

M.A. Geography, 2012-13 onwards
SCHEME OF EXAMINATION AND COURSE STRUCTURE

M.A. Geography shall be of two years duration spread over four semesters. Each Semester shall consist of four theory papers and one practical paper of 100 marks each. The duration of examination for theory and practical papers shall be three and four hours respectively. Practical examination shall be conducted by two external examiners appointed by the Vice-Chancellor on the recommendation of the P.G. Board of Studies in Geography. Marks of Internal assessment shall be awarded as per the laid down norms of the University. The department will provide for the optional papers according to its administrative and academic convenience.

The outline of course structure shall be as under :

Paper	Nomenclature	Max. Marks	Internal Assessment	End Semester Exam	Duration of Exam.
Semester-I					
Paper-I	Geomorphology	100	20	80	3 Hours
Paper-II	Climatology	100	20	80	3 Hours
Paper-III	Resource Geography	100	20	80	3 Hours
Paper-IV	Any one of the following: i) Population Geography ii) Urban Geography iii) Geography of Rural Settlements iv) Cultural Geography	100	20	80	3 Hours
Paper-V	Practical : Interpretation of Topographical Sheets and computer Aided Statistical Diagrams	100	Distribution of marks: Lab work test:60 Record on lab work:20 Viva-Voce:20		4 Hours
Semester-II					
Paper-VI	Geography of India: Contemporary Issues	100	20	80	3 Hours
Paper-VII	Geography of Transport	100	20	80	3 Hours
Paper-VIII	Statistical Methods in Geography	100	20	80	3 Hours
Paper-IX	Any one of the following: (i) Agricultural Geography (ii) Political Geography (iii) Social Geography	100	20	80	3 Hours

	(iv) Geography of Health				
Paper-X	Practical : Field work and Report Writing.	100	Distribution of marks: Lab work test:30 Field Report:40 Viva-Voce:30		4 Hours
Semester-III					
Paper-XI	Geography of World Economy	100	20	80	3 Hours
Paper-XII	Oceanography	100	20	80	3 Hours
Paper-XIII	Environmental Geography	100	20	80	3 Hours
Paper-XIV	Any one of the following (i) Geography of Tourism (ii) Hydrology (iii) Biogeography (iv) Soil Geography	100	20	80	3 Hours
Paper-XV	Practicals: Morphometric Analysis	100	Distribution of marks: Lab work test:60 Record on lab work:20 Viva-Voce:20		4 Hours
Semester – IV					
Paper-XVI	Geographical Thought	100	20	80	3 Hours
Paper-XVII	Research Methodology	100	20	80	3 Hours
Paper-XVIII	Remote sensing & GIS	100	20	80	3 Hours
Paper-XIX	Any one of the following: (i) Regional Development & Planning (ii) Water Resource and Management (iii) Geography of Natural Hazards and Disaster Management (iv) Rural Geography	100	20	80	3 Hours
Paper-XX	Practicals: Interpretation of Aerial Photographs & Satellite Images and Thematic Mapping	100	Distribution of marks: Lab work test:60 Record on lab work:20 Viva-Voce:20		4 Hours

HOD (Geog.)

M.A. Geography : Semester-I
Paper-I Geomorphology

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Geomorphology - Definition, Nature and scope, History and development of geomorphic ideas : Fundamental concepts - uniformitarianism, geological structure, process and stage. The Earth's interior - structure and constitution, Recent Views. Plate tectonics meaning and concept; plates, plate margins and boundaries; plate motion; Tectonic activities along the boundaries and Distribution of plates.

UNIT-II

Endogenetic processes - Faulting, folding and their geomorphic expressions. earthquake concept, causes, classification, intensity and magnitude, Geographical distribution. Vulcanism - concept, mechanism and causes; Volcanoes- classification, volcanic materials; Topography associated with vulcanicity and geographical distribution.

UNIT-III

Exogenetic : Weathering and mass wasting - meaning and concept, controlling factors, classification and significance. Dynamics of fluvial, aeolian, glacial and karst processes and resulting landforms.

UNIT-IV

Applied Geomorphology - meaning; Applications of Geomorphology in Regional planning, engineering projects, mineral exploration and hydrology. Regional Geomorphology of Punjab plain, Aravalli Region and Thar desert of India.

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire. All questions carry equal marks.

Recommended Readings :

1. Bloom, A.L. (1992) **Geomorphology**, Second Edition, Prentice Hall of India, New Delhi.
2. Dayal, P. (1990) **A Text Book of Geomorphology**, Shukla Book Depot, Patna.
3. Husain Majid (2002), **Fundamentals of Physical Geography**, Second Edition, Rawat Publications, Jaipur and New Delhi.
4. Singh Savindra (1993), **Physical Geography**, Prayag Pustak Bhawan, Allahabad.
5. _____ (1998), **Geomorphology**, Prayag Pustak Bhawan, Allahabad.
6. Strahler, A.N. and Strahler, A.H.(1996), **Introducing Physical Geography**, John Willey and Sons, New York.
7. Strahler, A .N. (1988), **Earth Sciences**, Harper and Row Publishers, N.D.
8. Thornbury, W.D. (1991), **Principles of Geomorphology**, John Wiley, New Delhi (Indian reprint)
9. Wooldridge, S. W and Morgan, R.S. (1991), **An Outline of Geomorphology**, Orient Longmans, Calcutta.

M.A. Geography: Semester I
Paper-II Climatology

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Nature and Scope of Climatology Climatic elements – atmospheric temperature, pressure, moisture , general atmospheric circulations jet stream.

UNIT-II

Weather system and disturbances - airmass, fronts, Cyclones, Tornadoes, ; Ocean atmospheric interaction- EI Nino, Monsoon winds.

UNIT-III

Global climate system - Approaches to climatic classification ;Classification of Koppen, and ThornthwaiteMajor climate of the world-tropical and polar.

UNIT-IV

Climatic changes - evidences, possible causes, global warming acid rain and problems of acid rain.

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings :

1. Aggarwal, S.K. (1972), **Fundamentals of Ecology**, Ashish Publishers, New Delhi.
2. Barry, R.G. and Chorley, R.J., **Atmosphere, Weather and Climate**, ELBS, Methuen & Co. Ltd. London.
3. Bhutani Smita, (2000) Our Atmosphere, Kalyani Publishers, New Delhi.
4. Critchfield, H.J. (1987) **Climatology**, Prentice Hall of India, New Delhi.
5. Griffith, J.F. and Driscoll, D.M. (1982) **Survey of Climatology**, Charles Merrill.
6. Lal, D.S. (1993) **Climatology**, Chaitanya Publishing House, Allahabad.
7. Riehl, H. (1968), **Introduction to Atmosphere**, McGraw Hill, New York.
8. Robinson, P.J. and Henderson Sellers (1986) **Contemporary Climatology**, Longman, London.
9. Trewartha, G.T. (Latest edition) Introduction to Climate McGraw Hill, New York.

M.A. Geography: Semester-I
Paper-III: Resource Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Nature, scope and significance of the Geography of Resource, Definition and concept of Resources, Classification of Resources.

UNIT-II

Models of Natural Resources Process: Zimmermann's Primitive and Advance Models of natural resource process, Kirk's Decision Model, Brookfield System Model.

UNIT-III

Use and Misuse of Resources: Soil Resource, Water Resource, Forest Resource and Mineral Resources, Future prospects of Natural resources

UNIT-IV

Conservation and Management of Natural Resources: Meaning and Concept of conservation of Natural Resources, Resources Conservation and Management Methods of Natural resources: Soil Resource, Water Resource, Forest Resource and Mineral Resources, Problems of Natural Resource Management in India.

Note:

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire Syllabus.

All questions carry equal marks.

Recommended Readings:

1. **Borton, I. and R.W. Kates. (1984) Readings in Resource Management and Conservation,** University of Chicago Press, Chicago.
2. Bruce, Mitchell (1989) **Geography and Resource Analysis,** John Wiley and Son, New York.
3. Eliot Hurst, M.E. (1972) **A Geography of Economic Behaviour : An Introduction,** Duxbury Press, California.
4. Guha, J.L. and P.R. Chattroj (1994) **Economic geography- A Study of Resources,** The World Press Pvt. Ltd. Calcutta
5. Martino, R.L. (1969) **Resource Management.** Mc Graw Hill Book Co., London.
6. Negi, B.S. (2000) **Geography of Resources,** Kedar Nath and Ram Nath, Meerut
7. Owen, Oliver, S. (1971) **Natural Resource Conservation : A Ecological Approach.** Mc Million New Delhi.
8. Raja, M. (1989) **Renewable Resources, Development,** Concept Pub. New Delhi.
9. Ramesh, A. (1984) **Resource Geography (Ed.) R.P. Misra,** Contribution to Indian geography, Vol Heritage Publishers, New Delhi.
10. Singh, A and Raja, M. (1982) **Geography of Resources and conservation (Hindi Edition)** Pargati Parkashan, Meerut.
11. Zimmermann, E. W. (1951) **World Resources and Industries,** Harper and Brothers, New Delhi.

