University of Rajasthan
Jaipur

SYLLABUS

M.SC.

GEOGRAPHY

(ANNUAL SCHEME)

2015-2017
M.A./M. Sc. Geography (Annual Scheme)

(Regular/Non-Collegiate Candidates)

SCHEME OF EXAMINATION

Each Theory Paper 3 Hrs. Duration 100 Marks
Dissertation if offered in lieu of an elective paper 100 Marks
Practical 100 Marks

N.B. Non-Collegiate candidate are not eligible to offer dissertation as per provisions of O. 170-A.

1. The number of papers and the maximum marks for each paper/practical shall be shown in the syllabus for the subject concerned. It will be necessary for a candidate to pass in the theory part as well as in practical part (wherever prescribed) of a subject/paper separately.

2. A candidate for passing at each of the Previous and the Final Examination shall be required to obtain:
   (i) Atleast 36% marks in the aggregate of all the papers prescribed for the examination, and
   (ii) Atleast 36% marks in practical(s) wherever prescribed at the examination, provided that if a candidate fails to secure atleast 25% marks in each individual paper at the examination and also in the dissertation/survey report/field work, wherever prescribed, he shall be deemed to have failed at the examination notwithstanding his having obtained the minimum percentage of marks required in the aggregate for that examination. No division will be awarded at the Previous and the Final Examination. Division shall be awarded at the end of the Final Examination on the combined marks obtained at the Previous and the Final Examinations taken together, as noted below:

   First Division 60% of the aggregate marks taken together of the Previous and the Final Examination.
   Second Division 48%

All the rest will be declared to have passed the examination.

3. If a candidate clears any Paper(s) Practical(s)/Dissertation prescribed at the Previous and/or Final Examination after a continuous period of three years, then for the purpose of working out his division the minimum pass marks only viz. 25% (36% in the case of practical) shall be taken into account in respect of such Paper(s)/Practical(s)/Dissertation are cleared after the expiry of the aforesaid period of three years, provided that in case where a candidate requires more than 25% marks in order to reach the minimum aggregate as many marks in out of those actually secured by him will be taken into account as would enable him to make up the deficiency in the requisite minimum aggregate.

4. The Thesis/Dissertation/Survey Report/Field Work shall be type written and submitted in triplicate so as to reach the office of the Registrar atleast 3 weeks before the commencement of the theory examinations. Only such candidates shall be permitted to offer Dissertation/Field Work/Survey Report/Thesis (if provided in the
scheme of examination) in lieu of a paper as have secured at least 55% marks in the aggregate of all the papers prescribed for the previous examination in the case of annual scheme I and II semester examination taken together in the case of semester scheme irrespective of the number of papers in which a candidate actually appeared at the examination.

5. The Students are permitted to use simple calculator, Log Table & map stencils in the Examinations if needed.

6. Non-collegiate candidates both in previous and final year are required to attend a practical training camp of forty eight hours at the Department of Geography, University of Rajasthan, Jaipur on payment of fee fixed by the University from time to time. The candidate should contact the Head, Department of Geography, University of Rajasthan, Jaipur for practical camps immediately after the filling the examination forms. Head, Department of Geography will issue a Certificate to each of the non-collegiate candidate for successful completion of the training camp. The candidate have to submit the Certificate at the time of practical examination.

M.A./M.SC. Geography

There will be four theory papers and a practical each in Previous and Final Examination. Each of the theory papers will be 100 marks. Each theory paper will be of three hours duration. Candidate will be required to pass both in theory and practicals separately.

**PREVIOUS**

**Paper –I**  Evolution of Geographical Thought
**Paper –II**  Physical Basis of Geography
**Paper –III**  Principles and Theory of Economic Geography
**Paper –IV**  Any one of the following:
   (a) Advanced Geography of Monsoon Asia
   (b) Geography of Rural Development
   (c) Comparative Geography of U.S.A. and Russia
   (d) Geography of South Asian Countries (Bangladesh, Nepal, Pakistan, Srilanka)
   (e) Advanced Regional Geography of West Europe.
   (f) Man and Natural Environment.
   (g) Quantitative Techniques in Geography.
   
   **Practicals**

**FINAL**

**Paper –V**  Advanced Geography of India
**Paper –VI**  Any one of the following:
   (a) Population Geography
   (b) Agricultural Geography (Elements & Applied)
   (c) Industrial Geography
(d) Transport Geography  
(e) Geography of Settlements  
(f) Advanced Geomorphology  

Paper - VII  Any one of the following:  
(a) Urban Geography  
(b) Geography of Crimes  
(c) Climatology and Oceanography  
(d) Applied Geography  
(e) Pedology  
(f) Medical Geography  
(g) Fundamentals of Remote Sensing and Geographical Information System  

Paper - VIII  Any one of the following:  
(a) Political Geography  
(b) Cultural Geography  
(c) Bio-Geography  
(d) Regional Planning and Development  
(e) Meteorology  
(f) Research Methodology  
(g) Geography of water resources, their management and utilization  


**Practical**  

Instructions for Geography Practical Examination (Both Regular and Non-collegiate)  

1. The record work should have 50 sheets (1/6th of 20” x 30”) and they should cover the total syllabus proportionately. The teacher should revise fresh exercises every time so that the student may not undertake tracing of old exercises. The work must be done in the class rooms and signed on the same date. This would discourage completing the whole work at the nick of the examination emphasis should be laid on ink; and color maps.  
2. The Viva-voce Exam. be held to judge the real knowledge of the student and to examine the authenticity of the record work. The marking on the record work and its viva-voce be based on the original work of the candidate and not by merely producing the record work got done by any other agency. Marks be deducted for the syllabus not covered.  
3. On an average about 20 students be examined in one batch in M.A. Previous. As far as possible practical exercise be set to judge the practical skill through the Practical exercise.  
4. (a) The field Survey by instruments in M.Sc./M.A. Final be given 3 hours alongwith Viva-voce. Each students will have to do exercise on each instrument individually.  
(b) The practical examination in M.Sc./M.A. (Final) will be conducted in batches of not more than 20 students.  
5. The paper for written test in M.A. Final be so set that the questions are not duplicated with field exercise.
6. The External examiner be provided detailed syllabus and detailed instruction before commencement of examination.

