

**DEPARTMENT OF GEOGRAPHY
KURUKHSETRA UNIVERSITY KURUKSHETRA**

Syllabus for Ph.D. (Geography) Entrance Test 2011-12.

<u>Paper No.</u>	<u>Title</u>
I	Climatology
II	Geography of India
III	Economic Geography
IV	Statistical Methods in Geography
V	Cartographic Method in Geography (Practical)
VI	Geomorphology
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XV	Introduction to Remote Sensing (Practical)
XVI	Geographical Thought
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XVIII	Fundamental of Geographical Information Systems (Practical)

Climatology

Section-A

1. Definition of weather and climate; Climatology and Methodology.
2. Origin, composition and structure of atmosphere.
3. Solar radiation, heat budget and temperature distribution.
4. Atmospheric Pressure and its distribution pattern..
5. General circulation and planetary winds, walker circulation- ENSO and La Nina, origin of monsoons and jet streams.
6. Atmospheric Moisture : Humidity, evaporation, condensation.
7. Precipitation : Dynamics and types of precipitation.

Section-B

8. Stability and instability of atmosphere, air masses and fronts.
9. Airmasses and fronts.
10. Weather Systems : Extra tropical and tropical cyclones.
11. Climatic classification: Basis of climatic classification by koeppen, Trewartha and Thornthwaites.
12. Climatic changes- Evidences and explanations.
13. Global warming and its impacts.

Suggested Readings

1. Trewartha G. T., An Introduction to Climate, McGraw Hill Company, New York, 1980.
2. Chritchfield, H J, General Climatology, Printice Hall of India, New Delhi, 1987.
3. Barry R. G. and Chorley, R. J, Atmosphere, Weather and Climate, Marthren , 1968.
4. Lal, DS, Climatology, Chetanya Publishing House, Allahabad, 1966
5. Das, PK, The Monsoons, National Book Trust, New Delhi, 1984
6. Ramasastry, AA, Weather and Weather Forecasting, Publication Division, New Delhi.

Geography of India

Section-A

1. Physiography and Divisions
2. Drainage Pattern
3. Climate : Characteristics of climatic conditions.
4. Natural vegetation : types and regions
5. Major soil types in India
6. Agriculture : Characteristics of Indian Agriculture, Irrigation and Agricultural Development in India, problems of Indian agriculture
7. Agro climatic regionalisation
8. Population : Growth and Distribution

Section-B

1. Power Resources : Coal, Natural gas and thermal power
2. Mineral Resources : Iron, Bauxite and Mica
3. Major industries : Iron and steel and cotton textile
4. Transport and communication
5. Regional disparities in Social and Economic Development

References:

1. Bharucha, J.P., 1982 : Vegetation of India, Oxford India, Bombay.
2. Dubey, R. N. , 1974 : Economic Geography of India, Kitab Mahal, Allahabad
3. Joshi, H. L. , 1990 : Industrial Geography of India, Rawat Publications, Jaipur
4. Nag, P. and Sangupta, S., 1992 : Geography of India, concept publications. Co., New Delhi, 280pp.
5. Rautray, J.K. : Geography of regional disparity, Asian Institute of Technology, Bangkok, 1993
6. Singh, R. L. : India : A Regional Geography, N.G.S.I., varanasi, 1971
7. Sharma, T. C. and O. 1988 : Economic and Commercial Geography of India, Vikas publishing house Pvt. Ltd, New Delhi, 392 pp.
8. Tirtna, R. and Krishan G., 1996 : Geography of India, Rawat Publications, Jaipur & New Delhi, 292 pp.
9. Tiwari, R. C. : Geography of India, Prayag Pustak Bhawan, Allahabad.

