB; Geomorphology of EGMB – controls of geomorphic evolution, evolution of geomorphology of EGMB, river system in EGMB, geomorphology of the coastal plains.

Unit 3:

Passive continental margins of India (ECMI) – characteristics, Evolution of ECMI, two stage evolution of ECMI, linkup with Gondwanaland Break-up, ambiguities in the proposed theories on the evolution of ECMI, summary of structural lineaments over the ECMI, land-ocean tectonic lineaments/signatures of the K-G basin, seismic hazards over the ECMI.

Unit 4:


Application of multispectral remote sensing in structural mapping and Neotectonism; lineaments – Definition and terminology, scale and manifestation, mapping of lineaments, visual vs. digital interpretation, statistical analysis, genetic types of lineaments and discrimination between them, scope of lineament studies; Neotectonism-Definition, Evidences for neotectonic movements, seismic hazards and disaster assessment.

Unit5:

Concepts of modeling and inversion of gravity and magnetic anomalies, modeling and inversion of gravity anomalies of density interfaces, modeling and inversion of magnetic anomalies of magnetic interfaces, inversion of gravity anomalies of faults and sheets, inversion of magnetic anomalies dykes and sheets, role and application of gravity, magnetic, seismic, electrical and MT techniques in exploration of EGMB, ECMI and East coast basins based on earlier research works.

References

1. Proceedings of workshop on Eastern Ghats Mobile Belt, Geological Survey of India Special Publication 44, 1998.
2. K. S. R, Murthy et.al., 2012, Tectonics of the Eastern Continental Margin of India, The Energy and Research Institute (TERI), New Delhi, India.
3. I. V. R. Murthy, 1998, Gravity and Magnetic Interpretation in Exploration Geophysics, Geological Society of India, Bangalore, India.


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Model Question Paper
ADIKAVI NANNAYA UNIVERSITY
Department of Geo-Sciences
Model Question Paper

Paper II: Structure and tectonics of EGMB in some Coastal districts of Andhra Pradesh:
A geophysical and remote sensing approach

Time: 3Hrs

Max. Marks: 100

Answer all questions.

1. Write in detail about the geological evolution of the Eastern Ghat Mobile Belt and its relation with Southern Granulite Terrain.

OR

2. Write an essay about the tectonic divisions within EGMB and limits of EGMB in India.
3. Write in detail about the shear zones in EGMB and magmatism in shear zones of EGMB.

OR

4. Describe about the evolution of geomorphology of EGMB and geomorphology of coastal plains in EGMB.
5. Write on any of two of the following. Each question carries 10 marks.
 - a) Characteristics of passive margins of India.
 - b) Two stage evolution of ECMI
 - c) Seismic hazards over the ECMI.
 - d) Linkage of ECMI with Gondwanaland break-up

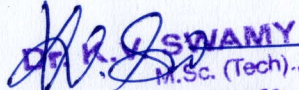
6. What is meant by neotectonism? Write about the role of multispectral remote sensing in structural mapping and neotectonism.

OR

7. Define a lineament. Describe different genetic types of lineaments and discrimination between them.
8. Write in detail about the concepts of modeling and inversion of gravity and magnetic anomalies.

OR

9. Write down the magnetic anomaly equation of dykes. Write down the inversion of magnetic anomalies due to a dyke model.


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ADIKAVI NANNAYA UNIVERSITY:: RAJAHMUNDRY
DEPARTMENT OF GEOLOGY
Pre-PhD course work syllabus::2022

Paper-I: Recent Advances in Geological sciences and Research Methodology

Unit 1: Types of research- Process of Research-Formulation of objectives. Hypothesis to theory – geological example: Continental drift hypothesis to plate tectonics theory.

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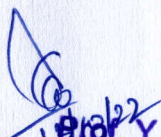
Application of Remote sensing & GIS in Geosciences.

Unit 4: Writing of Research proposal, Report and Research paper, Meaning and types – stages in preparation-characteristics-structure-documentation, foot notes and bibliography - Editing the final draft-Evaluating the final draft-checklist for a good proposal/reporter/research paper.