M.A. Geography: Semester-I
Paper-IV (i): Population Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Population Geography: Definition, nature and scope; relationship with other disciplines – demography and population studies; sources of data with particular reference to India – census, vital or civil registration system, Sample Registration System, Sample surveys with particular reference to NSSO and NFHS; Problems of their reliability and comparability.

UNIT-II

Population Distribution and Growth: Factors affecting population distribution; Population growth - trends and determinants; spatial dimension of population growth in India; Theories of population growth – pre-Malthusian views, Malthus' Theory, views of socialist writers, optimum population theory, demographic transition model.

UNIT-III

Components of population change: trends and patterns in fertility and mortality levels; Theories of fertility; Migration: major international migrations; features of internal migration in India; theories of migration; population composition and characteristics - age and sex composition, literacy, marital status and economic characteristics of population.

UNIT-IV

Population and development: population growth and economic development; population growth and environmental quality; population control movement: population policies and its types; India's Population Policy: Post independence development – Reproductive and Child Health Programme.

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Beaujeu- Garnier J (1966) **Geography of Population**; Longman, London.

Bhende Asha A and Kanitkar (2002) **Principles of Population Studies**, 14th Edition, Himalaya Publishing House, Mumbai.

Chandana, R.C. (2002) **Geography of Population** : Concepts, determination and patterns, Kalyani Publishers, New Delhi.

Clarke, J.I. (1992) **Population Geography**, Second Edition, Pergamon Press, Oxford England.

Hassan, M.I. (2005) **Population Geography**, Rawat Publication, Jaipur.

Premi, M.K. (1991) **India's Population Heading Towards a Billion**, B.R. Publishing Corporation, New Delhi.

M.A Geography: Semester-I
Paper IV (ii): Urban Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

Unit –I

Definition, nature and scope of urban geography; different approaches and recent trends in urban geography; Origin and evolution of urban places in Ancient, Medieval, Modern and Post-Modern periods- factors, stages, evolution and characteristics.

Unit-II

Aspects of urban places: Location, site and situation - definition, nature and significance; Urban ecological processes; Theories of city structure-concentric zone theory, sector theory, multiple nuclei theory and social area analysis.

Unit-III

Settlement systems: the rank-size distribution of cities, Primate city distribution, central place theory of Christaller and Losch; the rural-urban fringe-definition, delimitation and structure; city-region relationship.

Unit-IV

Urbanization: definition and measures of urbanization, factors affecting urbanization, cycle of urbanisation; Historical development of urbanization in the world: Primordial and definitive urbanization; Regional aspects of world urbanization; Patterns and trends of urbanisation in India.

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Suggested Readings:

1. Bala, Raj (1986), *Urbanisation in India*, Rawat Publishers, Jaipur.
2. Bansal, S.C. (2008), *Urban Geography* (Hindi Edition), Meenakshi Prakashan, Meerut.
3. Bansal, S.C. (2010), *Urban Geography*, Meenakshi Prakashan, Meerut.
4. Cadwallader, Martin (1986), *Urban Geography*, Prentic Hall, New Jersey.
5. Carter, Harold (1995), *The Study of Urban Geography* (4th Edition), Arnold, London.
6. Dickinson, R.E. (1964), *City and Region*, Routledge, London.
7. Kundu, A (1992), *Urban Development and Urban Research in India*, Khanna Publication, New Delhi.
8. Mayer H.M. and Kohn, C.F. (eds.) (1958), *Readings in Urban Geography*, University of Chicago Press, Chicago.
9. Pacione, Michael (2001), *Urban Geography-A Global Perspective*, Routledge, London,

10. Ramachandran, R. (1989), *Urbanisation and Urban Systems in India*, Oxford, New Delhi.
11. Rao, B.P. and Sharma, N. (2000-01), *Urban Geography* (Hindi Edition), Vasundhra Prakashan, Gorkhpur.
12. Singh, K. and Steinberg, F. (eds.) (1987), *Urban India in Crisis*, New Age International, New Delhi.
13. Smailes, A.E. (1953), *The Geography of Towns*. Hutchinson, London.

M.A. Geography : Semester- I

Paper- IV (iii) Geography of Rural Settlement

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Definition, nature and scope of rural settlement geography; trends in rural settlement geography with special reference to India; Approaches to rural settlement geography

UNIT-II

Culture-Historical Perspective: Archaeological finds and settlements; Mesopotamia, the Nile valley, the Indus valley, Historical development of rural settlements (based on major cultural periods) in India, Analysis of Place Names and Environments.

UNIT-III

Morphology of Rural settlements in India: Religio-ritual model, Secular-dominance model, Types and Patterns of rural settlements in India and causes of diverse types of rural settlements.

UNIT-IV

Functions of rural settlements, Rural Service Centers- their nature and hierarchy, Basics of Rural Settlement Planning, Rural Settlement Planning of India.

Note:

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Alam, S. M. et. al. (1982), **Settlement System of India**, Oxford and IBH Publication Co. New Delhi.
2. Chisholm, M. (1967), **Rural Settlements and Land Use**, John Wiley, New York.
3. Clout, H.D. (1977) **Rural Geography of Settlements**, Mac Donald & Evans, New York.
4. Hudson, F.S. (1976), **A Geography of Settlements**, Mac Donald & Evans, New York.
5. Mandal, R.B. (1988), **System to Rural Settlements** in Developed Countries, Concept Publication, New Delhi.
6. Mandal, R.B. (2001), **Introduction to Rural Settlements**, Concept Publication, New Delhi.
7. Misra, H.N. (1987) **Rural Georaphy**, Vol. IX, Contributions to Indian Geography, Heritage Publishers, New Delhi.
8. Singh, R.L. and K.N. eds. (1975), **Readings in Rural Settlements Geography**, NGSI, Varanasi
9. Singh, R.L. (1976), **Geographic Dimensions of Rural Settlements**, NGSI, Varanasi
10. Singh, R.Y.(1994), **Settlements**, NGSI, Varanasi. 11. Singh, R.Y. (2005), **Adhiwas Bhugol**, (in Hindi) Rawat Publication, New Delhi.
12. Wanmali, S. (1983), **Service Centres in Rural India**, B.R. Publication, New Delhi.

M.A. Geography: Semester-I
Paper-IV (iv) Cultural Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

Unit-I

The Nature Meaning & Scope of Cultural Geography. The evolutionary approach in cultural geography. The Framework of cultural Geography. The evolution of cultural Geography-The contribution of Otto Schlüter and Carl Sauer and others. Themes in cultural Geography-The Cultural Region. Functional Formal and perceptual Determinism and Possibilism.

Unit-II

Cultural Geography : Elements & Components; Culture Areas & Cultural Realm. Environment and Culture, Concept of culture areas and culture regions, Dwelling places as cultural expressions. Role of Environment in the Development of Folk Culture and its Diversity, Revival of Folk Culture. Cultural Adaptation and Environmental perception. Man as modifier of the earth

Unit-III

spatial structure. Focuses on similarities and differences of various cultures with respect to racial, ethnic, religious, linguistic, demographic, and organizational characteristics in Indian context. Studies of the socio-cultural characteristics of contemporary societies within their manifested

Unit-IV

Human races, Habitat economy and Society of tribal groups. Racial Elements in India's Population; Tribes of India (Bhil, Gond, Toda, Naga); Tribes of World (Eskimo, Pigmy, Bushman). Role of Environment in the Development of Folk Culture and its Diversity, Revival of Folk Culture, Patterns of popular Culture and Cultural fusion

Note:

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Suggested Readings:

Ahmad, Aijazuddin, **Social Geography**, Rawat Publication, New Delhi, 1999 .

De Blij, B.d. **Human Geography**. John Wiley and Son, New York.

Dreze Jean, Amartya Sen, **Economic Development and Social Opportunity**, Oxford University press, New Delhi, 1996 .

Dubey, S.C.: **Indian Society**, National Book Trust, New Delhi, 1991.

