



## DEPARTMENT OF GEOGRAPHY

**University College of Social Sciences & Humanities**

**Mohanlal Sukhadia University, Udaipur, Raj. - 313001**

Proposed Scheme of Courses in Geography

**M. A. /M. Sc. Geography: Annual 2017-18**

### **M. A. / M. Sc. Previous**

Paper I	: Geographical Thoughts
Paper II	: Advanced Physical Geography
Paper III	: Economic & Resource Geography
Paper IV	: Advanced Geography of India
Practical - I	: Advanced Cartography
Practical - II	: Air-Photo Interpretation and Remote Sensing

### **M. A. / M. Sc. Final**

Paper I	: Agricultural Geography
Paper II	: Political Geography
Paper III	: <b>Elective: Any one of the following</b>
III A.	: Regional Development and Planning
III B.	: Urban Geography
III C.	: Population and Settlement Geography
III D.	: Cultural Geography
Paper IV	: <b>Elective: Any one of the following</b>
IV A.	: Industrial Geography
IV B.	: Transport Geography
IV C.	: Environmental Geography
IV D.	: Social Geography
Practical - I	: Surveying & Leveling
Practical - II	: GIS & Digital Cartography

Notes:

1. There will be four theory papers and two practicals of 100 marks each.
2. Use of map stencils (outline of political boundaries only), Log Tables and simple function calculators are allowed in the examination.
3. There will be 16 hours theory teaching per week and 12 hours practical teaching per week. Each practical batch will comprise of 20 students.
4. A common Practical Test Paper of three hours duration will be held along with the main theory examination.
5. The Practical Test Paper will be set and evaluated by External Examiner in the line of theory papers.
6. Each theory paper of three hour duration will be divided into five units and three categories of questions will be set from each unit as per following distribution:

Sections	Questions		Marks	Distribution of Questions
	To be Asked	To be Attempted		
1. Very Short (20-50 Words Answers)	10	10	20	Proportionately from each Unit with internal choice
2. Short Answers (250 words)	10	5	40	
3. Analytic/Descriptive Answers (500 words)	5	2	40	
Total	25	17	100	

7. The practical exercises, record work and viva-voce examination shall be conducted by an external examiner in consultation with the internal examiner and shall be conducted in two days.
8. Special notes for M. A. Previous Practical Examinations:
  - i. The Cartographic record work should contain 18 exercises drawn on one fourth of the full drawing sheet.
  - ii. The Quantitative Methods record work should contain 30 exercises.
  - iii. The internal examiner for M.A. (P) practical examinations will be common for both the Cartography and Quantitative Methods.
  - iv. Cartography practical exercises shall be of three hours duration. Candidate will be required to attempt any three exercises out of six.
9. Special notes for M. A. previous Practical Examinations of Air Photo Interpretation & Remote Sensing:
  - i. Practical exercise shall be of three hours duration and of 20 marks and candidates will be required to attempt any 2 exercises out of 4.
  - ii. The identification of objects (at least 10) on the satellite imagery and air photo pairs shall be of 30 minutes duration and will carry 5 marks.

10. Special note for M. A. Final Practical Examinations of Computer Applications:

- i. Practical exercise shall be of three hours duration comprising of two tests and candidates will be required to attempt any 4 exercises out of 6 on the systems.

11. Special note for M. A. Final Practical Examinations of Surveying:

- i. Practical exercise shall be of three hours duration based on the practical working on each instruments with following distribution of marks:

Instrument	Exercise	Marks	Timing (Minutes)
a. Plane Table	Resectioning	10	35
b. Theodolite	Measurement of angle between two distant points	5	10
c. Dumpy Level	Measuring level difference between two distant points	5	10
d. Clinometer	Measuring heights of and level difference between two distant points	5	10
e. Tacheometer	Measuring distance of any distant point	5	10

12. Special notes with regard to for M. A. Final Examinations:

- i. A student who obtained 55 per cent marks in the aggregate on successful completion of all the courses prescribed in M. A. Previous may be permitted to work on dissertation in lieu of any one of the optional papers of M. A. Final.
  - ii. The topic and the synopsis of the work are to be got approved by the Departmental Committee.
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**M.A. / M.Sc. (Previous) Geography**  
**Paper - I: Evolution of Geographical Thought**

**Unit - I**

**Philosophy of geography and geography during ancient and medieval period:**

- a) Philosophy, definition and nature of geography; scope and purpose of geography.
- b) Brief study of Greek and Roman scholars.
- c) Geographical concept in ancient India.
- d) The dark age of geography.
- e) The Arab period.

