



SYLLABUS

2015-2016

BASTAR UNIVERSITY, JAGDALPUR

CHHATTISGARH

M.A./M. Sc. GEOGRAPHY
SEMESTER I (2015-16)

M. A. /M. Sc. Geography Semester I shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	I	Geomorphology	80	20	100
2.	II	Climatology	80	20	100
3.	III	Geographical Thought	80	20	100
4.	IV	Geography of India	80	20	100
5.	V	Practical-I : Advanced Cartography	---	---	100

1. The M. A. /M. Sc. Semester I examination in Geography shall consist of 500 marks.

There shall be four theory papers each of 100 marks and one practical of 100 marks as follows:

Paper I	Geomorphology
Paper II	Climatology
Paper III	Geographical Thought
Paper IV	Geography of India
Paper V	Practical-I: Advanced Cartography

2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examinations.
4. (a) In the practical examination the following shall be the allotment of time and marks.

(i)	Practical record	20%
(ii)	Lab work (up to three hours)	70%
(iii)	Viva on i. ii.	10%
- (b) The external and internal examiners shall jointly submit marks.
- (c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

PAPER –I (2015-16)

GEOMORPHOLOGY

- UNIT – I Nature and scope of Geomorphology; Fundamental concepts; Interior of the earth; Earth movement: epeirogenic and orogenic movements With reference to the evolution of the Himalaya: Forces of Crustal instability, Isostasy, Geosyncline, Plate tectonic, Mountain building, Earthquake and Vulcanicity.
- UNIT – II Exogenic processes: concept of gradation; Agents and processes of gradations: weathering, wasting and erosion, aggradations; Climatic Geomorphology and morphogenetic regions; slope evolution, Arid and Semi-Arid and Karst topography.
- UNIT – III Concept of Geomorphic cycle and its controversy; Dynamic of glacial and periglacial processes and resulting landforms, Complications of fluvial geomorphic cycle and resulting landforms.
- UNIT – IV Geological structure and landform: development of landscape and drainage on uniclinal, folded and domal structures and Erosion surfaces, Applied Geomorphology.

SUGGESTED READINGS:

1. Ahnmed, E.: Coastal Geomorphology of India.
2. Chorley, R.. J.: Spatial Analysis in Geomorphology, Methuen, London, 1972.
3. Cooke R.IJ. and Doornkamp, J.C. : Geomorphology in Environmental Management. An Introduction, Clarendon press, Oxford, 1974.
4. Dury, G.H.: The Face of the Earth, Penguin Hormondsworth 1959.
5. Fairbridge, R.W. Encyclopedia of Geomorphology, Reinholdts, New York, 1968.
6. Goudie, A.: The Nature of the Environment Oxford & Blackwell, London, 1993.
7. Garner, H.F. : The Origin of landscape- A Synthesis of Geomorphology, Oxford University Press. London, 1974.
8. Holms, A.: Principles of Physical Geology, Thomas Nelson, London.
9. Mitchell, C.W.: 'l'erra.ii'i Evaluation. Longman, London, 1973.
10. Oilier, C.D. : Weathering, Longman, London, 1979.
11. Pitty, A.F.: Introduction to Geomorphology, Methuen, London, 1971.
12. Stoddart, D.R. (ed.) : Process and Form in Geomorphology, Roulledge, New York, 1996.
13. Skinner, B.J. & Porter, S.C.: The Dynamic Earth John Wiley. New York, 1995.
14. Sparks, B.W. Geomorphology, Longman, London, 1960.
15. Sharma, H.S. (cd.): Perspective in Geomorphology, Concept, New Delhi, 1980.
16. Singh, S : Geomorphology, Prayag Publication, Allahabad, 1998.
17. Steers, J.A. : The Unstable Earth Methuen, London.
18. Thornbury, W.I.). Principles of Geomorphology, John Wiloy, New York, 1960.
19. Strahler, A.N.: Physical Geography, Willey, New York.
20. कौशिक, एस.डी. : भू-आकृति विज्ञान
21. नेगी, बी.एस. : भू-आकृति विज्ञान
22. दयाल परमेश्वर : भू-आकृति विज्ञान
23. यादव तथा रामसुरेश : भू-आकृति विज्ञान, ग्रनीय, कानपुर
24. सिंह, सविन्द्र के. भू-आकृति विज्ञान, शारदा पुस्तक भवन, इलाहाबाद

PAPER - II (2015-16)

CLIMATOLOGY

- UNIT – I Nature and scope of climatology and its relationship with meteorology; composition of atmosphere; Insolation, heat balance of the earth, stability and instability, green house effect, vertical and horizontal distribution of temperature.
- UNIT – II Jet stream; General circulation in the atmosphere; Acid rain; concept of air masses and Front. EL Nino and La Nina. Monsoon winds and cyclones.
- UNIT – III The application of general principles of elementary physical and synoptic meteorology to the study and classification of climate. Climatic classification of Koppen and Thornthwaite. Major climate of the world- tropical, temperate, desert and mountain climate.
- UNIT – IV Climatic changes during geological and historical times, evidences, possible causes, global warming, Applied climatology.

SUGGESTED READINGS:

1. Barry, R.G. and Chorley P..1.; Atmosphere, Weather and Climate, Roulledge, London and New York, 1998.
2. Critchfiedid, J.H. : General Climatology, Prentico Hall, India, New Delhi, 1993.
3. Das, P.K. : Monsoons 'National Book Trust, New Delhi, 1987.
4. Fein, J.S. and Slephens, P.N. : Monsons. Wiley Interscience, 1987.
5. India Met. Deptt : Climatologically Tables of Observatories in India, Govt. of India 1968.
6. Lal, D.S. : Climatology, Chaitanaya Publications, Allahabad, 1986.
7. Lydolph, P.H. : The Climate of the Earth, Rowiman, 1985.
8. Menon, P.A. : Our Weather, N.B.T., New Delhi, 1989.
9. Pelerson, S. : Introduction to Meteorology, Me G-r-aw Hill Book, London, 1969.
10. Robinson, P.J. and Henderson S. : Contemporary Climatology, Henlow, 1999.
11. Thompson, R.D. and Perry, A (ed.) : Applied Climatology, Principles and Practice. Raoutledge, London. 1997.
12. तिवारी अनिल कुमार : जलवायु विज्ञान, राजस्थान हिन्दी ग्रंथ अकादमी

PAPER – III (2015-16)

GEOGRAPHICAL THOUGHT

- UNIT – I The Field of geography, its place in the classification of science, geography as a social science, and natural science. Definition, scope and functions of geography; Geography as science of relationship, as science of areal differentiation, as spatial science, Spatial Organisation, Geography and environmentalism : forms of man-nature relationship and current view; Dualism in geography; Regional Concept.

UNIT – II The growth of geographical knowledge from earliest times up to the 15th century. Contributions of Greek and Roman thinkers. Arab Geographers and their contributions. Geographical information in Ancient Indian literature. The dark age in Geography. The Great Age of Maritime Discovery and Exploration.

Contributions of various schools of thought in modern Geography:

- | | |
|---------------------|------------------------------------|
| (i) German School | (ii) French School |
| (in) British School | (iv) American and Russian Schools. |

UNIT – III Scientific explanations: routes to scientific explanation (inductive/deductive); Type of explanation: cognitive description, cause and effect, temporal, functional/ecological, systems; Laws, theories and models in geography; Quantitative revolution and philosophy of positivism.

UNIT – IV Responses to positivism, behaviourism and humanistic, relevance movement and radical geography; Changing paradigms; Status of Indian Geography; Future of Geography.

SUGGESTED READINGS:

1. Abler, Ronald; Adams, John S. Gold, Peler : Spatial Organization : The Geographer's view of the world. Prentice Hall, N.J. 1971.
2. Ali S.M. : The Geography of Puranas, Peoples Publishing House, Delhi, .1968.
3. Amedeo, Douglas : An Introduction to Scientific Reasoning in Geography, John Wiley, U.S.A. 1971.
4. Dikshit, R.D. (ed.): The Art & Science of Geography Rand Me Nally & Co., 1959.
5. Hartshorne, R.: Perspectives on Nature of Geography Rand Me Nally & Co., 1959.
6. Husain, M. : Evolution of Geographic Thought, Rawat Pub., Jaipur, 1984.
7. Johnston, R.J.: Philosophy and Human Geography, Edward Arnold, London, 1983.
8. Johnston, R.J.: The Future of Geography, Methuen, London, 1988.
9. Minshull, R.: The Changing Nature of Geography, Hutchinson University Library, London, 1970.
10. Ali, S. M.- Arab Geography.
11. Taylor, G.: Geography in the 20th Century.
12. Dikshit, R.D.: Geographical Thought : A Contextual History of Ideas, Prentice Hall of India, New Delhi.
13. Harvey D. : Explanation in Geography.
14. सिंह उजागर : भौगोलिक चिन्तन का विकास
15. त्रिपाठी एवं बिरले : भौगोलिक चिंतन का विकास एवं विधितंत्र
16. कौशिक , एस.डी. : भौगोलिक विचारधाराओं का इतिहास एवं विधितंत्र
17. सिंह , जगदीश : भौगोलिक चिंतन का मूलधार.

PAPER – IV (2015-16)

GEOGRAPHY OF INDIA

- UNIT – I Physical and Biological elements in the Geography of India: Geological structure, relief, climate Drainage, vegetation and soils.
- UNIT – II Agriculture: Major characteristics and problems, Impact of infrastructural and institutional factors on agriculture. Important crops-wheat, rice, cotton, sugarcane, oil-seeds, tea and coffee, Agricultural regions. Green revolution, Agro-climatic regions.
- UNIT – III Sources of power: Coal; Petroleum, Natural gas. Hydroelectricity and Atomic energy. Mineral resources with special reference to iron ore, manganese and bauxite. Industrial development with special reference to iron and steel, cement, cotton, jute, sugar and paper industries; Industrial regions.
- UNIT – IV Regional division of India: Purpose and Methodology. Major schemes of regions of India: O.H.K. Spate and R.L. Singh. Physical and cultural geography of Chhattisgarh State.

SUGGESTED READINGS:

1. Centre for Science & Environment (1988) State of India's Environment, New Delhi.
2. Desphande C.D. India. : a Regional Interpretation ICSSR & Northern Book Centre 1992.
3. Dreza, Jean & AMartya. Sen (ed.) India Economic Development and Social opportunity Oxford University Person, New Delhi. 1996.
4. Kundu A. Raza Moonis : Indian Economy : the Regional Dimension Speclaum Publishers, New Delhi, 1992.
5. Robinson, Francs : The Cambridge Encyclopedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives Cambridge University Press, London, 1989.
6. Singh R.L. (ed.) : India - A Regional Geography National Geographical Society, India Varanasi, 1971.
7. Spale OHK & ATA Learnont-India & Pakistan Methuen, London. 1967.
8. Tirtha R. & Gopal Krishna, Emerging India Reprinted by Rawat Publications, Jaipur 1996.
9. Sharma T.C. and O. Coutinho : Economic and Commercial Geography of India.
10. अग्रवाल पी.सी. भारत का भौतिक भूगोल, एशिया प्रकाशन कं., रायपुर 2003
11. बंसल सुरेशचंद्र, भारत का भूगोल, मिनाक्षी प्रकाशन, मेरठ.
12. वर्मा रामविलास, भारत : एक भौगोलिक विवेचन, भवदीय प्रकाशन श्रृंगारघाट-अयोध्या, फैजाबाद, पिन –224123, 2007.

PAPER – V (2015-16)

PRACTICAL I - ADVANCED CARTOGRAPHY

Graphs and Diagrams: Triangular graph. Logarithmic and semi logarithmic graphs, scatter graphs; climatograph. Proportional circles, spheres and cubes.

Thematic Maps: Choropleth maps, isolines, Flow maps, isochrones and class intervals. Morphometric Analysis: Profiles, Slope Analysis; Altimetric, and Clinographic curves; Block Diagrams.

SUGGESTED READING:

1. Monk house F.J. & H.R. Wilkinson: Maps and Diagrams, Methuen, London.
2. मॉक हाउस तथा विल्किन्सन (अनु.प्रो.प्रेमचन्द अग्रवाल) : मानचित्र तथा आरेख, म.प्र. हिंदी ग्रंथ अकादमी.
3. हीरालाल : प्रायोगिक भूगोल.

M.A./M. Sc. GEOGRAPHY (2015-16)

SEMESTER – II

M. A. /M. Sc. Geography Semester II shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	VI	Economic and Natural Resource Management	80	20	100
2.	VII	Oceanography	80	20	100
3.	VIII	Regional Development and Planning	80	20	100
4.	IX	Social Geography	80	20	100
5.	X	Practical-II : Map Projections, Map Interpretation and Surveying	---	---	100

1. The M. A./M. Sc. Semester II examination in Geography shall consist of 500 marks.

There shall be four theory papers each of 100 marks and one practical of 100 marks as follows:

Paper VI	Economic and Natural Resource Management.
Paper VII	Oceanography
Paper VIII	Regional Development and Planning
Paper IX	Social Geography
Paper X	Practical-II : Map Projections, Interpretation and Surveying.

2. The theory papers shall be of three hours duration.

3. Candidates will be required to pass separately in theory and practical examinations.
4. (a) In the practical examination the following shall be the allotment of time and marks.
- | | |
|--------------------------------------|-----|
| (i) Practical record | 20% |
| (ii) Lab work (up to three hours) | 40% |
| (iii) Field work (up to three hours) | 30% |
| (iv) Viva on i, ii & iii above | 10% |
- (b) The external and internal examiners shall jointly submit marks.
- (c) Candidates shall be examined in survey individually. They will however be allowed to take the help of a labourer each at their own expense.
- (d) All the candidates shall present at the time of the practical examination their Practical record regularly signed by the teachers concerned.

