

Draft Syllabus for BA/BSc Course in Geography

TO BE EFFECTIVE FROM THE ACADEMIC SESSION 2009-2010

FRAMED AT THE WORKSHOP HELD ON 20.4.2009 AND 21.4.2009



West Bengal State University

Berunanpukuria, Malikapur

Barasat, North 24 Parganas

West Bengal – 700126

General Papers

Section 1: Course Structure

Part	Type	Paper	Subject	Marks	Exam Time
I	Theoretical	I	Physical Geography	100	3 hours
II	Theoretical	II	Human and Regional Geography of India	100	3 hours
	Practical	III	Applied Geographical Techniques	100	
III	Theoretical	IV A	Applied Geography	70	
	Practical	IV B	Applied Geography Practical	30	

Section 2: Syllabus with Details of Marks Division

Part-I Paper

/// PAPER-I: PHYSICAL GEOGRAPHY

Full Marks: **100**

Examination Time: **3 hours**.

Number of Questions to be answered

Marks division of each group	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 40 Marks	20 + 20	2 out of 4	4 out of 7
Gr B = 30 Marks	10 + 20	1 out of 2	4 out of 7
Gr C = 30 Marks	10 + 20	1 out of 2	4 out of 7

GROUP A: GEOMORPHOLOGY

(40 MARKS)

1. Structure of the earth
2. Influence of rocks on topography: Limestone and Granite
3. Broad outline of plate tectonics and major crustal formations – fold mountains, trenches and island arcs.
4. Evolution of landforms under fluvial process, Normal Cycle of Erosion.
5. Processes of formation of erosional and depositional landforms: coastal and aeolian

GROUP B: CLIMATOLOGY

(30 MARKS)

1. Insolation and Heat Budget.
2. Horizontal and Vertical distribution of temperature and pressure.
3. Greenhouse effect.
4. Atmospheric disturbances: Tropical and Mid-latitude cyclones.
5. Characteristics of Monsoonal rainfall
6. Climatic classification after Köppen.

GROUP C: BIO-GEOGRAPHY

(30 MARKS)

1. Factors of soil formation.
2. Development of an ideal soil profile and eluviation and illuviation
3. Properties of soil: Physical (texture, structure) and Chemical (pH, organic matter).
4. Concept of zonal, azonal and intrazonal soils
5. Concept of Ecosystem and Biomes – i) Tropical Rainforest, ii) Hot Desert
6. Plant types and distribution (Halophyte, Xerophytes, Hydrophite, Mesophite).

Part-II Papers

/// PAPER-II: HUMAN GEOGRAPHY AND REGIONAL GEOGRAPHY OF INDIA

Full Marks: 100

Examination Time: 3 hours.

Number of Questions to be answered

Marks division of each group for examination	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 30 Marks	10 + 20	1 out of 2	4 out of 7
Gr B = 30 Marks	10 + 20	1 out of 2	4 out of 7
Gr C = 40 Marks	20 + 20	2 out of 4	4 out of 7

GROUP-A: POPULATION AND SOCIAL GEOGRAPHY

(30 Marks)

1. Factors of growth and distribution of world population.
2. Fertility, mortality and age-sex structure of population with reference to India.
3. Migration: Types, causes and consequences.
4. Contemporary Social issues: Literacy and poverty.

GROUP-B: ECONOMIC GEOGRAPHY

(30 Marks)

1. Sectors of the economy: primary, secondary, tertiary and quaternary: Changing emphasis through time.
2. Types of agriculture:

- a) Shifting cultivation of India.
 - b) Intensive subsistence rice farming in India.
 - c) Plantation farming in India: Tea and Coffee
3. Scales of production: cottage, small scale and large-scale industries — general characteristics and examples.
4. Location, problems and prospects of Indian industries.
- a) Cotton textile industry.
 - b) Heavy engineering industry: locomotive.
 - c) Petroleum refining industry

GROUP-C: REGIONAL GEOGRAPHY AND ENVIRONMENTAL ISSUES OF INDIA

(40 Marks)

1. Regions of India:
 - a) Concept of regions: formal and functional
 - b) Broad physiographic regions of India: special reference to Deccan Trappe
 - c) Agricultural Regions of India: special reference to Punjab-Haryana wheat belt,
 - d) Industrial Regions of India: special reference to Asansol-Durgapur industrial belt.
2. Indian monsoon and its impact: problem of flood, drought and cyclone.
3. Forest resources of India: issues concerning deforestation and social forestry.
4. Causes and consequences of soil erosion in India.

/// PAPER-III (PRACTICAL): APPLIED GEOGRAPHICAL TECHNIQUES

Full Marks: 100.

• *Group A to C:* Internal Assessment: 80 marks. • *Group D:* Evaluation of Field Report: 10 marks + Viva-voce on Field Report: 5 Marks • *Group E:* Viva-voce on Practical Notebook by external examiner: 5 marks.

GROUP-A: CARTOGRAPHY

1. Scales: Concept of scales, drawing of linear scales. (10 Marks)
2. Projections: Concept and major classification. Construction may be done graphically or mathematically (15 Marks)
 - a) Simple conic with one standard parallel
 - b) Cylindrical Equal Area
 - c) Polar Zenithal Gnomonic.
3. Cartograms: Choropleth, pie-graphs and square diagrams with proportional scales. (15 Marks)

GROUP-B: MAP INTERPRETATION

(20 Marks)

1. Basis of numbering and scale of Survey of India Topographical sheets.
2. Interpretation of 1:50,000 topographical sheets under the following heads:
 - I. Interpretation of relief and drainage from topographical maps with profiles and sketches.
 - II. Interpretation of communication and settlement from topographical maps with sketches.
 - III. Relationship between physical and cultural features with the help of transect chart.