**Unit - II**

**The beginning of modern geography:**

- a) Contribution of Bernhardus Varenius.
- b) Contribution of Immanuel Kant.
- c) Impact of Darwinian Theory on geographical thoughts.
- d) Contribution of Alexander von Humboldt.
- e) Contribution of Carl Ritter.

**Unit - III**

**Major school of thoughts and their contribution:**

- a) Main characteristics of German school of thoughts and contributions of Friedrich Ratzel, Alfred Hettner and Ferdinand von Richtofen.
- b) Main characteristics of French school of thought and contributions of Paul Vidal de la Blache and Jean Brunhes.
- c) Main characteristics of American school of thought and contributions of W.M. Davis Richard Hartshorne, and Carl O. Sauer.
- d) Main characteristics of British school of thought and are contribution to geography.
- e) Main characteristics of contemporary Indian geographical teaching and research.

**Unit - IV**

**Major conceptual trends in geography:**

- a) The study of man-land relationship: environmental determinism, possibilism and neo-determinism.
- b) Geography as chorological science and areal differentiation.
- c) Geography as morphology of landscape.
- d) Dichotomies in geography: physical v/s human and systematic v/s regional geography.
- e) Dichotomies in geography: qualitative v/s quantitative approach, analysis v/s synthesis approach.

**Unit - V**

**Issues related to explanations in geography:**

- a) General ideas of hypothesis, theories and laws in geography.
- b) Forms of explanations in geography.
- c) Exceptionalism in geography and the Schaefer-Hartshorne debate.
- d) Impact of positivism and scientific method in geography.
- e) Behaviouralism, humanism and radicalism in geography.

**Suggested Readings:**

1. Abler, Ronal F. et al, Geography's Inner Worlds: Pervasive Themes in Contemporary American Geography, Routledge, New Jersey, 1992.
2. Ali, S.M., Arab Geographers, Institute of Islamic Studies.
3. Ali, S.M., The Geography of Puranas, People's Publishing House, New Delhi.
4. Dikshit R.D., Geographical Thought: A Contextual History of Ideas, Prentice Hall of India Pvt. Ltd. 2000.
5. Dikshit R.D., The Art and Science of Geography: Integrated Readings, Prentice Hall of India, New Delhi, 1994.
6. Dohrs, F.E. and Sommers, L.W. (eds.) Introduction to Geography, Thomas Y. Crowell Co., New York, 1967.

7. Fischer, E. et al, A Question of Place: The Development of Geographic Thought, R.V. Beatty Ltd., Arlington, 1967.
8. Ruson, R.H., A Geography of Geography: Origins and Development of the Discipline, W.M.C. Brown Company.
9. Hartshorne, Richard, The Nature of Geography, Association of American Geographers, Lancaster, Pennsylvania, 1939.
10. Hartshorne, Richard, Perspective on the Nature of Geography, RandMcNally and Co., Chicago, 1959.
11. Harvey, M.E. and B.P. Holly (eds.), Themes in Geographic Thought, Rawat Publications, Jaipur, 1999.
12. Husain, Majid, Evolution of Geographical Thought, Rawat Publications, Jaipur, 1984.
13. Mandal, R.B. and V.N.P. Sinha, Recent Trends and Concepts in Geography (three volumes), Concept Publishing Company, New Delhi.
14. Peet, R., Modern Geographical Thought, Blackwell, Oxford, 1998.
15. Prasad, H., Research Methods and Techniques in Geography, Rawat Publications, Jaipur.
16. Raza, Moonis, A Survey of Research in Geography, ICSSR, New Delhi.
- 17<sup>ए</sup> जैन, एस.एम.: भौगोलिक चिन्तन का विकास (साहित्य भवन, आगरा)
- 18<sup>ए</sup> कौशिक, एस.डी.: भौगोलिक विचाराधारा एवं विधि तंत्र (रस्तोगी प्रकाशन, मेरठ)
- 19<sup>ए</sup> माथुर एवं जोशी: भौगोलिक विचाराधाराओं का इतिहास (आर.बी.एस. पब्लिशर्स, जयपुर)
- 20<sup>ए</sup> सिंह, जे.: भौगोलिक चिन्तन के मूलाधार (वसुधरा प्रकाशन, नई दिल्ली)
- 21<sup>ए</sup> सिंह, यू.: भौगोलिक चिन्तन का विकास (..... पब्लिशर्स, नई दिल्ली)