PAPER- VI (2015-16)

ECONOMIC AND NATURAL RESOURCE MANAGEMENT

- UNIT – I Nature and scope of economic Geography; fundamental concepts in economic geography; classification of economies, sectors of economy (primary, secondary, tertiary). Meaning, nature and classification of resources, Resource appraisal : human want and social objective, technological status and resources. Appraisal of quality and quantity of human resources, relation between population and resource, natural resources and economic development, resource adequacy and scarcity, limits to growth. Resource use, concept of absolute and relative abundance of resources, optimum, under use, misuse and over use of resources.
- UNIT – II World pattern of major natural resources: land and soils, biotic resources, water resources mineral and energy resources, oceanic resources.
- UNIT – III Classification of Industries, Theories of industrial location; case studies of selected industries; Iron and Steel; Aluminium, Chemical, Textile. Means of transport, International trade, trade blocks, globalization and Indian economy.
- UNIT – IV Conservation and management of resources; evolution of the concept, principles, philosophy and approaches to conservation, resource conservation and management methods. Policy making and resource management; sustainable development of resources.

SUGGESTED READING:

- | | | |
|------------------------|---|---|
| Ahemd, Jaleel | - | Natural Resources in Low Income Contries. |
| Bennet, II.II. | - | Elements of Soil Conservation. |
| Ciriacy, Wantrup,S.V.& | - | Natural resources: Quality & Quantity |

Persons (eds.)	
Betall, R.C. & R.O. Buehanan	- Industrial Activity and Economic Geography.
Edvard and Rosers	- Agricultural Resources.
Freeman, T.W.	- Geography and Planning.
Fryer, D.M.	- World Economic Development.
Isard, Walter	- Method of Regional Analysis.
Mehta, M.M.	- Human Resource Development Planning.
Owen, O.S.	- Natural Resource Conservation.
Peach, W.N. & James, A.	- Zimmerman's World Resources Contenting and Conservation.
Parkin's, E.A. & J.R. Whitakr	- Our Natural Resource and their conservation.
Renner, G.T.	- Conservation of National Recourses.
Stamp, L.D.	- Land of Britain Its use and Misue.
Smith, G.H. (ed.)	- Conservation. of Natural Recourses.
Symoos, L.	- Agriculture Geography.
Thomas W.L. (et.al. reds.)	- Man's Role in Changing the face of the Earth.
Wales, H. & H.O. Lathrop	- The Conservation of Natural Recourses.
Wheeler, T.O. et al	- Economic Geography, John Wiler New York 1995.

PAPER – VII (2015-16)

OCEANOGRAPHY

- UNIT – I Nature and scope of Oceanography; Distribution of land and water; Major features of ocean basins; Marine sediments. Physical and chemical properties of sea water.
- UNIT – II Interlink between atmospheric circulation and circulation pattern in the oceans, surface currents, themohaline, waves and tides.
- UNIT – III Marine biological environment : Bio geochemical cycle in the ocean. biozones, types of organisms; plankton, nekton and benthos, food and mineral resources of the sea. Major marine environments; coastal : esturary, deltas, barrier island, rocky coasts : Open : reefs, continental shelf, continental slope and deep : Pelagic environment and floor of the ocean basins.
- UNIT – IV Impact of Humans on the marine environment. Law of the sea; exclusive economic zone; marine deposits and formation of coral-reefs.

SUGGESTED READINGS:

1. Davis Rechard J.A. : "Oceanography-An Introduction to the Marine Environment". Wm. C. Brown Iowa, 1986.
2. Duxbury, C.A. and Duxbury B. : An Introduction to the world's Oceans-C. Brown. Iowa 2nd ed., 1986.
3. Garrison, T. : "Oceanography - An Introduction to Marine Science" Books/Cole, Pacific Grove, USA, 2001.
4. Gross, M. Grant : Oceanography, a View of the earth, prantice-Hall inc, New Delhi, 1987.

5. King C.A.M. Oceanography for Geographers 1962.
6. Sharma, R. C. "The Oceans" Rajesh N. Delhi, 1985.
7. Urnmerkutty, A.N.P. Science of the Eceans and Human life, NBT, New Delhi, 1985.
8. Ornmany, F.D. : The Ocean.
9. Sharma, R. C. & M. Vital : Oceanography : A Brief Introduction kislaya Pub. New Delhi.
10. Siddartha, K.. : Oceanography : A Brief Introduction, Kislya Pub. New Delhi.
11. नेगी, बी.एस. : जलवायु तथा समुद्र विज्ञान.

PAPER – VIII (2015-16)

REGIONAL DEVELOPMENT AND PLANNING

- UNIT – I Regional Planning: Definition, Scope, evolution and Objectives. Region and Regionalism, Planning Regions: Concept and Delineation. Type of Regions. Spatial organisation: Central Place Theory, Concept of core and periphery Friedmann's Model of Spatial Organisation and Economic Growth.
- UNIT – II Regional Development Theories: Development Theories of Myrdal and Hirschman, Economic and Export Base model, Frank's Theory of Under development.
- UNIT – III Approaches and Strategies of Regional Development: Growth Pole Theory Agropolitan Development, Community Development, River Basin Planning, Metropolitan Planning (with reference to India)
- UNIT – IV Regional Planning in India. Regional Imbalances and Inequalities, Indicators of Regional Development; Regional Policies in Five Year Plans, Centre State Relations and Multilevel Planning, Planning for special problem Regions: Hill area, Tribal areas, Drought prone areas, Command areas and River basins. Regional development and planning in India.

SUGGESTED READING:

1. Daysch, C.H.J. & others: Studies in Regional Planning.
2. Deckinsonm R.E. : City Region and Regionalism.
3. Freeman, E.W. : Geography arid Planning.
4. Golksin A. : Regional Planning and Development.
5. Keeble, L. : Principle and Practice of Town and Country Planning.
6. Stamp L.D. : The Land of Britain : Its use and Misure.
7. Sdasyuk. Gatina and Dengupta, P. : Economic Regionalization of India problems and Approaches.
8. Desai, P.B. & others : Regional Perspective of Industrial and Urban Growth the case of Kanpur, Bombay, 1969.
9. Prakash, Rao V.L. & S.P. : Regional Planning.
10. Censuts of India : Economic and Socio Cultural Dimensions of regionalization (An Indo-USSR Collaborative Study)
11. Friedmann J. & Alonsow : Regional Development and Planning, M.I.T. Press.
12. Misra R.P. (ed.) : Regional Planning : Concept; Techniques, Policies and cade studies Mysore 1969.
13. Misra, R.P. & others : Regional Development and Planning in India.
14. Timbergen : Essays on World Regional Planning.

15. Lord, W. : Methods of Regional Analysis, M.I.T., 1960.
16. Zimmerinan, E.W. : World Resources and Industries.
17. Burton & Kates : Reading in Resource Management Conservation.
18. Burton & Kates : Regional Planning in India.
19. Ahamed, Enayet : Regional Planning with particular Reference to India. Vol. I and li New Delhi.
20. Bhatt L.S. and others: Micro level planning - A Case Study of Karnal Area, Hyryana (K.B. Publishing, New Delhi)
21. Bhatt LS : Regional Planning in India, Statistical Publishing Society, Calcutta, 1973.
22. Gosal GS, and G. Krishanan : Regional Disparities in levels of Socio-economic Development in Punjab, Vishal Publications Kurukshetra, 1984.
23. Chandna, R.C. : Regional Planning : A comprehensive Text-Kajyani Publishers.
24. Ray Choudhari, Jayasri : An Introduction to Development and Regional Planning Orient Longman.
25. Sundaram, KV (ed) Geography and Plann8ing, Essaya in houour of VLS Prakasa Rao, Concept Publishing Co., New Delhi, 1985.
26. Raza, Meomis (ed) Regional Development, Hefitage Publishiers, Delhi, 1988.
27. Mishra R.P. et al : Multilevel Planning, Heritage Phulishers Delhi,1980
28. श्रीवास्तव व्ही.के. एवं अन्य : प्रादेशिक नियोजन एवं संतुलित विकास.
29. ओझा, रघुनाथ : प्रादेशिक नियोजन का भूगोल.
30. शर्मा, राजीवलोचन : प्रादेशिक एवं नगरीय नियोजन.
31. चन्द्राकर, इन्द्रमण : व्यावहारिक भूगोल, वसुन्धरा प्रकाशन, गोरखपुर, 1998.

PAPER – IX (2015-16)

SOCIAL GEOGRAPHY

- | | |
|------------|---|
| UNIT – I | Definition, meaning and scope of Social geography and it's Nature and relationship with other Social sciences. Development of Social Geography, Approaches to the study of Social Geography. |
| UNIT – II | Concept of Society – Social Environment, Geographic bases of Social Formation. Social Geography of India - Social Stratification, Caste and Class. Social organization and groups, Social transformation and change in India, Religion and linguistic group of India. Evolution of Socio-Cultural Regions of India. |
| UNIT – III | Social well- being– meaning and indicators of Social well- being. Quality of life, Human Development, Measurement of Human Development with Social, Economical and Environmental indicators, Pattern and bases of rural and urban society. Deprivation and discrimination issues relating to women and under privileged groups. Cultural Realms and Cultural Region of the World. |
| UNIT – IV | Social development planning – meaning and importance. Public policy and Social planning in India : Review of Five year Plans strategies to improve Social well being in tribal, hill, drought and flood prone Areas. |

SUGGESTED READINGS:

- 1 Ahmad Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999.
- 2 De Blij. H.D. Human Geography. John Wiley and son, New York.
- 3 Dreze Jean, Amariya Sen, Economic Development and Social opportunity. Oxford University Press. New Delhi. 1996
- 4 Dubey. S.C : Indian Society. National Book Trust, New Delhi, 1991.
- 5 Gregory. D . and J. Larry (Eds.) Social. relations and spatial structures. MCMillan. 1985.
- 6 Haq. Mahbubul : Reflections on Human Development. Oxford University Press, New Delh6.
- 7 Jones, Emrys, Reading in Social Geography, Oxford University Press, Ely House, London, 1977.
- 8 Jones, Emrys and John Eyles, An Introduction to Social Geography, Oxford University Press, London, 1977.
- 9 Maione. Clarence: People of South Asia, Winston, New York, 1974.
- 10 Planning Commission, Government of India: Report on Development of Tribal areas, 1981.
- 11 Rao, M.S.A.. Urban Sociology in India, Orient Longman, 1970.
- 12 Schwartzberg Joseph : An Historical Atlas of South Asia, University of Chicago Press, (Chicago, 1978.
- 13 Sen, Amartya & Dreze Jean. Indian Development : Selected Regional Perspectives. Oxford University Press, 1996
- 14 Smith, David: Geography : A welfare Approach, Edward Arnold, London, 1977.
- 15 Sopher, David. An Exploration of India, Cornell University Press, 1980.
- 16 Subba. Rao. Personality of India : Pre and Proto Historic foundation of India and Pakistan, M.S. University Baroda. Vadodai'a, 1958
- 17 मौर्य, एस.डी., सामाजिक भूगोल शारदा पुस्तक भवन, 11, युनिवर्सिटी रोड, इलाहाबाद-2 , 2004.

PAPER – X (2015-16)

PRACTICAL II- MAP PROJECTIONS, INTERPRETATION AND SURVEYING

Map Projections: Mathematical construction of world projections.

Interpretation of Maps: Geological Maps.

Principles and methods of topographical surveying involving the use of Theodolite and Dumpy level. Solution of problems in Surveying.

Topographical Information – International series, South east Asia Series, Indexing, Classification & Interpretation of topographical sheets.

SUGGESTED READINGS:

1. Davis, R. C. & E. S. Forte : Surveying : Theory and Practical.
2. Kanetkar, T.R. & S.V. Kulkarni: Surveying and leveling part I & II A.V.G. Prakashan, Poona.

3. Monkhouse F.J. & H.R. Wilkinson: Maps and Diagrams, Methuen, London.
4. मॉक हाउस तथा विलकौन्सन (अनु.प्रो.प्रेमचन्द अग्रवाल) : मानचित्र तथा आरेख, म.प्र. हिंदी ग्रंथ अकादमी.
5. हीरालाल : प्रयोगिक भूगोल.

**M.A./M. Sc. GEOGRAPHY
SEMESTER III (2015-16)**

M.A./M. Sc. Geography Semester III shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Inte. Asse.	Total
1.	XI	Population Geography	80	20	100
2.	X II	Settlement Geography	80	20	100
3.	XIII (A)	Remote Sensing Techniques	80	20	100
	OR	OR			
4.	XIII (B)	Biogeography and Ecosystem	80	20	100
5.	IV	Research Methodology	80	20	100
	V	Practical-III : Remote Sensing and Quantitative Techniques	---	---	100

1. The M.A. /M. Sc. Semester III examination in Geography shall consist of 500 marks.

There shall be four theory papers each of 100 marks and one practical of 100 marks as follows:

Paper XI : Population Geography

Paper XII : Settlement Geography

Paper XIII (A) : Remote Sensing Techniques

OR

Paper XIII (B) : Biogeography and Ecosystem

Paper XIV : Research Methodology

Paper XV : Practical – III: Remote Sensing and Quantitative Techniques

2. The theory papers shall be of three hours duration.
3. Candidates will be required to pass separately in theory and practical examinations.
4. (a) In the practical examination the following shall be the allotment of time and marks.

(i) Practical record : 20%

- (ii) Lab work (up to Four hours) : 70%
- (iii) Viva on i.& ii. Above : 10%
- (b) The external and internal examiners shall jointly submit marks.
- (c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

SEMESTER – III (2015-16)

PAPER - XI

POPULATION GEOGRAPHY

- UNIT – I** Definition and scope of Population Geography. Relation of Population Geography with other subjects of social sciences. Historical development of Population Geography in western countries and in India. Sources of population data, Census and its history.
- UNIT – II** Distribution of Population: The concept of population density and its types. Factors affecting population distribution. Distribution & Density of population in the world with special reference to Europe, Asia and India. Growth of population: Measure of decennial and annual rates of population growth, prehistoric and modern trends of population growth in the world. Regional aspect of population growth in India. Population theories. Demographic transition.
- UNIT – III** Population composition in terms of age and sex, rural, urban residence, educational status and occupational structure. Significance of these elements in population analysis, factors affecting their composition in population, broad world patterns and detailed spatial patterns in India. Fertility and Mortality of population: Significance and factor. Indices and rates. World pattern and pattern in India.
- UNIT – IV** Migration of population: Causes, characteristics and types. Methods of estimating value of internal migration. Important international migrations of the world, internal migration in India: Population and Resources: Population-Resource regions. Population Regions: Concept and methods, population regions of India, population policies of India.