Gregory, D. and UJ. Larry. (eds.) **Social relations and Spatial Structures**, McMillan, 1985

Haq, Mahbul: **Reflection on Human Development**. Oxford University Press. New Delhi

Maloney, Clarence: **People of South Asia**, Winston, New York, 1974 .

Planning Commission, **Government of India**: Report on Development of Tribal areas.1981

Rao, M.S.A.: **Urban Sociology in India**. Orient Longman, 1970 .

Schwartzberg Joseph: **An Historical Atlas of South Asia**. University of Chicago Press. Chicago, 1978 .

Sen, Amartya and Dreze Jean, **Indian Development Selected Regional Perspectives**. Oxford University Press,1996 .

Smith, David: **Geography: A Welfare Approach**. Edward Arnold, London, 1977 .

Sopher, David: **An Exploration of India**. Cornell University Press. 1980 .

Subba Rao. personality of India: **Pre and Proto Historic Foundation of India and Pakistan**, M.S. University, Baroda, Vadodara, 1958.

M.A. Geography: Semester II
Paper IX (i): AGRICULTURAL GEOGRAPHY

End Semester Exam : 80 marks
Internal Assessment : 20 marks
Total : 100 marks
Time : 3 hrs.

UNIT-I

Definition, nature, scope, and significance of agricultural geography; approaches to the study of agriculture in geography-commodity, deterministic, systematic, and regional.

UNIT-II

Factor influencing agricultural patterns-Physical factors; terrain, climate, soils and water resources; institutional factors; demographic, land holding, farm family structure, cast, religion, peasant way of life, infrastructural services; technological factors, irrigation, mechanical inputs.

UNIT-III

Agricultural system of the world: Whittlessey's classification- shifting cultivation, plantation farming, Meditterrean agriculture, commercial grain farming; agricultural region-concept and techniques; Normative technique, empirical technique, single element technique and statistical technique.

UNIT-IV

Nature, significance and classification of agricultural models; economic and descriptive models; food security, sustainable agriculture WTO and Agriculture.

Note :The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings

1. Andreae, B.(1981) Farming Development and Scope: A World Agricultural Geography, Water de Grytar, New York
2. Grigg, D. Agricultural Geography, Longman Ontario.
3. Hussain M. (1997) Systematic Agricultural Geography, Rawat Publications, Jaipur.
4. Singh, J. and S.S. Dhillon (1984) Agricultural Geography, TataMcGraw Hills, New Delhi.

M.A. Geography : SEMESTER - II
Paper- XIV (ii) Political Geography

Full Marks: 100
End Semester Exam : 80 marks
Internal Assessment : 20 marks
Time : 3 hrs.

UNIT - I

Nature and scope of Political geography; Schools of thought: Political Economy, World Systems, Place, and Globalisation.

UNIT - II

Concepts of Nation, State, Nation- State, Nationalism and Nation- Building; Emergence and Growth of territorial state; Globalisation and the Crisis of the Territorial State; Forms of Governance : Unitary and Federal.

UNIT - III

Rise and Demise of German Geopolitics; Geo-strategic theories of Mackinder and Spykman; Geopolitics in the post Cold War World - S.B. Cohen's model of Geo-politics.

UNIT - IV

India as a regional power in South Asia; India as a democratic state: National and Regional Political Parties, Women as marginalized section in India politics; Inter-State water disputes in India (special reference to SYL canal).

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings :

1. Agnew, J.A. (1987), **Place and Politics**, Boston : Allen and Unwin
2. Blacksell, Mark (2003), **Political Geography**, London Routledge.
3. Cox, Kevin R. (2008) **The Sage Handbook of Political Geography**, New Delhi sage.
4. Dicken, Peter (2003), **Global Shift**, New Delhi : Sage
5. Dikshit, R.D. (2000) **Political Geography: The Spatiality of Politics**, New Delhi : Tata Mc Graw Hill
6. Jones, Martin Rhys Jones and Michael Woods (2003), **An Introduction to Political Geography**, London : Routledge
7. Khor, Martin (2001) **Rethinking in Globalization**, London : Zed Books.
8. Painter J. (1995) Politics, **Geography and Political Geography**, London : Arnold.
9. Taylor, P.J. and Colin Flint (2001), **Political Geography**, New Delhi : Pearson.
10. Taylor, P.J. and R.J. Johnston (1979), **Geography of Elections** Hammonds worth : Penguin
11. Adhikari, Sudepto (2008), **Political Geography of India**, Allahabad: Sharda Pustak Bhandar.

M. A. Geography: Semester-II
Paper- IX (iii) Social Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT - I

Social Geography: Nature, meaning & Development of Social Geography; Philosophical bases of Social Geography : Positivism, Radicalism, Humanism, Empiricism, Feminism.

UNIT - II

Towards a social geography of India; Concept of Social differentiation, socio cultural regions of India, social transformation and change in India Religious and linguistic groups of India. Caste System in India.

UNIT - III

Social Well-being : Concepts of social well being, Human Development Index. Human Development in India. Factors of social change. Social Disorganization.

UNIT - IV

Gender Issues of social Well Being: Female Literacy, family Planning, Women Health. Sex Ratio, Women Empowerment. Women Employment.

Note:

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus.

All questions carry equal marks.

Recommended Readings :

1. Ahemd, Aijazuddin (1999) **Social Geography**, Rawat: New Delhi.
2. Dreze, Jean and Amartya Sen (1996) **Economic Development and Social Opportunity**, New Delhi : Oxford University, Press.
3. Gregory, D and Larry (eds) **Social Relations and Spatial Structures**, Oxford : Macmillan
4. Hamnett, Chris (
5. Jackson, Peter and Susan J Smith (1984), **Exploring 27, 28**

M.A. Geography - Semester – II
PAPER-IX (iv) GEOGRAPHY OF HEALTH

End Semester Exam : 80 Marks

Time : 3 Hours

Internal Assessment : 20 Marks

Total : 100 Marks

UNIT-I

Ecology and etiology of diseases; Communicable diseases : Cholera, malaria, tuberculosis, hepatitis, leprosy, AIDS and STDs. Non-communicable diseases : leprosy, cardiovascular and cancer.

Unit-II

Diffusion of diseases and their causes. Deficiency disorders and problems of malnutrition and over-nutrition; malnutrition diseases and over nutrition diseases.

Unit-III

Health-care planning : National level - Government and NGOs; Health-care Planning and Policies; availability, accessibility and utilization of Health care services; International support - WHO, UNICEF, Red Cross.

Unit-IV

Primary health care; inequalities in health-care services in India; family welfare, immunization, national diseases eradication and “Health for All” programmes.

Note : The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Akhtar Rais (1990), **Environmental population and health problems**, Ashish Publishers Home, New Delhi.
2. Ansari, S.H. (2005), “**Spatial Organization of health care facilities in Haryana**” NGJI, Vol 51, PP 3-4, 2005, P 51- 61.
3. Chakrabarti, N., (1954), “**Some factors influencing the mortality of cholera**. Calcutta,” Medical Journal, Vol. 51.
4. Misra, R.P., (2007), **Geography of Health**, Concept Publishing Company, New Delhi,2007.
5. Shafi, M. (1967), “**Food Production, efficiency and Nutrition in India.**” The Geographer, Vol. pp. 23-27.
6. Siddiqui, M.F. (1971), “**Concentration of Deficiency Diseases in Uttar Pradesh.**” The Geographer, Vol. 18 pp 90-98.
7. Singhai, G.C. (2006), **Medical Geography**, Vasundhra Publication, Gorakhpur, 2006.
8. Ansari, S.H., “**Pattern of Vehicular traffic in Rohtak City**, Haryana, India; The Geographer, Vol. 53, No. 1, 2006 pp- 55-72.
9. J. Nasir, E.F. Khanam, “**Traffic Noice Pollution in National Capital region : A case study : The Grographer**, Vol. 53, No. 1, 2006, pp. 73-79
10. K. Chaubey, “**Epidemic of HIV/AIDS in India : A Study in Medical Geography.**” Annal of NAGD, Vol. XXV No.1 , 2005 pp 28-33.
11. Aikat, B.K. (1985) **Tropical diseases in India**, Arnold Meinemann, Delhi, Ist Edn.
12. Learmonth, A.T.A. (1985) **Diseases in India**, Concept Pub. Company, New Delhi, 1stEdn.
13. Egles, J. and Woods, K.J. (1983) **The Social Geography of Medicine and Health**, Groom Helm London, 1st Edn.