**M.A. / M.Sc. (Previous) Geography  
Paper - II: Advanced Physical Geography**

**Unit - I**

- a) Earth's interior: seismological evidences of the structure and zoning of the earth's interior.
- b) Revival of the continental drift theory.
- c) Plate tectonic theory: division of the crust in plates; plate boundaries and plate margins, mechanism of plate movements; plate tectonics and associated structures.
- d) Process of denudation; mass wasting: types and results.
- e) Development of slopes: approaches to the study of slopes; views of W. Penck, A. Wood and A.N. Strahler.

**Unit - II**

- a) Fluvial morphometry:
  - i. Linear properties: stream orders, bifurcation ratio, stream numbers and stream lengths.
  - ii. Areal properties: basin area, drainage density and texture of topography;
  - iii. Relief properties; channel slope and valley side slope.
- b) Cycle of erosion: views of W.M. Davis.
- c) Cycle of erosion: views of W. Penck.
- d) Fluvial landforms:
  - i. Erosional landforms.
  - ii. Depositional landforms.
  - iii. Fluvial cycle of erosion and interruptions in it.

**Unit - III**

- a) Land form of arid and semi-arid lands.
- b) Arid cycle of erosion.
- c) Glacial topography: erosional and depositional landforms; fluvo-glacial landforms.
- d) Coastal landforms.
- e) Karst cycle.

**Unit - IV**

- a) Atmospheric heat: insolation, heat budget; horizontal and vertical distribution of temperature.

- b) Motions in the atmosphere: atmospheric pressure and its thermal and dynamic controls.
- c) General atmospheric circulation; forces controlling the atmospheric circulation; uni-cell and tri-cell model of atmospheric circulation.
- d) Jet streams: characteristics, types and origin.
- e) Air masses: source region, modifications in air masses and their classification; Fronts and their types.

### **Unit - V**

- a) Tropical and extra tropical cyclones: origin, areas and weather association with them.
- b) Atmospheric humidity: sources and types.
- c) Condensation, Sublimation and their forms.
- d) Submarine topography.
- e) Relief features of the Indian and Atlantic Ocean floors.

### **Suggested Readings:**

1. Barry, R.G. and R.J. Chorley, Atmosphere, Weather and Climate, Routledge, 1998.
2. Critchfield, H., General Climatology, Prentice-Hall, New York, 1975.
3. Dayal, P., A Text Book of Geomorphology, Shukla Book Depot, Patna, 1996.
4. Garrison, T., Oceanography, Wadsworth Co., USA, 1998.
5. Kale, V., and A. Gupta, Elements of Geomorphology, Oxford University Press, Calcutta, 2001.
6. Mather, J.R., Climatology, McGraw Hill, New York, 1974.
7. Monkhouse, F.J., Principles of Physical Geography, Hodder and Stoughton, London, 1960.
8. Pitty, A., Introduction to Geomorphology, Methuen, London, 1974.
9. Sharma, H.S., Tropical Geomorphology, Concept, New Delhi, 1987.
10. Singh, S., Geomorphology, Prayag Pustakalaya, Allahabad, 1998.
11. Sparks, B.W., Geomorphology, Longmans, London, 1960.
12. Strahler, A.N. and A.H. Strahler, Modern Physical Geography, John Wiley & Sons, 1992.
13. Trewartha, G.T., An Introduction to Climate, International Students Edition, McGraw Hill, New York, 1980.
- 14<sup>ए</sup> सिंह, सविन्द्र :भौतिक भूगोल, वसुन्धरा प्रकाशन, गोरखपुर, 1997
- 15<sup>ए</sup> चतुर्भुज मामोरिया एवं जैन :भौतिक भूगोल एवं जीव मण्डल, साहित्य भवन, आगरा, 1996
- 16<sup>ए</sup> वीरेन्द्र सिंह चौहान :भौतिक भूगोल, रस्तोगी पब्लिकेशन्स, मेरठ, 1996
- 17<sup>ए</sup> उपाध्याय एल.एन. :भौतिक भूगोल, राज. हिन्दी ग्रन्थ अकादमी, जयपुर
- 18<sup>ए</sup> तिवारी, ए.के. :जलवायु विज्ञान के मूल तत्व, राज. हिन्दी ग्रन्थ अकादमी, जयपुर
- 19<sup>ए</sup> तिवेखा, रामनाथ :भौतिक भूगोल, केदारनाथ रामनाथ, मेरठ
- 20<sup>ए</sup> नेगी, बी.सी. :जलवायु विज्ञान तथा समुद्र विज्ञान, केदारनाथ रामनाथ, मेरठ
- 21<sup>ए</sup> कौशिक, एस.डी. :मौसम विज्ञान (राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर)
- 22<sup>ए</sup> सिंह, सविन्द्र :भू-आकृति विज्ञान, वसुन्धरा प्रकाशन, गोरखपुर, 1997