SUGGESTED READINGS:

1. Bilasboruw, Richard Ii and Daniel Hogan, Population and Deforestation in the Humid Eropics, International Union for the Scientific Study of Population, Belgium 1999.
2. Boglia, D.J. Principles in Demography, John Wiley, New York 1969.

3. Bose, Ashish et al. : Population in India's Development (1947-2000); Vikas Publishing House, New Delhi, 1974.
4. Census of India, India : A State Profile, 1991.
5. Chandna, R. C. Geography of Population, Concept, Determinants and Patterns. Kalyani Publishers, New York, 2000.
6. Clarke, John I. Population Geography, Pergamon Press, Oxford, 1973.
7. Crook, Nigel Principles of Population and Development Pergamon Press. New York 1997.
8. Daugherty, Helen Gin, Kenneth C.W. Kammeyir, An Introduction to Population (Second Edition), The Guilford Press, New York, London, 1998.
9. Garnier, B.J. Geography of population Longman, London. 1970.
10. Koclihar, Rakesh, The Veclic People : Their History and Geography Orient Longman Ltd., New Delhi, 2000.'
11. Mamoria, C.B. India's Population Problem, Kitab Mahal New Delhi, 1981.
12. Mjitra, Ashok India's Population : Aspects of Quality and (control Vol I & II. Abhiman Publications, New Delhi, 1978.
13. Premi, M.K. India's Population : Heading Towards a Billion, B.R., Publishing Corporation 1991.
14. Srinivasan, K. and M. Vlassoff, Population Development Nexus in India :Challenges for the New Millennium Lata Me Graw-Hill, New Delhi, 2001.
15. Srinivasan K. Basic Demographic Techniques and Applications Sage, Publications, New Delhi, 1998.
16. Sundaaram K. V. and Sudesh Nangia., (ed.) Population Geography, Henlage Publications, Delhi, 1986.
17. UNDP : Human Development Report, Oxford University Press, Oxford, 2000.
18. United Nations, Methods for Projections of urban and Rural Population No. VIII, New York, 1974.
19. Woods R.. Population Analysis' in Geography Longman, London, 1979.
20. Zeiinsky Wilbur, A Prologue to Population Geography, Prentice Hall, 1966.
21. बघेल, अनुसुइया : अनुसूचित जातियों एवं अनुसूचित जनजातियों में प्रजननता प्रतिरूप : छत्तीसगढ़ राज्य के रायपुर संभाग के विशेष संदर्भ में', पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर, 2002.
22. बघेल, अनुसुइया : शिशु मर्त्यता : सिंघई पब्लिशर्स एण्ड डिस्ट्रीब्यूटर, रायपुर, 2004.
23. शर्मा, सरला : औद्योगिक नगरों में जनसंख्या आप्रवास (भिलाई एवं कोरबा नगर के विशेष संदर्भ में), पं. रविशंकर शुक्ल विश्वविद्यालय, रायपुर, 2002.
24. शर्मा, सरला : छत्तीसगढ़ बेसिन में ग्रामीण शिशु मर्त्यता प्रतिरूप.
25. पंडा, बी.पी. : जनसंख्या भूगोल.
26. ओझा, रघुनाथ : जनसंख्या भूगोल.
27. हीरालाल : जनसंख्या भूगोल.
28. चन्दना, आर.सी. : जनसंख्या भूगोल.
29. त्रिपाठी, रामदेव : जनसंख्या भूगोल.

SEMESTER – III (2015-16)

PAPER - XII SETTLEMENT GEOGRAPHY

- UNIT – I Meaning, Objectives and Scope of Settlement Geography; Evolution, Distribution, Types and Patterns of Rural Settlements; Rural House Types; Rural Service Centers.
- UNIT – II Evolution and growth of urban settlements; The Geographical setting of Urban Centers: Site, Situation and Location.
- UNIT – III Rank- size-relationship; Cities as Central Places, Central Place Theory, Growth Centre Theory.
- UNIT – IV City- Country Relationship : Umland, Rural-Urban Fringe.

SUGGESTED READINGS:

1. Abercrombee, Sir P. : Town and Country planning 1961.
2. Alani, Shah Manzoor : Hyderabad Secuidrabad (Twin Cities) A. study in urban geography)
3. Alam, S.M. & V.V. Tokshishevesky : Urbanization in developing countries.
4. Berry Brain .I. L. : Geographic Prospective on Urban .Systems.
5. Bresse, C. & D.F. Whiteman : An approach to Urban Planning
6. Dickinson, R.E, : City, Religion and Regionalism.
7. Gallion and Fisher : The Urban Pattern.
8. Grifitth, , J.P : A study of Urban constructions in India.
9. Gibbs : Urban Research Methods.
10. Mayor, H.M. & (.,'1". Kohn : Readings in Urban Geography.
11. Morgan, F.W. : Ports and Harbours.
12. Mumford L. : Culture of cities.
13. Robson, W.A. : Great cities of world.
14. Robson, B.T. : Urban Growth : An approach, Methuen, London.
15. Carter, Harold : Study of Urban Geography, London, Edward Arnold, 1979.
16. Singh R.I., & K.N. Singh : Readings in Rural Settlement Geography, NGSI Varanasi, 1975.
17. सिंह, उजागिर : नगरीय भूगोल ।

SEMESTER – III (2015-16)

PAPER – XIII (A) REMOTE SENSING TECHNIQUES

- UNIT – I Historical development of remote sensing as a technology - Relevance of remote sensing in Geography - Concepts and basics: Energy source, energy and radiation principles, energy interactions in the atmosphere and earth surface features, remote sensing systems: platform sensors and radiation records. Microwave sensing interpretation of SLAR imageries, thermal imageries.

- UNIT – II Remote Sensing Satellite: platforms LANDSAT, SPOT, NOAA, RADARSAT, IRS, INSAT: principles and geometry of scanners and CCD arrays, orbital characteristics and data products - MSS, TM, LISS I & II, SPOTPLA & MLA, SLAR.
- UNIT – III Image Processing: Types of imagery, techniques of visual interpretation, ground verification transfer of interpreted thematic information to base maps-digital processing: rectification and restoration, image enhancement - contrast manipulation, Classification: Supervised and Unsupervised, post-classification analysis and accuracy assessment.
- UNIT – IV Applications : Air photo and image interpretations arid mapping land use and land cover, land evaluation, urban land use, landform and its processes, weather studies and studies of water resources : integration of Remote Sensing and GIS. Remote sensing and hazard management, remote sensing and environmental management.

SUGGESTED READINGS:

1. American Society of Photogrammetry: Manual of Remote Sensing. ASP, Falls Church V.A., 1983.
2. Barrett E.C. and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation on, Memillan, New York, 1992.
3. Compbell J.: Introduction to Remote Sension, Guilford, New York, 1989.
4. Curran, Paul J.: Principles of Remote Sensing. Longman, London, 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Date, Academic, New York, 1983.
6. Luder D., Aerial Photography Interpretation: Principles and Application, CcGraw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
8. Rao D. P. (eds.): Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hederabad, 1998.
9. Thomas M. Lollesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, Wiley & sons, New York, 1994.
10. Aronoff S. Geographic Information Systems : A. Management Perspective, Publication Offiawa, 1989.
11. Burrough P.A. Principles of Geographic Information Systems for Land Reson Assessment Oxford University Press, New York, 1986.
12. Fraser Taylor D.R. Geographic information Systems. Pergamor Press, Oxford 1990.
13. Maquire D.J.M.F. Goodchild and D.W. Rhind (eds.). Geographic information System 'Principles arid Application. Taylor & Francis, Washingron, 1991.
14. Mark S. Monmonier. Computer - assisted Cartography, Prentice-Hall, Englewood Cliff, Jersey, 1982.
15. Peuquet D. .1. and D.F.- Marble, Introductory Reading in Geographic. Information System Taylor & Francis, Washington, 1990.
16. Star J. and J. Estes, Geographic Information Systems : An Introduction, Prentice Englewood Cliff, New Jersey, 1994.
17. चौनियाल, देवी दत्त : सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली.

PAPER – XIII (B) (2015-16)

BIOGEOGRAPHY AND ECOSYSTEM

- UNIT – I Definition and scope of Biogeography Environment, Habitat and Plant-animal association, Biome Types.
- UNIT – II Elements of plant geography, distribution of forests and major communities. Plant successions in newly formed land forms. Zoogeography and its Environmental Relationship. Pale botanical and Palaeo climatological records of environmental change.
- UNIT – III Ecosystems: concept and components, Ecosystem-form and function: tropic level, ecological pyramids, ecological niche, energy and nutrients in the ecosystem, hydrological cycle, food chains and food webs. Major terrestrial ecosystems of the world : agriculture, forests, grassland and desert. Population growth and environment.
- UNIT – IV Biodiversity and its Conservation. Preservation and conservation of the ecosystem through resource management, 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. Agrawal D.P. : Man and Environment in India through Ages, Book & Books, 1992.
2. Bradshaw, M.J. : Earth and Living Planet, ELBS. London, 1979.
3. Cox, C.D. and Moore, P.D. : Biogeography : An Ecological and Evolutionary Approach 5th edn. Blackwell, 1993.
4. Gaur, R. : Environment and Ecology of Early Man in Northern India R. B. Publication Corporation 1987.
5. Hoyt, J.B. Man and the Earth, Prentice Hall, U.S.A. 1992.
6. Huggett. R.J. : Fundamentals of Biogeography, Routledge, U.S. A. 1998.
7. Illes, J. : Introduction to Zoogeography, Mcmillan, London, 1974.
8. Khoshoo, T. N. and Sharma. M. (eds) : Indian Geosphere-Biosphere Har-Anand Publication, Delhi 1991
9. Lapedes, D.N.(ed) : Encyclopedia of Environmental Science, McGraw Hill, 1974.
10. Mathur H.S. : Essentials of Biogeography, Anuj Printers, Jaipur, 1998.
11. Pears, N. : Basic Biogeography, 2nd edn. Longman, London, 1985.
12. Simmons, I.G. Biogeography, Natural and Cultural, Longman, London, 1974.
13. Tivy J. : Biogeography: A Study of Plants in Ecosphere 3rd edn. Oliver and Boyd, U.S. A., 1992.
14. Ackerman, E.A. : Geography as a Fundamental Research Discipline, University of Chicago Research Papers, 1958
15. Agarwal, A. and Narain, S. : The Citizens Fifth Report. Centre for Science and Environmental, New Delhi, 1999.
16. Bertalanffy, L. : General Systems Theory, George Bragiller, New York, 1958.
17. Bodkin, E. : Environmental studies, Charles E Merrill Pub. Co., Columbus, Ohio, 1982.
18. Chandana, R.C. : Environmental Awareness, Kalyani Publishers, New Delhi, 1958.
19. Chorley, R.J. : Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.
20. Eyre, S.R. and Jones, G.R.J. (eds) Geography as Human Ecology, Edwares Arnold, London, 1966.
21. Kormondy, E.J. : Concepts of Ecology, Prentice Hall, 1989.

22. Manners, I.R. and Mikesell, M.W. (eds.) Perspectives on Environment, Commission on College Geography, Publ. No. 13 Washington, D.C., 1974.
23. Nobel and Wright : Environmental Science, Prentice Hall, New York, 1996.
24. Odum, E.P.: Fundamentals of Ecology, W.B. Saunders, Philadelphia, 1971.
25. Russwurm, L.H. and Sommerville, E. (eds.) : Man's Natural Environment-A Systems Approach, Duxbury, Massachusetts, 1985.
26. Sharma, H.S. : Ranthambhore Sanctuary – Dilemma of Eco-development, Concept, New Delhi, 2000.
27. Simmons, I.G. : Ecology of Natural Resources, Edward Arnold, London, 1981.
28. Singh S. : Environmental Geography, Prayag Publications, Allahabad, 1991.
29. Smith, R.L. : Man and his Environment : An Ecosystem Approach, Harper & Row, London, 1992.
30. U.N.E.P. : Global Environmental Outlook, U.N. Pub. , New ork, 1998.
31. World Resources Institute : World Resoources, (Latest Report) Washington.
32. कुलश्रेष्ठ, कामता प्रसाद : जैव भूगोल

SEMESTER – III (2015-16)

PAPER - XIV RESEARCH METHODOLOGY

- UNIT – I Research Methodology-An Overview; Procedure of scientific Research, Defining Research Problem; Formulating Hypothesis; Research Design.
- UNIT – II Methods of Data Collection: Observation, Questionnaire, Schedule and Interview; Sampling: Sampling Methods, Size of Sample;
- UNIT – III Processing and Analysis of Data: Processing- Editing, Coding, Classification and Tabulation, Analysis – Measurement of Central Tendency, Dispersion, Correlation.
- UNIT – IV Preparation of Research Reports: Steps, Layout and Types of Reports

SUGGESTED READING:

- | | |
|--|--|
| 1. Selltitz, C.M. Jahoda, M. Deutsch and others. | Research Methods in Social Relations, Holt, . New York, 1961. |
| 2. Goode, W and P.K, Hatt | Methods in Social Research, Mc Graw Hill, .Tokyo, 1962. |
| 3. Harvey, David | . Explanation in Geography, Edward Arnold, London, 1971 |
| 4. Chorley, R.J. and P. Haggett (ed) | Models in Geography, Methuen, London, 1967. |
| 5. Minshull, R. | Introduction to Models in Geography. Longman London, 1975. |
| 6. Sheskin, I.M. | Survey Research for Geographers Scientific Publisher, Jodhpur, 1987. |
| 7. Kothari, C. R. | Research Methodology : Methods and Techniques, Wishwa Prakashan, 1994. |

- | | |
|------------------------------|---|
| 8. Misra H.N. and V.P. Singh | Research Methodology in Geography: Social, Spatial and Policy Dimensions, Rawat Publications New Delhi, 1998. |
| 9. Har Prasad | Research Methods and Techniques in Geography, Rawat Publications, New Delhi. 1992. |

SEMESTER – III (2015-16)

PAPER - XV

PRACTICAL -III

Remote Sensing, Interpretation of Topographical Sheets and Quantitative Techniques

1. **Principles of Photogrammetry:** - Air Photo- Stereo test, Orientation of stereo model under mirror stereoscope, Preparation of photo/line index and determination of photo scale, Use of parallax bar and determination of heights, Identification of features on aerial photo graph, Tracing of details from stereo pair, Interpretation of physical and cultural details, Preparation of Land use map pre field interpretation, Field visit for ground truthing.
2. **Remote Sensing:**– Study of satellite Image – Annotation Identification of features on FCC imageries, Tracing of details from satellite imageries, Basic Principles of Image interpretation, Interpretation of Physical and Cultural details and preparation of land use and land cover map using IRS Images. Pre field visit.
3. **Land use Processing System:-** Familiarization and startup procedure, Visualization of satellite image data, importing data, Creating a subset image, Identification of object on video display, Display of Histogram and image information, Image rectification and registration, Image to image registration, Image Enhancement techniques, Filtering techniques, Band Rationing, Principal component Analysis, Image classification.