Economic Geography

Section-A

1. Definition Nature and Scope of Economic Geography. Relationship of economic geography with economics and other branches of social sciences, location of economic activities.
2. Classification of World Economy
3. World Agricultural Types : Basis and classification.
4. Classification of Resources : Renewable and non-renewable.
5. Production and Distribution of Coal and Petroleum.
6. Distribution of Industries : Iron and steel Industry, Cotton Textile Industry, Chemical Industry, Oil refining.

Section-B

7. Basis of International Trade.
8. Major Ocean Trade Routes.
9. Networks Structures and Economic Activities.
10. Von Thunen's model on agricultural location and its modifications.
11. Alfred Weber's model on industrial location and its modification.
12. Walter Christaller's model on the location of Tertiary Activities.
13. Edward Ullman's Spatial Interaction Model.

Suggested Readings :-

1. Hartshorne, T. A. and Alexander, J. W., Economic Geography (fourth Edition) 2001, New Delhi, Prentice Hall of India.
2. Jones, C. F., and Darkenwarld , G. G., Economic Geography New York, The Macmillan and Co.
3. James. D., Wheeler and Peter O., Muller, Economic Geography, New York, John Wiley and Sons.
4. Morgan and Munton, RJC, Agricultural Geography, Methuen, London
5. Symons, L., Agricultural Geography, Bell and Sons, London.
6. Singh, Jasbir and Dhillon, SS., Agricultural Geography, New Delhi Tata McGraw Hill, 2001.

Statistical Methods in Geography

Section-A

1. Descriptive Statistics : Histograms and Graphs, Measures of Central Tendency : mean, median, mode. Partitioned values: Quartiles and deciles. Comparing the mean, median and mode.
2. Measures of Dispersion : Absolute measures : Range, Quartile Deviation, Mean Deviation, Standard Deviation. Relative dispersion: coefficient of variation.
3. Normal distribution curve.
4. Sampling : Theory of sampling, Methods of sampling, Sampling distribution and standard error.

Section-B

5. Bivariate Analysis: Scatter diagram, correlation analysis, spearman's rank correlation and Karl Pearson's correlation coefficient. Test of significance.
6. Simple Linear Regression Model: properties of least square estimate. Coefficient of determination.
7. Residual and their mapping.
8. Multivariate Analysis: Correlation Matrix, partial and multiple correlation.
9. Basics of Multiple Regression.

References:-

1. Aslam Mahmood : Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi, 1993.
2. Saroj K. Paul : Statistics for Geoscientists : Techniques and Applications, Concept Publishing Company, New Delhi, 1998.
3. C. B. Gupta : An Introduction to Statistical Methods, Vikas Publishing House, Delhi, 1974.
4. S. Gregory, : Statistical Methods and the Geographers, Longman, London, 1964.
5. A. Reza Hoshmand (second edition), : Statistical Methods for Environmental and Agricultural Sciences, CRC Press, New York, 1998.
6. R. J. Johnston : Multivariate Statistical Analysis in Geography, Longman Scientific and Technical, John Wiley & Sons, 1989 (4th edition).

Cartographic Methods in Geography(Practical)

1. Climate diagrams and maps :
 - Line and bar graph
 - Poly graph
 - Rainfall deviation diagram
 - Climograph (Taylor and Foster's)
 - Hyther graph
 - Isoleth Isohyets
 - Wind rose diagram

2. Diagrams : Types and properties of diagrams:
 - One dimensional diagram - Bar diagram : Simple bar, multiple bar, comparative bar
 - Two dimensional diagram- pie diagram proportional circle, rectangle, square.
 - Three dimensional diagram- Sphere, cube, curbsi

3. Distribution maps and diagrams
 - Dot method
 - Choropleth – monovariate and bivariate

4. Miscellaneous diagrams and graphs
 - Trend graph
 - Age and Sex pyramid
 - Flow diagram and cartogram

5. Qualitative Techniques
 - Chorochromatic
 - Choroschematic

References:

1. Monkhouse, F.J., and Wikinson, H.R. : Maps and diagrams, B. I Publications put. Ltd.
2. Singh, R. L. : Elements of Practical Geography, Kalyani Publishers, New Delhi.