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Model Question Paper

ADIKAVI NANNAYA UNIVERSITY:: RAJAHMUNDRY

DEPARTMENT OF GEOLOGY

Pre-PhD Examination::2022

Paper-I: Recent Advances in Geological sciences and Research Methodology

Time: 3Hrs

Max. Marks: 100

Answer all the questions

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ADIKAVI NANNAYA UNIVERSITY:: RAJAHMUNDRY
DEPARTMENT OF GEOLOGY
Pre-PhD course work syllabus:: 2022
(Area of Research and methodology)

Paper-II: Groundwater studies at hydrocarbons seepage areas and at development activity areas (G Uma Mahesh)

Unit 1: Groundwater: Occurrence and movement of groundwater, types of aquifers, groundwater levels, Types of wells – Methods of artificial groundwater recharge, Site selection criteria for artificial recharge - Groundwater assessment and management methods – Seawater intrusion in coastal aquifers – Land subsidence – Optimal groundwater development – Indian GEC norms.

Unit 2: Aquifer parameters: Determining aquifer parameters for unconfined, leaky and non-leaky aquifers – Determination of well characteristics and specific capacity of wells – Investigation and evaluation of Groundwater: geophysical methods – Electrical Resistivity method – GPR techniques – surveying procedure and Interpretation of data – Subsurface investigations – Test drilling – Resistivity logging.

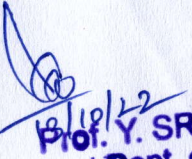
Unit 3: Fluvial geomorphology: Fluvial processes – Fluvial landforms – types – evolution of fluvial landforms. Morphometric analysis of Drainage pattern - Watershed delineation and codification – watershed characteristics – linear, aerial and relief aspects and slope analysis. Groundwater Quality assessment – Quality of groundwater for agriculture, drinking and industrial purposes -.Groundwater pollution.

Unit 4: Water resources in East and West Godavari districts: Godavari river basin and its tributaries – Rainfall distribution and run-off, Geology and Structure and geomorphological landforms in Godavari districts of Andhra Pradesh, Status of Groundwater resources in Godavari districts. Delta areas of India and special emphasis on Godavari and Krishna delta area.

Unit 5: Applications of Remote Sensing and GIS for identification of groundwater potential zones, pollution zones, Paleo-channels and hydrocarbon seepage zones.
Groundwater problems in coastal zones and delta areas. Detecting methods for hydrocarbon seepage zones. Application of geophysical, geochemical, sedimentological and isotope techniques for identification of hydrocarbon seepages and paleo-channels.

Text books:

1. P.S.Roy, R.S.Diwedi and D.Vijayan (2010), Remote sensing applications, NRSC, Hyderabad
2. Chow V.T., Maidment D.R., Mays L.W., (1995): Applied Hydrology, Mc Graw Hill publ.
3. Ragnath H.M., (1994): Hydrology, Wiley Eastern Ltd., New Delhi, 1994.
4. Ven Te Chow, Hand book of Hydrology, McGraw Hill Publications, New York, 1995.
5. Groundwater geophysics – A tool for hydrogeology, Reinhard Kirsch, Springer verlag, 2006
6. Andreas Laake (2022): Remote sensing for hydrocarbon exploration, Springer publisher
7. Treatise of petroleum geology/Handbook of Petroleum Geology (1999): Exploring for oil and gas traps, Edited by Edward A. Beaumont and Norman H. Foster, Chapter 18:Surface geochemical exploration, by Dietmar schumachere, 18-1 to 18-27pp.


18/12/22
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Model Question Paper

**ADIKAVI NANNAYA UNIVERSITY:: RAJAHMUNDRY
DEPARTMENT OF GEOLOGY**

Pre-PhD Examination::2022

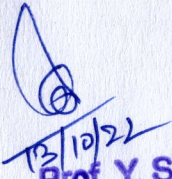
Paper-II: Groundwater studies at hydrocarbons seepage areas and at development activity areas (G Uma Mahesh)

Time: 3Hrs

Max. Marks: 100

Answer all the questions

1. Give a detail note on Occurrence and movement of groundwater ?
OR
2. Discuss the seawater intrusion in coastal zones ?
3. Explain the aquifer parameters determination methods for various aquifers ?
OR
4. Explain the groundwater exploration techniques ?
5. Discuss the fluvial processes and fluvial landforms ?
OR
6. Give a detail note on morphometric analysis of drainage pattern in a river basin ?
7. Discuss the rainfall distribution and run-off conditions in Godavari districts of Andhra Pradesh
OR
8. Explain the Geomorphology of Godavari districts, Andhra Pradesh ?
9. Discuss the application of RS and GIS in Groundwater pollution zones identification?
OR
10. Give a detail note on groundwater problems in coastal and delta areas ?


13/10/22

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