Statistical Techniques:

Product moment and Rank Correlation Coefficients, Linear Regression.

Hypothesis Testing:

Chi-Square test, t-test & F test, Sampling Techniques, Point, Line and Area Sampling.

SUGGESTED READINGS:

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church V.A. 1983.
2. Barren E.C. and I...F. Clirtis : Fundamentals of Remote Sensing and Air Photo Interpretation 'on, Memillan, New York, 1992.

3. Conipbell .1. : Introduction to Remote Sension, Glinford, "New York, 1989.
4. Clirran, Paul J. : Principles of Remote Sensing. Longman, London, 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Date, Academic, New York,1983
6. Luder D., Aerial Photograpliy Interpretation : Principles and Application, Cc Graw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
8. Rao D. P.. (eds.) : Remote Sensing for Earth Resources, Association of Exploration Geophysicisi, Hederabad, 1998.
9. Thomas M. Lollesand and Ralph W. Keler, Remote Sensing and Image Interpretation, Wiley & sons. New York, 1994.
10. Aronoff S. Geographic Information Systems: A Management Perspective, Publication Offawa, 1989.
11. Burroligh P..A. Principles of Geographic Information Systems for Land Reson Assessment Oxford University Press, New York, 1986.
12. Fraser Taylor D.R. Geographic information Systems. Pergamor Press, Oxford 1990.
13. Maquire D.J.M.F. Goodchiln and D.W. Rhind (eds.). Geographic information System Principles and Application. Taylor& Francis, Washingron, 1991.
14. Mark S. Monrnonicr. Computer-assisted Cartography, Prentice Hall, Englewood Cliff, Jersey, 1982.
15. Peuquer D.J. and D.F. Marble, Introductory Reading in Geographic Information System Taylor & Francis, Washington, 1990.
16. Star J. and J. Estes, Geographic Information Systems; An Introduction, Prentice Eaglewood Cliff, New Jersey. 1994.

M.A./M. Sc. GEOGRAPHY
SEMESTER IV (2015-16)

M.A./M.Sc. Geography Semester IV shall consist the following papers:

S. No.	Paper	Title	M. M.		
			Written	Int. Ass.	Total
1.	XVI	Urban Geography	80	20	100
2.	X VII	Agricultural Geography	80	20	100
3.	XVIII (A)	Geographical Information System	80	20	100
	OR	OR			
4.	XVIII (B)	Environmental Geography	80	20	100
	XIX	Political Geography	80	20	100
5.	XX	Practical-IV:Geographical Information System and Quantitative Techniques	---	---	100

1. The M.A./M.Sc. Semester IV examination in Geography shall consist of 500 marks.

There shall be three theory papers and one Field Work report each of 100 marks and one practical of 100 marks as follows.

S. No.	Paper	Title
1.	XVI :	Urban Geography
2.	XVII :	Agricultural Geography
3.	XVIII (A) :	Geographical Information System
	OR	
	XVIII (B) :	Environmental Geography
4.	XIX :	Political Geography
5.	XX :	Practical-IV: Geographical Information system and Quantitative Techniques

2. The theory papers shall be of three hours duration.

3. Candidates will be required to pass separately in theory and practical examinations.

4. Candidates will be required to submit their Field Report in three copies in hard bound at least one hundred pages for Valuation.

5. (a) In the practical examination the following shall be the allotment of time and marks.

(i) Practical record	20%
(ii) Lab work (up to Four hours)	70%
(iii) Viva on i. & ii. above	10%

(b) The external and internal examiners shall jointly submit marks.

(c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

SEMESTER – IV (2015-16)

PAPER-XVI

URBAN GEOGRAPHY

UNIT – I	Definition, Objective and Scope of urban geography, General Nature of City Structure.
UNIT – II	Internal structure: Morphology and Land use. Theories of Urban Structure: The Concentric Zone Theory, the Sector Theory, the Multiple Nuclei Theory. Commercial Structure of Cities; The Central Business District (CBD),
UNIT – III	Centrifugal and Centripetal forces in Geography, Economic Base of Towns: Basic, Non-basic concept. Urban Functions: Functional Classification of Towns: Webb, Harris, and Nelson.
UNIT – IV	Contemporary Urban Issues: Urban renewal, Urban sprawl, Slums, Environmental Pollution, Urban Planning; Landuse Planning, Urban and Metropolitan Planning in India.

SUGGESTED READINGS:

1. Abercrombee, Sir P. : Town and Country planning 1961.
2. Alam, Shah Manzoor : Hyderabad Securdabad (Twin Cities) A. study in urban geography)
3. Alam, S.M. & V.V.Tokshishevesky : Urbanization in developing countries.
4. Berry Brain .1. L. : Geographic Prospectives on Urban .Systems.
5. Bresse, C. & D.F. Whiteman : An approach to Urban Planning
6. Dickinson, R.E, : City, Religion and Regionalism.
7. Gallion and Fisher : The Urban Pattern.
8. Grifitth, , J.P. : A study of Urban constructions in India.
9. Gibbs : Urban Research Methods.
10. Hall P. : Urban and Regional Planning, Rout ledge, London, 1992.
11. Kundu, A. : Urban Development and Urban Research in India, Khanna Publication, 1992.
12. Mayor, H.M. & Kohn : Readings in Urban Geography.
13. Morgan, F.W. : Ports and Harbours.
14. Mumford L. : Culture of cities.
15. Nangia Sudesh : Delhi Metropolitan Region ; A Study in Settlement Geography, Rajesh Publication, 1976.
16. Robson, W.A. : Great cities of world.
17. Robson, B.T.: Urban Growth : An approach, Methuen, London.
18. Smailes, A E : The Geography of Town, Hutchinson, London, 1953.
19. Tewari, Vinod K, Jay A : Indian Cities : Ecological
20. Weinstein, VLS Prakash Rao (editors) : Perspectives, Concept, 1986.
21. Carter, Harold: Study of Urban Geography, London, Edward Arnold, 1979.
22. Singh R.I., & K.N. Singh: Readings in Rural Settlement Geography, NGSI Varanasi, 1975.
23. सिंह, उजागर : नगरीय भूगोल.
24. करन, एम.पी. : नगरीय भूगोल.
25. बंसल सुरेश चन्द्र : नगरीय भूगोल.
26. सिंह, ओमप्रकाश : नगरीय भूगोल.
27. तिवारी आर.सी. : आधिवास भूगोल, प्रयाग पुस्तक भवन, इलाहाबाद, 1997.
28. करण एवं यादव : आधिवास भूगोल.
29. यादव रामसुरेश : अधिवास भूगोल

SEMESTER – IV (2015-16)

PAPER – XVII

AGRICULTURAL GEOGRAPHY

- UNIT – I Nature, scope, significance and development of agricultural geography. Approaches to the study of agricultural geography: Commodity, systematic and regional systems. Origin and dispersal of agriculture. Sources of agricultural data.
- UNIT – II Determinants of agricultural land use - Physical, economic, social, and technological Land holding and land tenure systems, Land reforms, land use Agriculture policy and planning. Selected agricultural concepts and their measurements; cropping pattern, crop concentration, intensity of

cropping, degree of commercialization, diversification and specialization, efficiency and productivity, crop combination regions and agricultural development.

UNIT – III Theories of agricultural location based on several multi-dimensioned factors:-Von Thunen's theory of agricultural location and its recent modifications; Whittlesey's classification of agricultural regions; land use and land capability.

UNIT – IV Contemporary Issues: Food, nutrition and hunger, food security, drought and food-security, food aid Programmes; role of irrigation, fertilizers, insecticides and pesticides, technological know-how. Employment in the agricultural sector: landless labourers, woman, children: occupational and agricultural activities.

SUGGESTED READINGS:

1. Bayliss Smith, IP.: The Ecology of Agricultural Systems. Cambridge University London, 1987.
2. Berry, B.J.L et. al. : The Geography of economic Systems. Prentice Hall, New York, 1976.
3. Brown, L.R. : The Changing World Food Prospects - The Nineties and Beyond, World Watch Institute, Washington D.C., 1990.
4. Dyson, T. : Population and Food - Global Trends and Future Prospects. Routledge. London, 1996.
5. Gregor, H.P. : Geography of Agriculture. Prentice Hall, New York, 1970.
6. Grigg, D.B. : The Agricultural Systems of the World. Cambridge University Press, New York 1974.
7. Hartshorn, T.N. and Alexander, J.W. : Economic Geography. Prentice Hall, New Delhi, 1988
8. Mannion, A.M. : Agriculture and Environment Change, John Wiley, London, 1995.
9. Morgan W.B. and Norton , R.J.C. : Agricultural Geography. Mathuen, London, 1971.
10. Morgan, W.B.:Agriculture in the Third World - A Spatial Analysis. Westview Boulder, 1978.
11. Sauer, C.O. : Agricultural Origins and Dispersals,. M.I.T. Press, Mass, U.S.A., 1988.
12. Singh, J. and Dhillon, S.S. : Agricultural Geography. Tata McGraw Hill' Pub.; Delhi, 1988.
13. Tarrant, J.R. : Agricultural Geography. Wiley, New York, 1974.

SEMESTER – IV (2015-16)

PAPER – XVIII (A)

GEOGRAPHICAL INFORMATION SYSTEM

- UNIT – I Spatial Science : Geography as a spatial science, maps and spatial information dynamics of spatial information, elements of information technology, Geographic objects and their relations definition and development of GIS, computer environment for GIS.
- UNIT – II Spatial Data: Elements of spatial data: data sources: Primary and secondary census and sample data, quality and error variations Raster and vector data structures, data conversion comparison of raster and vector data bases, methods of spatial interpolation – GIS data formats for the computer environment.
- UNIT – III GIS Technology: Coordinate system-basic principles of cartography and computer assisted cartography for GIS – remote sensing data as a data source for GIS integration of GIS and remote Sensing-GPS and GIS: technology, data generation and limitations – visualization in GIS-Digital Elevation Models (DEM and TINS).
- UNIT – IV GIS Application: GIS as a Decision Support System –expert system for GIS-basic flow chart for GIS application – GIS standard legal system and national GIS policy application of GIS in Land Information System, Urban Management, Environmental Management and Emergency Response System.

SUGGESTED READINGS:

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church V.A., 1983.
2. Barrett E.C. and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation on, Memillan, New York, 1992.
3. Compbell J. : Introduction to Remote Sension, Guilford, New York, 1989.
4. Curran, Paul J. : Principles of Remote Sensing. Longman, London, 1985.
5. Hord R.M.:Digital Image Processing of Remotely Sensed Date, Academic, New York, 1983.
6. Luder D., Aerial Photography Interpretation : Principles and Application, CcGraw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
8. Rao D. P. (eds.) : Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hederabad, 1998.
9. Thomas M. Lollesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, Wiley & sons, New York, 1994.
10. Aronoff S.Geographic Information Systems: A. Management Perspective, Publication Offiawa, 1989.
11. Burrough P.A. Principles of Geographic Information Systems for Land Reson Assessment Oxford University Press, New York, 1986.
12. Fraser Taylor D.R. Geographic information Systems. Pergamor Press, Oxford 1990.
13. Maquire D.J.M.F. Goodchild and D.W. Rhind (eds.). Geographic information System 'Principles arid Application. Taylor & Francis, Washington, 1991.

14. Mark S. Monmonier. Computer-assisted Cartography, Prentice-Hall, Englewood Cliff, Jersey, 1982.
15. Peuquet D. .1. and D.F.- Marble, Introductory Reading in Geographic. Information System Taylor & Francis, Washington, 1990..
16. चौनियाल, देवी दत्त, : सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली.

SEMESTER – IV (2015-16)

PAPER – XVIII (B) ENVIRONMENTAL GEOGRAPHY

- UNIT – I** Environment: Meaning, definition, concepts and theories related to environment.
Environment and its components: Classification, Characteristics and their interdependent relationship, Development of the environmental studies and their approaches: Development of environmentalism in Geography.
- UNIT – II** Environment and development. Ecological concepts; Geography as human ecology; Ecosystem: meaning definition, Concept and components. Main terrestrial ecosystems of the world-forests and agriculture.
- UNIT – III** Environmental hazards- natural and human made, environmental pollution : meaning definition, nature and types-air, water, noise and others. Ecological impacts of pollution. Resource use and ecological imbalance with special reference to soil, forests and water resources.
- UNIT – IV** Environmental Management : meaning, importance and approaches, need for environmental policy and laws. Preservation and conservation of environment through resource management (Green revolution, Chipko movement, National Parks). Environmental Actions: concept, need and importance Stockholm Conference, Earth Summit, E.I.A. definition and methods and need for EM Environmental education and People's participation.