Geomorphology

Section-A

1. Definition, Nature and scope of Geomorphology.
2. Some fundamental concepts:
 - (i) Geological structure and landforms.
 - (ii) Uniformitarianism
 - (iii) Multicycle and polygenetic evolution of landscape
 - (iv) Thresholds in Geomorphology.
 - (v) Morphogenetic regions
3. Forces affecting the earth crust Endogenetic forces – sudden forces and movement, diastrophic forces and movements- folds nappes, faults, rift valley and graben and exogenetic forces.
4. Continental Drifting Theory and its basic consideration. Theory of plate Tectonic tectonic cycle, plate boundaries, seismicity and volcanism.

Section-B

5. Weathering : Causes; types of weathering: Physical weathering; chemical weathering and biological weathering.
6. Mass movement, causes, classifications and types of mass movements- slow and rapid mass movements.
7. Processes and their landforms :
 - (i) Fluvial
 - (ii) Glacial and Periglacial
 - (iii) Aeolian
 - (iv) Karst (under groundwater)

References :-

1. Embleton, C. Thomne. J. (eds) 1979. Process in Geomorphology. London, Edward Arnold.
2. Fourbridge, R. W. (Ed) 1968 Encyclopedia of Geomorphology, New York, John Wiley & Sons.
3. Ritter D. F. Kochel, R. C. and Miller J. R., 1995, Process Geomorphology. Dubuque, Win C. Brown Publishers (3rd Edn)
4. Thornbury, W. D. 1969, Principle of Geomorphology, New York, John Wiley & Sons.
5. Sparks B. W. Geomorphology, Longman, London, 1960.
6. Sharma, H. S. (ed) Perspectives in Geomorphology, concept, New Delhi, 1980.
7. Singh, Savinder. Geomorphology, Prayag Publication, Allahabad, 1998.
8. Singh, Savinder, Physical Geography Prayag Publication, Allahabad, 1994.
9. Bloom. Geomorphology : A systematic Analysis of late canozic landforms.

Population Geography

Section-A

1. Nature and Scope of Population Geography.
2. Methodological problems in population geography.
3. Sources of population data: quality and reliability of data; Problems of mapping population data.
4. Concepts, determinants and world patterns of the following attributes of population:

Distribution and density

Vital rates: birth and death rates

Migration (including laws of migration)

Growth

Age and Sex Composition

Occupation

Section-B

5. Demographic Transition Model
6. Population Resource Regions
7. Theories of population: Malthus, Ricardo and Marx
8. Population policy of India
9. A comparative study of population problems and policies of developed and less developed countries.
10. Population and Environment : Implications for the future

Suggested Readings:

1. Beaujeu, Garnier, J. (1966) Geography of Population, Longman, London.
2. Brooks, S. (1977) : The World Population Today (Ethnodemographic Process), USSR Academy of Sciences, Moscow.
3. Cassen, Robert & Bates, Lisa M. (1994) : Population Policy : A New Consensus Overseas Development Council, Washington, D.C.
4. Chandna, R. C. (1997) : Jansankhya Bhugol, Kalyani Publishers, New Delhi.
5. Chandna, R. C. (1998) : Population, Publishers, New Delhi.
6. Chandna, R. C. (1998) : Environmental awareness, Publishers, New Delhi.
7. Chandna, R. C. (1998) : a Geography of Population : Concepts, Determinants and Patterns, Publishers, New Delhi.
8. Clarks, John, I. (1971) : Population Geography and the Developing Countries, Pergamon Press, New York.
9. Demko, G. J. and others (Eds.) (1971) : Population Geography, Reader, McGraw-Hill Books Co., New York
10. Jones, Huw, R. (1981) : A Population Geography, Harper and Row Publishers, London.
11. Petrov, V. (1985) : India: Spotlight of Population, Progress Publishers, Moscow.
12. Trewartha, G. T. (1972) : The Less Developed Realm-A Geography of its Population, John Wiley & Sons, Inc., New York.
13. Trewartha, G. T. (1978) : The More Developed Realm-A Geography of its Population Pergamon Press, New York.
14. Woods, R. (1979) : Population Analysis in Geography, Longman, London.

