

SYLLABUS

(Annual Scheme)

**SCHEME OF EXAMINATION AND
COURSES OF STUDY
(REGULAR MODE)**

Faculty of Arts & Social Sciences

MASTER OF ART

SUBJECT: GEOGRAPHY

(Two Year Course)

M.A. FINAL -2017-18

Institute of advance studies in education deemed university

Gandhi vidyamandir, sardarshahr – 331401

SCHEME OF EXAMINATION

Each theory paper	3Hrs.duration	Marks 80
Internal Marks		Marks 20
Dissertation/Thesis/Survey Report/Field Work, if any		100 Marks

- 1- The number of paper 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 the practical part (Whenever prescribed) of a subject /paper separately.
- 2- A candidate for a pass at each of the Previous and the Final Examination shall be required to obtain (i) at least 36% marks in the aggregate of all the paper prescribed for the examination and (ii) at least 40% marks in practical (s) whenever prescribed in the examination provided that a candidate fails to obtain atleast 36% marks in each individual paper work. Whenever 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 the examination. No division shall be awarded at the previous examination. Division shall be awarded at the end of the Final Examination on the basis of combined marks obtained at the Previous and the Final Examination, as noted below:
 - First Division 60% of the aggregate marks taken together
 - Second Division 48% of the Previous and the Final Examination

All the rest shall 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 continues period of .three years, then for the purpose of working out his division the minimum pass marks only viz 36% (40% in the case of practical) shall be taken into account in respect of such paper(s) Practicle(s)/Dissertation are cleared after the expiry of the aforesaid period of three year, provided that in case where a candidate requires more than 36% marks in order to reach the minimum aggregate as many marks out of those actually secured by him will be taken into account as would enable him to make the deficiency in the requisite minimum aggregate.
- 4- The Thesis/Dissertation/Survey Report/Field Work shall be written & typed and submitted in triplicate so as to reach the office of the Registrar at least 3 weeks before the Commencement of the theory examination. Only such candidate 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 scheme and I and II semester examination taken in the case of semester scheme, irrespective of the number of paper in which a candidate actually appeared at the examination.
- 5- The list of text books/ Recommended books/ Reference Books as approved by the Various BoS, are Printed along with the English Version only.

IASE Deemed University, Sardarshahar, Churu

Faculty of Arts & Social Sciences

Content M.A. Final - Geography

There will be Nine Papers in 2 years and each paper will be of 3 hours duration and will carry 80 marks.

Important points to be noted:

- The theory question paper will consist of Five Sections.
- Theory (External) – 80
- Internal Sessional Marks (Internal) – 20
(Division of Sessional: Assignments – 10, 2 Terminal Test- 05, Attendance- 03, Co-curricular Activity- 02)
 - (a) Every subject paper has five (5) units, and every unit covers two (2) marks. A sessional work is to be done on every unit - **(2X5= 10 marks)**
 - (b) Two terminal Tests - **(2½X2 = 05 marks)**
 - (c) Attendance of Theory/Practical Classes - **03 marks**
 - (76%-84% - 01 mark)
 - (85%-93% - 02 marks)
 - (93%-100% - 03 marks)
 - (d) Co-curricular Activities - **02 marks**
 - Cultural & Literary (01 mark)
 - Games & Sharmdaan (01 mark)
- Total Marks – 900 (Nine Papers : 100 Marks Each)
- Pass Marks – 36 percent.
- Please note that the Practical subject requires 40 % of marks to pass the examination separately
- Mandatory to pass the Internal and External (Written Exam) separately, Obtaining 36 Percent Marks.
- Duration of Examination :

Content M.A. Geography Final

Scheme of Examination of M.A. Final

Paper No.	Nomenclature of the Paper	Paper Code	INTERNAL SESSIONAL	THEORY (WRITTEN EXAM)	Max. Marks
Paper V	Advanced Geography of India	MAGY -210	20	80	100
Paper VI	Urban Geography	MAGY -220	20	80	100
Paper VII	Agricultural Geography (Elements & Applied)	MAGY -230	20	80	100
Paper VIII	(i) Remote sensing and G.I.S.. (ii) Population Geography (iii) CLIMETOLOGY (iv) Geography of Water Resources	MAGY -240 (i) MAGY -240 (ii) MAGY -240 (iii) MAGY -240 (vi)	20	80	100
	Practical				100

M.A. (Final)
GEOGRAPHY,2017-18

1. There shall be four theory papers in each year of 80 marks and one practical of 100 marks.
2. The M.A. **Annual-** examination in Geography shall consist of 500 marks.
3. There will be four theory papers and a practical in previous examination. Each of the theory papers will be of 80 marks. Each of the theory paper will be three hours duration. Candidates will be required to pass of both in theory an practical separately.
4. The theory papers shall be of three hours duration.
5. Candidates will be required to pass separately in theory and practical examinations.
6. (a) In the practical **examination** the following shall be the allotment of time and marks.