Suggested Readings :

1. Agrawal, Anil and Sunita Narain. Dying Wisdom : The Fourth citizen Report. Centre for Science and Environment, New Delhi, 1998.
2. Burton I.; R.W. Kates & G.F. Wiley. The Environment as Hazards. O. U.P. New York, 1978, Carledge, Bryen. Population and the Environment, O.U.P., New York, 1995.
3. Chandna, R.C. Environmental Awareness Kalyani Publishers, New Delhi, 1998.
4. Dawson, J. and J.C. Doornkamp, eds.: Evaluating the Human Environment. Edward Arnold, London, 1975
5. Detwyler, J.R.: Man's impact on Environment. Pelican, 1970.
6. Edington, J.M. & M.A. Edington : Ecology and Environmental Planning. Chapman & Hall, London, 1977.
7. Goudie, Andrew. The Human Impact on the Natural Environment, Blackwell Oxford, U.K. 1994

8. Jain, R. K., L.V. Urban and G.S. Stacy; Environmental Impact Analysis-A New Dimension in Decision-Making. Van Norstrand Reinhold Co. New York, 1977.
9. Khoshoo, T.N. Environmental Concepts and Strategies. Ashish Publishing House, New Delhi.
10. Mohan, M. Ecology and Development. Rawat Publications; Jaipur, 2000.
11. Munn, R.E. Environmental Impact Assessment : Principles and Procedures. John Wiley & Sons, New York, 1979.
12. Narain, Sunita. The Citizen Fifth Report. Centre for Science and Environment, New Delhi 2003.
13. Mukherji, A and V. K. Agnihotri : Environment and Development. Concept Pu. Co. New Delhi, 1993.
14. Rudig Wolfgang. Environmental Policy Edward Elger Publishing Ltd. UK. 1998.
15. Saxena, H.M. Environmental Geography. Rawat Publications, Jaipur, 1999
16. Saxena, H.M. Environmental Management. Rawat Publications, Jaipur, 2000
17. Sharma, B.L. & Puar P: Global Environmental Challenges. Rohini Books, Publishers & Distributors, Jaipur, 2004.
18. Singh, K.N. and D.N. Singh : Population Growth, Environment and Development Issues, Impacts and Responses. Environment & Development Study Centre, Varanasi, 1991.
19. Singh, R. B. and S. Mishra : Environmental Law in India : Issues and responses, Concept Pub. Co. New Delhi, 1966.
20. Singh, S. Environmental Geography. Prayag Pustak Sadan, Allahabad, 2000.
21. Smith, R.L. : Man and his Environment: An Ecosystem Approach. Harper & Row. London, 1992.
22. U.N.E.P.: Global Environmental Outlook. U.N. Pub. New York.
23. अवस्थी एन. एम. एवं आर.पी. तिवारी पर्यावरण भूगोल, मध्यप्रदेश ग्रंथ अकादमी भोपाल ।
24. नेगी, पी. एस. : परिस्थितिकीय विकास एवं पर्यावरण भूगोल, रस्तोगी एन्ड कम्पनी, मेरठ, 1995 ।
25. रघुवंशी अरूण और चन्द्रलेखा रघुवंशी : पर्यावरण तथा प्रदूषण, मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल, 1989 ।
26. सविन्द्र सिंह : पर्यावरण भूगोल, प्रयाग पुस्तक सदन इलाहाबाद, 1993 ।
27. शर्मा, बी एल : पर्यावरण : साहित्य भवन, आगरा, 1992 ।
28. तिवारी, विजय कुमार : पर्यावरण और परिस्थितिकी, हिमालय पब्लिशिंग हाउस, दिल्ली 1998 ।
29. तिवारी, विजय कुमार, : पर्यावरण अध्ययन, हिमालय पब्लिशिंग हाउस, दिल्ली, 1998 ।

SEMESTER – IV, (2015-16)

PAPER - XIX

POLITICAL GEOGRAPHY

- UNIT – I Nature, scope, subject matter and recent development in political geography; approaches to study; Geopolitics. Geographic Elements and the State: Physical Elements; Human elements; Economic elements; Political geography and environment interface.
- UNIT – II Themes in Political Geography; State, Nation, Nation-State and Nation-building. Frontiers and boundaries, Colonialism, decolonization, Neocolonialism, Federalism and other forms of governance. The changing patterns of World Powers Perspectives on core-periphery concept, Conflicts and cooperation.
- UNIT – III Geopolitical Significance of Indian Ocean: Political geography of SAARC, South-East Asia, West Asia, East Asia Regions.
- UNIT – IV Political geography of Contemporary India with special reference to : The changing political map of India; Interstate issues (like water disputes & riparian claims) and conflict resolutions insurgency in border states; Emerging geo-political geo-geographical issues in modern state,

Suggested Readings

1. Dikshit, R.D. Political Geography: A Contemporary Perspective. Tata McGraw Hill, New Delhi. 1996.
2. Adhikari, Sudepta : Political Geography of India, 2009, Publishers, R.K. Books, New Delhi 2013.
3. Dwivedi, R.L.: Fundamentals of Political Geography, Publishers, R.K. Books, New Delhi 2013.
4. Cohen, S.L.: Geo-politics: The Geography of International Relations (2010) Publishers, R.K. Books, New Delhi 2013.
5. Painter/Jeffry: Political Geography (2009) Publishers, R.K. Books, New Delhi 2013.
6. Ahmad (A) : Political Geography (2010) Publishers, R.K. Books, New Delhi 2013.
7. Mohanty : Political Geography (2005) Publishers, R.K. Books, New Delhi 2013.
8. Husain (Ahmad) : Political Geography(2007) Publishers, R.K. Books, New Delhi 2013.

9. Gupta (Rajeev) : Political Geography (2012) Publishers, R.K. Books, New Delhi 2013.
10. सक्सेना, हरिमोहन : राजनीतिक भूगोल, रस्तोगी प्रकाशन, मेरठ (2013–14)
11. दीक्षित, आर. डी.: राजनीतिक भूगोल, समसामयिक परिदृष्टि, पी. एच. आई.
12. दीक्षित श्रीकांत : राजनीतिक भूगोल और भू राजनीति, दिल्ली पब्लिकेशन लाईब्रेरी भारत सरकार पर्यटन मंत्रालय
13. चौहान, पी. आर. : राजनीतिक भूगोल, वसुन्धरा प्रकाशन, गोरखपुर, 2001
14. अधिकारी सुदीप्ता एवं रतन कुमार : राजनीतिक भूगोल, शारदा पुस्तक भवन इलाहाबाद, 2011

SEMESTER – IV, (2015-16)

PAPER - XX

PRACTICAL-IV

GEOGRAPHICAL INFORMATION SYSTEM AND QUANTITATIVE TECHNIQUES

Geographical Information System

An overview of GIS software, Elements of GIS: Data capture-verification and preprocessing-data storage and maintenance of databases-Database Management Systems: Spatial data creation, Editing the layers and table creation, Creation of non Spatial data, data manipulation, analysis (integrated analysis of spatial and attribute data, overlay analysis, neighborhood operations and connectivity functions) and spatial modeling-output format and generation. Buffer analysis, Network Analysis, Creation of DEM & TIN Generation of thematic map.

GPS – Demonstration and handling of Hand held GPS receivers, Checking and updating of existing map, Use of GPS to Check/update the existing topographical map, Ground truthing by GPS.

Quantitative Techniques:

Running mean, Mean centre, Nearest Neighbor Analysis; Lorenz Curve, Normal distribution curve, Probability.

SUGESSTED READINGS:

1. Singh, R.L. & P.K. Dutt : Elements of Practical Geography Students trends.
2. Monkhouse, F.J. & H.R. Wilkinson; Maps and Diagrams Mathuen, London.
3. Mahmood, Aslam 1971 : Statistical Methods in Geographical studies Rajesh Pub., New Delhi.
4. Gregory, S. Statistical Methods and The Geographer.

5. Hammond & Mccullah 1977 : Quantitative Techniques in Geography, Clarendon Press,Oxford.
6. Fitz, Gomid, B.P. : Science in Geography, Developments in Geographical Method, Oxford University Press.
7. Yeaters, M. : An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
8. मॉक हाउस तथा विल्किन्सन 1976 : मानचित्र तथा आरेख, म.प्र. केदारनाथ , रामनाथ, मेरठ.
9. नेगी, डी.एस. : भूगोल में आधारभूत सांख्यिकी, केदारनाथ , रामनाथ, सेठ.
10. हीरालाल : प्रायोगिक भूगोल, किताबघर, कानपुर.
11. आर.सी. तिवारी एवं सुधाकर त्रिपाठी : अभिनव प्रयोगात्मक भूगोल, प्रयाग पुस्तक भवन, इलाहाबाद.

GEOGRAPHY (Code-021)

M.A./M.Sc. पूर्व भूगोल में निम्नलिखित प्रश्न पत्र होंगे -

क्रमांक	प्रश्न पत्र	प्रश्न पत्र का नाम	कोड संख्या	पूर्णांक
1.	प्रथम	Geomorphology	(0399)	100
2.	द्वितीय	Climatology & Oceanography	(0400)	100
3.	तृतीय	Geographical Thought	(0401)	100
4.	चतुर्थ	Advanced Geography of India	(0402)	100
5.	पंचम	Population Geography	(0403)	100
6.	प्रायोगिक	Advanced cartography and surveying		100

The M.A./M.Sc. Previous examination in Geography shall consist of 600 marks.

There shall be five theory papers and one practical each of 100 marks as follows:

Paper I	Geomorphology
Paper II	Climatology & Oceanography
Paper III	Geographical Thought
Paper IV	Advanced Geography of India
Paper V	Population Geography
Practical	Advanced Cartography and Surveying

The theory papers shall be of three hours duration.

Candidates will be required to pass separately in theory and practical examinations.

Each theory paper in M.A./M.Sc. Previous Geography has been divided into four units.

(a) In the practical examination the following shall be the allotment of time and marks.

- (i) Practical record 20%
- (ii) Lab work (up to three hours) 50%
- (iii) Field work (up to three hours) 25%
- (iv) Viva on i. ii. & iii above 5%

(b) The external and internal examiners shall jointly submit marks.

(c) Candidates shall be examined in survey individually. They will however be allowed to take the help of a labourer each at their own expense.

(d) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

PAPER - I GEOMORPHOLOGY (Paper Code - 0399)

- NIT-1** Nature and scope of Geomorphology; Fundamental concepts; Interior of the earth; Earth movements: epeirogenic and orogenic movements : Forces of crustal instability, isostasy, plate tectonics, earthquakes, volcanic activities, faulting, mountain building.
- NIT-2** Exogenic processes : concept of gradation; Agents and processes of gradation : weathering, mass wasting and erosion, aggradation; soil formation; Climatic Geomorphology and morphogenetic regions; slope evolution.
- NIT-3** Concept of geomorphic cycle and its controversy; Dynamics of fluvial, glacial, periglacial, aeolian and marine (coastal) processes and resulting landforms; Complications of fluvial geomorphic cycle.

UNIT-4 Geological structure and landforms: development of landscape and drainage on uniclinal, folded and domal structures and in Karst region; Erosion surfaces; Applied geomorphology

SUGGESTED READINGS -

1. Ahmed, E. : Coastal Geomorphology of India.
2. Chorley, R.J. : Spatial Analysis in Geomorphology, Methuen, London, 1972
3. Cooke R.U. and Doornkamp, J.C.: Geomorphology in Environmental Management A introduction, Clarendon Press, Oxford, 1974
4. Dury, G. H. : The Face of the Earth, Penguin Harmondsworth 1959
5. Fairbridge, R.W. Encyclopedia of Geomorphology, Reinholdts, New York, 1968.
6. Goudie, A.: The Nature of the Environment Oxford & Blackwell, London, 1993.
7. Garner, H.F. : The Origin of landscape- A Synthesis of Geomorphology, Oxford University Press, London, 1974.
8. Holms, A. : Principles of Physical Geology, Thomas Nelson, London.
9. Mitchell, C.W.: Terrain Evaluation, Longman, London, 1973.
10. Ollier, C.D.: Weathering, Longman, London, 1979.
11. Pitty, A.F.: Introduction to Geomorphology, Methuen, London, 1971.
12. Stoddart, D.R. (ed.): Process and Form in Geomorphology, Roulledge, New York, 1996.
13. Skinner, B.J. & Porter, S.C.: The Dynamic Earth John Wiley, New York, 1995.
14. Sparks, B.W. Geomorphology, Longman, London, 1960.
15. Sharma, H.S.(ed.): Perspectives in Geomorphology, Concept, New Delhi, 1980
16. Singh, S: Geomorphology, Prayag Publication, Allahabad, 1998.
17. Steers, J.A. : The Unstable Earth Methuen, London.
18. Thornbury, W.D. Principles of Geomorphology, John Wiley, New York, 1960.
19. Strahler, A.N. : Physical Geography, Wiley, New York.
20. कौशिक, एस.डी. : भू - आकृति विज्ञान
21. नेगी, बी.एस. : भू - आकृति विज्ञान
22. दयाल परमेश्वर : भू - आकृति विज्ञान
23. यादव तथा रामसुरेश .: भू - आकृति विज्ञान, ग्रन्थय, कानपुर
24. सिंह, सविन्द्र के. : भू - आकृति विज्ञान, शारदा पुस्तक भवन, इलाहाबाद

PAPER - II

CLIMATOLOGY AND OCEANOGRAPHY

(Paper Code - 0400)

(A) CLIMATOLOGY

UNIT-1 Nature and scope of climatology and its relationship with meteorology; composition of the atmosphere; Insolation, heat balance of the earth, stability and instability, green house effect, vertical and horizontal distribution of temperature; Jet stream; General circulation in the atmosphere; Acid rain; concept of air masses and atmospheric disturbances. Ocean atmospheric interaction. EL Nino and La Nino. Monsoon winds and cyclones.