M.A. Semester –II

Paper VI: India: Contemporary Issues

Unit-1

India and its neighbours: border disputes with China. Pakistan, with special reference to Sir Creek and Siachin and Aksaichin disputes

Water Treaties with Pakistan, Bangladesh and Nepal

Unit-II

Disputes of river water sharing in India with particular reference to Narmada, Krishan, Cauvery and SYL:

Interlinking of rivers, reorganization of state in India: demand of creation of new state: Issue of Talangana; problem of internal Security: growth of Naxalism.

Unit-III

Liberalization and new economic policy in India; Its impact on industries, Agriculture and disparities in levels of development; problems food security in India: five year planning and regional development in India; Energy crisis in India: Nuclear, Solar and wind power.

Unit-IV

Demographic Scenario: Demographic dividend: Recent trends in demographic transition; Imbalances in female – male ratio – recent trends and pattern; problems of population ageing; Population policy in India.

M.A. Geography: Semester- II

Paper- VII Geography of Transport

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT - I

Nature and scope of transport geography, Geographic relevance of transportation, Transport and Development: conceptual frameworks; Theoretical framework, Models of global relevance; (i) The Vance model, (ii) The Rimmer model, and (iii) The Taaffe, Morrill and Gould model.

UNIT - II

The Modes of Transport: Introduction to the modes of transport, modal characteristics, Roads, Railways, Pipelines, Ropeways and Cableways, Waterways and Airways.

UNIT - III

Structural Analysis of Transport Networks: Networks, Networks Graphs and Types; Measures of individual elements of transportation networks: Mileage, Nodality Matrix, Weighted Mileage Matrix, Weighted Nodality Matrix, Gross accessibility; Measures of route density, Measure of route sinuosity, Connectivity of Networks (Cyclomatic number, Diameter)

UNIT - IV

Transport Policy, Development and Planning: Transport Development in India, **Railways;** Distribution Patterns of Railways in India, Problems and Issues in Railways Development, **Road Transport;** Growth and Development of Roads, Importance and Problems of Road transport in India, Road transport and regional development in India.

Note:

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire. All questions carry equal marks.

Recommended Readings:

1. Bamford, C.G. and Robinson, H. (1978), **Geography of Transport**, Macdonald and Evans, London.
2. Bhaduri S. (1992), **Transport and Regional Development**, Concept Publishing Company, New Delhi.
3. Chorley, R.J. and Haggett, P. (1967), **Modes in Geography**, Methuen and Company, London.
4. Eliot Hurst, M.E. (1972), **A Geography of Economic Behaviour: An Introduction**, Duxbury Press, California.
5. Hammond, R. and Mc Cullagh, P.S. (1989), **Quantitative Techniques in Geography; An Introduction**, Clarendon Press, Oxford.
6. Hay, A. (1973), **Transport Economy**, Macmillan, London.
7. Hoyle, Band Knowles, R. (2000), **Modern Transport Geography**, John Wiley and Sons, New York.
8. Hoyle, B.S. (1973) **Transport and Development**, Macmillan, London.
9. Husain, M. and Zaidi, S.S.H. (1996), **Environmental Management in India**, Concept Publications Pvt. Ltd. New Delhi.

10. Raza, M. and Aggarwal, Y.P. (1985), **Transport Geography of India** Concept Publishing Company, New Delhi.
11. Saxena, H.M. (2010), **Transport Geography**, Rawat Publications, New Delhi.
11. Singh, J. (1994), **Indian: A Comprehensive Systematic Geography**, Radha Publication, New Delhi.
12. Taaffe, E.J. and Gauthier, H.L. (1973) **Geography of Transportation**, Prentice Hall Englewood Cliff, New Jersey.
13. Vaidya, B.C. (1998), **Reading's in Transport Geography**, Devika Publications, Delhi.

M.A. Geography : SEMESTER - II
Paper- VIII: Statistical Methods in Geography

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT - I

Statistics, Geography and Statistics; Significance of Statistics in geographical studies; Primary and Secondary Data; levels of data measurement: nominal, ordinal, interval, and ratio.

UNIT - II

Measures of Central Tendency: Arithmetic Mean, Median, Mode and their geographical significance; Centographic techniques: mean centre, median centre and standard distance.

UNIT - III

Measures of dispersion and concentration: Range, quartile deviation, mean deviation, standard deviation; coefficient of variation, Lorenz Curve and Gini's Coefficient; location Quotient.

UNIT - IV

Correlation and regression: Scatter diagram, correlation by Spearman's Rank Difference and Karl Pearson's Product Moment, Significance testing of Correlation; Regression analysis regression equations construction of regression line, computation of residuals and mapping.

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings :

1. David M. Smith (1975), **Patterns in Human Geography**, Penguin, Harmondsworth.
2. Ebdon D (1983) **Statistics in Geography : A Practical Approach**, Blackwell, London.
3. Gregory, S. (1978) **Statistical Methods and the Geographer** (4th Edition), Longman, London.
4. Gupta, S.P. : **Statistical Methods**, Sultan Chand and Sons, Latest Edition.
5. Mathews, J.A. (1987) **Quantitative and Statistical Approaches to Geography**, Practical Manual, Pergamon, Oxford.
6. Pal, S.K. (1998) **Statistics for Geoscientists; Techniques and Applications**, Concept Publishing Company, New Delhi.
7. Peter, J. Taylor (1977), **Quantitative Methods in Geography**, Houghton Mifflin Company, Boston.
8. Robert Hammond and Patrik Mc. Cullagh (1974), **Quantitative Methods in Geography**, Clarendon Press, Oxford.
9. Yeates, Mauris (1974), **An Introduction to Quantitative Analysis in Human Geography**, McGraw Hill, New York.

M.A. Geography: Semester-II
PAPER-X PRACTICALS : FIELD WORK AND REPORT WRITING

Max. Marks : 100

Time : 4 Hours

Distribution of marks :

Lab work test : 60

Record on labwork : 20

Viva Voce : 20

UNIT-I

Sources of data – primary and secondary; Collection of primary data: methods of primary data collection – observation method, interview method, through questionnaire, through schedule and other methods; questionnaire and schedule; processing and analysis of data.

UNIT - II

Field work and report writing: Identification of research problem; preparing research design; data collection through field visit; Report writing.

Note: The students shall conduct physical/ socio-economic survey in different parts of the country as decided by the department under the supervision of a member of the faculty of the department. The teacher in charge shall be paid TA/ DA as per university rule.

M.A. Geography: Semester III
PAPER-XI GEOGRAPHY OF WORLD ECONOMY

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Nature of Economic Geography: Commercial Geography, Environmental Determinism, Areal Differentiation, Locational Analysis, World Economy. Fundamental Concepts : Capital, Capital Accumulation, Capital Accumulation by Dispossession.

Unit-II

Transition from Feudalism to Capitalism, Merchant capitalism and colonialism, Capitalism in Twentieth Century-Organized Capitalism, Disorganized Capitalism; Neo-Liberalism.

Unit-III

World Economy and the Capitalist mode of production, The Basic Elements of World Economy : A Single Market, a Multiple State System, the Three-tier structure; A Space-Time Matrix of the World Economy, Spatial Structure of the World Economy.

Unit-IV

Economic Development : Globalization or Internationalization, Patterns of International Trade, A Brief introduction to World Trade Organization; WTO and Developing Countries.

Note: The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Daniels, Peter et. al. (2003), **Human Geography**, New Delhi : Pearson
2. Dicken, P. (2003), **Global Shift : Reshaping the Global Economic Map in the 21st Century**, New Delhi : Sage Publications.
3. Gwynne, Robert et. al. (2003), **Alternative Capitalism**, London : Arnold.
4. Harvey, David (1982), **The Limits to Capital**, Oxford : Blackwell.
5. Harvey, David (1985), **The Urbanization of Capital**, Oxford Blackwell.
6. Harvey, David (2005), **New Imperialism**, Oxford University Press.
7. Harvey, David (2008), **A Brief History of Neoliberalism**, Oxford University Press.
8. Hudson Ray (2005), **Economic Geographies**, New Delhi : Sage Publications.
9. Johnston, R.J. et. al. (eds.) (2003), **Geographies of Global Change**, Oxford Blackwell.
10. Knox, Paul et. al. (2003), **The Geography of the World Economy**, London : Arnold.
11. Taylor, P.J. and Collin Flint (2000), **Political Geography : World Economy, Nation-State and Locality**, New York : Prentice Hall.
12. World Bank (2002), **Globalization, Growth and Poverty : Building an Inclusive World Economy**, New York : Oxford University Press.