SYLLABUS

M.A./M.Sc. Previous

Paper- I Evolution of Geographical Thought

Section A

Definition, scope, nature, purpose and philosophy of geography, fundamental concepts of geography; ancient Indian geography during Vedic and Puranic periods, ancient classical age: contributions of Greeks (Herodotus and Eratosthenese) and Romans (Strabo and Ptolemy); medieval geography: contributions of Al Biruni, Al Masudi, Idrisi, Ibn-Batutta, Ibn Khaldun, Geography during the period of Renaissance: contributions of Sebastian Munster, Philip Cluverious, Nathanael Carpenter, Varenius, Anton Friedrich Bushing, Immanuel Kant and Conrad Malte Brun.

Section B

Modern geography: geography in Germany-contributions of Humboldt and Ritter, Richthofen, Ratzel, Hettner and Schluter; geography as a chorological science, geography in France-Blache and Brunches, geography in Anglo-American- Sauer and Schafer, geography as science of distribution and relationship, geography as chorological science, geography as science of landscape morphology, geography as spatial science and human ecology.

Section C

Dualism in geography: physical and human geography, systematic and regional geography, environmental determinism and possibilism, qualitative and quantitative, reductionism and holism; quantitative revolution; philosophical pluralism- empiricism, logical positivism, humanistic geography and structuralism. Approaches in geography, behavioural, radical, feminist, Post modern and critical geography; Indian geography: development, problems, perspectives and prospects.

Recommended Readings:


बंसल, रुपेश चंद्र. 2008: भौगोलिक विचारन के मूल तत्त्व। मीनाक्षी प्रकाशन, मेरठ।


Paper- II: Physical Basis of Geography

Section A

Meaning, scope and development of physical geography, approaches and recent trends in physical geography, zoning of the earth’s interior and thermal state, isostasy, endogenetic and exogenetic forces, mountain building theories (Kober, Jeffreys, Daly, Joly, Holmes) plate tectonics, denudation: erosion and weathering: types and processes, models of landscape evaluation: Davis and Penck.

Erosional and depositional landforms formed by running water, underground, wind, glacial-periglacial; process of desertification, models of slope development (Wood, Davis, Penck, King).

Section B

Atmosphere: composition and layers, air temperature, heat balance, adiabatic and non adiabatic processes, stability and instability, evaporation, humidity and condensation, precipitation, world precipitation pattern.

Air pressure variations, pressure belts and planetary wind system, monsoon winds and local winds, air masses and fronts, secondary circulation: cyclones (Tropical and extra tropical) and anticyclones, world climatic classification: Koppen’s and Thornhwaite’s schemes.

Section C

Oceanic bottom relief, oceanic deposits, horizontal and vertical distribution of temperature and salinity, oceanic water currents, tides and tidal theories, atolls and coral islands, theories of coral reef formation, marine resources biotic, mineral and energy resources and their utilization.

Soils: genesis, classification and distribution, biodiversity loss and measures for conservation, biotic succession and major biotic regions of the world with special reference to ecological aspects of savannah and monsoon biomes.
Recommended Readings:

Jait, V.P. 2013: भौतिक भूगोल। मलिक एण्ड कम्पनी, जयपुर।

Paper III: Principles and Theory of Economic Geography

Section A

Meaning and scope of economic geography, simple model of economy and spatial structure of economy, environmental relations of economy, classification of the economies of the world (primary, secondary and tertiary), theories, concepts and models of development-developed, developing and under developed economies, agricultural typology with special reference to subsistence agriculture, plantation agriculture, Mediterranean agriculture, mixed farming, commercial grain farming, livestock rearing.

Section B


Section C

Decision making process: Location decision-behavioral view, spatial organization of landuse: Central place theory of Christaller Von Thunen’s Agriculture location theory, emerging patterns of world trade, barriers to trade, dynamics of blocks, economic development, regional disparities in economic development, economic regionalization for area development and planning-economic regions of India.
Recommended Readings:

Gupta, P. Sen and Sydasuk, Galyna: Economic Regions and Regionalization in India.
मार्क्स, जी.सी. 2014: आर्थिक भूमीका। पंचशील प्रकाशन, जयपुर।

Paper IV Any one of the following:

Paper IV (a): Advanced Geography of Monsoon Asia

Section A

Unity in Diversity in Monsoon Asia, importance of location, geological structure, physiographic, drainage basins, climate regions, natural vegetation, mineral wealth, population and its characteristics, power resources, agricultural characteristic, importance of Monsoon lands with respect of food stuffs and raw materials, natural rubber lands with respect to good stuffs and raw materials, natural rubber and its world trade, tea, coffee spices, developments of transportation and accessibility.

Section B

Singapore-problems of industrial expansion, port developments, human resource, Philippines—population and food problem and development programme, Thailand—problem of urbanization and regional division and development programmes Indonesia—population
densities and its trends, mineral resources, type of agriculture, sugar industry, Burma-regional division, agricultural, forest and mineral resources, Hong Kong-urban growth, changing trade pattern, industrial development, changing land use pattern, Korea-agricultural and industrial development.

Section C

China state farms and people communes, population and food supply industrialization, changing pattern of industrial complex, Red Basin, the Hwango Ho, Yagize Kiang and Sikiang basins, Japan-Coal resources, water power, conservation of forest, copper production, tea, soyabean and rice culture, fishing industry, motor vehicle steel and industries, industrial belts.

Recommended Readings:


ममित्रित्व एवं अभिगम एवं अभिगम 2012: एशिया का भूगोल। साहित्य भवन, आगरा।

राव, श्री. एवं सतपथि, दी.मी. 2002: एशिया की भौगोलिक समीक्षा। वसुश्च ग्रंथालय, गोरखपुर।

सतपथि, दी.मी. 1995: चीन की भौगोलिक समीक्षा। वसुश्च ग्रंथालय, गोरखपुर।


सकसेना, एच.एम. 2010–11: विश्व का प्रादेशिक भूगोल। रसलोगी पश्चिमोत्तर। मेरठ।


Paper IV (b): Geography of Rural Development

Section A

Geography and rural development, agricultural geography and rural development, agricultural location theory, rural land use, agricultural, pastoral, forestry and land use competition, landuse and landscape, approaches to rural development, growth center approach, infrastructure reformist, rural settlement, housing, population and employment, rural transport service provision, recreation, health and nutrition.