UNIT-2 The application of general principles of elementary physical and synoptic meteorology to the study and classification of climate. Climatic classification of Koppen and Thornthwaite. Major climates of the world- tropical, temperate, desert and mountain

climate. Climatic changes during geological and historical times. evidences. possible causes, global warming, environmental impacts and society's response. Applied climatology.

(B) OCEANOGRAPHY

- T-3 Nature and scope of oceanography; Distribution of land and water; Major features of ocean basins; Marine sediments. Physical and chemical properties of sea water; Interlink between atmospheric circulation and circulation pattern in the oceans, surface currents, thermohaline, waves and tides.
- T-4 Marine biological environment: Bio geochemical cycle in the ocean. biozones, types of organisms; plankton, nekton and benthos, food and mineral resources of the sea. Major marine environments; coastal: estuary, deltas, barrier island, rocky coasts; Open: reefs, continental shelf, continental slope and deep; Pelagic environment and floor of the ocean basins. Impact of Humans on the marine environment. Law of the sea; exclusive economic zone; marine deposits and formation of coral-reefs.

SUGGESTED READINGS :

- Barry, R.G. and Chorley P.J.: Atmosphere, Weather and Climate, Roulledge, London and New York, 1998
- Critchfield, J.H.: General Climatology, Prentice Hall, India, New Delhi, 1993.
- Das, P.K.: Monsoons National Book Trust, New Delhi, 1987.
- Fein, J.S. and Stephens, P.N.: Monsoons. Wiley Interscience, 1987.
- India Met. Deptt. : Climatological Tables of Observatories in India, Govt. of India 1968.
- Lal, D.S.: Climatology, Chaitanya Publications, Allahabad, 1986.
- Lydolph, P.E. : The Climate of the Earth, Rowman, 1985.
- Menon, P.A.: Our Weather, N.B.T., New Delhi, 1989.
- Pelerson, S.: Introduction to Meteorology, Mc Graw Hill Book, London, 1969.
- Robinson, P.J. and Henderson S.: Contemporary Climatology, Henlow, 1999.
- Thompson, R.D. and Perry, A (ed.): Applied Climatology, Principles and Practice, Routledge, London, 1997.
- Davis Richard J.A.: "Oceanography- An Introduction to the Marine Environment". Wm. C. Brown Iowa. 1986.
- Duxbury, C.A. and Duxbury B.: An Introduction to the world's Oceans-C. Brown. Iowa 2nd ed. 1986.
- Garrison, T.: "Oceanography - An Introduction to Marine Science" Books/Cole, Pacific Grove, USA, 2001.
- Gross, M. Grant: Oceanography, a View of the earth, Prentice-Hall inc, New Jersey, 1987.
- King C.A.M. Oceanography for Geographers 1962.
- Sharma, R.C. "The Oceans" Rajesh N. Delhi. 1985.
- Ummerkuty, A.N.P. Science of the Oceans and Human life, NBT, New Delhi 1985.
- Trewartha, G.T. : An Introduction to weather and climates.
- Omman, F.D.: The Ocean
- Sharma, R.C. & M. Vatal : Oceanography : A Brief Introduction Kishore Pub. New Delhi.
- Siddhartha, K. : Oceanography : A Brief Introduction, Kishore Pub. New Delhi.
- तिवारी, अनिल कुमार : जलवायु विज्ञान, राजस्थान हिन्दी ग्रंथ अकादमी
- नेगी, बी. एस. : जलवायु तथा समुद्र विज्ञान

PAPER-III
GEOGRAPHICAL THOUGHT
(Paper Code - 0401)

- UNIT-1** The field of geography, its place in the classification of science; geography as a social science, and natural science. Definition, scope and functions of geography; Geography as science of relationship, as science of areal differentiation, as spatial science, Geography and environmentalism: forms of man-nature relationship and current view; Dualism in geography; Regional Concept.
- UNIT-2** The growth of geographical knowledge from earliest times upto the 15th century. Contributions of Greek and Roman thinkers. Arab Geographers and their contributions. Geographical information in Ancient Indian literature. The dark age in Geography. The Great Age of Maritime Discovery and Exploration. Contributions of various schools of thought in Modern Geography:
(i) German School. (ii) French School.
(iii) British School (iv) American and Russian Schools.
- UNIT-3** Scientific explanations: routes to scientific explanation (inductive/deductive); Types of explanation: cognitive description, cause and effect, temporal, functional/ ecological, systems; Laws, theories and models in geography; Quantitative revolution and philosophy of positivism.
- UNIT-4** Responses to positivism, behaviouralism and humanistic geography, relevance movement and radical geography; Changing paradigms; Status of Indian Geography; Future of geography.

SUGGESTED READINGS :

1. Abler, Ronald; Adams, John S. Gold, Peter: Spatial Organization: The Geographer's view of the World, Prentice Hall, N.J., 1971.
2. Ali S.M.: The Geography of Puranas, Peoples Publishing House, Delhi, 1968.
3. Amedeo, Douglas: An Introduction to Scientific Reasoning in Geography, John Wiley, U.S.A., 1971.
4. Dikshit, R.D. (ed.): The Art & Science of Geography Rand Mc Nally & Co., 1959.
5. Hartshorne, R.: Perspectives on Nature of Geography Rand Mc Nally & Co., 1959.
6. Husain, M.: Evolution of geographic Thought, Rawat Pub. Jaipur, 1984.
7. Johnston, R.J.: Philosophy and Human Geography, Edward Arnold, London, 1983.
8. Johnston, R.J.: The Future of Geography, Methuen, London, 1988.
9. Minshull, R.: The Changing Nature of Geography, Hutchinson University Library, London, 1970.
10. Ali, S.M. : Arab Geography
11. Taylor, G. : Geography in the 20th Century.
12. Dikshit, R.D. : Geographical Thought : A Contextual History of Ideas, Prentice Hall of India, New Delhi.
13. Harvey D. : Explanation in Geography
14. सिंह उजागर : भौगोलिक चिन्तन का विकास , 1971, पब्लिशर्स ऑफ़ बी.सी.
15. त्रिपाठी एवं बिरले : भौगोलिक चिन्तन का विकास एवं विधितंत्र , कलाकला काठगढ़
16. कौशिक, एस.डी. : भौगोलिक विचारधाराओं का इतिहास एवं विधितंत्र , भौगोलिक प्रकाशन, 2016
17. सिंह, जगदीश : भौगोलिक चिन्तन का मूलधार , 1971, पब्लिशर्स ऑफ़ बी.सी.

PAPER-IV
ADVANCED GEOGRAPHY OF INDIA
(Paper Code - 0402)

- UNIT-1** Physical and Biological elements in the Geography of India : Geological structure, relief, climate, water resources, vegetation and soils.
- UNIT-2**
- (a) Population: distribution, density and growth, problems and policies.
 - (b) Irrigation
 - (c) Agriculture : Major characteristics and problems, impact of infrastructural and institutional factors on agriculture. Important crops-wheat, rice, cotton, sugarcane, oil-seeds, tea and coffee, Agricultural regions. Green revolution, Agro- climatic regions.
 - (d) Sources of power: Coal, Petroleum, Natural gas, Hydroelectricity and Atomic energy.
- UNIT-3**
- (a) Mineral resources with specific reference to iron ore, manganese and bauxite.
 - (b) Industrial development with specific reference to iron and steel, cement, cotton, jute, sugar and paper industries; Industrial regions.
 - (c) Transport infrastructure: Road, rail, water and air.
 - (d) Trade: Internal and Foreign.
- UNIT-4**
- (a) Regional division of India: Purpose and Methodology.
 - (b) Major schemes of regions of India: O.H.K. Spate and R.L. Singh.
 - (c) Detailed regional study of the following: Kashmir valley, Middle Ganga Plain, Narmada Basin, Marusthali and Kerala.
 - (d) Physical and cultural geography of Chhattisgarh State.

SUGGESTED READINGS :

1. Centre for Science & Environment (1988) State of India's Environment, New Delhi.
2. Deshpande C.D. India: a Regional Interpretation ICSSR & Northern Book Centre 1992.
3. Dreze, Jean & Amartya Sen (ed.) India Economic Development and Social opportunity Oxford University Press, New Delhi. 1996.
4. Kundu A. Raza Moonis: Indian Economy: the Regional Dimension Spectra Publishers, New Delhi, 1992.
5. Robinson, Francis: The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives Cambridge University Press, London, 1989.
6. Singh R.L. (ed.): India- A Regional Geography National Geographical Society, India Varanasi, 1971.
7. Spate OHK & ATA Learmont-India & Pakistan Methuen, London. 1967.
8. Tirtha R. & Gopal Krishna, Emerging India Reprinted by Rawat Publications, Jaipur 1996.
9. Sharma T.C. and O. Coutinho : Economic and Commercial Geography of India.
10. अग्रवाल पी.सी. : भारत का भौतिक भूगोल, एशिया प्रकाशन कं., रायपुर 2003.
11. जोशी, यशवन्त गोविंद : नर्मदा बेसिन का कृषि भूगोल
12. देशबन्धु प्रकाशन : संदर्भ छत्तीसगढ़

PAPER - V
POPULATION GEOGRAPHY
(Paper Code - 0403)

- UNIT-1** Definition and scope of Population Geography. Relation of Population Geography with other subjects of social sciences. Historical development of Population Geography in western countries and in India. Sources of population data, Census and its history.
- UNIT-2** Distribution of Population : The concept of population density and its types, Factors affecting population distribution. Distribution of population in the world with special reference to Europe and Asia. Distribution of population in India.
Growth of population: Measure of decennial and annual rates of population growth, prehistoric and modern trends of population growth in the world. Regional aspect of population growth in India.
Population theories. Demographic transition. Future growth of population.
- UNIT-3** Population composition in terms of age and sex, rural-urban residence, educational status and occupational structure. Significance of these elements in population analysis, factors affecting their composition in population, broad world patterns and detailed spatial patterns in India.
Fertility and Mortality of population : Significance and factor, Indices and rates. World pattern and pattern in India.
- UNIT-4** Migration of population: Causes, characteristics and types. Methods of estimating value of internal migration, Important international migrations of the world, internal migration in India.
Population and Resources: concept of optimum population, over population and under population, Population-Resource regions.
Population Regions: Concept and methods, population regions of India, causes and consequences of population growth. population policies of India. Human Development Index and its components.

SUGGESTED READINGS :

1. Bilasborrow, Richard E and Daniel Hogan, Popopulation and Delorestation in the Humid Eropics, International Union for th Scientific Study of Population, Belgium 1999.
2. Bogua, D.J. Principles in Demography, john Wiley, New York 1969.
3. Bose, Ashish el at.: Population in India's Development (1947-2000); Vikas Publishing House, New Delhi 1974.
4. Census of India, India: A State Profile. 1991.
5. Chandna, R.C. Geography of Population; Concept, Determinants and Patterns. Kalyani Publishers, New York 2000.
6. Clarke, John I. Population Geography, Pergamon Press, Oxford 1973.
7. Crook, Nigel Principles of Population and Development. Pergmaon Press. New York 1997.
8. Daugherty, Helen Gin, Kenneth C.W. Kammeyir, An Introduction to Population (Second Edition)The Guilford Press, New York London 1998.
9. Garnier, B.J. Geography of Population Longman, London 1970.
10. Kochhar, Rajesh; The Vedic People: Their History and Geography Orient l ongman ltd., New Delhi 2000.
11. Mamoria, C.B. India's Population Problem, kitab Mahal New Delhi 1981.
12. Mitra, Ashok India's Population: Aspects of Quality and Control Vol I & II. Abhiman Publications, New Delhi 1978.

13. Premi, M.K. India's Population: Heading Towards a Billion, B.R., Publishing Corporation 1991.
14. Srinivasan, K. and M. Vlassoff. Population Development Nexus in India: Challenges for the New Millennium- Lata Mc Graw- Hill, New Delhi 2001.
15. Srinivasan K. Basic Demographic Techniques and Applications Sage Publications, New Delhi 1998.
16. Sundaram K.V. and sudesh Nangia, (ed) Population Geography, Henlage Publications, Delhi 1986.
17. UNDP: Human Development Report, Oxford University Press, Oxford 2000.
18. United Nations, Methods for Projections of urban and Rural Population No VIII, New York 1974.
19. Woods R. Population Analysis in Geography Longman, London 1979.
20. Zelinsky Wilbur, A Prologue to Population Geography, Preglic Hall, 1966
21. पंडा, बी.पी. : जनसंख्या भूगोल
22. ओझा, खुनाथ : जनसंख्या भूगोल
23. हीरालाल : जनसंख्या भूगोल
24. चन्दना, आर. सी. : जनसंख्या भूगोल
25. त्रिपाठी रामदेव : जनसंख्या भूगोल

**PRACTICAL
ADVANCED CARTOGRAPHY AND SURVEYING.**

SECTION A

Max. Marks 25

Graphs and Diagrams : Triangular graph. Logarithmic and semi logarithmic graphs, scatter graphs; climatograph. Proportional circles, spheres and cubes.

Thematic Maps: Choropleth maps, isolines, Flow maps, Isochrone and class intervals.

Morphometric Analysis : Profiles, Slope Analysis; Altimetric, and Clinographic curves; Block Diagrams.

SECTION B

Max. Marks 25

Map Projections: Mathematical construction of world projections.

Interpretation of Maps : Geological Maps.

SECTION C

Max. Marks 25

Principles and methods of topographical surveying involving the use of Theodolite and Dumpy level. Solution of Problems in Surveying.