Regional Development and Planning with Special reference to India

Section-A

1. Growth and Development: Evolution, concept of development.
2. Regional Development, diversity and disparity.
3. Indices of measurement of Regional Development.
4. Theories of Regional Development : Growth Pole and Core-Periphery Model.
5. Regional Imbalances in India with Spatial reference to agricultural and industrial development .

Section -B

6. Regional Planning : Concept, sectoral versus spatial planning.
7. Planning Regions: definition, classification and delineation.
8. Approaches in Regional Planning.
9. Regional Planning in India through 5- year Plans.
10. Introduction to some Area Development Programmes in India : (i) Hill area development programme, (ii) Tribal area development programme, (iii) Integrated watershed development programme-Hariyali
11. Hierarchy in Regional Planning- Multi- level Planning in India.

References :-

1. Mahesh Chand and V. K. Puri ; Regional Planning in India, Allied Publishers, New Delhi, 1983.
2. Planning Commission of India: Eighth Five Year Plan (1992-97) Vol. I, Govt. of India, New Delhi.
3. K. V. Sundaram : Urban and Regional Planning in India, Vikas Publishing House, 1986, New Delhi
4. R. P. Mishra, (1988), Moonis Raza (ed) Regional Development Vol. 10, Contribution to Indian Geography Heritage Publishers, New Delhi.
5. A. Kundu and Moonis Raza (1988) : Indian Economy: The Regional Dimension, CSRD/SSS, JNU. New Delhi.
6. Meier, Leading Issues in Economics, Oxford.

Hydrology and Oceanography

Section-A

1. Introduction, hydrological cycle, water balance of oceans and continents.
2. Precipitation, evaporation, evapotranspiration, interception.
3. Groundwater : origin, movement, regime, aquifers parameters, saline and fresh water aquifers.
4. Rivers : river system and river basin, hydrograph and analysis of discharge data.
5. Estimation of water resources of a river basin.
6. Water resources of India.

Section-B

7. The nature and origin of oceanic environment.
8. Ocean bottom relief and deposits.
9. Composition of Oceanic water.
10. Fluctuations in sea level, waves, tides and oceanic currents.
11. Utilisation of marine resources fisheries and minerals.

Suggested Readings

1. Chorley, R. J. Water, Earth and Man, Methuen, London, 1969.
2. Dakshinamurthy and others, water resources of India and their utilisation in agriculture , IARI, New Delhi, 1973.
3. Rao, K.L. , India's Water Wealth, Orient Longman, New Delhi, 1975.
4. Ward, WC, Principles of Hydrology, McGraw Hill, New York, 1967
5. King CAM, Oceanography for geographers, 1962
6. Sharma and Vatal, Oceanography.

Interpretation of Toposheets and Morphometric Analysis (Practical)

1. Interpretation of toposheets : (a) Physical features and (b) Cultural features.
2. Transverse Profiles:
 - a) Serial Profiles
 - b) Superimposed Profiles
 - c) Composite Profiles
 - d) Projected Profiles
3. Longitudinal or valley Thalweg Profile.
4. Linear Properties of Streams :
 - a) Relationship between stream order and stream Number
 - b) Relationship between stream order and Average stream length.
5. Areal Properties of streams:
 - a) Drainage Frequency
 - b) Drainage Texture/Density
6. Morphometric Analysis
 - a) Area Height Curve
 - b) Hypsographic Curve
 - c) Hypsometric Integral Curve
 - d) Clinographic Curve
 - e) Wentworth's Method of Average Slope
 - f) G. H. Smith's Method of Relative Relief.