Section B

Rural planning and land management: resource development and integrated rural development: crop and soil management, live stock range and management: water management, ecological management, desertification monitoring and control.
Section C

Rural development in Rajasthan: major tools and techniques, rural development schemes—irrigation and land development schemes, drought prone areas schemes, desert development programme, integrated rural development in Rajasthan, tribal areas development, wasteland development.

Recommended Readings:

Association of Country Councils 1979: Rural Deprivation, London, ACC.
Morgan, W.B. and RJS Munon-Agricultural Geography, London Methuen.

Paper IV (c): Comparative Geography of U.S.A. & Russia

Section A.

Strategic importance of location, geological structure, physical features and physiographic division, drainage pattern and river basins, climatic controls and climatic divisions, natural vegetation and vegetation divisions, demographic characteristics.

Section B.

Natural resources-forest, soil mineral, livestock, development of power resources, development of agriculture-agricultural crop regions (Belts).
Section C

Important industries, their location and distribution, transportation networks (rail, road, air, water and pipelines).
International trade.
Detailed study of important regions-economic and industrial programmes for future development.

Recommended Readings:

Hait: The South Eastern United Co., N.Y.
Lames, P.E.: Latin America (Cassel and Co., London).
Mirow, N.T.: Geography of Russia (John Willey and Sons, New York).
Methn, Vendo: Soviet Economic Development and Structure, Sterling Publisher Pvt. Ltd.,
AB/9 Safdarganj Enclave, New Delhi.
Schwartz, H.: Russia's Social Economy (Prentice Hall of India, Delhi).
T. Shabad: Industrial Resources of U.S.S.R.
White, C.L.: Regional Geography of Anglo America (Prentice Hall, New York).

Paper IV (d): Geography of South Asian Countries (Bangladesh, Nepal, Pakistan, Srilanka)

Section A

Geographical realms of South Asia, homogeneity and diversity, study of Pakistan under the following heads-geographical and political units, climate and climatic regions, vegetation, agriculture, livestock, mineral resources, power resources, industries, trade population and natural regions, political relations.
Section B

Study of Bangladesh under the following heads-geographical and political units, climate and climatic regions, vegetation, agriculture, livestock, mineral resources, industries, trade, population, natural regions, political relations.

Section C

Study of Nepal, Bhutan, Srilanka and Maldive Islands under the following heads-geographical and political units, climate, vegetation, agriculture, livestock, industrial and economy, trade, population, political relations.

Recommended Readings:

Cooke: Ceylon.
Johnson, B.L.C. 1970: Geography of South Asia.
Karan, P.P.: The Himalayan, Kingdom.
Rashid, R.E. 1977: Geography of Bangladesh, University Press Ltd., Bangladesh.

Paper IV (e): Advanced Regional Geography of West Europe

Section A

Strategic importance of location, geological structure, physical features and physiographic divisions.
Drainage Pattern and river basins, climatic controls and climatic division, natural vegetation, vegetation division, demographic characteristics.

Section B

Natural resources-forest, soil mineral livestock, development of power resources, development of agriculture - major agricultural crop regions (belts)

Section C

Important industries: their location and distribution, transportation networks (Rail, road, air, water and pipe lines), international trade, detailed study of important regions-economic and industrial, programmes and plans for future development.
Recommended Readings:

Houston J.M. 1963: Social Geography of Europe, Duckworth.

वर्मा, एल.एन. 2001: प्रादेशिक भूगोल, राजस्थान हिंदी ग्रंथ अकादमी, जयपुर, तृतीय संस्करण
Husain, M. 2012: world Geography, Rawat Publications, Jaipur
अल्ला, एल.आर. व अन्य 1999: प्रादेशिक भूगोल I कुलदीप पत्रिका, अजमेर
सक्तेन, एस.एम. 2010–11: विश्व का प्रादेशिक भूगोल I रस्तोंगि पत्रिका, मेरठ।

Paper IV (f): Man and Natural Environment

Section A

Definition and scope of environmental geography, its relation with other subjects, elements of the environment, man and environmental relationships: environmental determinism, possibilism and neo determinism, biosphere and its components, concept of ecology and ecological succession, types of ecosystems, energy flow in the ecosystem, soil system, geobiochemical cycles, major biomes of the world.

Section B

Environmental degradation and natural disasters, environmental crises: ozone depletion, green house gas effects, El-Nino, global warming and climate change, water scarcity, acid rain, sea level change, desertification, environmental pollutions: water, air, soil, noise and radioactive.

Section C

Environmental quality, sustainable development, environmental management, soil and forest resources management, water management, wildlife conservation, biodiversity and its conservation, environmental awareness and education, international efforts of environmental conservation.

Recommended Readings:


Gurjar, A.K., et al. 2001: पर्यावरण भूगोल। पंचवीं ल प्रकाशन, जयपुर।
सिंह, जगदीश 2003: पर्यावरण एवं संविकास। ज्ञानोदय प्रकाशन, गोरखपुर।
शर्मा, पी.जी. 2009: पारिस्थितिकी एवं पर्यावरण। स्त्रीसों प्रकाशन, मेरठ।
श्रीगुप्त, श्रीं.के. एवं राव, रोजी. 2002: पर्यावरण और पारिस्थितिकी। वसुवन्ध प्रकाशन, गोरखपुर।

Paper IV (g): Quantitative Techniques in Geography

Section A

Probability: theory of probabilities-law of addition and multiplication probabilities of distribution: normal, binomial, poisson-sampling: basic concepts, sample units and design, sampling frame and procedures, standard error and sample size, testing the adequacy, samples.
Hypothesis testing: needs and types of hypotheses—goodness of fit and significance and confidence levels-parametric and non-parametric procedures; contingency tables, chi-square test, binomial test, t-test, mann-whitney U test, analysis of variance (ANOVA)

Section B

Bivariate analysis: forms of relation and measuring the strength of association and relation-construction and meaning of scatter diagram simple linear and regression analyses-spearman’s rank and product moment correlation coefficients- the ordinary least square method of fitting a regression line-construction of regression line: interpolation, prediction, explanation and residual-statistical tests of significance of the estimates, residuals and their mapping.