(i) Lab work (up to three hours)	40
(ii) Field work	20
(iii) Practical record	20
(iv) Viva	20
- (b) The external and internal examiners shall jointly submit marks.
- (c) All the candidates shall present at the time of the practical examination their practical record regularly signed by the teachers concerned.

M.A. Final Geography Examination – 2017-18

Paper I : Advanced Geography of India

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit – I

Physiographic and drainage systems, soils, vegetation. Climate and its regional variations; Origin and mechanism of India monsoon; Schemes of natural, physiographic and climatic classifications. Identification of drought and flood prone areas.

Unit – II

Resources : Conservation and utilization of land, mineral, water, biotic and marine resources. Agriculture, Agro climatic regions; land use pattern, green revolution and its impact on Indian agriculture. Agriculture infrastructure irrigation fertilizers and seeds. Dry zone agriculture.

Unit – III

Mineral- Iron ore, copper, coal, Aluminum, Bauxite, Jink and Power- Petroleum, hydropower, nuclear resources, Factors of Industrial localization, classification of industries, Major industries – iron and steel, cotton, textile, cement, fertilizer, paper and pulp and sugar industries.

Unit – IV

Tribal areas and their problems. Population distribution, density and growth, population problems and policies. Study of the network of roadways, railways, airways and waterways. Regional disparities in social and economic development in India.

Unit – V

Geographical study of Rajasthan under the following heads – Relief, climate, vegetation, soils, agriculture development, irrigation, mineral and power resources industrial development, Physiographic division & Rajasthan State (1) Marusthali (2) Aravalli (3) Hadoti Plateau (4) Bangar

Books Recommended :

1. Chatterji, S.B. : Climatology of India, Calcutta University, Calcutta.
2. Choudhary, M.R. : Indian Industries – Development and Location.
3. Dreze, Jean and AmartyaSen (ed.) : India : Economic Development and Social Opportunity, Oxford University Press, New Delhi .
4. Galyan and Sengupta : Economic Regions and Regionalization in India.
5. Govt. of India : Five Year Plans of India.
6. Govt. of India : National Atlas of India, NATMO Publication, Calcutta.
7. Govt. of India : The Gazetteer of India, Vol.I&III, Publication Division, New Delhi.
8. India Year Book (Lates Edition) : Publication Division, Delhi.
9. Irrigation Atlas of India.
10. Khular, D.R. : Geography of India.
11. Kumar, L.S.S. and Others: Agriculture in India Vol. I&II, Asia Publishing House, Bombay.
12. Kundu, A. RazaMoonis : Indian Economy – The Regional Dimension, Spectrum Publishers, New Delhi.
13. Misra, V.C. : Geography of Rajasthan, National Book Trust, New Delhi.
14. Puri, G.S. : Indian Forest Ecology, Oxford Book Stationery Co.
15. S.P. Roy Choudhary : Land and Soil, National Book Trust, New Delhi.
16. Sharma, T.C. and Coutino, O. : Economic and Commercial Geography of India, Vikas Publishing House, New Delhi.
17. Singh, R.L.: India : A Regional Geography, N.G.S.I., Varanasi.
18. Spate, O.H.K. and Learmonth, A.T.A. : India and Pakistan – Land, People and Economy, Methuen & Co., London.
19. Tiwari, R.C. : Geography of Inida.
20. Ekeſj ; k] pŕŕkŕt % Hkkj rdkogrHkkſy] l kfgR; Hkou] i fcy'kl l , .M fMLVŦC; Wl ŀ k- fy-] vlxj kA
21. cl y] , l - l h- % Hkkj rdkogrHkkſy] ehuk{ſhi dſk' ku] ej B
22. 'keſ] , p- , l - , oa 'keſ] , e- , y- % jktLFkkudkHkkſy] i p'khyi dſk' ku] t; i j A
23. 'keſ] hdey] fglſhſſk v dſkneſ] Hkkſi ky] e/; i nſ k
24. pſſj ku oſ- , l - , oa vy dſkſſe % Hkkj rdkogrHkkſy] j Lſſſhi dſk' ku] ej B

Paper II : Any Three of the Following

Paper II : Urban Geography

Examination – 2017-18

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit – I

Aims and scope of urban geography. Factors affecting the growth of towns during Neolithic period, Greek and Roman Period, Dark Ages, Medieval period, Renaissance period, Industrial Revolution and Modern times. Chief characteristics of the towns of each period.