## **M.A. / M.Sc. (Previous) Geography Paper - III: Economic and Resource Geography**

### **Unit - I**

- a) Scope, approaches and recent trends in economic geography.
- b) Location, movement and interaction in the simplified and heterogeneous landscape.
- c) Spatial variation in transport costs : location and structure of transport cost; location of economic activities and spatial organisation of economies;
- d) Transportation development and spatial impact.
- e) Spatial variation in production costs: labour, capital, technical knowledge; location impact.

### **Unit - II**

- a) Classification of economies, sectors of economy: primary, secondary and tertiary.
- b) Types of farming; subsistence agriculture.
- c) Tropical plantations.
- d) Commercial grain farming and corn region of USA.
- e) Mediterranean agriculture.

### **Unit - III**

- a) Study of Great Lake industrial region of USA.
- b) Study of Ruhr industrial region.
- c) Study of industrial belt of Japan.
- d) Study of industrial region of Ukraine.
- e) World pattern of water transportation and trade.

### **Unit - IV**

- a) Scope, approaches and trends in resource geography.
- b) Resources: concepts and classification.
- c) Distribution, production and problems of conservation of iron, ore and manganese.
- d) Distribution, production and problems of conservation of coal, petroleum, and nuclear resources.
- e) Forest and water resources: distribution, utility and conservation.

### **Unit – V**

- a) Distribution, density and growth of human resources.
- b) Population-resource equilibrium.
- c) Population resource regions of the world.
- d) Problems of resource utilization and conservation of resources.
- e) Resource regions of world.

### **Suggested Readings:**

1. Alexander, J.W., Economic Geography, Prentice Hall of India, New Delhi.
2. Bengston, N.A. and M.W. Royen, Fundamental of Economic Geography, Prentice Hall.
3. Berry, B.J.L. et al, D.M., Economic Geography, Prentice Hall.
4. Hamilton, F.E.I. (ed.), Resources and Industry, Oxford University Press, New York, 1992.
5. Janaki, V.A., Economic Geography, Concept Publishing Co., New Delhi.
6. Robinson, H., Economic Geography, MacDonal and Evans.
7. Singh, G., Economic and Commercial Geography, Manol Talao.
8. Thomas, R.S., The Geography of Economic Activity, McGraw Hill, New York.
9. Wheeler, J.O. et al, Economic Geography, John Wiley, New York, 1995.
10. Whitbeck, R.S. and Finch, V.L. Economic Geography, McGraw Hill, New York.
11. Zimmermann, E.W., World Resources and Industries, Harber.
12. श्रीवास्तव, वी.के. एवं राव, बी.पी.: आर्थिक भूगोल के मूल तत्व (वसुन्धरा प्रकाशन, गोरखपुर)
13. जैन, हरकचन्द: सैद्धान्तिक आर्थिक भूगोल (कमलेश प्रकाशन, भीलवाड़ा)
14. रजा, एम. एवं सिंह, ए.: संसाधन भूगोल
15. नैगी, बी.एस. : संसाधन भूगोल
16. सिंह एवं सिंह : आर्थिक और संसाधन भूगोल

## **M.A. / M.Sc. (Previous) Geography Paper - IV: Advanced Geography of India**

### **Unit - I**

- a) Geographical structure of India.
- b) Physiographic divisions and sub divisions.
- c) Climate: regional variations, phenomena of Monsoon and cycle of seasons.
- d) Vegetation types and vegetation regions; problem of deforestation.
- e) Major soil types; problem of soil erosion.

### **Unit – II**

- a) Water resources: status and problems; problem of floods and droughts.
- b) Coastal and marine resources.
- c) Irrigation: sources; multipurpose schemes and their problems with reference to Kaveri, Chambal and Sutlej.
- d) Agro-climatic regions;
- e) Cropping pattern.