Section C

Multivariate analysis, basics of multiple regression—partial correlation coefficient regression analysis and ANOVA-testing the overall significance of a regression auto correlation—multicollinearity basis principles and elements of factor analysis and principal component analysis.

Surface and models: gravity potential, model-spatial interpolation and trend surface analysis—simulation models, random walk and diffusion models-markov chain model similarity indices and region building construction of Thiessen polygons.

Recommended Readings:


श्रीवास्तव एवं प्रसाद 2008. भूगोल की सांख्यिकी की विद्या, वसुचन्द्र राक्षसन, गोरखपुर।


Practicals

Scheme of examination

Min. Pass Marks: 36

Non-collegeiate candidate

Regular candidates

Max. Marks: 100

Bifurcation of Marks

Written test

60 (6 questions)

40

Record work and viva voce

30+10

20+10

Project report and viva voce

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20+10

Time

4 hrs.

N.B. In written test there shall be 2 questions from each section. Candidates have to answer 4 questions selecting at least one question from each section. All questions carry equal marks. Examination be conducted in batches of not more than 20 candidates in any case. 12 hours of teaching practicals be provided for a batch of 20 students per week.

SYLLABUS

Section A

The art and science of cartography, history of maps, materials, techniques and preparation of maps, enlargement, reduction and finding of area of maps, use of planimeter, Study of geological maps and preparation of their section and interpretation, interpretation of weather maps and weather forecast.

Section B

Map projections (mathematical construction): classification and characteristics of any three from each of the four classes of projections.

I. Conical Projections:
   1. Equal area with the one standard parallel (Lambert’s Projections)
   2. Equal Area with two standard parallels (Albert’s Projections)
   3. Bonne’s
   4. Polyconic

II. Cylindrical Projections:
   1. Cylindrical Equal Area
   2. Mercator’s
   3. Gall’s Stereographic

III. Zenithal Projections:
   1. Gnomonic:
      (a) Polar Case
      (b) Eq. Case
   2. Stereographic:
      (a) Polar Case
   3. Orthographic:
      (a) Polar Case
      (b) Eq. Case
   4. Equal Area:
      (a) Polar Case
      (b) Eq. Case
   5. Equidistant:
      (a) Polar Case
      (b) Eq. Case

IV. Conventional Projections:
   1. Sinusoidal
   2. Mollweide
   3. Interrupted Sanson Flemsteed (Homolosine)

Choice of projections, used for maps produced in India.
Section C

Geographical maps and diagrams: computation of data, preparation of frequency tables, representation of data by histograms and ogives, finding skewness, computation of mean, median and mode, deviation-standard deviations and mean deviations, theoretical basis of nearest neighbor analysis, practical exercises of nearest neighbor analysis, location analysis of urban centers, coefficient variation. All these be computed from the Statistical data, preferably based on State, District, Tehsil and community Development Block as unit areas and the following types of maps and diagrams be prepared.

Maps and their interpretations: isopleths, choropleth and chorochromatic, choroschematic and isochronic map, population pyramids map.

Three dimensional diagrams of economic and social data, accessibility and flow maps, network analysis.

Diagrams: Polygraph semi-log and log graphs, trilinear chart, circular graph, climatograph, Hythergraph, climograph, annual water deficiency and water surplus graph.

Project Report: A regular candidate is to prepare project report of a village area. The candidate is free to select any supervisor amongst the staff members of the project. A supervisor can take only 5 candidates, the marking on the project report will be awarded by the external examiner in consultation with the supervisor concerned, the project should be based on primary data obtained by the candidates, the data should be represented by suitable cartographic methods.

N.B. Project Report is not applicable in case of non-collegiate candidates.

Recommended Readings:

चौहान, श्री.आर. 2005: प्रयोगात्मक भूगोल, वसुक्ष्म प्रकाशन, गोरखपुर।
Lawrence, G.R.P. 1971: Cartographic Methods, Methuen, London.
शर्मा, जे.भी. 2010—11: प्रयोगात्मक भूगोल की उपरेखा,रस्तोगी पब्लिकेशन्स, भेरठ।
विवादी, आर.सी. एवं सुधाकर, त्रिपाठी 2009: प्रयोगात्मक भूगोल, प्रयाग पुस्तक भवन, इलाहाबाद।
M.A./M.Sc. Final

Paper V: Advanced Geography of India

Section A

Geological structure and its relation to distribution of minerals, physiographic divisions; climate: seasons and associated weather characteristics, mechanism of Indian monsoon, major climatic regions; soils: characteristics, distribution and major soil regions; drainage pattern, watersheds and river systems.

Section B


Section C

Resources development and utilization: power, industries and transport, river basins of India, riverine problems of sharing water and their planning, industrial regions and economic regions of India and regional economic disparities.

Recommended Readings:

Bansil, B.C. 1975: Agricultural Problems in India, Delhi.


Hastane, En. 2001: जनजातीय भारत। जवाहर पब्लिशर्स एण्ड डिस्ट्रीब्यूटर्स, नई दिल्ली।

Mitra, A. 1967: Levels of Regional Development India Census of India. Vol. I, Part I-A (i) and (ii), New Delhi.


Paper IV Any one of the following

Paper VI (a): Population Geography

Section A


Section B

Migration: brief history, theories, trends and patterns of international and internal migration, population dynamics: fertility and mortality- measurement, determinants and distribution, World population composition and characteristics, World urbanization: trends, patterns and challenges.

Section C

India- population characteristics and relationship with development; population control movement and policies; urbanization and population explosion; post independence development: reproductive and child health programme, contemporary issues – ageing of population; declining sex ratio; HIV/AIDS.

Readings Recommended:


Paper VI (b): Agricultural Geography (Elements & Applied)

Section A


Section B


Section C


Recommended Readings:

ICAR: Soil Conservation of India.
Singh, Jasbir: Agricultural Geography of Haryana.

**Paper VI (c): Industrial Geography**

**Section A**

Evolution of industrialization (India and World), locational factors of industries, theories of Industrial location: least cost school, transport cost school, market area school, marginal location school and behavioural school, new trends in industrial geography concept of entrepreneur and firm, significance of cost and price, concept of optimum location.
Geographical inertia, multi-locational industries, market oriented industries, foot loose industries, raw material oriented industries, manufacturing industries, processing industries..