Unit – II

Trends of urbanization in the world. Urbanization in India since 1901 and its problems. Census of India, Definitions of urban centres. Chief characteristics of modern town, City Conurbation, Metropolis and Megalopolis. Spatial pattern and distribution of urban centres : types of cities, central places, transport foci and centre of specialized services.

Unit – III

Classification of cities based on functions, Urban Rank-size relationship, Primate city, The Basic and Non-Basic concept of urban economic functions and its application. Urban hierarchy based on functions, Christaller's central place theory, August Losch's theory of market centres.

Unit – VI

Urban Morphology, Unplanned and planned growth of town : Urban plans, Morphology of Indian cities. Functional Structure of towns, Chief characteristics of C.B.D., Residential areas, Manufacturing areas and other functional areas. Theories and Models of urban structure.

Unit – V

Centrifugal and centripetal forces in urban geography. Development of suburbs, rural-urban fringe, satellite town, ring towns. Sphere of urban influence (Umland) and its delimitation.

Principles of Town Planning – Preparation of a Master Plan, Study of Master Plans of Jaipur, Bikaner, Sriganaganagar and Churu, Principles of regional planning.

Books Recommended :

1. Alam, S.M. : Hyderabad and Secunderabad. Twin City, Asia Publishing House, Bombay.
2. Carter : The Study of Urban Geography, Edward Arnold, London.
3. Chorley, R.J.O.,
Haggett, P. (ed.) : Models in Geography, Methuen, London.
4. Dickinson, R.E. : City Region and Regionalism, Routedledge and Kegan Paul, London.
5. Gibbs, J.P. : Urban Research Methods, Van Nostrand Co. Inc., Princeton, New Jersey.
6. Govt. of Rjasthan : Master Plan of Jaipur, Bikaner, Sriganaganagar and Churu.
7. Johnson, R.H. : Urban Geography.
8. Mandal, R.B. : Urban Geography – A Textbook, Concept Publishing Co., New Delhi.
9. Meyor, H.M., Kohn, C.F. : Readings in Urban Geography, University of Chicago Press, Chicago.
10. Mumford, L. : Culture of Cities, McMillan & Co., Landon.
11. N.V. Sovani : Urbanization and Urban India, Asia Publishing House, Bombay.
12. Northan. R.C. : Urban Geography, John Wiley and Sons, New York.
13. Singh, R.L. : Bangalore – An Urban Servey, National Geographical Society of India, B.H.U. Varanasi.
14. Singh, K. and
Steinberg, F. (ed.) : Urban Indian in Crisis, New Age Interns, New Delhi.

15. Singh. R.L. : Banaras – A Study in Urban Geography, Students Friends, Allahbad.
16. Smailes, A.E. : The Geography of Towns, Huchinson, London.
17. Taylor, G. : Urban Geography, Mathuen and Co., London.
18. Tewari, Vinod K. Jay A.,
19. Weinstein, V.L.S. PrakasaRao : Indian Cities : Ecological Perspective.
20. त्रिभुवन, य- % uxjh; Hkksy] jkt- fgUnhxfkvdkeh] t; ij
21. वक्रिचक्रि फि ग % uxjh; Hkksy
22. चय, ल-ल-ह % uxjh; Hkksy] ehuk(khi d'ku] ej B
23. जको च-ि-ह % uxjh; Hkksy] ol t/kj ki d'ku] xlg [ki j

Paper III : Agricultural Geography (Elements & Applied)

Examination – 2017-18

Duration: 3 hrs.
Marks

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit – I

Elements of Agricultural Geography : Concept of agricultural origin and dispersal. Development of agriculture through the ages in important agricultural areas of the world. Trends and practices.

Factors affecting agriculture : Physical – Relief, climate, soil, water, storage etc. Social-land ownership and size of holdings.

Economic input of human and animal power, irrigation, and fertilizers, mechanizations etc. Others : Financial Management, market system, transport, trade etc.