Suggested Readings:-

1. Manual of Photographic interpretation (1960), American Society of photogrammetry, The George Banta Co., Wisconsin.
2. Lilies, T. M. and Kiefer R. W. (1987), Remote Sensing and Image Interpretation, Jhon Wiley and Sons, New York.
3. Sabins, P. F., (1987), Remote Sensing, Freeman, New York.
4. Singh, R. L. (1986), Practical Geography, Kalyani Publications, Ludhiana.
5. Monkhouse, F. J. and Wilkinson (1980), Maps and Diagrams, B.I. Publications, New Delhi.
6. Miller, A., (1953), The Skin of the Earth, Methuen and Co., London. Dury, G. H. (ed.), (1966), Essays in Geomorphology, Heinmann, London.

Geography and Ecosystem

Section-A

1. Concept of Ecosystem; Types, Components and function of Ecosystem.
2. Energy flow in ecosystem: food chain, food web, trophic levels, ecological production and ecological pyramids.
3. Biogeochemical cycles: Hydrological, carbon, oxygen and nitrogen cycles
4. Biome: Scheme of Classification: Factor affecting the distribution of biomes
 - a. Tropical evergreen rain forest biome
 - b. Savana biome
 - c. Monsoon biome
 - d. Temperate biome
 - e. Marine biome
2. Ecosystem approach and its relevance in geography

Section-B

3. Man-environment relationship: Resource use and ecological imbalance with reference to soils, forests and energy resources
4. Biodiversity and conservation: preservation and conservation of ecosystem through resource management
5. Problems of Pollution: concept of air, water, and noise pollution, deforestation and soil erosion
6. Environment legislation: The Stockholm conference, the earth summit, Environmental laws in India (the Wild Life Act, Water Act, Forest Act, Environment Protection Act and National Environment Tribunal Act).

Suggested Readings

1. Ackerman, E.A., Geography as a Fundamental Research Discipline, University of Chicago Research Papers, 1958.
2. Agarwal, A. and Sen, S.: The Citizens Fifth Report. Centre for Science and Environment New Delhi 1999.
3. Bertalanffy, L. General Systems Theory, George Bragiller New York, 1958.
4. Bodkin, E.: Environmental Studies, Charles E. Merrill Pub Co., Columbus, Ohio, 1982.
5. Chandna, R.C.: Environmental awareness, Kalyani Publishers, New Delhi, 1998.
6. Chorley, R.J., Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.

7. Eyre, S.R. and Jones, G.R.J. (eds.), *Geography as Human Ecology*, Edward Arnold, London, 1966.
8. Kormondy, E.J.: *Concepts of Ecology*, Prentice Hall, 1989.
9. Manners, I.R. and Mikesell, M.W. (eds.), *Perspectives on Environment*, Commission on College Geography, Publ. No.13, Washington, D.C., 1974.
10. Nobel and Wright: *Environmental Science*, Prentice Hall, New York 1996.
11. Odum, E.P.: *Fundamentals of Ecology*, W.B. Saunders, Philadelphia, 1971.
12. Russwurm, L.H. and Sommerville, E.(eds.): *Man's Natural Environment- A systems Approach*, Duxbury, Massachusetts, 1985.
13. Sharma, H.S.: *Ranthambhore Sanctuary-Dilemma of Eco-development*, Concept, New Delhi, 2000.
14. Simmons, I.G.: *Ecology of Natural Resources*, Edward Arnold, London, 1981.
15. Singh, S.: *Environmental Geography*, Payag Publications, Allahabad, 1991.
16. Smith, R.L: *Man and his Environment: An Ecosystem Approach*, Harper & Row, London, 1992.
17. I.N.E.P.: *Global Environmental Outlook*, U.N. Pub, New York, 1998.
18. World Resources Institute: *World Resources, (Latest Report)* Washington D.C.
19. World Watch Institute: *State of the World, Latest Report)* Washington, D.C.