**Section B**

Formation and delineation of industrial regions, industrial complexes, industrial houses including public sector undertakings, industrial regionalization.
Industrial regions in India: Hooghly side industrial regions, Damodar valley industrial regions, DMIC (Delhi-Mumbai industrial corridor). industrial policies of India: liberalization, privatization and globalization (special reference of India); special economic zones (SEZs).

**Section C**

Industries: cotton, jute, textile, iron and steel, aluminum, fertilizer, paper and pulp, copper, chemical and pharmaceutical, ship building, automobile, cottage and agro-based industries and tourism industry.
industrial regions of world: Ruhr basin industrial region and Great lakes industrial region.

**Recommended Readings:**

Lloyd and Dicken: Location in Space: A theoretical Approach to Economic Geography.
M.C. Cart and Lindberg Hodder and Lee Economic Geography: A Preface to Economic Geography.
Paper VI (d) : Transport Geography

Section A

Meaning, scope and nature of transport geography, transportation and space, network growth models, nature of inter-regional flows, basis for interaction, models of spatial interaction, distance decay theory, gravity models and potential surface models, issues and challenges in transport geography.

Section B

Transportation and spatial structure, transportation models, model accessibility and hinterlands, accessibility and land use, transport economics, transport problems of metropolitan areas and urban travel patterns.

Section C

Developments of transport system in India, role of transportation in regional development in India, major transport regions, regional development in India, transport-network, structure, connectivity and transport mobility linkages.
Recommended Readings:

Elliot, H. and E. Michael (eds.) 1974: Transportation Geography. Comments and Readings M.C. Growth M.S.
सिंह, के.एन. 2003: परिवहन मूर्तिक. ज्ञानोदय प्रकाशन, गोरखपुर।

Paper VI (e): Geography of Settlements

Section A

Definition, scope and development of settlement geography, theories in settlement geography, methodology in settlement geography, causes of origin of settlement types, the form of settlements types clustered, semi-clustered and dispersed, settlement pattern, size and spacing of rural settlements.

Section B

Site and situation of rural settlements, the evolution of street pattern in rural settlements, morphological characteristics of rural settlements, segregation and orientation of social groups in settlements, the evolution of field boundaries and the field patterns, folk housing, folk architecture and traditional building materials.

Section C

Urban settlements: their site and situation, size and spacing of urban settlements, Christallers system of urban hierarchy and spacing of cities morphological characteristics of urban...
settlements, the cultural ecology of the city, theories of stricture of urban centres: grid, concentric zone, sector, multiple nuclei and irregular pattern models, problems of urban housing and emergence of slums.

Recommended Readings:

Census of India 1991: India-A State Profile.

Paper VI (f) : Advanced Geomorphology

Section A

Fundamental concepts of geomorphology; schools in geomorphology, recent trends in geomorphology, earth movements: epeirogenic, orogenic types and classification of weathering, mass movement erosion. plate tectonics, seismicity, vulcanicity, orogenic structures with reference to the evolution of Himalaya, various models of landscape evolution (Davis, Penck, King, Hacks, Morisawa, Schumm, multicyclic and polygenetic evolution of landscapes.

Section B

Geomorphic processes, dynamics of fluvial, glacial, Aeolian, marine, and karst processes and resultant landforms, polycyclic landforms, various models of slope development (Wood, Davis, Penck, King, R. Savigear, Strahler, Fisher-Lehmann, Young), concept
morphogenetic region. Systems in geomorphology; Models in geomorphology, erosion
surfaces-techniques of indentification and correlation.

Section C

Terrain evaluation, geomorphic mapping. geomorphic hazards and mitigation measures;
Digital Elevation Model (DEM) and Triangulated Irregular Network (TIN) unit, land
capability and land suitability classification, hydro-geomorphology, urban geomorphology,
environmental geomorphology, geomorphic hazards.

Recommended Readings:

Chorley, R.J., Schumm S A and Sugden D E. 1984: Geomorphology. Methuen and Company
Ltd., London.
Cooke, R.U. and Doornkamp, J.C. 1974: Geomorphology in Environmental Management-A
University Press, London.

Paper VII (a): Urban Geography

Section A

Meaning, aims, importance and scope of urban geography, factors affecting growth of towns
and cities of different historical periods: neolithic, greek and roman. dark ages, medieval,
renaissance, industrial revolution. and modern times, chief characteristics of the towns,
trends of urbanisation in the world, urbanisation in India since 1901 and its problems. Definitions of urban centres, chief characteristics of modern towns, city conurbation, metropolitan and megalopolis, spatial pattern and distribution of urban centres, types of cities-central places and urban transportation and mobility.

Section B

Functions and functional classification of towns. Urban rank-size relationship. Concept of urban economic functions and its urban hierarchy based on functions. Law of promate city, urban morphology, unplanned growth of towns, urban master plans, morphology of Indian cities. Functional structure of towns, characteristics of C.B.C. residential area, and other functional areas. Central place theory (Christaller and Losch) and models of urban structure theory of urban structure (Burgess, Hoyt, Harris & Ullman, Mann, White).

Section C

Centrifugal and centripetal forces in urban geography. Development of suburbs, rural, urban fringe, satellite towns, ring towns, sphere of urban influence (umland) and its delimitation. Control of urban problems: urban poverty, slums, transportation, housing, crime. Principles of town planning, preparation of a master plan, study of master plan of Jaipur city, principles of town and regional planning country.

Recommended Readings:

केसल, ए.सी. 2010: नगरीय भूगोल, मीनाश्री प्रकाशन, मेरठ।
Dickinson, R.E.: City Region and Regionalism. Routleged and Kegon Paul London.
Herrold M. Mayer: Readings in Urban Geography, Central Book Depot, Allahabad.
N.V. Sovani: Urbanization and Urban India. Asia publishing House, Bombay.
P.C. Malhotra: Survey of Bhopal City and Bairagarh (Asia publishing Bombay)
Shah Manzoor Alam: Hyderabad and Secunderabad, Twin City Studies in Urban Geography. Allied Published, Delhi.
Paper VII (b): Geography of Crimes

Section A

Meaning, scope and nature of geography of crimes, approaches to the study of geography of crime, causes of crimes: physical, economic, social, spatial dimension of crimes and crime mapping, source of data on crimes and reliability of crime data.