Unit – II

Water : Water resources, quality of water for irrigation, water quality criteria, various methods of irrigation and their comparative advantages. Soil and water balance. Types of agriculture – Whittlesey's classification of agricultural regions and special study of shifting cultivation, plantation agriculture, Mediterranean, Collective and state farming, extensive and intensive agriculture, dry farming and their characteristics.

Unit – III

Applied Agricultural Geography : Agricultural Land use : Concept, history of agricultural land use surveys, principles, objectives, policies and planning and land use surveys. Land classification: need and basis of land classification. British Pattern, American pattern, Indian pattern, Irish pattern, Land use data: Sources, types of mapping and problems.

Unit – IV

Models in agricultural land use : concept, need and principles. Von Thunen's Agricultural Location Theory and its recent modifications, Coleman's model, Preparation and planning of a detailed proforma for land use surveys.

Unit – V

Measurements of the level of agricultural development : Concept and methodology – Agricultural regionalization – Concept, methods of delimitation (including statistical methods).

Crop-ranking, crop-combination regions – meaning and methodology. (Detailed study of Kendal, Weaver, Doi and S.M. Rafiullah), Cropping Intensity, Crop-diversification – methods and deductions.

Agricultural efficiency – concept methods of measurement. Nutrition and balance sheet. Crop land use and deficiency diseases.

Note : the candidates are expected to make field studies. A field trip be organized for landuse survey of a village. A question be asked in examination.

Books Recommended :

1. Ali Mohammed : Dynamics of Agriculture Development in India, Concept Publication Co., Delhi.
2. Ali Mohammed : Situation of agriculture, Food and Nutrition in Rural India, Concept Publishing Co., Delhi.
3. Gregor, H.P. : Geography of Agriculture, Prentice Hall, New York
4. Grigg, D.B. : The Agricultural Systems of the World, Cambridge University Press, New York
5. Hartshorn, T.A. and Alexander, J.W. : Economic Geography, Prentice Hall, New Delhi
6. I.C.A.R. : Soil and Water Conservation Research
7. I.C.A.R. : Soil Conservation in India.
8. Kostrowicki, J. : World Types of Agriculture, Polish Academy, Warsaw.
9. Morgan, W.B. and Norton. R.J.C. : Agricultural Geography, Mathuen, London.
10. Noor Mohammed : Agriculture Land use in India, Inter-India Public, Delhi.
11. Noor Mohammed : New Dimension in Agricultural, Concept, New Delhi.
12. Sachchidananda : Social Dimensions of Agricultural Development, National Publishing House, Delhi.
13. Shafi M. : Agriculture Geography.
14. Singh, J. and Dhillon, S.S.: Agricultural Geography, Tata McGraw Hill Pub., New Delhi
15. Stamps, L.D. : The Land of Britain, Its Use and Misuse, Longman, London
16. Symon Leslie : Agricultural Geography, G. Bell and Sons Ltd., London
17. Tarrant, J.R. : Agricultural Geography, Wiley, New York
24. ifeykdpj % d f " k H l a k s y] e / ; i n s k f g l n t x i k v d k n e h
25. cztHkkk.k fl g % d f " k H l a k s y] x k j [k i j
26. ekftngd & % d f " k H l a k s y

Paper IV : (I) Remote sensing and G.I.S.

Examination – 2017-18

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit – I

Historical development of remote sensing as a technology – Relevance of remote sensing in geography – concepts and basics : Energy source, energy and radiation principles, energy interactions in the atmosphere and earth surface features. Remote sensing systems : Platforms, Sensors and radiation records.

Unit – II

Air photos and photogrammetric : Elements of photographic system : Type, scales and ground coverage, resolution, radiometric characteristics, films, filters, aerial, cameras, film exposures, geometric fundamentals of photogrammetric : elements of vertical photographs, relief displacement, image parallax, stereoscopic, ortho photos air photo interpretation : shape, size, pattern, tone, texture, shadows, site advantage and limitation.

Unit – III

Satellite Remote Sensing: History and development of various types of satellite and space programme. Image processing : types of imagery, techniques of visual interpretation, ground verification, transfer of interpreted thematic information of base maps-digital processing : rectification and resolution, Image enhancement contrast manipulation, classification supervised and unsupervised, Post classification analysis. Remote sensing and its comparison with map.

Unit – IV

Applications : Air Photo and image interpretations and mapping forest and wild life, mines & Geology, Geomorpho.