SUGGESTED READING :

1. Davis, R.C. & E.S. Forte : Surveying : Theory and Practical
2. Knetkar, T.R. & S.V. Kulkarni : Surveying and levelling part I & II A.V.G. Prakashan, Poona.
3. Monk house F.J. & H.R. Wilkison : Maps and Diagrams, Methuen, London.
4. Mahmood, Aslam : Statistical Methods in Geographical studies.
5. Gregory, S. : Statistical Methods and the Geographers.
6. Hammond & Mc Gullagh : Quantitative Techniques in Geography.
7. Fitz Gerald, S.P. : Science in Geography & Data Description and Presentation by Petter Davis.
8. मॉक हाऊस तथा विलकौन्सन (अनु. प्रो. प्रेमचन्द अग्रवाल) : मानचित्र तथा आरेख, म.प्र. हिन्दी ग्रन्थ अकादमी
9. नेगी, बी.एस. : भूगोल में आधारभूत सांख्यिकी
10. हीरालाल : प्रायोगिक भूगोल

GEOGRAPHY (Code- 022)

M.A./M.Sc. अंतिम भूगोल में निम्नलिखित प्रश्न पत्र होंगे –

क्रमांक	प्रश्न पत्र	प्रश्न पत्र का नाम	कोड संख्या	पूर्णांक
1	VI	Economic Geography and Natural Resource Management,	(0404)	100
2	VII	Settlement Geography	(0405)	100
3	VIII	Regional Development and Planning	(0406)	100
4	IX (A) Or	Remote Sensing Techniques and Geographical Information System	(0407)	100
5	IX (B)	Biogeography and Ecosystem	(0408)	100
6	X	Agricultural Geography	(0409)	100
		प्रायोगिक कार्य Quantitative Techniques, Remote Sensing and GIS		100
			कुल योग	600

The M.A./M.Sc. Final examination in Geography shall consist of 600 marks. There shall be five theory papers and one practical, each of 100 marks as follows.

Paper VI Economic Geography and Natural Resource Management,

Paper VII Settlement Geography

Paper VIII Regional Development and Planning

Paper IX (A) Remote Sensing Techniques and Geographical Information System

OR

Paper IX (B) Biogeography and Ecosystem

Paper X Agricultural Geography

Practical: Quantitative Techniques, Remote Sensing and GIS

1. The Theory papers shall be of three hours duration.
2. Candidates will be required to pass separately in theory and practical exam.
3. Each theory paper in M.A./M.Sc. Final Geography has been divided into four units.
4. (a) In the Practical examination the following shall be the allotment of time and marks.

(i)	Practical Record	20%
(ii)	Lab. Work (up to 4 hours)	70%
(iii)	Viva on (i) & (ii) above	10%
- (b) the external and internal examiners shall jointly submit marks.
- (c) All the candidates shall present at the time of the practical examination their practical record, regularly signed by the teachers concerned.

PAPER VI
ECONOMIC GEOGRAPHY AND NATURAL RESOURCE MANAGEMENT
(Paper Code - 0404)

- UNIT-I** Nature and scope of Economic Geography ; fundamental concepts in economic geography ; concept and classification of resources ; classification of economies, sectors of economy (primary, secondary and tertiary)
World distribution of population : Appraisal of quality and quantity of human resources, relation between population and resource, population resource regions of the world, natural resources and economic development, resource adequacy and scarcity, limits to growth.
- UNIT-II** World pattern of major natural resources : land and soils, biotic resources, water resources, mineral and energy resources, oceanic resources.
- UNIT-III** Concept and techniques of delimitation of agricultural regions and their features, Von Thunen's model of agricultural location and its modifications.
Classification of Industries, Theories of industrial location ; case studies of selected industries ; Iron & Steel ; Aluminium, Chemical, Textile.
Means of transport, International trade, trade blocks, globalisation and Indian economy.
- UNIT-IV** Conservation and management of resources ; evolution of the concept, principles, philosophy and approaches to conservation, resource conservation and management methods.
Resource appraisal and policy making ; Use of GIS and remote sensing in resource appraisal ; policy making and resource management ; sustainable development of resources.

SUGGESTED READINGS :

1. Berry, J.I., Geography of Market Centres and Retail Distribution, Prentice Hall, New York, 1967.
2. Chatterjee, S.P. : Economic Geography of Asia, Allied Book Agency, Calcutta, 1984.
3. Chorley, R.J. and Haggett, P. (ed.) : Network Analysis in Geography, Arnold, 1969.
4. Dreze, J. and Sen, A. : India : Economic Development and Social Opportunity ; Oxford University Press, New Delhi, 1996.
5. Eckarsley, R. (ed.) : Markets, the state and the environment, McMillan, London, 1995.
6. Garnier, B.J. and Deiobez, A. : Geography of Marketing, Longman, London, 1979.
7. Hamiton, F.E.I. : Spatial Perspectives on Industrial Organisation and Decision Making John Wiley, New York 1974.
8. Hamiton, I. (ed.) : Resources and Industry, Oxford University Press, New York, 1992.
9. Hurst E. : Transport Geography : Comments and Readings : McGraw Hill, New York, 1974.
10. Morgan, WB and Munton R.J.C. : Agricultural Geography, Methuen, London, 1977.
11. Pachuri, R.K. Energy and Economic Development in India, Praeger, New York, 1977.
12. Robertson, D. (ed.) : Globalization and Environment, E. Elgar Co., U.K. 2001.

13. Roslow, W.E. : The stages of economic growth : Cambridge University Press, London 1960.
14. Singh J. and Dhillon S.S. Agricultural Geography, McGraw Hill, India, New Delhi, 1984
15. Symons, L. : Agricultural Geography, Bell and Sons, London, 1972.
16. Wheeler, J.O. et.al. : Economic Geography, John Wiley, New York, 1995.
17. Adams, W.M. : Green Development : Environment and Sustainability in the third world, Routledge & Chapman Hall, New York, 1990.
18. Granfelt, T.R. : Managing the globalized environment : J. & L. Composition Ltd., New York, 1999.
19. Holechek, J.L. et.al. : Natural Resources : Eulogy Economics & Policy, Prentice Hall, New Jersey, 2000.
20. Hooja, R. & Roshni, R. : Desert, Drought and Development, studies in Resource Management and sustainability ; Rawat Publication, Jaipur, 1994.
21. Howard, M.C. (ed.) : Asia's environmental crisis, Westview Press, Prouldar, 1993.
22. Kates, R.W. & Burton, I. (eds.) : Geography, Resources and Environment, Vol. I & II, University of Chicago Press, Chicago, 1986.
23. Mc. Laren, D.J. and Skinnnet, B.J. (eds.) : Resources and World Development, John Wiley & Sons, New York, 1986.
24. Newson, M.D. : land, water & development, River, Basin systems & Management, Routledge, London, 1991.
25. Owen, S. & Owens, P.L. : Environment Resources & Conservation, Cambridge University Press, New York, 1991.
26. Peckford, John et.al. (ed.) 1994 : Water, sanitation, environment & development, IT Publication, London, 1994.
27. Rees, J. : Natural Resources : Allocation, Economics and Policy, Methuen, London, 1988.
28. Redclift, M. : Sustainable Development : Exploring the Contradiction : Methuen, London, 1987.
29. Simmons, I.G. : Earth, Air & Water : Resources and Environment in Late 20th Century Edward Arnold, New York, 1991.
30. Thoman, Alan et.al. : Environmental Politics & NGO Influence, Routledge, London 2001.
31. Zimmerman, E.W. : World Resources and Industries.
32. सिंह काशीनाथ एवं जगदीश सिंह : आर्थिक भूगोल के मूल तत्व
33. करन, एम.पी. : संसाधन भूगोल
34. शर्मा, राजीव लोचन : संसाधन संरक्षण
35. सिंह, अमर : संसाधन तथा संरक्षण
36. कुमार प्रमिला एवं श्रीकमल शर्मा : कृषि भूगोल

PAPER - VII
SETTLEMENT GEOGRAPHY
(Paper Code - 0405)

- UNIT-I**
1. Meaning, Objectives and Scope of Settlement Geography
 2. Evolution, Distribution, Types and Patterns of Rural Settlements.
 3. Rural House Types

4. Rural Service Centres
- UNIT-II**
1. Evolution and growth of urban settlements
 2. The Geographical setting of Urban Centres : Site, Situation and Location
 3. Rank-size-relationship
 4. Cities as Central Places, Central Place Theory, Growth Centre Theory.
 5. City-Country Relationship : Umland, Rural-Urban Fringe.
- UNIT-III**
1. General Nature of City Structure :
 - (i) Internal structure : Morphology and landuse.
 - (ii) Theories of Urban Structure : The Concentric Zone Theory, The Sector Theory, The Multiple Nuclei Theory.
 2. The Central Business District (CBD)
 3. Centrifugal and Centripetal forces in Urban Geography.
 4. Economic Base of Towns : Basic/non-basic concept.
- UNIT-IV**
1. Urban Functions
 2. Functional Classification of Towns.
 3. Urban Planning (i) Types and Elements (ii) Urban Problems, Blight and renewal.
 4. Urban Planning in India.

SUGGESTED READINGS :

1. Abercrombee, Sir P. : Town and Country planning 1961.
2. Alam, Shah Manzoor : Hyderabad Secundrabad (Twin Cities) A study in urban geography
3. Alam, S.M. & V.V. : Urbanization in developing countries Pokshishevesky
4. Berry Brain J.L. : Geographic Perspectives on Urban Systems
5. Bresse, C. & D.F. : An approach to Urban Planning Whiteman
6. Dickinson, R.E. : City, Religion and Regionalism
7. Gallion and Fisher : The Urban Pattern
8. Griffith, J.P. : A study of Urban constructions in India
9. Gibbs : Urban Research Methods
10. Mayor, H.M. & C.F. Kohn : Readings in Urban Geography
11. Morgan, F.W. : Ports and Harbours
12. Mumford L. : Culture of cities
13. Robson, W.A. : Great cities of world
14. Robson, B.T. : Urban Growth : An approach, methuen, London
15. Carter, Harold : Study of Urban Geography, London, Edward Arnold, 1971
16. Singh R.L. & K.N. Singh : Readings in Rural Settlement Geography, NGSI Varana 1975.
17. सिंह, उजागिर : नगरीय भूगोल
18. करन, एम.पी. : नगरीय भूगोल
19. बंसल, सुरेश चन्द्र : नगरीय भूगोल
20. सिंह, ओमप्रकाश : नगरीय भूगोल
21. तिवारी आर.सी. : आधिवास भूगोल, प्रयाग पुस्तक भवन, इलाहाबाद, 1997
22. करण एवं यादव : आधिवास भूगोल

PAPER - VIII
REGIONAL DEVELOPMENT AND PLANNING
(Paper Code - 0406)

- UNIT-I** Regional Planning : Definition, Scope, Evolution and Objectives.
Region and Regionalism, Planning Regions : Concept and Delineation.
Spatial organisation : Central Place Theory, Concept of core and periphery.
Friedmann's Model of Spatial Organisation and Economic Growth.
- UNIT-II** Regional Development Theories : Development Theories of Myrdal and Hirschman,
Economic and Export Base model, Frank's Theory of Underdevelopment.
- UNIT-III** Approaches and Strategies of Regional Development. Growth Pole Theory.
Agropolitan Development, Community Development, River Basin Planning, Metropolitan
Planning (with reference to India).
- UNIT-IV** Regional Planning in India. Regional Imbalances and Inequalities, Indicators of
Regional Development ; Regional Policies in Five Year Plans, Centre State
Relations and Multilevel Planning, Planning for special problem Regions : Hill areas,
Tribal areas, Drought prone areas, Command areas and River basins.

RECOMMENDED READING :

1. Daysch, C.H.J. & others : Studies in Regional Planning.
2. Deckinsonm R.E. : City Region and Regionalism
3. Freeman, E.W. : Geography and Planning
4. Golksin A. : Regional Planning and Development
5. Keeble, L. : Principle and Practice of Town and Country Planning.
6. Stamp L.D. : The Land of Britain : Its use and Misure.
7. Sdasyuk. Galina and : Economic Regionalization of India problems and
Dengupta, P. Approches.
8. Desai, P.B. & others : Regional Perspective of Industrial and Urban Growth -
the case of Kanpur, Bombay, 1969.
9. Prakash, Rao V.L., S.P. : Regional Planning
10. Censuts of India : Economic and Socic Cultural Dimensions of regionalisation
(An Indo-USSR Colaborative Study)
11. Friedmann J. & Alonsow : Regional Development and Planning, M.I.T. Press
12. Misra R.P. (Ed.) : Regional Planning : Concept; Techniques, Policies and
cade studies Mysore 1969.
13. Misra, R.P. & others : Regional Development and Planning in India.
14. Timbergen : Essays on World Regional Planning.
15. Isard, W. : Methods of Regional Analysis, M.I.T. 1960.
16. Zimmerman, E.W. : World Resources and Industries.
17. Burton & Kates : Reading in Resource Management Conservation.
18. Bhatt, L.S. : Regional Planning in India.
19. Ahamed, Enayet : Regional Planning with particular Reference to India. Vol.
I and II New Delhi.
20. Bhatt L.S. and Others : Micro level planning - A Case Study of Karnal Area,
Haryana (K.B. Publishing, New Delhi)

- | | |
|------------------------------------|--|
| 21. Chandna, R.C. | : Regional Planning : A Comprehensive Text-Kalyani Publishers. |
| 22. श्रीवास्तव, व्ही. के. एवं अन्य | : प्रादेशिक नियोजन एवं संतुलित विकास |
| 23. ओझा, रघुनाथ | : प्रादेशिक नियोजन का भूगोल |
| 24. शर्मा, राजीवलोचन | : प्रादेशिक एवं नगरीय नियोजन |

PAPER - IX (A)

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

(Paper Code - 0407)

- UNIT-I** Historical development of remote sensing as a technology - Relevance of remote sensing in Geography - Concepts and basics : Energy source, energy and radiation principles, energy interactions in the atmosphere and earth surface features, remote sensing systems : platforms, sensors and radiation records.
Applications : Air photo and image interpretations and mapping landuse and land cover, land evaluation, urban landuse, landform and its processes, weather studies and studies of water resources : integration of Remote Sensing and GIS, remote sensing and hazard management, remote sensing and environmental management.
- UNIT-II** Image Processing : types of imagery, techniques of visual interpretation, ground verification, transfer of interpreted thematic information to base maps-digital processing : rectification and restoration, image enhancement - contrast manipulation, classification : supervised and unsupervised, post-classification analysis and accuracy assessment, microwave sensing : interpretation of SLAR imageries, elements of passive microwave sensing.
- UNIT-III** Spatial Science : Geography as a spatial science, maps and spatial information. dynamics of spatial information, elements of information technology, geographic objects and their relations-definition and development of GIS, computer environment for GIS.
Spatial Data : Elements of spatial data : data sources : primary and secondary, census and sample-data; quality and error variations-raster and vector data structures, data conversion-comparison of raster and vector databases - methods of spatial interpolation-GIS data formats for the computer environment.
- UNIT-IV** GIS Technology : Coordinate system - basic principles of cartography and computer assisted cartography for GIS-remote sensing data as a data source for GIS and integration of GIS and Remote Sensing-GPS and GIS : technology, data generation and limitations - visualization in GIS-Digital Elevation Models (DEM and TINS).
GIS Application : GIS as a Decision Support System-expert system for GIS-basic flow chart for GIS application - GIS standards, legal system and national GIS policy application of GIS in Land Information System, Urban Management, Environment Management and Emergency Response System.