Section B

Crimes in developing countries with special reference to India, seasonality of crimes, crime and poverty, crime and illiteracy, urban and rural crimes: crime towards women, children and weaker section of the society; crime as social pollution and role of police and legal system in prevention and mitigation of crimes at varying spatial scale.

Section C

Role of illegal migration and its impact on crime scenario, problem of naxalites and its social implications, international links of terrorism, role of religion in terrorism in India, controlling crimes and terrorism: international and national efforts and strategy; measures of rehabilitation and socialization of criminals.

Recommended Readings:

Chandel, R.S.: Aparadh Samasya Aur Samadhan: Kitabghar, Delhi.

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Paper VII (c): Climatology and Oceanography

Section A

The basis of modern climatology, composition and layered structure of atmosphere, atmospheric energy: air temperature, the energy balance, atmospheric pressure and pressure belts, the planetary wind system, moisture in the Atmosphere: humidity and its expression, adiabatic non-adiabatic processes, stability and instability, evaporation: factors affecting evaporation, precipitation types, world precipitation pattern.
Section B

Air masses, fronts and synoptic climatology, the nature and hazard of atmospheric extreme events: cyclones (tropical and extra tropical) and anticyclones. Koppen and Thonthwaite classification of world climates; major climatic types – equatorial, monsoon, Mediterranean and savanna types.

Section C

Scope of oceanography, horizontal and vertical distribution of temperature, salinity, factors and distribution patterns, dynamics of oceanic water: currents, sea waves, tides and tidal theories currents of Atlantic ocean, Pacific ocean, Indian ocean and other seas, oceanic bottom relief, (Atlantic, Pacific and Indian oceans) oceanics deposits, coral reef formation, atolls and coral islands, theories of coral reef formations, Man and oceans, marine resources-biotic and abiotic, (mineral and energy resources) and their utilization.

Recommended Readings:

गौतम, अल्का 2010: जलवायु एवं समुद्र विज्ञान। रस्तोगी पत्रिकासंस, मेरठ, द्वितीय संस्करण।
पुस्तक, एस.एस. 2000: जलवायु विज्ञान। हिंदी माध्यम कार्यालय निदेशालय, दिल्ली विश्वविद्यालय, दिल्ली।
सिंह, एस. 2006: जलवायु विज्ञान। प्रयाग पुस्तक भावन, इलाहाबाद।

Paper VII (d) : Applied Geography

Section A

Meaning, nature and scope, principles and approaches, application of geographical methods of survey and geospatial tools in analysis of resource base, its appraisal, micro regional planning and demographic attributes.
Section B

Delineation of resource regions, regional divisions according to variations in levels of socio-economic development, special purpose regions - river valley regions, national capital region, problem regions - hilly regions, tribal regions, regions of drought and floods.

Section C

Planning for a region’s development, state capital region (Jaipur), indicators of development and their data sources, measuring levels of regional development and disparities - case study of Rajasthan, land use policy implications with special reference to India, review of policies related to decentralized planning, formulation of plans at national, state, district, block and grass root level.

Recommended Readings:


Paper VII (e): Pedology

Section A

Modern pedological principles underlying soil formations: soil genesis and factors influencing it, characterization and classification of soil groups of the world and their distribution, soils: of Indian soils, soil nutrients in relation to agriculture and problems.

Section B

Methods of soil survey, soil analysis, soil mapping, soil profiles, their description, analysis and interpretation of results, soil erosion, soil exhaustion, soil conservation mechanical and biological measures with special reference to India.

Section C

Physical properties of soils, structure, texture, colour and moisture, organic matter, culture practices affecting soil characteristics, manures and fertilizer in relation to soils with special reference to India, soil survey for land capability and land utilization, detailed study of soils of Rajasthan, soil productivity and fertility status, management of sandy, loamy and clay soils.

Recommended Readings:

Jeffe, J.S.: Pedology.
Moghe, B.: Soils of Rajasthan, Hindi Academy.
Wright: Soil Analysis.
Ray-Choudhary: Soils of India.
Russel, F.I.: The World of Soil.
Agarwal, R.R.: Soil Fertility in India.
De, S.K.: Methods of Soil Analysis: Soil-Geographical Zening of the USSR (Published by the Academy Sciences of the USSR, Moscow).
Clarke: The Study of Soil in the Field.
Bunting, B.T.: The Geography of Soil.
Paper VII (f) : Medical Geography

Section A

Definition, nature, scope and contents, relation of medical geography with other allied disciplines, elementary, knowledge of human anatomy and physiology, geographical, pathology, epidemiology and geomedicine, history and development of medical geography in the West and India, concept of health and disease, major disease and their geomedical classification.

Section B

Geomedical data: source, methods of representation, analysis limitations and problems, conceptual and cartographic models, pathogenic and geogenic aspects of medical geography studies in disease environment association disease diffusion, spatial and temporal variations in the physical, cultural and the biotic environment and its influence upon human health, nutritional levels in India, disease of under-nutrition and malnutrition.

Section C

Disease of civilization: Cancer, blood vascular the smoking disease accidents, drug abuse and drug abictions, distribution of major diseases in Rajasthan, community health: distribution of medical facilities and population, healthcare planning in urban and rural area. A critical evaluation of health care delivery system in your own area/state, family planning programme in India, national malaria eradication programme in India, survey of common epidemic and endemic diseases in a small area on the basis of field study, standard of living: housing, diet, clothing, income and sanitation

Recommended Readings:

Stevenson-Introduction of Food and Nutrition.
Wilson and Evad-Principles of Nutrition.

Paper VII (g): Fundamentals of Remote Sensing and Geographical Information System

Section A

Definition and scope of remote sensing, remote sensing as an established field, elements of remote sensing: Electro-magnetic radiation and interaction with Earth surface features, data products and users, atmospheric windows, remote sensing systems: platforms, sensors, resolution and radiometric characteristics, elements of image interpretation and keys, types of aerial photographs, aerial cameras types of mosaics, relief displacement and parallax, satellites: LANDSAT- MSS & TM, SPOT, NOAA-AVHHR; IRS, MODIS, RADARSAT, IKONOS, QUICKBIRD & CARTOSAT.