Landuse and land cover soil, land evaluation, weather studies, water resources, hazard management and environmental management.

Unit – V

GIS – Introduction, definition & scope, its application in various field& planning.

Suggested Readings:

1. American Society of Photogrammetric : Manual of Remote Sensing, ASP, Falls Church, V.A., 1983, Vol.I,II.
2. Barrett, E.C. and L.E. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York.
3. Burrough P.A. : Principles of Geographic Information Systems for Land Resource Assessment, Oxford University Press, New York.
4. Campbell, J. : Introduction to Remote Sensing, Guilford, New Your.
5. Curran, Paul J. : Principles of Remote Sensing, Longman, London.
6. Gautam, N.C. : SPGU. Technology of Geography, N.R.S.A., Hyderabad.
7. Hord, R.M. : Digital image processing of remotely sensed data, Academic, New York.
8. Luder, D. : Aerial Photography Interpretation : Principles and Application, McGraw Hill, New York.

9. Mark, S. Monmonier : Computer Assisted Cartography, Prentice Hall, Englewood Cliff, New Jersey.
10. Pratt, W.K. : Digital image processing, wiley, New York.
11. Rao, D.P. (eds.) : Remote Sensing for Earth Resources, Association of Exploration geophysicist, Hyderabad.
12. Singh, S. : Remote Sensing Technology, AS Publication, Jodhpur.
13. Star, J. and Estes, J. : Geographic Information Systems : An Introduction, Prentice Hall, Englewood Cliff, New Jersey.
14. Thomas M. Lillesand and Ralph W. Kefer : Remote Sensing and Image interpretation, John wiley& sons, New York.
15. Wolf Paul, K. : Elements of Photogrammetry, McGraw Hill Book Co.

Dissertation on Geographical Problem (In lieu of paper Vi, VII, VIII)

N.B. : The candidates offering this paper will be required to submit dissertation at least three weeks before the commencement of the theory examination. It will be examined by a board of two examiners. Three copies of dissertation must 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 field work and statistical analysis as far as possible and be prepared under the guidance of a postgraduate teacher of five years standing. The volume of dissertation should not exceed 100 papers.

Paper – IV : (II) Population Geography :

Examination – 2017-18

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit - I

Definition and scope of Population Geography, Theory in Population Geography-Malthusian, Neo Malthusian and optimum Population theory and Biological Population Theory. Types of Data and Population census with special reference to the Indian census.

Unit - II

Density and Distribution factors affecting population distribution in the world. Measures of population density, Measures of dispersal and concentration of population and population potential. Demographic transition.

Unit - III

The Growth of population, world patterns of fertility and mortality. Age and Sex composition, Marital status, Families and households, Language and literacy, Religious composition of population, Economic composition of population.

Unit - IV

Primary occupations, manufacturing industry, Transport, Trade and service etc. Rural and urban population and urbanization. Internal and international migration behavioral migration studies.

Unit - V

The Growth of India's Population, The death rate and birth rate in India, density and distribution of population in India, Is India over populated? Age and sex composition in India's population, Urbanization in India. Occupational composition and internal Migrations.

Economic composition of India's population, Internal migration in India. The Population policy of Govt. of India.

Books Recommended :

1. Clarks : Population Geography.
2. Johnes : A Population Geography.
3. Trewarth : A Geography of Population.
4. Woods : Population Analysis in Geography.
5. Woods : Theoretical Population Geography.
6. Beanijen Garnier : Geography of Population.
7. Zelinsky : A prologue to population Geography.
8. Wilson : Population Geography.
9. Chandra : Population Geogaphy.
10. Davis : The Population of India and Pakistan.
11. Clarks (ed.) : Geography of Population.
12. Schnell & Monmonier : The study of population – Elements Patterns and Processes.
13. Dyson and Crook : India's Demography.
14. Rees and Wilson : Spatial Population Analysis.
15. Pacione : Population Geography – Problems and prospects.
16. , l -Mh- eWZ % tul ¶; k Hk

Paper – IV : (III) CLIMATOLOGY

Examination – 2017-18

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit - I

Nature and scope of climatology and its relationship with meteorology. Composition, mass and structure of the atmosphere. Isolation, Heat balance of the earth, green house effect, vertical and horizontal distribution of temperature.