SUGGESTED READINGS :

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church, V.A., 1983.
2. Barrett E.C. and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992.

3. Campbell J. : Introduction to Remote Sensing, Guilford, New York, 1989.
4. Curran, Paul J. : Principles of Remote Sensing. Longman, London 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Data, Academic, New York, 1983.
6. Luder D, Aerial Photography Interpretation : Principles and Application, CcGraw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
8. Rao D.P. (eds.) : Remote Sensing for Earth Resources, Association of Exploration Geophysicists, Hyderabad, 1998.
9. Thomas M. Lillesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, John Wiley & sons, New York, 1994.
10. Aronoff S, Geographic Information Systems : A Management Perspective, DDL Publication Offawa, 1989.
11. Burrough P.A. Principles of Geographic Information Systems for Land Resource, Assessment Oxford University Press, New York, 1986.
12. Fraser Taylor D.R. Geographic information Systems. Pergamon Press, Oxford 1991.
13. Maquire D.J.M.F. Goodchild and D.W. Rhind (eds.) : Geographic information Systems : Principles and Application. Taylor & Francis, Washington. 1991.
14. Mark S. Monmonier. Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982.
15. Peuquet D.J. and D.F. Marble, Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington. 1990.
16. Star J. and J. Estes, Geographic Information Systems : An Introduction, Prentice Hall, Englewood Cliff, New Jersey, 1994.
17. दत्त, नियाल देव : सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली

PAPER - IX (B)

BIOGEOGRAPHY AND ECOSYSTEM

(Paper Code - 0408)

- UNIT-I** Definition and scope of Biogeography. Environment, Habitat and Plant-animal association, Biome types.
- UNIT-II** Elements of plant geography, distribution of forests and major communities. Plant successions in newly formed land forms.
Zoogeography and its Environmental Relationship.
Paleobotanical and Palaeo climatological records of environmental change.
- UNIT-III** Ecosystems : concept and components, Ecosystem-form and function : trophic level, ecological pyramids, ecological niche, energy and nutrients in the ecosystem, hydrological cycle, foodchains and foodwebs.
Major terrestrial ecosystems of the world : agriculture, forests, grassland and desert. Population growth and environment.
- UNIT-IV** Biodiversity and its conservation. Preservation and conservation of the ecosystem through resource management. Environmental 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. Agrawal D.P. : Man and Environment in India Through Ages, Book & Books, 1992.
2. Bradshaw, M.J. : Earth and Living Planet, ELBS, London, 1979.
3. Cox, C.D. and Moore, P.D. : Biogeography : An Ecological and Evolutionary Approach 5th edn. Blackwell, 1993.
4. Gaur, R. : Environment and Ecology of Early Man in Northern India R.b. Publication Corporation 1987.
5. Hoyt, J.B. : Man and the Earth, Prentice Hall, U.S.A. 1992.
6. Huggett, R.J. : Fundamentals of Biogeography., Routledge, U.S.A. 1998.
7. Illies, J. : Introduction to Zoogeography, Mcmillan, London, 1974.
8. Khoshoo, T.N. and Sharma, M. (eds.) : Indian Geosphere-Biosphere Har-Anand Publication, Delhi 1991.
9. Lapedes, D.N. (ed.) : Encyclopedia of Environmental Science, McGraw Hill, 1974.
10. Mathur H.S. : Essentials of Biogeography, Anuj Printers, Jaipur, 1998.
11. Pears, N. : Basic Biogeography, 2nd edn. Longman, London, 1985.
12. Simmon, I.G. : Biogeography, Natural and Cultural, Longman, London 1974.
13. Tivy J. : Biogeography : A study of Plants in Ecosphere 3rd edn. Oliver and Boyd, U.S.A., 1992.
14. Ackerman, E.A. : Geography as a Fundamental Research Discipline, University of Chicago Research Papers, 1958.
15. Agarwal, A. and Narain, S. : The Citizens Fifth Report. Centre for Science and Environmental New Delhi 1999.
16. Bertalanffy, L. : General Systems Theory, George Bragiller New York, 1958.
17. Bodkin, E. : Environmental Studies, Charles E. Merrill Pub. Co., Columbus, Ohio, 1982.
18. Chandna, R.C. : Environmental Awareness, Kalyani Publishers, New Delhi, 1998.
19. Chorley, R.J. : Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.
20. Eyre, S.R. and Jones, G.R.J. (eds.) Geography as Human Ecology, Edward Arnold, London, 1966.
21. Kormondy, E.J. : Concepts of Ecology, Prentice Hall, 1989.
22. Manners, I.R. and Mikesell, M.W. (eds.) Perspectives on Environment, Commission on College Geography, Publ. No. 13, Washington, D.C., 1974.
23. Nobel and Wright : Environmental Science, Prentice Hall, New York 1996.
24. Odum, E.P. : Fundamentals of Ecology, W.B. Saunders, Philadelphia, 1971.
25. Russwurm, L.H. and Sommerville, E. (eds.) : Man's Natural Environment-A systems Approach, Duxbury, Massachusetts, 1985.
26. Sharma, H.S. : Ranthambhore Sanctuary - Dilemma of Eco-development, Concept, New Delhi, 2000.
27. Simmons, I.G. : Ecology of Natural Resources, Edward Arnold, London, 1981.
28. Singh S. : Environmental Geography, Prayag Publications, Allahabad, 1991.
29. Smith, R.L. : Man and his Environment : An Ecosystem Approach, Harper & Row, London, 1992.
30. U.N.E.P. : Global Environmental Outlook, U.N. Pub., New York, 1998.
31. World Resources Institute : World Resources, (Latest Report) Washington.
32. कुल श्रेष्ठ, कामता प्रसाद : जैव भूगोल

PAPER X
AGRICULTURAL GEOGRAPHY

(Paper Code - 0409)

- Unit I: Nature, scope, significance and development of agricultural geography. Approaches to the study of agricultural geography: Commodity, systematic and regional systems. Origin and dispersal of agriculture. Sources of agricultural data.
- Unit II: Determinants of agricultural land use - Physical, economic, social, and technological Land holding and land tenure systems, Land reforms, land use Agriculture policy and planning. Selected agricultural concepts and their measurements; cropping pattern, crop concentration, intensity of cropping, degree of commercialization, diversification and specialization, efficiency and productivity, crop combination regions and agricultural development.
- Unit III: Theories of agricultural location based on several multi-dimensioned factors:- Von Thunen's theory of agricultural location and its recent modifications; Whittlesey's classification of agricultural regions; land use and land capability.
- Unit IV: Agricultural in India- Land use and shifting cropping pattern. Regional pattern of productivity in India. Green Revolution, White Revolution, Food deficit and food surplus regions; nutritional index. Specific problems in Indian agriculture and their management and planning. Agricultural Policy in India. Contemporary Issues: Food, nutrition and hunger, food security, drought and food-security, food aid Programmes; role of irrigation, fertilizers, insecticides and pesticides, technological know-how. Employment in the agricultural sector: landless labourers, woman, children: occupational and agricultural activities.

SUGGESTED READINGS:

1. Bayliss Smith, IP.: The Ecology of Agricultural Systems. Cambridge University London, 1987.
2. Berry, B.J.L et. al. : The Geography of economic Systems. Prentice Hall, New York, 1976.
3. Brown, L.R. : The Changing World Food Prospects - The Nineties and Beyond, World Watch Institute, Washington D.C., 1990.
4. Dyson, T. : Population and Food - Global Trends and Future Prospects. Routledge, London, 1996.
5. Gregor, H.P. : Geography of Agriculture. Prentice Hall, New York, 1970.
6. Grigg, D.B. : The Agricultural Systems of the World. Cambridge University Press, New York 1974.
7. Hartshorn, T.N. and Alexander, J.W. : Economic Geography. Prentice Hall, New Delhi, 1988
8. Mannion, A.M. : Agriculture and Environment Change, John Wiley, London, 1995.
9. Morgan W.B. and Norton, R.J.C. : Agricultural Geography. Mathuen, London, 1971.

10. Morgan, W.B.:Agriculture in the Third World - A Spatial Analysis. Westview Boulder, 1978.
11. Sauer, C.O. : Agricultural Origins and Dispersals,. M.I.T. Press, Mass, U.S.A., 1988.
12. Singh, J. and Dhillon, S.S. : Agricultural Geography. Tata McGraw Hill' Pub.; Delhi, 1988.
13. Tarrant, J.R. : Agricultural Geography. Wiley, New York, 1974.

PRACTICAL

QUANTITATIVE TECHNIQUES, REMOTE SENSING AND GIS

Section (A) : Quantitative Techniques

Marks 35

- (i) Product Moment and Rank Correlation Coefficients, Linear Regression.
- (ii) Hypothesis Testing ; Chi-square and 't' tests, Analysis of variance and test; Sampling
- (iii) Running mean, Mean centre, Nearest Neighbour Analysis ; Lorenz Curve,
- (iv) Normal distribution curve, probability.

Section (B) : Remote Sensing and GIS

Marks 35

- (i) Air-Photos and Photogrammetry : Elements of photographic system : types, scales and ground coverage resolution, films, filters, aerial Cameras vertical photographs, relief displacement, airphoto interpretation.
- (ii) Image Processing : types of imagery, techniques of visual interpretation, ground verification, transfer of interpreted thematic information to base maps-digital processing rectification & Restoration image enhancement. Application : Air photo and image interpretations and mapping landuse and studies of water resources.
- (iii) Spatial Data : Elements of spatial data : quality and error variations raster and vector data structures data conversion.
- (iv) Elements of GIS : Data capture-verification and preprocessing-data storage and maintenance of database-Database Management Systems : types and merits and demerits-data manipulation, analysis integrated analysis of spatial and attribute data.

SUGGESTED READINGS:

1. American Society of Photogrammetry : Manual of Remote Sensing. ASP, Falls Church, V.A. 1983.
2. Barrett and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992.
3. Compbell J. : Introduction of Remote Sensing, Guilford, New York, 1989.
4. Curran, Paul J. : Principles of Remote Sensing, Longman, London, 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Data, Academic, New York, 198...
6. Luder D. : Aerial Photography Interpretation : Principles and Application, McGraw Hill, New York, 1959.
7. Pratt W.K. Digital Image Processing, Wiley, New York, 1978.
8. Rao D.P. (eds.) : Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hyderabad, 1998.
9. Thomas M. Lillo sand and Ralph W. Keler, Remote Sensing and Image interpretation, John Wiley & sons, New York, 1994.
10. Aronoff S. Geographic Information Systems : A. Management Perspective, DDI, Publication Ottawa, 1980.
11. Burrough, P.A. : Principles of Geographic Information Systems for Land Resource

- Assessment Oxford University Press, New York, 1986.
12. Fraser Taylor D.R. Geographic Information Systems. Pergamon Press, Oxford 1991.
 13. Maqurie D.J. M.F. Goodchild and D.W. Rhind (eds.) Geographic information Systems : Principles and Application. Taylor & Francis, Washington, 1991.
 14. Mark S. Monmonier : Computer-assisted Cartography, Prentice-Hall, Englewood Cliff, New Jersey, 1982.
 15. Peuquet D.J. and D.F. Marble : Introductory Reading in Geographic Information Systems : Taylor & Francis : Washington 1990.
 16. Star J and J. Estes : Geographic Information Systems : An Introduction, Prentice Hall, Englewood Cliff, New Jersey, 1994.
 17. Singh, R.L. & P.K. Dutt : Elements of Practical Geography Students friends.
 18. Monkhouse, F.J. & H.R. Wilkinson : Maps and Diagrams Mathuen, London.
 19. Mahmood, Aslam 1971 : Statistical Methods in Geographical studies Rajesh Pub., New Delhi.
 20. Gregory, S. : Statistical Methods and The Geographer.
 21. Hammond & McCullah 1977 : Quantitative Techniques in Geography, Clarendon Press, Oxford.
 22. Fitz, Gomid, B.P. : Science in Geography, Developments in Geographical Method, Oxford University Press.
 23. Yeates, M. : An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
 24. मॉकहाउस तथा विल्किंसन 1976 - "मानचित्र तथा आरेख" मध्यप्रदेश केदारनाथ रामनाथ, मेरठ
 25. नेगी, डी.एस. - "भूगोल में आधारभूत" साह्यकी केदारनाथ रामनाथ, मेरठ
 26. हीरालाल - "प्रायोगिक भूगोल" किताबघर, कानपुर