M.A. Geography:Semester III
PAPER-XII OCEANOGRAPHY

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Definition and scope of oceanography, oceanography and other sciences; distribution pattern of land and sea, origin of ocean basins :Wegner's drift hypothesis and sea floor spreading and Plate Tectonics.

Unit-II

Depth of ocean, ocean floor profile-continental shelf, slope, ridge and deeps, abyssal plains; submarine canyons; coral reefs-origin and distribution; ocean deposits; configuration of ocean floors of Indian Ocean and Atlantic Ocean.

Unit-III

Temperature of oceans; salinity in oceans; density of oceans; dynamics of ocean currents; currents of Atlantic, Pacific and Indian Ocean; tides and origin; Tsunami.

Unit-IV

Ocean currents and their impact on climate and economy; oceans as source of food, mineral and energy resources;; sea-level changes; evidences, mechanism and impact.

Note :The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Sharma, R.C. and V. Vatal, (1986), **Oceanography for Geographers**, Chatanaya Publishing, Allahabad.
2. Denny, M., 2008 **How the Ocean works : An introduction to Oceanography**, Princeton University Press, New Jersey.
3. T. Garrison, 2006, **Oceanography : An Invitation to Marine Science**, Thomson, Brooks/ Cole.
4. S. Kerhsaw, 2004, **Oceanography : An Earth Science Perspective**, Routledge, UK.
5. Garrison, T., 1995, **Essentials of Oceanography** Wardsworth Pub. Co., London.
6. Kennel, J.P., 1982, **Marine Geology**, Prentice Hall, Englewood Cliff, New Jersey.
7. Shepart, F., 1969, **The Earth Beneath the Sea**, Athneum, Rev. ed., New York.
8. Sieboldt, E., and W.H. Berger, 1994, **The Sea Floor**, 2nd ed., Freeman, New York.
9. Von Arx, W.S., 1962, **An Introduction to Physical Oceanography**, Addison, Wesley, New York.
10. Stopmmel, H., 1987, **A view of the Sea**, Princeton University Press, New Jersey.

M.A. Geography: Semester III
PAPER-XIII ENVIRONMENTAL GEOGRAPHY

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Environmental Geography: Nature and scope of environmental geography, fundamental concepts of environmental geography; Approaches and methods in Environmental Geography; Relationship with other branches of knowledge, Environment and Ecology: Meaning, structure and type of Environment, Ecology - meaning, scope and concepts. Sub-division of ecology.

Unit-II

Ecosystem: Meaning and concepts of ecosystem, Classification and components of ecosystem, trophic structure, ecological pyramid, energy flow and biogeochemical cycle; Ecological regions of India.

Unit-III

Environmental Degradation – Nature, process, types and causes of environmental degradation, Types of environmental pollution, Sources and effects of environmental pollution: air, water and land, Green house effect, Global warming.

Unit-IV

Environmental Management and Conservation and in India: Environmental management-concept, methods and approaches. Emerging environmental issues in India, Environmental conservation and management in India; Environmental awareness and movements in India.

Note : The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Anderson J.M. (1981): Ecology for Environmental Science : Biosphere, Ecosystems and Man, Arnold, London.
2. Awasthi, N.M. and Tiwari, R.P.L. (1995) :ParyavaranBhugool (Environmental Geography), Madhya Pradesh Hindi Granth Academy, Bhopal.
3. Goudie, Andrew (1984) : The Nature of the Environment, Oxford Katerpring Co. Ltd.
4. Nobel and Wright (1996) : Environmental Science, Prentice Hall, New York.
5. Odum, E.P. (1971) : Fundamental of Ecology, W.B. Sanders, Philadelphia.
6. Saxena, H.M. (1994) :PrayavaranevnParisthitikiBhugool (Geography of Environment and Ecology) Rajasthan Hindi Granth Academy, Jaipur.
7. Singh, Savinder (1991) : Environmental Geography, PrayagPustakBhawan, Allahabad.
8. Singh, R.B. (ed.) (1989) : Environmental Geography, Heritage, New Delhi.
9. Strahler, A.N. and Strahler, A.H. (1973) : Environmental Geosciences : Interaction between natural systems and Man, John Wiley and Sons, New York.
10. Strahler, A.H. and Strahler A.N. (1977) : Geography and Mans Environment, John Wiley, New York.
11. William, M.M. and John, G. (1996) : Environmental Geography - Science, Landuse and Earth System, John Wiley and Sons, New York.

M.A. Geography: Semester-III
Paper XIV (i) Geography of Tourism

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

Unit-I

Geography of Tourism: Definition, nature and scope; Concept of Tourism; Approaches to the study of Tourism.

Unit- II

Motivating factors of Tourism: Historical, Natural, Socio-cultural and Economic; Lundberg's, Robinson's and Plog's classification of motivating factors of Tourism.

Unit- III

Infrastructure and Support System of Tourism: Accommodation and Supplementary Accommodation, Agencies and Intermediaries; Tourism Industry.

Unit- IV

Impact of Tourism: Physical, economic and social, perceptual, positive and negative impacts. Tourism Paradigms: Ethnic Tourism, Sustainable Tourism and Ecotourism.

Note: The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidates are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Bhatia A.K. - Tourism Development: Principles and Practices, Setrling Publishers, New Delhi, 1996.
2. Carter, E and G. Lowman, - Ecotoursim, John Wiley and Sons, New York, 1994.
3. Robinson, H.A. - Geography of Tourism, Macdonald and Evans, London, 1996.
4. Williams Stephen - Tourism Geography, Routledge, contemporary Human Geography, London, 1998.
5. Kamra K.K. and Mohinder Chand - Basics of Tourism: Theory, Operation and Practice, Kanishaka publishers New Delhi, 2007.

M.A. Geography: Semester-III
Paper XIV (ii) Hydrology

End Semester Exam : 80 Marks
Internal Assessment : 20 Marks
Total : 100 Marks
Time : 3 Hours

Unit – I

Introduction to hydrologic science: History of hydrology; Hydrology as a science; Basic hydrologic concepts: Physical quantities and laws; hydrologic systems; Conservation equations.

Unit- II

Drainage Basin-Characteristics of drainage basin: size of the basin.Shape of the basin, compactness ratio, form factor, type and arrangement of stream channels.

Unit – III

Precipitation-Process; Types,Forms. Mean Areal Depth of precipitation: Arithmetic average method, Thiessen polygon method and Isohyetal method; Intensity of rainfall.Analysis of precipitation data. Some worked examples

Unit –IV

Evaporation- Actual evaporation, Potential evaporation; Estimation of actual and potential-evaporation;Thornthwaite's book-keeping method of climatic water balance. Runoff- Factor affecting runoff

Note :The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings

1. Davie, T.(2008) Fundamentals of Hydrology, Routledge, London.
2. Manning, J.C. (1997) Applied Principals of Hydrology, Prentice Hall, New Jersey.
3. Digman, L.S. (2002) Physical Hydrology, Prentice Hall, New Jersey.
4. Raghunath, H.M. (1990) Hydrology, Wiley Eastern Limited, New Delhi.
5. Garg, S.K. (1988) Hydrology and WaterResources Engineering, Khanna Publishers, Delhi.

M.A. Geography: Semester-III
PAPER-XIV: (iii) BIOGEOGRAPHY

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT-I

Biogeography - Development, field, functions and problems; Biosphere - definition, nature and composition.

Unit-II

Biogeochemical cycles- the hydrological cycle, the carbon cycle, the oxygen cycle, the nitrogen cycle, the phosphorous cycle and the sediment cycle.

Unit-III

Ecosystem - Meaning, types, components and functioning of ecosystem; Evolution of living organism and factors influencing their distribution on the earth.

Unit-IV

Biomes- Meaning and types, Bio-geographical realms : Zoogeography and Zoogeographical realms.

Note : The question will have five units. Each of the first four units of question paper will contain

two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Aggarwal, S.K. (1992), **Fundamental of Ecology**, Ashish Pub. House, New Delhi.
2. Bradshaw, M.J. (1979) **Earth and Living Planet**, ELBS, London. 3. Cox. C.D. and Moore, P.D. (1993), **Biogeography : An Ecological and Evolutionary Approach** (fifth Edition), Blackwell.
3. Huggett, R.J. (1998), **Fundamentals of Biogeography**, Routledge, U.S.A.
4. Illics, J. (1974), **Introduction to Zoogeography**, Mcmillian, London.
5. Lapedes, D.N. (ed.) (1974), **Encyclopedia of Environmental Science**, McGraw Hill.
6. Mathur, H.S. (1998), **Essentials of Biogeography**, Anuj Printers, Jaipur.