Section B

Digital image processing and classification: pre-processing and image enhancement techniques- rectification and restoration, contrast manipulation, density slicing, spatial filtering and band ratio, classification- supervised and unsupervised, post-classification analysis and accuracy assessment. microwave remote sensing, advantages over optical, unique capabilities of microwave (SAR & SLAR).

Section C

RS applications: mapping and monitoring of land use and land cover, forestry and desertification, soil and water resources, remote sensing and hazard mapping and
Recommended Readings:


Paper VIII (a) : Political Geography

Section A

Definition, scope nature and importance of political geography: its relation with other social sciences, history and development of political geography: pre-modern phase (before 19th Century), geopolitics and German school of thought, global strategic views: views of Mackinder, Spykman, Meining, Hooson and De Seversky, world's geostrategic regions, critical.

Section B

State and nation, the idea of state: the elements of the state: territory, population, organization and power concept of nation, nationalism. heart of the state: core areas, the focus: capital city, frontiers and boundaries: definitions, classification and concepts, boundaries as economic barriers, buffer zones, concept of territorial sea and maritime boundaries, landlocked states.
Politics and transportation, geography of foreign aid and economic development, emergence of third world block, politico-geographical study of India, political geography of administration, politico-geographical implications of space research. function, methods and trends of electrol geography: voter's participation before voting prededion, conceptual model of the voting decision, operationalisation of conceptual decision, garrymendering in relation to India.

Recommended Readings:

सक्सेना, एच.एम.: राजनैतिक भूगोल के शिक्षालय। राजनीतिक पृष्ठभूमि।

Paper VIII (b): Cultural Geography

Section A

Definition, nature and scope of cultural geography, the evolutionary approaches and conceptual framework, evolution of man and human society from pleistocene to palaeolithic period, rise and dominance of homo sapiens and their deployment over the continents, spatial distribution and characteristics of primary races of the world.

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S.K. Sharma

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Sumita
Section B

Beginning of plant domestication, animal domestication and their regions, evolution of civilization: Mesopotamian, Nile, Indus and Hwang Ho Valley with respect to racial, ethnic, religious, linguistic, demographic, and organizational characteristics. School of cultural determinism, cultural adaptation, assimilation, integration diffusion and Environmental perception. Major cultural hearths, realms and regions of the world, basic similarities and differences.

Section C

Major linguistic families and their distribution in the world, bases of cultural diversity: race, religion, language and nationalism, culture and environment, human settlements: origin, types, pattern and distribution, westernization, sanskritization and cultural urbanization and cosmopolitization.

Readings Recommended:

रिजोचुट, पुणे 2001: सांस्कृतिक भूगोल। राजस्थान हिंदी ग्रन्थ अकादमी, जयपूर।


**Paper VIII (c): Biogeography**

**Section A**

Definition, scope and significance nature, approaches, history, recent trends and developments, plant and animal ecology forms and functions of eco system, ecosystem with special reference to mountain and desert factors influencing distribution of flora, taxonomical and ecological classification of plant, ecological succession, ecotone and community, patterns of distribution of world vegetation.

**Section B**

Nature and classification of animals, dispersal and migration of animals: type and causes – case studies, geographical isolation. the zoo-geographical region, biogeography of the seas: island biogeography.

**Section C**

Conservation and management of forest and wild life with reference to India, process of desertification, its consequences and management principals, projecting into the future: climate change: biogeographical consequences of global change: changing communities and biomes, effect of climate change on biological diversity, environmental hazards and problems of pollutions.

**Recommended Readings:**


सिंह, एस. 2013: जैव भूगोल। प्राकृतिक पुस्तक भवन, इलाहाबाद।

**Paper VIII (d) : Regional Planning and Development**

**Section A**

Conceptual and theoretical framework of regional planning, principles and determinants of regional planning, multi-level planning and inter-regional stresses, regional hierarchy, role of geography in preparation of a regional plan, significance of the term integration (political, economic and spatial) for regional planning.

**Section B**

The process of regional development: indicators of development; levels of regional development and disparities, strategies for development, regional planning in India: concept and indicators of development; regional imbalances; type of regions and methods of regionalization, growth pole and growth centres, environmental issues in regional planning for sustainable development.

**Section C**

Use of remote sensing, global positioning systems (GPS) and geographic information system (GIS) in modern regional planning, case studies from selected countries: Regional planning in USA (TVA) and regional planning in India (DVC and NCR), fundamentals of town and country planning.

**Recommended Readings:**

Journal of Geography and Regional Planning (JGRP) is an open access.
श्रीवास्तव, शर्मा एवं चौहान 2008: प्रादेशिक निर्योजन और संसाधित विकास। वसुद्धर प्रकाशन, गोरखपुर।
www.academia.edu/Papers/in/Economic_Geography
www.jstor.org/stable/143805

**Paper VIII (e): Meteorology**

**Section A**

Atmosphere: chemical composition and layered structure, insolation, temperature distribution, temperature: heat budget of atmosphere, radiation, measurement, various lapse rates inversion, albeo, adiabatic processes in the atmosphere and greenhouse effects, pressure: definition, law and hydrostatic equilibrium, variation of pressure, Laplace formula, measurements of pressures, isobars and pressure systems, humidity: vapour pressure, humidity quantities. the dry bulb and dew point density of air, stability and instability, thermodynamic diagrams and instability, clouds and precipitation: classification of clouds and their description, formation of clouds, condensation, formation of rain, bergeron’s and capture theories, convective, frontal and orographic precipitation.

**Section B**

Motion of air : byes ballot law, coriolis force, geostrophic and gradient winds, effect of friction, seas and land breeze, orographic winds, thermal wind, gust and squall, variation and wind the height, jet-streams, upper air observations : history, baloon observations, rediasound, uses of radar and satellites, upper observation in india.
synoptic meteorology :
structure of pressure systems: weather conditions associated with different types of pressure system, air masses fronts. frontogenesis and frontiolsis world circulation of air and...
geographical distribution of grunts, intertropical convergence zones, tropical revolving stems, development and movement of simple pressure systems and fronts, morgale formula.