Unit - II

Atmospheric motion : forces controlling motion of air vertical motion and vorticity, local wind, jet stream, general circulation in the atmosphere, Atmospheric moisture: Humidity, evaporation, condensation, precipitation : types, acid rain, world pattern of precipitation.

Unit - III

Tropical, temperate and high latitude weather systems – concept of air masses and atmospheric disturbances, ocean atmospheric interaction – EL Nino, Southern oscillation (ENSO) and La Nina. Monsoon winds, norwesters and cyclones tropical and temperate phenomena, climate of India and its controls; Western disturbances.

Unit - IV

Climatic Classification of Koppen, and Thorntwaite, Major climates of the world – tropical, temperate desert and mountain climate.

Climatic changes Evidences, possible causes; global warming, environmental impacts and society's response.

Unit - V

Applied climatology : Data collection, archiving, accessing, interpretation and generation of climatic information specially for water balance studies, soils, agriculture activities, house types and health.

Suggested Readings

1. Barry, R.G. and Chorley P.J. : Atmosphere, Weather and Climate, Routledge, London and New York.
2. Critchfield, J.H. : General Climatology. Prentice Hall, India, New Delhi.
3. Lydolph, P.E. : The climate of the Earth, Rowman.
4. Fein, J.S. and Stephens, P.N. : Monsoons. Wiley Interscience.
5. India Met. Deptt. : Climatological Tables of Observatories in India, Govt. of India.
6. Mh-, l - yky % tyok; foKku

**Paper – IV : (IV) Geography of Water Resources
Examination – 2017-18**

**Duration: 3 hrs.
Marks**

Min. Pass Marks : 29 Marks

Max. Marks : 80

Note : This paper will contain ten questions having two questions from each unit. Candidates are required to attempt five questions in all selecting at least one question from each unit.

Unit - I

Water as a focus of geographical interest, inventory and distribution of world's water resources (surface and subsurface); world hydrological cycle : quantitative estimates, water storages. Glaciers, river channels, lakes and reservoirs, soil moisture, ground water.

The basic hydrologic cycle : precipitation, potential, evapotranspiration and interception losses : runoff.

Water demand and use : methods of estimation – agricultural, industrial and municipal uses of water.

Unit - II

Agricultural use of water : estimation of crop – water requirement; soil-water-crop relationships; water balance and drought; major and minor irrigation : methods of distribution of water to farms; water harvesting techniques, soil water conservation.

Irrigation-water logging, salinity and alkalinity of soil over exploitation of ground water, land subsidence, saline water intrusion into the alluvial aquifers. Water quality parameters, water pollution over and ground water-fluoride and arsenic.

Unit - III

Industrial use of water : methods of estimation; demand for water in the industrial sector of India.

Municipal use of water : General trends in water supply to the urban and rural communities in India. Internal navigation, hydel power and recreation.

Unit - IV

Problems of water resource management Floods-magnitude/frequency, structural and non structural adjustment of flood hazards; embankments, reservoirs, channel improvement, soil conservation, afforestation, flood forecasting, evacuation, floodplains, landuse regulation and insurance. Case studies of major floods.

Droughts-occurrence, major drought management with reference of Rajasthan.

Unit - V

Conservation and planning for the development of water resources-social and institutional considerations; integrated basin planning conjunctive use of surface and ground water resources; watershed management; international and interstate river water disputes and ties, some case studies.

Suggested Readings

1. Agarwal, Anil and Sunita Narain : Dying wisdom : Rise, Fall and Potential of India's Traditional Water Harvesting System. Centre for science and environment, New Delhi, 1997.
2. Economic and social Commission for Asia and the Pacific United Nations: Guidelines for the preparation of National Master water Plan.
3. Gulhatim N.D.: Development of Inter-state rivers : Law and Practice in India. Allied pub., Bombay.
4. International Water Resource Association and Central Board of Irrigation & power, water of human needs, Vols. I to V Proceedings of the Second world congress on weather resources, 12-16 December, New Delhi.
5. Jones, J.A.: Global hydrology: processes, resources and environmental Management, Longman.
6. Krutilla, John V. and Eckstein, O. : Multiple purpose river development : studies in applied economic analysis, John hopkin's press, Boston.
7. Law. B.C. (ed.) : Mountains and rivers of India IGU national committee for Geography, Calcutta.
8. Michaelm A.M. : Irrigation : Theory and Practices, Vikas publishing House Pvt. Ltd., New Delhi.