M.A. Geography: Semester-III
Paper –XIV (iv): SOIL GEOGRAPHY

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

Unit - I

Soil Geography: meaning, nature, and scope; its relationship with Pedology. Soil and regolith; Soil forming factors: parent material, organic, climatic, topographic, and time; Soil components: inorganic materials, organic matter, soil air, and soil water; the soil-water balance.

Unit - II

Processes of soil formation and soil development: physical, biotic and chemical.

Soil Profile and its development; Pedogenic Regimes: podzolization, laterization, calcification, gleization, and salinization.

Unit - III

Physical properties of soils: morphology, texture, structure, water, air, temperature and other properties of soil; Chemical properties of soil and soil reaction; Genetic classification of soils; Taxonomic classification of soils: zonal, azonal and intra-zonal soils, their characteristics and world patterns; classification and spatial distribution of Indian soils.

Unit - IV

Evaluation of land and soil: Parametric and non parametric systems, Land capability classification, Soil survey, modern techniques, field study of soil profile and their characteristics; Soil erosion, degradation, and conservation.

Soil reclamation and management: soil survey and landforms in environmental management; Integrated soil and water management; Soil conservation in India Sustainable development of soil resources with reference to India.

Suggested Readings

1. Backman, H.O and Brady, N.C. (1960): *The Nature and Properties of Soils*, McMillan, New York.
2. Basile, R.M. (1971): *A Geography of Soils*, William C. Brown, Dubuque, Ia.
3. Bennet, Hugh H.: *Soil Conservation*, McGraw Hill, New York.
4. Bunting, B.T. (1973): *The Geography of Soils*, Hutchinson, London.
5. Clarke G.R. (1957): *Study of the Soil in the Field*, Oxford University Press, Oxford.
6. De N.K. and Ghos, P. (1993): *India: A Study in Soil Geography*, Sribhumi Publishing Co., Calcutta.
7. Foth H.D. and Turk, L.M. (1972): *Fundamentals of Soil Science*, John Wiley, New York.
8. Govinda Rajan, S.V. and Gopala Rao, H.G. (1978): *Studies on Soils of India* Vikas, New Delhi.
9. James S. Gardiner (1977), *Physical Geography*, Harper's College Press, New York.
10. McBride, M.B. (1999): *Environmental Chemistry of Soils*, Oxford University Press, New York.
11. Mcknight, Tom L. (1987), *Physical Geography: A Landscape Appreciation (2nd Ed.)*, Prentice Hall, inc., Englewood Cliffs, N.J.
12. Raychoudhuri, S.P. (1958): *Soils of India*, ICAR, New Delhi.
13. Steila, D. (1976): *The Geography of Soils*, Prentice Hall, inc., Englewood Cliffs, N.J.

M.A. Geography: Semester-III

Paper- XV Practical: Morphometric Analysis

Distribution of Marks
Lab Work Test : 60
Record on Lab Work : 20
Viva-Voce : 20
Max.Total : 100
Time : 4 hrs.

UNIT - I

Morphometric Analysis of Drainage basin- its geographical significance, basin morphometry of fluviially originated drainage basin, **Linear Aspects:** Stream ordering based on Horton and Strahler, Bifurcation ratio, **Areal Aspects:** Geometry of basin shape, Basin Perimeter, Length and Area, Stream frequency and Drainage density

UNIT - II

Relief Aspects: Hypsometric analysis- Hypsometric curve and Integral Hypsometric curve, Clinographic analysis, Altimetric analysis, **Slope Analysis**- Average Slope (Wentworth's method), Relative Relief (Smith's method), Dissection Index, **Profile Analysis** -Longitudinal profile.

Note :

The question paper shall contain six questions in all, including three questions from each unit. Candidate(s) are required to attempt three questions in all selecting at least one question from each unit. All questions carry equal marks.

Recommended Readings:

1. Monkhouse, F.J. and H.R. Wilkinson (1980), **Maps and Diagrams**, B. I. Publications, Bombay.
2. Singh, R.L. (1979), **Elements of Practical Geography**, Kalyani Publishers, New Delhi.
3. Singh, S. (1997), **Geomorphology**, Prayag Pustak Bhawan, Allahabad.

M. A. Geography: Semester-IV
PAPER-XIX (i) : REGIONAL DEVELOPMENT AND PLANNING

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

Unit I

Conceptual and Theoretical Framework: Regional concept in Geography and its application to planning; types of regions and methods of regional delineation; Concept of Development, Indicators of Development, Regional Development; Planning Process: Types of Planning, Regional Planning and its rationale, principles and objectives; Approaches of Regional Planning; National vs Regional Planning.

Unit II

Regional Growth Theories: Economic Base Theory; Input and Output Model; Regional Multiplier; Friedman's Core-Periphery Theory; Polarisation and Trickle-down Theory of Hirschman; Spread and Back Wash Theory of Myrdal; Growth Pole Theory of Perroux.

Unit III

Planning Region: Need for Planning Region; Characteristics of Planning Regions; City-Region Concept; Hilly Region; Tribal Region; Multi-level planning.

Unit IV

Regional Planning in India: Regional Imbalances/Disparities – Causes and consequences; Measurements of Regional Disparities; Planning Policies for Regional Development; National Capital Region

Note: The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Bhatt, L.S. (1972) **Regional Planning in India**, Statistical Publishing Society, Calcutta.
2. Bhatt, L.S. et. al. (eds) (1982) **Regional Inequalities in India**, Society for the study Regional Disparities, New Delhi.
3. Blunder. J. et. al. (1973) **Regional Analysis and Development**, Harper & Row, London.
4. Chand, M and V.K. Puri (1985) **Regional Planning in India**, Allied Pub. Pvt. Ltd. New Delhi.
5. Coates, B.R. and R.J. Johnston (1977) **Geography and Inequality**, Oxford University Press, Oxford.
6. Friedmann, J and William Alonso (1967) **Regional Development and Planning: a Reader**, MIT Press, Cambridge Massachusetts.
7. Kuklinski, A.R. (ed) (1972) **Growth Poles and Growth Centres in Regional Planning**, Monton, The Hague.
8. Misra R.P. et. al. (eds.) (1974) **Regional Development Planning in India**, Vikas, New Delhi.
9. Raza, Moonis (1988) **Regional Development**, Heritage, New Delhi.
10. Sundram, K. V. (1977) **Urban and Regional Planning in India**, Vikas Publishig House Pvt Ltd, New Delhi

M.A. Geography: Semester IV
PAPER-XIX (ii) WATER RESOURCES AND MANAGEMENT

End Semester Exam : 80 Marks
Internal Assessment : 20 Marks
Total : 100 Marks
Time : 3 Hours

UNIT-I

Water as a focus of geographical interest- water links natural, environment and man's activities, coalescence of physical and human geography. Basic hydrological cycle and its components; precipitation, potential evapotranspiration, interception loss, runoff, factor affecting water resources development – climatic factors, physiographic factors, geological factors.

Unit-II

Ground water and its occurrence- consolidated formation, semi-consolidation formation, in-consolidated formation. A rainbow of water-green water, blue water, white water, virtual water; some worked examples relating to the chapter (examples on evaporation, water balance, surface water resources).

Unit-III

Utilisation of water resources- physical and socio-economic basis of water resource utilization. Problems of groundwater utilization - groundwater quality, groundwater salinity, water-logging and groundwater depletion.

Unit-IV

Surface and Groundwater pollution; scarcity of water resources; Water resources management - definition, function and strategies; problems of drinking water supply in urban areas; Ganga Action Plan.

Note : The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Andrew A. Dzurik, (2002) **Water Resources Planning**, Rowman & Littlefield Publishers, Inc., Savage, Maryland.
2. Chorley, R.J. (1979) **Water, Earth and Man**, Methuen, London.
3. Daniel P. Loucks and E.V. Beek, (2005) **Water Resources Systems Planning and Management : An introduction to Methods, Models and Applications**, UNESCO Publishing.
4. Jeet, Inder, (2005) **Groundwater Resources of India- Occurrence, Utilization and Management**, Mittal Publication, New Delhi.
5. Neil S. Grigg, (1996) **Water Resources Management** McGraw-Hill Book Co., New York.
6. S.L. Dingman, (2002) **Physical Hydrology**, Prentice-Hall Inc., New Jersey.
7. T.V. Ceck, (2005) **Principles of Water Resources : History, Development, Management and Policy**, John Wiley & Sons, Hoboken.