### **Unit – III**

- a) Major mineral resources: ferrous - iron ore and manganese; and non-ferrous - bauxite and copper.
- b) Power resources: conventional - thermal and hydro; and non-conventional - solar and wind.
- c) Major industries: cement, chemical and engineering industries.
- d) Industrial regions of India.
- e) India's international trade : items, destination/origin, problems and policies.

### **Unit - IV**

- a) Population: distribution and growth; tribal population distribution pattern and belts.
- b) Population problems and population policy of India.
- c) Settlement types and pattern.
- d) Transportation: rail, road and air.
- e) Regional disparities and socio-economic development in India; Indian five year plans: objectives and achievements.

### **Unit - V**

- a) Concept of geographical regions; outline scheme of regions proposed by S.P. Chatterjee and R.L. Singh.
- b) Detailed study of Kashmir region,
- c) Detailed study of Middle Ganga plain region.
- d) Detailed study of Malwa plateau region.
- e) Detailed study of Tamil Nadu coastal plain and Bay of Bengal islands.

### **Suggested Readings:**

1. Blandford, H.F., Climate and Weather of India, Ceylon and Burma, Meteorological Department of India.
2. Brown, C. and Dey, India's Mineral Wealth, Oxford University Press, London.
3. Chandrashekhar, S., India's Population: Facts and Policy, Allen and Unwin.
4. Chatterjee, S.D., Climatology of India, Calcutta University, Calcutta.
5. Chhibber, H.L., India, Part-III, Nand Kishore and Bros.
6. Davis, K., The Population of India, Princeton.
7. Deshpande, C.D., India - A Regional Interpretation, Northern Book Centre, New Delhi, 1992.
8. Joshi, H., Industrial Geography of India: A Case Study of Fertiliser Industry, Rawat Publication, Jaipur.
9. Khullar, D.R., India: A Comprehensive Geography, Kalyani Publishers, Ludhiana, 2000.
10. Mitra, A., Levels of Regional Development of India, Census of India, Vol. 1, Part I-A (i) and (ii), New Delhi, 1967.
11. Routray, J.K., Geography of Regional Disparity, Asian Institute of Technology, Bangkok, 1993.
12. Shafi, M., Geography of South Asia, McMillan & Co., Calcutta, 2000.
13. Singh, G., Geography of India, Atmaram & Sons, Delhi.
14. Singh, R.L. (ed), India: A Regional Geography, National Geographical Society, India.
15. Wadia, D.N., Geology of India, McMillan & Co., London, 1967.
16. बंसल, एस.सी.: भारत का वृहत् भूगोल, मिनाक्षी प्रकाशन, मेरठ, नई दिल्ली
17. मामोरिया, सी.बी.: भारत का भूगोल (साहित्य भवन, आगरा)
18. मामोरिया, सी.बी.: भारत का वृहद् भूगोल (साहित्य भवन, आगरा)
19. चौहान, टी.एस. : भारत का भूगोल (विज्ञान प्रकाशन, जयपुर)
20. सिंह एवं सिंह : भारत एक भौगोलिक समीक्षा (वसुन्धरा प्रकाशन, गोरखपुर)

## **M.A. / M.Sc. (Previous) Geography Practical - I: Advanced Cartography**

### **Unit - I**

- e) Meaning of cartography, art & science of cartography, history of cartography.
- f) Cartographic materials and techniques.
- g) Quantitative and qualitative symbols.
- h) Maps and their classification.



- i) Sources of geographic data (India).  
The representation of data, information, features related to the following geographical aspects through maps and diagrams and their interpretation (to be submitted along with the record work):

### **Unit - II**

Climatic aspects:

- e) Isohyets or isotherms
- f) Rainfall dispersion diagram.
- g) Rainfall variability graphs (running average and cumulative deviation).
- h) Rainfall trend line.
- i) Temperature variation graph.

### **Unit - III**

Geomorphic aspects (based on toposheets of 1:50,000 or 1:25,000 scale):

- a) Profiles: serial, composite, superimposed and projected.
- b) Slope: average slope map according to Wentworth's method.
- c) Drainage density and texture.
- d) Stream order & River Basin
- e) Hypsometric curve

### **Unit - IV**

Demographic, transport and settlement aspects (atleast with 20 administrative units):

- c) Density and population trend.
- d) Age and Sex composition.
- e) Urban and rural composition.
- f) Traffic flow: cartograms.
- g) Nearest neighbour analysis.

