Savitribai Phule Pune University

(Formerly University of Pune)

Syllabus for M.Phil./Ph.D. (PET) Entrance Exam
Geography

Research Methodology

1. **Foundation of Research:** Meaning, Objectives, Motivation, Utility.Concept of theory, Empiricism, Deductive and Inductive theory.Characteristics of scientific method - understanding the language of research - Concept, Construct, Definition, Variable. Research process
2. **Problem Identification & Formulation:** Definition and formulating the research problem, Necessity of defining the problem, Importance of literature review in defining a problem, Research question – Investigation question - Measurement issues - Hypothesis - Qualities of a good hypothesis - Null hypothesis and Alternative hypothesis. Hypothesis testing - Logic and importance
3. **Research Design:** Concept and importance in research - Features of a good research design - Exploratory research design - Concept, types and uses, Descriptive research design - Concept, types and uses. Experimental design - Concept of independent and dependent variables.
4. **Qualitative and Quantitative Research:** Qualitative - Quantitative research - Concept of measurement, causality, generalization, replication. Merging the two approaches.
5. **Data Collection and analysis:** Execution of the research - observation and collection of data - Methods of data collection, hypothesis-testing - Generalization and interpretation.
6. **Measurement:** Concept of measurement - what is measured? Problem in measurement in research - Validity and Reliability.Levels of measurement - Nominal, Ordinal, Interval, Ratio.
7. **Sampling:** Concept of Statistical population, Sample, Sampling frame, Sampling error, Sample size, Non response. Characteristics of a good sample.Probability sample - simple Random sample, Systematic sample, Stratified random sample and Multi-stage sampling.Determining size of the sample - Practical considerations in sampling and sample size.
8. **Data Analysis:** data Preparation - Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis - Cross tabulations and Chi-square test including testing hypothesis of association, Correlation- Time series analysis, multivariate techniques, regression.
9. **Interpretation of Data and Paper Writing:** Layout of a Research paper, Journals in Geography and allied subjects, Impact factor of journals, When and where to publish? Ethical issues related to publishing, Plagiarism and self-plagiarism.
   Use of Encyclopedias, Research guides, Handbook etc., Academic databases for Geography.
10. **Use of Tools / Techniques for Research:** methods to search required information effectively, Reference management software like Zotero/mendeley, Software for paper formatting like LaTeX/MSOffice, Software for detection of plagiarism.
11. **Reporting and Thesis writing:** Structure and components of scientific reports - Types of report - Technical reports and thesis - Significance - Different steps in the preparation - Layout, Structure and Language of typical reports - Illustrations and tables - bibliography, referencing and footnotes - oral presentation - planning - preparation - practice - Making presentation - Use of visual aids - Importance of effective communication

12. **Application of Results and Ethics:** Environmental impacts - Ethical issues - ethical committees - Commercialization - Copyright - royalty - Intellectual property rights and patent law - Trade related aspects of intellectual property rights - Reproduction of published material - Plagiarism - citation and acknowledgement - Reproducibility and accountability.
13. **Reasoning and Mental Ability**: Analogy, Classification, Series, Coding-Decoding, Direction sense, Representation through Venn diagrams, Mathematical operations, Arithmetical reasoning, Inserting the missing Character, Number, Ranking and Time sequence test, Eligibility test**,** Number and symbols ordering, Comprehension questions, Statement and assumptions, Statement and conclusions, Statement and actions

Books Recommended

1. Research Methodology - C. R. Kothari
2. Research Methodology : An Introduction - Stuart Melville and Wayne
3. Practical Research Methods - Catherine Dawson
4. Select references from the Internet

REFERENCES

1. Garg, B. L., Karadia, R., Agarwal, F. and Agarwal, U. K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothati , C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.
3. Sinha, S. C. and Dhiman, A. K., 2002. Research Methodology, EssEss Publications.2columes.
4. Trochim, W. M. K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p
5. Wadehra, B. L. 2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.

Additional reading

1. Anthony, M., Graziano, A. M. and Raulin, M. L., 2009. Research Methods: A Process of Inquiry, Allyn and Bacon.
2. Carlos, C. M., 2000. Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options. Zed Books, New York.
3. Coley, S. M. and Scheinberg, C. A., 1990, "Proposal Writing", Sage Publications.
4. Day, R. A., 1992. How to Write and Publish a Scientific Paper, Cambridge University Press.
5. Fink, A., 2009. Conducting Research Literature Reviews: From the Internet to Paper. Sage Publications
6. Leedy, P. D. and Ormrod, J. E., 2004 Practical Research: Planning and Design, Prentice Hall.
7. Satarkar, S. V., 2000. Intellectual property rights and Copy right. EssEss Publications.