M.A. Geography: Semester-III
Paper XIX (iii): Geography of Natural Hazards and Disaster
Management

End Semester Exam:	80 Marks
Internal Assessment:	20 Marks
Total:	100 Marks
Time:	3 Hours.

Unit I

Concept of Hazards, Risk, Vulnerability and Disaster.

Types of Hazards: Natural (Tectonic Hazards – Earthquakes and Volcanoes; Hydrological Hazards – Floods and Droughts.

Unit II

Regional Dimension of Natural Hazards: Occurrence and Trends. (Tectonic Hazards – Earthquakes and Volcanoes; Hydrological Hazards – Floods and Droughts.

Unit III

Disaster Losses and Impact – Displacements, Livelihood.

Economy and Infrastructure, and Health.

Unit IV

Mitigation and Management: Plans and Policies. Role of Remote Sensing, GIS and GPS in Disaster Management.

Note:-Question Paper will consist of five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. Unit-V will be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Suggested Readings:

1. Allan, S., Adam, B. and Carter, C., (eds.), (2000): *Environmental Risks and the Media*, Routledge, London.
2. Ambala-Bertrand, J.M., (1993): *Political Economy of Large Natural Disasters: With Special Reference to Developing Countries*, Claredon Press, Oxford.

3. Blaikie, P., Cannon, T., Davis, I., (*et al.*), (1994): *At Risk: Natural Hazards, People's Vulnerability, and Disasters*, Routledge, London.
4. Burton, I., Kates, R.W. and White, G.F., (1993): *Environment as Hazards*, 2nd edition, Guilford Press, New York.
5. Hewitt, K., (1997): *Regions of Risk" A Geographical Introduction to Disasters*, Longman, London.
6. Hood, C. and Jones, D.K.C. (eds.), (1996): *Accident and Design: Contemporary debates in Risk Management*, UCL Press, London.
7. Kasperson, J.X., Kasperson, R.E. and turner, B.L., (1995): *Regions at Risk: Comparisons of Threatened Environments*, United Nation University Press, Tokyo.
8. Mitchell, J.K., (ed.) (1999): *Crucibles of Hazard: Mega-Cities and Disasters in Transition*, United Nations University Press, New York.
9. Schneider, S.K., (1995): *Flirting with Disaster: Public Management in Crisis Situations*, M.E.Sharpe, New York.
10. Quarantelli, E.L. (ed.) (1998): *What is a Disaster? Perspective on the Question*, Routledge, London.
11. Schneid, T. and Collins, L. (1998): *Disaster Management and Preparedness*, Lewis Publishers, Washington, D.C.
12. Godschalk, D.R. (et.al.) (1999): *Natural Hazard Mitigation Recasting Disaster Policy and Planning*, Island Press, Washington, D.C.
13. Smith, Keith (1996): *Environmental Hazards; Assessing Risk and Reducing Disaster*, Routledge, London and New York.
14. Paraswamam, S. and Umikrishnan, P.V. (2000): *India Disaster Report*, Oxford University Press, New Delhi

M.A. Geography: Semester- IV
PAPER-XIX (iv) RURAL GEOGRAPHY

End Semester Exam: 80 Marks

Internal Assessment: 20 Marks

Total: 100 Marks

Time: 3 Hours

UNIT-I

Nature and scope of rural geography; **Infrastructure in rural India:** Irrigation, Electrification, and Roads.

Unit-II

Rural House Types : House Types based on Building Materials, Size and Shape as basis for classification, House Types based on Socio-Economic Status, Regional Patterns of Houses in India.

Unit-III

Issues of Rural Development in India: Land Reforms, Agricultural land-use, Distribution of landholdings, Rural Poverty, Rural Unemployment.

Unit-IV

Untouchability and Dalits in Rural India: Some Theoretical Explanations, Anti Untouchability Movements: A Historical Overview; Scheduled Castes in Rural India, Patterns of Female Work Participation of Scheduled Castes, Women Empowerment in Rural India.

Note: The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Alam, S.M. et. al. (1982) Settlement System of India, Oxford and IBH Publication Co., New Delhi.
2. Chisholm, M. (1967) Rural Settlements and Land Use, John Wiley, New York.
3. Clout, H.D. (1977) Rural Settlements and Land Use, John Willy, New York.
4. Hudson, F.S. (1976) A Geography of Settlements, Mac Donald & Evans, New York.
5. Mandal. R.B. (1988) Systems of Rural Settlements in Developing Countries, Concept Publication, New Delhi.
6. Mandal, R.B. (2001) Introduction to Rural Settlements, Concept Publication, New Delhi.
7. Misra, H.N. (1987) Rural Geography, Vol. IX, Contributions to Indian Geography, Heritage Publishers, New Delhi.
8. Misra, S.K. and Puri, V.K. (2009) Indian Economy, Himalaya Publishing House, New delhi.
9. Rai, S. (2005) Kurukshetra, Ank. 12, October, Gramin Vikas Mantralaya, New Delhi.
10. Shah, G. Thorat S. et.al. (2006) Untouchability in Rural India, Sage Publication, New Delhi.
11. Singh, R.L. and K.N. Singh eds. (1975) Readings in Rural Settlements Geographhy, NGSi, Varanasi.
12. Singh, R.L. (1976) Geographic Dimensions of Rural Settlements,NGSI, Varanasi.
13. Singh, R.Y. (1994) Geography of Settlements, Rawat Publication, New Delhi.
14. Singh, R.Y. (2005) Adhiwas Bhugol, (in Hindi) Rawat Publication, New Delhi.

M.A. Geography: Semester-IV
Paper-XVI: Geographic Thought

End Semester Exam : 80 marks

Internal Assessment : 20 marks

Total : 100 marks

Time : 3 hrs.

UNIT - I

Geography - its place in the classification of sciences; Basic concepts in the philosophy of geography - distributions, relationships, areal differentiation and spatial organization; Darwin's influence on geography; Historical geography and the study of change.

UNIT - II

Kuhn's model of 'paradigm of Science'; Dominant paradigms in geography ; exploration, environmental determinism and possibilism, regionalism and spatial analysis; Scientific Explanation : inductive and deductive approaches.

Unit-III

A general survey of developments in Geography upto World War-II – Contributions of Ratzel, Richthofen, Hettner, Blache, Schluter, Mckinder, Sauer.

Unit-IV

Quantitative revolution in Geography; Development of 'human centred theories ; behavioral and humanistic perspectives in Geography; The call for Social Relevance in Geography : Liberals, Radicals; Postmodernism and Geography.

Note : The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings :

1. Abler, Ronald; Adams, John S. Gould, Peter, (1971), **Spatial Organization : The Geographer's**
2. Agnew, John et. al. (ed.) (1996), **Human Geography**, Blackwell Publishers London. 3. Dikshit,
3. Aitken Stuart & Gill Valentine ed. (2006) **Approaches to Human Geography**, Sage, London.
4. Bonnet, Alastair (2008) **What is Geography?** Sage, New Delhi.
5. Cloke, Paul and Johnston, Ron (2005) **Spaces of Geographical Thought**, Sage, London.
6. Dickinson, R.E. (1969), **The Makers of Modern Geography**, London.
7. Dikshit, R.D. (1999), **Geographical Thought - A Contextual History of Ideas**, Prentice Hall of India, New Delhi.
8. Hartshorne, R. (1959), **Perspective on Nature of Geography**, Rand Mc Nally & Co.
9. Harvey, David (1969), **Explanation in Geography**, Edward Arnold, London.
10. Harvey, David (1990) **The Condition of Postmodernity**, Blackwell, London.
11. Harvey, Milton E and Brian P. Holly (1981), **Themes in Geographic Thought**, Croom Helm, London.

12. Hubbard, Phil, Rob Kitchin and Gill Valentine (2008) **Key Texts in Human Geography**, Sage, London.
13. Hubber, Phil et. al. (2002), **Thinking Geographically: Space Theory and Contemporary, Human Geography**, Continuum, New York.
14. Husain, M. (2001), **Evolution of Geographic Thought** (fourth edition), Rawat Publication Jaipur.
15. James P.E. and Martin J. Geoffret (1972) **All Possible Worlds**, John Wiley and Sons, New York.
16. Johnston, R.J. (1988) **The Future of Geography**, Methuen, London.
17. Johnston, R.J. (2004) **Geography and Geographers**, Arnold London.
18. Peet, Richard (1998) **Modern Geographical Thought**, Oxford Blackwell.
19. Peet, Richard (2003) **Radical Geography**, (Indian Reprint), Rawat Publication, New Delhi.
20. R.D. (ed.) (1994) **The Art & Science of Geography: Integrated Readings**, Prentice Hall of India, New Delhi.
21. Soja, Edward W. (1997) **Postmodern Geographies**, Indian edn. Rawat Publications, New Delhi.
22. Unwin, Tim (1992) **The place of Geography**, Pearson Education Limited, Essex.
23. **View of the World**, Prentice Hall, N.J.