9. Matter, J.R., : Water Resources Distribution, use and Management, John Wiley, Maryland.
10. Newson, M.Land, :Water and Development River Basin systems and their sustainable management, routledge, London.
11. Pareira, H.D. : Landuse and water resources, Cambridge University Press, Cambridge.
12. Rao, K.L.: India's Water Wealth, Orient Longman, New Delhi.
13. Kates R.W. and Burtgon, I. (ed.) : Geography, Resources and environment, Ottawa
14. Singh, R.A. and Singh, S.R.: Water Management; Principles and Practices, Tara Publication, Varanasim.
15. Smith, K.: Water in Britain : A study in Applied hydrology and resource Geography, McMillan, London.
16. Tebbutt, T.H.Y. (ed.) : Advances in Water engineering Elsevier applied science Pub., London.
17. Tideman, E.M. watershed Management : Guidelines for Indian Conditions, Omega, New Delhi.
18. Todd, D.K. : Ground water hydrology, John Wiley, New York.
19. U.S.D.A.: The Year Book of Agriculture : Water, Oxford and I.B.H. Publishing Co., New Delhi.
20. Verghese, B.G. : Water of Hope : Integrated water resource development and Regional Co-operation within the Himalayan-Ganga-Brahmaputra-Barak Basin, Oxford IBH, New Delhi.
21. White, G.F.L. : Environmental effects of Complex River Development. Westriver Press, Boulder, Colorado.

PRACTICALS

Surveying and Laboratory work (Total 10 hours per batch of 15 candidates spread over two days).

1. Laboratory work 4 hrs duration
40 marks
2. Record work and viva voce (10+10) (2 hrs.)
20 marks
3. Field surveying & viva voce (15+10) 4 hours duration
25 marks
4. Survey camp & viva voce (10+5)
15 marks

Total
100 marks

Note : 12 hours of teaching practical be provided per batch of 15 students per week.

The art of surveying, history of surveying, scope, utility, and problems. Classification of surveying.

Methods and techniques of representation of relief:

- (a) Methods and techniques of depicting relief.
- (b) Profile, gradients and calculation of slopes.
- (c) Contours and indivisibility.
- (d) Block diagrams, field sketching, serial profile, hypsographic curves, altimetric frequency graphs.

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 topographic sheets.

Air photo interpretation and exercise on the determination of height of plane, parallax, number of runs and number of photographs, knowledge of stereoscopic vision, mosaics, types of camera, emulsions and stereoscopes, interpretation and identification of cultural and physical features on aerial photography. Photo interpretation of land use and settlement in the field surveying.

Remote sensing and computer application in mapping; Digital mapping; Geographic information system (GIS): Thematic maps.

Field Survey Camp :

Theodolite : Its parts and their functions, use of theodolite – traverse computation, independent co-ordinates.

Use and application of plane table and clinometers in small area survey, traverse, reuniting – two and three point problems. Practical contouring by Clinometers.

Leveling : Terms, types and principles of leveling. Classification of leveling, profiles and other leveling. Use of Dumpy level, practical contouring, cross uniting, use and application of aneroid level.

Survey Camp – A topographical survey of settlement will be done by organizing a camp at least for a week duration and maps and reports of the camp will be prepared. Students will stay in camp. The report shall be prepared separately and independently.

Reference Books:

1. Breed, C.B. and Hommer, G.L. : The principles of surveying. Vol. I and II, New York.
2. Davis, R.E. and Foot, F.S. : Surveying Theory and Practice, Hohn Willey and Sons Inc., New York.
3. Deshpande, T.S. : A textbook of surveying and leveling, United book Corporation, Puna.

4. Gautam, N.C. : Urban Landuse Studies Through Air photo Interpretation Techniques, Pink Publishing House, Mathura.
5. Kanetkar, T.P. and Kulkarni, S.V. : Sruveying and leveling, A.V. GriaPrakash, Puna.
6. Punamia, B.C. : Surveying and field work Vol.I, Standard Books Depot., Delhi.
7. Roorkee Engineering College : Manual of surveying.
8. Sharma, JawaharLal : A Text Book of Surveying, CBS publishers Delhi, 1988.
9. Singh, R.L. and Dutt. P.K. : Elements of Practical Geography, Students Friends, Allahabad.
10. Tracy, T.R. : Surveying Theory and Practice, McGraw Hill book co., New York.
11. Williamson : Surveying and Field Work Constable.
12. ts i h- 'lekl % i k; kfx dHkxky