### **Unit - V**

Economic and social aspects (atleast 20 administrative units):

- e) Occupational structure.
- f) Cropping pattern
- g) Crop production and area.
- h) Literacy.
- i) SC and ST population.

Note: The record work will comprise of a minimum of 20 exercises drawn on one-fourth of a full drawing sheet and methodological and analytical interpretation of each one.

### **Distribution of Marks**

**Total Marks 100**

**A Part – Advance Cartography (40 Marks )** ,Practical paper of three hours duration will be held along with main theory paper examination.

- |             |   |
|-------------|---|
| Section – A | Objective type 5 marks. Asked 10 questions, attempt all questions.                                    |
| Section – B | Short Answers – 20 marks, Asked 10 questions, one question from each unit and attempt five questions. |
| Section-C   | Descriptive type-15 marks ,Asked 5 questions, one question from each unit and attempt two questions   |

**Practical** – Assessed by Internal Examiner

### **B Part – Advance Cartography, (60 marks)**

A Test paper Lab exercise – 30 marks, asked 6 questions, attempt three questions and duration 3 hours.

B - Record work – 20 marks

The Cartographic record work should contain 20 exercises drawn on one fourth of the full drawing sheet.

### References:

24. Arthur G., Advance Practical Geography, Heinemann.
25. Campbell, J., Introductory Cartography, Prentice Hall Inc., New York.
26. Govt. of Rajasthan, District Census Handbooks, latest as well as of previous Census,
27. Keates, J. S., Cartographic Design and Production, Longman, London.
28. Loxton, J., Practical Map Production, John Wiley & Sons, New York.
29. Mishra, R. P. and A. Ramesh, Fundamentals of Cartography, Concept Publishers, New Delhi.
30. Monkhouse, F. J. and H. R. Wilkinson, Maps and Diagrams, Methuen & Co., London.
31. Raisz, E., General Cartography, McGraw Hill Book Co., New York.
32. Robinson, A. H., Elements of Cartography, Chapman & Hall.
33. Sing, R. L., Elements of Practical Geography, Kalyani Publishing.
34. Singh, R. N., Map Work and Practical Geography, Central Book Depot.
35. भार्मा, जे. पी.: प्रयोगात्मक भूगोल (रस्तोगी पब्लिशर्स, मेरठ)

## **M.A. / M.Sc. (Previous) Geography Practical - II: Air Photo Interpretation and Remote Sensing**

### **Unit - I**

- a) Definition, Scope and Development of air photo interpretation techniques.
- b) Types and quality of aerial photographs; factors affecting quality of aerial photographs.
- c) Tools and geometry of air photographs: Pocket and mirror stereoscope; geometry of aerial photographs.
- d) Aerial camera, lens and filters.
- e) Stages of production of aerial photographs.

### **Unit - II**

- a) Construction of stereograms and stereotriplets; mosaics: types and their characteristics.
- b) Basic air photo measurements: Photographic scale and flying height; measuring height of objects.
- c) Displacement: relief and tilt.
- d) Calculation of area, number of strips and number of airphotos; measuring angles, shutter speed and expauser interval.
- e) Parallax: slope measurement.

### **Unit – III**

- a) Basic concepts and historical development of Remote Sensing techniques.
- b) Process and stages of remote sensing.
- c) Electromagnetic spectrum, properties of electromagnetic waves, energy interaction in the atmosphere and earth surface features.
- d) Basic principles of thermal Remote Sensing: properties, characteristics of India remote sensing imageries.
- e) Remote sensing platforms, sensors and resolution.

### **Unit - IV**

- a) Data analysis: Ground truth collection, concept of signatures, data processing and digital processing.
- b) Satellite remote sensing platforms - Landsat, SPOT, IRS, INSAT; principal characteristics and geometry of scanner.
- c) Orbital characteristics and data production : MSS, TM, LISS, I, LISS II and LISS III, HMR.

- d) Equipment and their uses: Optical reflecting projector; diazo printer; overhead reflecting projector; analog image analyzer.
- e) Working of above equipment.

### **Unit - V**

- a) Elements of object identification.
- b) Comparisons of maps, air photos and imageries.
- c) Mapping and interpretation of natural and cultural landscapes, field checking with air photos and imageries.
- d) Application of remote sensing in geomorphic, agricultural, forestry, resource management, and environmental studies.
- e) Computer based analysis of remote sensing data; GIS data model and structure; GIS and remote sensing integration.