Field Methods in Geography (Socio-economic) (Theory)

Section-A (Theory)

1. Significance of Field work in Geography
2. Identification of Research Problems and Formulation of Research Design.
3. Types and Sources of Data
4. Preparation of Questionnaires

Section-B

5. Sample Design and Collection of
6. Collection of socio-economic data.
7. Retrieval and Analysis of Data
8. Format of Report Writing.

Report based on Socio-economic Field Survey

The students will have to write field report on the basis of fieldwork conducted by them.

Scheme of Evaluation

1. Report writing-25 marks
2. Viva voce on Report-15 marks.

Introduction to Remote Sensing (Theory)

Section A

1. Fundamentals of Remote Sensing: Historical development and relevance in Geography.
2. Basic Geometric Characteristics of Aerial Photographs: Projection, Tilt, Swing, Scale and Resolution.
3. Basics of Space-borne remote sensing: definition, principle and stages.
4. Characteristics of EMR, interaction with earth's surface and atmosphere.

Section B

5. Orbits, platforms and Sensors, with special reference to Indian Satellites.
6. Elements of Aerial Photo and usual image interpretation.
7. Introduction to Digital Image Processing.
8. Application of Remote Sensing in agriculture, urban human settlements, transport studies, landforms and landuse, and natural hazards.

Suggested Readings:

1. Avery T.E., and G.L. Berlin (1992): Fundamentals of Remote Sensing and Air Photo Interpretation, 514 Ed. Macmillan, New York, USA.
2. Campbell, J.B. (2002) Introduction to Remote Sensing, 3rd ed., Taylor & Francis, New York, USA.
3. Lillesand, Thomas M. and R. Kiffer (1994), Remote Sensing and Image Interpretation, 3rd edition, John Willy & sons, Inc New York, USA.
4. Sabins, F (1982): Remote Sensing Principles and Application, Freeman and Compere, New York, USA
5. Jensen, J.R. (2000), Remote Sensing of the Environment: An earth Resource Perspectives, Pearson Education Inc. India.
6. Aggarwal C.S. and P.K. Garg (2000). Remote Sensing, A.H. Wheeler & Co. Ltd, New Delhi.
7. Nag and Kudrat (2002), Remote Sensing and Image Interpretation, Concept Publishers, Delhi.
8. Meenakhi Kumar(2000), Text book on Remote Sensing; NCERT, New Delhi.
9. Banarjee, R.K.

Introduction to Remote Sensing (Practical)

Topics	Exercises
1. Identification of Flight Line	1
2. Determination of scale and height & aerial photographs	2
3. Interpretation of single vertical aerial photograph	1
4. Interpret & Stereopair of aerial photos	4
5. Reference system of IRS Satellite, Data product, dataform	1
6. Interpretation of MSS images	<u>4</u>
	Total= <u>12</u>

Geographical Thought

Section A

1. Classification of knowledge, Nature of Geography and its place among sciences
2. Nature of Geographic Knowledge during Ancient (Greek and Roman) and Medieval (Arab) periods
3. Foundation of Modern Geography-contributions of Varenus, Kant, Humboldt and Ritter.
4. Emergence of Geography as a study of (i) Physical Features (ii) Chorology (iii) Landscapes.
5. Concepts and dualism in Geography: Environmental Determinism and Possibilism, Areal Differentiation; Physical vs Human Geography, and Systematic vs Regional Geography

Section B

6. Quantitative Revolution-Emergence of Theoretical Geography
7. Positivist Explanations in Geography- Laws, theories models, inductive & deductive logic.
8. Behavioral and Humanistic Perspectives in Geography
9. Social Relevance in Geography- Welfare, Radical and Feminist Perspectives
10. Postmodernism and Geography.