Section C

Monsoon climate, genesis of the Indian summer monsoon, the energetics and physics of monsoon rain, distribution of rainfall in monsoon and associated pressure system, long range forecasts of monsoon rain, consideration of analogues charts, climate classification of World-Koppen classification, precipitation and temperature criteria, Thornthwaite climatic classification, seasons in India with special reference to western disturbance, northwestern monsoon depressions and dust storms, physical climatology, biometeorology: health and design of houses.

Recommended Readings:

गोपता, धर्मकां व. वि. 2000: जलवायु विज्ञान। हिन्दी भाषा में। दिल्ली विश्वविद्यालय।

Paper VIII (f) : Research Methodology

Section A

Research: meaning, objectives, significance, types of research, research approaches, problems of geographical research, revelent and applied research, hypothesis and its basic concepts, testing of hypothesis, models and paradigm, formulation of research proposal and research design, types of research projects and report writing.

Section B

Sources of data, methods of data collection, processing, analysis and results, observation and interview questionnaire and field schedule, sampling theory, sample size, sampling techniques, selected techniques of spatial analysis, concentration and dispersal of economic activities, interaction theories, scaling techniques, measurements of disparities and
inequalities, methods of delimitation of economic, industrial, agricultural and planning regions.

Section C

Regional population analysis, population projections, network analysis, delimiting sphere of city influence, core and marginal area, morphometric analysis, drainage basin analysis and slope analysis, integrated, area development planning, introduction to remote sensing and geographical information system in landuse analysis.

Recommended Readings:

आदेहूजा, रम 2010: सामाजिक अनुसंधान। राजक परिक्षेत्रांक, नई दिल्ली।
डॉ. डॉ. चौर्याल 2006: सुदृढ संचयन एवं भौगोलिक सूचना प्रणाली। शाहदा पुस्तक भवन, इलाहाबाद।
श्रीवास्तव एवं प्रसाद 2008: भौगोल की साहित्यिक विद्या। वसुन्धर प्रकाशन, गोरखपुर।
वीरेंद्र प्रकाश सर्मा 2001: रिसर्च मैथेडोलॉजी। पंचसौंड प्रकाशन, फिल्म कॉलोफ्लो, चौड़ा रास्ता, जयपुर।

Paper VIII (g) : Geography of Water Resources, their Management and Utilization

Section A

Definition and scope of water resource geography, inventory and distribution of world's water resources, water resources of India, Groundwater, hydrological cycle, demand and use of water, irrigation methods and conservation of water.
Section B

Salinity, alkalinity, overexploitation of groundwater and arsenic problem, water pollution, river water pollution, demand and water supply in industries, flood management, drought and dry farming projects in India and Rajasthan.

Section C

Water conservation/participatory approach, traditional methods of water conservation in India and Rajasthan, integrated basin planning, watershed management, river water disputes, water management using remote sensing technology, environmental disasters and water crisis.

Recommended Readings:


भारती, राधाकांत, 1998: भारत की नारियाँ। नेशनल बुक ट्रस्ट ऑफ इंडिया, नई दिल्ली।


गुरजर, आर.के. एवं जाट, वी.सी. 2012: जल संसाधन भूगोल। रावत पब्लिकेशन, जयपुर।


गुरजर, आर.के. एवं जाट, वी.सी., 2001: जल प्रबंधन विज्ञान। रावत पब्लिकेशन, जयपुर।


जाट, वी.सी. 2007: जलग्रहण प्रबंधन पॉइंटर पब्लिकेशन। जयपुर।


DISSEMINATION

The candidates can offer dissertation on any geographical problem in lieu of any elective paper in final year examination.

N.B.: The candidates will be required to submit dissertation four weeks after the theory examination which will be examined by a board of two examiners. Three copies of dissertation will be submitted to the University out of which one copy will be returned to the Department/College and one to the supervisor.
The dissertation should exclusively be based on secondary data and statistical analysis as far as possible and prepared under the guidance of a post graduate teacher of five year standing. The volume of the dissertation will not exceed 100 pages.

Practicals

Scheme of examination

<table>
<thead>
<tr>
<th>Min. Pass Marks: 36</th>
<th>Non-collegiate candidates</th>
<th>Regular candidates</th>
<th>Max. Marks: 100</th>
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<tbody>
<tr>
<td>Bifurcation of Marks</td>
<td></td>
<td></td>
<td>Time</td>
</tr>
<tr>
<td>Written test</td>
<td>60(4 questions)</td>
<td>40 (4 questions)</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Record work and viva voce</td>
<td>15+5</td>
<td>14+06</td>
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</tr>
<tr>
<td>Field survey and viva voce</td>
<td>15+5</td>
<td>14+06</td>
<td>4 hrs.</td>
</tr>
<tr>
<td>Camp work and viva voce</td>
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<td>14+06</td>
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</tbody>
</table>

N.B. In written test there shall be 2 questions from each section. Candidates have to answer 4 questions selecting at least one question from each section. All questions carry equal marks. Examination be conducted in batches of not more than 20 candidates in any case. 12 hours of teaching practicals be provided for a batch of 20 students per week.
SYLLABUS

Section A

Methods and techniques of representation of relief:
Methods and techniques of depicting relief Profile, gradients and calculation of slope, Block
diagrams, hypsographic curves. altimetric frequency graph.
Interpretation of topographical maps:
A brief history of topographical maps of the world with special reference to India and their
interpretation. Detailed study of such topographical sheets which depict typical
g geomorphological and cultural landscapes.

Section B

Scanning and digitization of maps, knowledge of stereoscopic vision and types of
stereoscopy, identification of cultural and physical features on aerial photographs,
calculation of scale on air photo, number of runs, air photographs in each run and total air
photographs for a given area.

Section C

Field surveying and camp work: resectioning using plane table: two and three point
problems, use of dumpy level, practical on contouring and profiles.
Parts and use of theodolite in traverseing and angle computation.

Camp Work: A topographical survey of a settlement of about 200 hectares of land will be
done by organizing a camp at least for a week away from the centre of the institution and
maps and reports of the same will be prepared with help of computer technology (word
programme & Autocad). (Students are expected to stay in the camp at night).

Books Recommended

York.
Gautam, N.C.: Urban Land use studies through Airphoto Interpretation.
Roorke Engineering College: Manuall of Surveying.
Company, New Delhi.
Delhi.