### **Practical Exercises**

#### **Based on Aerial Photographs:**

- a) Object identification by Pocket Steoscope.
- b) Indexing of aerial photographs
- c) Interpretation of the following:
  - i. Topographical aspects: General physiography, drainage orders and basins, vegetation, surface materials. (One exercise of each aspect).
  - ii. Cultural aspects: Landuse-land covers (agricultural and general), field patterns settlement and transportation lines. (One exercise of each aspect).

#### **Based on Satelite Imageries: (One exercise of each aspect)**

- a) Landuse-land covers.
- b) Urban settlement pattern.
- c) Forest: types and density.
- d) Drainage order and basins.
- e) Settlement and transportation lines.
- f) Topographical aspects.

### **Distribution of Marks**

**Total Marks 100**

**A Part** –Practical paper of three hours duration will be held along with main theory paper examination. (40 marks)

- Section – A Objective type 5 marks. Asked 10 questions, attempt all questions.
- Section – B Short Answers – 20 marks, Asked 10 questions, one question from each unit and attempt five questions.
- Section-C Descriptive type-15 marks ,Asked 5 questions, one question from each unit and attempt two questions

**Practical** – Assessed by Internal Examiner

### **Part B- Air photo Interpretation and remote sensing**

60 marks

A.- Test paper Lab exercise – 35 marks (25+10),

- iii. Practical exercise shall be of three hours duration and of 25 marks and candidates will be required to attempt any 2 exercises out of 4.
- iv. The identification of objects (at least 10) on the air photo pairs shall be of 30 minutes duration and will carry 10 marks

B -Record work – 15 marks

C -Viva-voce – 10 marks

### **Suggested Readings:**

1. American Society of Photogrammetry: Manual of Remote Sensing, ASP, Falls Church, VA, 1983.
2. Avery, T.E., Interpretation of Aerial Photographs, Burges.
3. Barrett, E.C. and L.F. Curtis, Fundamentals of Remote Sensing and Air Photo Interpretation, Macmillan, New York, 1992.
4. Compbell, J., Principles of Remote Sensing, Longman, London, 1985.
5. Hord, R.M., Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989.
6. Robert, G. Reeves et al, Manual of Remote Sensing, Vol. I and II.
7. Smith, H.T.V., Aerial Photographs and their Applications, Appleton Century Crofts.
8. Talbutt, A., Essentials of Aerial Surveying and Photo Interpretation
9. Tomar, M.S. and A.R. Maslekar, Aerial Photographs in Land use and Forest Surveys Kishore and Co. Dehradun

## **M.A. / M.Sc. (Final) Geography Paper - I: Agricultural Geography**

### **Unit - I**

- a) The nature and scope of agricultural geography.
- b) Approaches in agricultural geography: recent trends.
- c) Origin and dispersal of agriculture.
- d) Development of agricultural geography.
- e) Sources of agricultural data.

### **Unit - II**

- a) Physical factors affecting agriculture: terrain, climate, soils and water.
- b) Non-physical factors affecting agriculture: Institutional (including social and economic) and technological.
- c) Agricultural systems of the world: critical review of classification of agricultural types.
- d) Major agricultural types of the world and their characteristics and world distribution.
- e) Detailed study of intensive subsistence, commercial grain farming, Mediteranean agriculture and tropical plantation agriculture.

### **Unit - III**

- a) Land use classification; landuse pattern in India; and land capability classification.
- b) Von Thunen's agricultural model of agricultural land use and recent modification in it.
- c) Cropping pattern; changing cropping pattern in India.
- d) Measures of carrying capacity of land; nutrition and food balance sheet; food surplus and food deficient regions of India.
- e) Diffusion model.

### **Unit - IV**

- a) Concept and techniques of delimitation of agricultural regions; agricultural regions of India and their characteristics.
- b) Measures of agricultural productivity and efficiency levels and other characteristics.
- c) Regional pattern of agricultural productivity in India.
- d) Crop combination methods: Weaver's Doi's and Rafiullah's methods and their applications.
- e) Agricultural typology: concept and methodology; patterns with special reference to the world and Rajasthan.

### **Unit - V**

- a) Sustainable development in agriculture.
- b) Green revolution: Its components, impact and consequences.
- c) White revolution: Its components, impact and consequences.
- d) Specific problems in Indian agriculture and their management and planning.
- e) Agricultural policy in India.