Subject Concerned Syllabus
Geography

Unit-I : General Geography :

1. **Geographical Thought :**
   - Contribution of Greeks and Romans to physical and mathematical geography
   - Classical period of modern geographical thought
   - Dualism in geography
   - Radicalism
   - Models
   - Behaviouralism in geography
   - Quantitative revolution
2. **Cartography, GIS and Remote Sensingand Surveying :**
   - Map projections, types of maps; digital cartography
   - Basics of GIS and remote sensing
   - Surveying and leveling, types of survey, theodolite and dumpy level survey
   - Introduction to GPS, d GPS and total station
3. **Regional Planning:**
   - Evolution, nature and scope of regional planning
   - Regional concept in geography
   - Concepts of planning regions
   - Types of regions
   - Methods of regional delineation
   - Regional planning in India
   - Indicators of development
   - Regional imbalance
4. **Political Geography :**
   - Concept of State, Nation, Nation-state
   - Heartland and Rimland theories
   - Boundaries and frontiers
5. **Statistical Methods :**
   - Types of scale
   - Frequency distribution, measures of central tendency
   - Measures of dispersion and concentration
   - Lorenz curve
   - Simple and multiple correlation and regression
   - Nearest- neighbor analysis
   - Rank score
   - Weighted score
   - Principal Component Analysis (PCA)
   - Trend Surface Analysis (TSA)
   - Factor Analysis (FA)

Unit – II: Geomorphology :

1. **Fundamentals:**
   - Basic concepts and paradigms in geomorphology
   - Branches of geomorphology
   - Approaches and models in geomorphology
   - Geological time scale

2. **Interior of the Earth, Deformation and Tectonics:**
   - Physico-chemical and seismic properties of earth's interior
   - Behavior of rocks under stress – folds and faults
   - Earthquakes
   - Paleomagnetism
   - Sea floor spreading and plate tectonics
3. **Processes and Landforms:**
   - Weathering and its types
   - Formation of soil
   - Hillslope processes
   - Fluvial, coastal, glacial, aeolinand karst processes and landforms
4. **Techniques in Geomorphology :**
   - Geomorphological mapping
   - Field techniques
   - Geomorphometry
   - Terrain analysis
   - Sediment analysis
   - Geostatistical methods
5. **Environmental Change and Hazards:**
   - Landscape evolution
   - Role of lithology, climate, tectonics and base level
   - Significance of Quaternary period in geomorphology, Ice Age
   - Role of human activities
   - Natural hazards

Unit – III: Climatology:

1. **Fundamentals :**
   - Development of modern climatology and tropical climatology
   - Climatic changes: natural and anthropogenic causes
   - Earth's atmosphere: evolution, structureand chemical composition
2. **Solar and terrestrial radiation:**
   - Electromagnetic spectrum
   - Insolation: factorsaffecting insolation, latitudinal and seasonal variations
   - Effect of atmosphere, greenhouse effect and heat budget
   - Temperature measurements and controls, lapse rate andinversion of temperature
3. **Atmospheric pressure and winds, cyclones and anticyclones:**
   - Pressure measurement and distribution
   - Wind observation and measurement, factors affecting wind, geostrophic wind and gradient wind
   - Circulation of the atmosphere: scales of atmospheric motion, global circulation: single and three cell model, local winds, Jet Stream
   - Tropical and extra-tropical cyclones: their life cycle. Anticylcones
   - Monsoons, meteorological teleconnections, El-Niño Southern Oscillation

4. **Moisture and atmospheric stability, air masses and fronts:**
   - Humidity: absolute humidity, relative humidity, mixing ratio, dew point
   - Adiabatic temperature changes, stable and unstable atmosphere
   - Forms of condensation and precipitation, hydrological cycle
   - Air mass classification and modification
   - Types of fronts and frontal weather

5. **Climatological Methods:**
    - Climatic classifications: Thornthwaite's and Koppen'sclassification
    - Types and methods of weather forecasting
    - Delineation of urban heat island (UHI)
    - Heat and cold wave analysis

Unit -IV: Population and Settlement Geography:

1. **Population Geography :**
    - Concepts of population geography
    - Approaches to the study of population geography
    - Demographic transition model
    - Pre-Malthusian and post-Malthusian theories
    - Issues and problems of population in developed and developing countries
    - Recent trends in population geography
2. **Urban Geography:**
    - Concepts in urban geography- urban hinterland, conurbation, megalopolis
    - Suburbanization, rural-urban divide
    - Gentrification
    - Urban renewal
    - Urbanization curve
    - Morphological models in urban geography
    - Central place theory
    - Problems of urbanization in developed and developing countries and recent trends in urban geography
3. **Rural Geography :**
    - Distribution of rural settlement, size and spacing of rural settlement
    - Land holdings and land tenure system
    - Concentration and dispersion of rural settlements
    - Challenges and problems in rural India
    - Recent trends in rural geography

Unit- V: Economic Geography:

1. **Economic Geography:**
    - Approaches to the study of economic geography
    - Evolution of world economy
    - Concepts of economic system and economic landscape
2. **Agricultural Geography:**
    - Factors influencing agricultural patterns- physical and non-physical determinants
    - Agricultural systems of the world
    - Agricultural regionalization : crop combination, crop intensity, crop diversification and crop concentration
    - Land use survey and land classification
    - Aspects of food security and world pattern of hunger
3. **Geography of Tourism:**
    - Concepts of tourism products
    - Planning for tourism development
    - Economic, social, physical and cultural impacts of tourism

4. **Geography of Development:**
    - Concept of sustainable development
    - Indices of human development
    - Theories of development
5. **Trade and Transport Geography :**
    - Modes and cost of transport
    - Types of transportation, transport network and its measurement
    - Characteristics of international trade, different trade theories
6. **Industrial Geography :**
    - Models of industrial location :Weber and Losch models
    - Industrial regions of India