Suggested Readings:

1. Dickinson, R E (1969), The Makers of Modern Geography, London.
2. Dikshit, RD (1997), Geographical Thought- A Contextual History of Ideas, Prentice Hall of India, New Delhi.
3. Harvey David (1989), Explanation in Geography, Edward Arnold, London.
4. Hartshorne, R (1959), Perspectives on the Nature of Geography, Rand MacNelly, Chicago.
5. James PE and Martin J Geoffrey (1972) All possible Worlds, John Wiley and Sons, New York.
6. Johnston, RJ (1983) Geography and Geographers, Edward Heinemann, London
7. Peet, Richard (1998) Modern Geographical Thought, Oxford, Blackwell Publishers.

Agricultural Geography

Section A

1. Definition Nature, scope and significance of agricultural geography: agricultural geography versus agricultural economics
2. Sources of agricultural data.
3. Approaches to the study of agricultural geography: commodity approach, systematic approach and regional approach
4. Origin and dispersal of agriculture.
5. Determinants of agricultural patterns: physical factors, technological factors and cultural factors
6. Surveys in agricultural Geography: land use Survey, land capability survey and land evaluation survey.

Section-B

7. Models in Agricultural Geography with special reference to Von Thunen Model, Diffusion Model and Input-Output Model.
8. Methods of regionalization of agriculture: Crop combinations; crop concentrations; crop diversification and degree of commercialization.
9. Agricultural Regions, concepts and techniques, Whittlesey's bases of agricultural regionalization, agricultural typology: its bases and methodology
10. Techniques of Measuring Regional imbalances in levels of agricultural productivity.
2. Green Revolution-Its impact and consequences.

Suggested Readings

1. Symons, Leslic (1967): Agricultural Geography, G. Bell and Sons, London.
2. Geoffrey, H.F.: (1970) Geography of Agriculture: Themes in Research, Practice Hall, N.J.
3. Morgon, W.B. and Munton, R.J.C.: (1971) Agricultural Geography Methuen, London.
4. Singh Jasbi and Dhillon S.S. (1994) Agricultural Geography, Tata Mc Graw Hill, New Delhi.
5. Husain, Majid (1996), Systemic Agricultural Geography Rawat Publications, Jaipur.
6. Tarrant, J.R. (1974) Agricultural Geography, Willey, New York.
7. Safi, Mohammad (2007) Agricultural Geography.
8. Singh Jasbir (1989) Agricultural Geography.

Fundamentals of Geographical Information Systems (Practical)

Theory

1. Definition of GIS, history, objectives and elements of GIS
2. Hardware and software requirements of GIS.
3. Conceptual models of spatial and non-spatial information.
4. Structure of spatial data: scanning, digitizing, error detection & correction, topology creation.
5. Application of GIS in Studies of land-use, land cover, urban management, real time mapping etc.

Practical Topics:

1. Data quality & sources of errors
 - i. nature & sources of geographical data.
 - ii. sources of errors in GIS database.
 - iii. data quality parameters.
2. Map scale and projections.
 - i. information on various scales.
 - ii. need of projection.
 - iii. spherical co-ordinate system.
 - iv. properties & map projections.
3. Preparation of vector database & maps: manual method of point, line & area entities.
4. Spatial Analysis. (Buffer)
5. Preparation of maps. (Chloropleth Technique and diagrams).
6. Integration of Remote Sensing Data into GIS

Suggested Reading

1. Ian Heywood, Sarah. C and Srinivas Raju (2006), An Introduction to GIS, Pearson Education, Delhi.
2. Prithvish Nag and Samita Sengupta (2007). GIS Concepts and Business opportunities, Concept publication, Delhi.
3. Jeffery Stare and John Estes (1990) Geographical Information Systems: An introduction, Prentice Hall.
4. Chrisman, Nicholas, (1997) Exploring GIS. John Wiley and Sons.
5. ESRI, (1997) Readings in: GIS at work in the Community.
6. ARC News, ESRI, Redlands, California.
7. GIS World, Inc, Fort Collins, Colorado