M.A. Geography: Semester – IV
PAPER-XVII: RESEARCH METHODOLOGY

End Semester Exam : 80 Marks

Internal Assessment : 20 Marks

Total : 100 Marks

Time : 3 Hours

UNIT-I

Meaning and Purpose of Research, Types of Research; Social Science Research, Identification of Research Question and Literature Surveying; Methods and Methodology in Human Geography.

Unit-II

Scientific Method in Human Geography; Analytical Steps of the Scientific Method; The Routes of Scientific Explanation: Deductive and Inductive forms of reference; Explanation in Geography: Some Problems.

Unit-III

From Quantitative to Qualitative Geography; Qualitative Data Production: Interviews (Process of Interviewing. Structure interviews and informal surveys; Depth Interviewing and Working with Groups); Observation.

Unit-IV

Field work in Geographical Studies; Data Creation: Census Method and Sampling Method (Random, Systematic, Stratified, Multi-Stage, Accidental and Purposive); Process of Research Report Writing.

Note : The question will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Dey, Ian (1993), **Quantitative Data Analysis**, London : Routledge.
2. Eyles, John and David M. Smith (1988), **Qualitative Methods in Human Geography**, Oxford : Polity Press.
3. Harvey, David (1969), **Explanation in Geography**, London : Edward Arnold.
4. Hubbard, Keith et.al. (2002), **Thinking Geographically**, London : Continuum.
5. Hoggart, Keith et.al. (2002), **Researching Human Geography**, London : Arnold.
6. Johnston, R.J. and J.D. Sidaway (2004), **Geography and Geographers**, London : Arnold.
7. Kitchin, Rob and Nicholas J. Tate (2002), **Conducting Research in Human Geography**, London : Prentice Hall.
8. Limb, Melanie and Claire Dwyer (2001), **Qualitative Methodologies for Geographers**, London : Arnold.
9. Robinson, Guy M. (1998), **Methods and Techniques in Human Geography**, New York : John Wiley.
10. Scale, Clive (ed.) (2008), **Social Research Methods**, London : Routledge (India Edition).
11. Somekh, Bridget and Cathy Lewin (eds.) (2005), **Research Methods in the Social Sciences**, New Delhi : Vistaar Publications.

M. A. Geography: Semester-IV

Paper XVIII: Remote Sensing and GIS

End Semester Exam: 80 marks
Internal Assessment : 20 marks
Total : 100 marks
Time : 3 hrs.

Unit-I

Photogrammetry: Development, Definition, Types;
Aerial photographs: Geometry, Types , Methods of determination of scale;
Stereoscopic view, Overlapping and Stereoscopes;
Elements of image interpretation;
Acquisition of aerial photographs in India.

Unit-II

Remote Sensing: Definition and Applications;
Radiation principles and EMR (Electromagnetic Radiation);
Energy interactions in atmosphere and Atmospheric Window;
Energy interactions on earth surface and Spectral Signature;
Spectral reflectance curves of earth surface features and their comparative analysis.

Unit-III

Remote Sensing Platforms: Airborne and Spaceborne;
Satellite orbits: Near polar orbits and Geostationary orbits;
Basic concepts of Optical, Thermal, Microwave and Hyperspectral Remote Sensing;
Remote Sensing set up in India.

Unit -IV

Definition and development of GIS;
Components of GIS;
Functions in GIS; Data input, storage and maintenance; manipulation and analysis, output;
Spatial and non spatial data in GIS and their representation;
Raster and vector format of data; Integration of remote sensing data and GIS;
Applications of GIS in Geography

Note :

The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire Syllabus. All questions carry equal marks.

Recommended Readings:

1. American society for Photogrammetry and Remote Sensing, 1999, *Remote Sensing for the Earth Sciences*, Manual of Remote Sensing, 3rd ed., vol. 3, Wiley, New York.
2. Avery, T.E., and G.L. Berlin, 1992, *Fundamentals of Remote Sensing and Airphoto Interpretation*, 5th ed., Macmillan, New York.
3. Campbell, J.B., 1996, *Introduction to Remote Sensing*, 2nd ed., Guilford, New York.

4. Curran, Paul J., (1985); *Principles of Remote Sensing*, Longman, London & New York.
5. Drury, S.A., *Images of the Earth: A Guide to Remote Sensing*, 2nd ed., Oxford University Press, Oxford.
6. Elachi, C., 1987, *Introduction to the Physics and Techniques of Remote Sensing*, Wiley, New York.
7. Gupta, R.P., (2003) : *Remote Sensing Geology*, Springer-Verlag.
8. Jensen, J.R., (2004); *Remote Sensing of the Environment: An Earth Resource Perspective*, Pearson Education.
9. Joseph, G., 2003: *Fundamentals of Remote Sensing*, Universities Press, Hyderabad.
10. Lillesand, T.M. and Kiefer, R.W. (2002), *Remote Sensing and Image Interpretation*, John Wiley and Sons, New York.
11. Nag. P. and Kudrat M. (1998) *Digital Remote Sensing*, Concept Publishing Co., New Delhi.
12. Rampal, K.K. (1999) *Handbook of Aerial Photography and Interpretation*, Concept Publishing Co., New Delhi.
13. Robbert, G. Reaves et.al. (1981) *Manual of Remote Sensing* (eds.), Fourth Edition, Vol. I & II, American Society of Photogrammetry, Falls Church, U.S.A.
14. Sabins, F. F., Jr., (1997): *Remote Sensing: Principles and Interpretation*, 3rd ed., W.H. Freeman, New York.
15. Sabins, F.F. (1986) *Remote Sensing-Principles and Interpretation*, Second Edition, WH Freeman and Co., New York.
16. Star, J.L., J.E. Estes, and K.C. McGwire, 1997, *Integration of GIS and Remote Sensing*, Cambridge University Press.
17. Wolf, Paul.R., *Elements of Photogrammetry*, 2nd ed., McGraw-Hill, New York, 1983.

M.A. Geography: Semester – IV

PAPER-XX Interpretation of Aerial Photographs & Satellite Images and Thematic mapping

Time : 4 Hours
Lab Work Test : 60
Record on Lab work : 20
Viva-Voce : 20
Total :100

Unit I

Stereo Vision Test, Orientation of stereo model under Mirror Stereoscope;
Determination of scale on an aerial photograph ;
Measurement of height of an object on single vertical aerial photograph ;
Parallax bar measurement and height determination;
Preparation of stereogram, stereotriplet and mosaic from aerial photographs.

Unit-II

Interpretation of Aerial photographs : Identification, mapping and interpretation of Natural and Cultural features (at least Two exercises);
Interpretation of a Satellite Image (Landsat, LISS III, LISS IV, Cartosat etc) : Identification, mapping and interpretation of Natural and Cultural features (at least Two exercises);

Unit III

Comparison of features on Panchromatic, True Colour and False Colour Composite images and Preparation of interpretation keys;
Mapping Land Use/land Cover with any Software (at least one exercise each on Point, line and polygon features)

Note : The question paper shall contain six questions in all containing two questions from each unit. Candidates are required to attempt three questions in all selecting at least one question from each unit.

Recommended Readings:

1. Heywood, Ian et. Al (2002), *Geographical Information Systems* (Second edition), Pearson Education, Delhi.
2. Lillesand, T.M. and Kiefer, R.W. (2002), *Remote Sensing and Image Interpretation*, John Wiley and Sons, New York.
3. Nag. P. and Kudrat M. (1998) *Digital Remote Sensing*, Concept Publishing Co., New Delhi.
4. Rampal, K.K. (1999) *Handbook of Aerial Photography and Interpretation*, Concept Publishing Co., New Delhi.
5. Robbert, G. Reaves et.al. (1981) *Manual of Remote Sensing* (eds.), Fourth Edition, Vol. I & II, American Society of Photogrammetry, Falls Church, U.S.A.
6. Sabins, F.F. (1986) *Remote Sensing-Principles and Interpretation*, Second Edition, WH Freeman and Co., New York.
7. Sharma, J.P. (1996) *Prayogic Bhoogol*, Rastogi Publicatoin, Meerut.
8. Wolf, Paul.R., *Elements of Photogrammetry*, 2nd ed., McGraw-Hill, New York, 1983.