GROUP-C: STATISTICS

(20Marks)

1. Nature and classification of data.

2. Process of tabulation and graphical representation: histogram, frequency polygon, cumulative frequency curve.
3. Measures of central tendency: mean, median and mode.

GROUP-D: FIELD REPORT

(Report 10 + 5 viva voce = 15 Marks)

Field Report on either a rural mouza or an urban ward (to be conducted during field excursion)

Guidelines for field report on rural mouza

One rural mouza is to be selected and the followings are to be done:

- (a) Landuse survey
- (b) Collection of socio-economic and physical data
- (c) Classification and tabulation of data
- (d) Preparation of landuse map on cadastral map
- (e) Preparation of maps and diagrams showing broad Physiography, drainage, settlement, demographic characteristics etc.

The report is to be prepared preferably under the following sections:

- (a) Introduction: Objective, extent and space relations, sources of information, methodology.
- (b) Physical components: drainage, surface condition, slope, climate, soil vegetation, etc.
- (c) Population: Number, FMR, literacy, occupational structure, religious composition, language, media exposure, per capita income (based on availability of data).
- (d) Settlement: Number of houses, building materials, number and size of rooms, amenities (based on availability of data)
- (e) Agriculture: irrigational facilities, general landuse, cropping intensity, production and marketing (based on availability of data).
- (f) Other economic activities: Fishing, horticulture, brick-making industries (based on availability of data).
- (g) Problems, prospects, suggestions and conclusion.
- (h) Bibliography.

Guidelines for field report on urban area

One urban area is to be selected and the followings are to be done:

- (a) Landuse survey
- (b) Collection of socio-economic data
- (c) Classification and tabulation of data
- (d) Preparation of urban landuse map
- (e) Preparation of maps and diagrams showing urban morphology, sewage networks, communication networks, traffic flow, demographic characteristics, cultural and economic zonation etc.

The report is to be prepared preferably under the following sections:

- (a) Introduction: Objective, extent and space relations, sources of information, methodology etc.
- (b) Physical components: Surface conditions, slope, drainage, climate etc.
- (c) Population: Number, FMR, literacy, occupational structure, religious composition, language, media exposure, per capita income (based on availability of data).
- (d) Town morphology: sectors of landuse.
- (e) Economy: Economic individuality of the town, production and marketing patterns, spatial

differences in occupation and per capita income characteristics (based on availability of data).

(f) Bibliography

Field report is to be hand-written.

Text of the report should not exceed 1500 words.

Maps and diagrams excluding photo-plates should not exceed 15.

GROUP E: VIVA-VOCE ON LABORATORY NOTEBOOK

(5 Marks)

Part-III Papers

/// PAPER-IV: APPLIED GEOGRAPHY

Full Marks: Theoretical: **70**

Practical: **30**

Examination Time: Theoretical: **hours.**

Practical: **hours**

Number of Questions to be answered for theoretical group

Marks division of each theoretical section	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A Section I = 40	20 + 20	2 out of 4	4 out of 7
Gr A Section II = 30	1 + 20	1 out of 2	4 out of 7

GROUP A: (THEORETICAL): APPLIED GEOGRAPHY

[70 Marks]

Section I: Land use and settlement Geography

(30 Marks)

1. Concept and attributes of land.
2. Objectives and principles of land use.
3. Factors influencing land use and land categories:
 - a) Agricultural land use.
 - b) Non-agricultural landuse.
4. Rural settlements: evolution, nature and effect of physical environment,
5. Urban settlements: definition, morphology and function.

Section II: Remote Sensing and Geographical Information System

(40Marks)

1. Concept of Remote Sensing, different methods of remote sensing – aerial photo and satellite imagery.
2. Aerial Photo: Types and interpretation keys; concept of principal point, fiducial marks, flight line, photo overlap.
3. IRS images: Sensors, different types of resolution and their applicability.
4. Concept of GIS and its applicability: Spatial and attribute data, raster and vector data structure and concept of information layers in GIS.

GROUP B: (PRACTICAL): APPLIED GEOGRAPHY

[30 Marks]

• *Item 1 to 2:* Internal Assessment: 24 marks. • *Item 4:* Evaluation of practical note book and viva-voce on Practical Notebook by external examiner: 6 marks.

1. Interpretation of Daily Weather Maps published by India Meteorological Department – Monsoon season (10 Marks)
2. Preparation of thematic maps: (7 Marks)
 - i) Flow diagram and ii) Determination of Detour Index
3. Aerial photo interpretation for identification of broad physical and cultural features. (7 Marks)
4. Laboratory Note Book and Viva-voce (3 + 3 = 6 Marks)

Section 3: Suggested books

/// PAPER-I:

Bandyopadhyay T and Sil A. K: Adhunik Bhu Porichoy, Chhaya Prakashani

Basu S.R and Maity R: Adhunik Bhumirupbigyan

Das P and Basu Swapna: Mrityikar kotha o Damodar Upatyakar Mrityika Khoyer Ruprekha

Dash, M.C., Fundamentals of Ecology, 2nd edition, Tata McGraw-Hill, New Delhi.

De, N.K. and Chattopadhyay, S. Jib Bhugol, Sribhumi Publishing Co.

De, N.K. Mrittika Bhugol, West Bengal State Book Board.

Lal, D.S. Climatology, 3rd edition, Chaitanya Pub. House, New Delhi.

Mukhopadhyay, S.C and Das, R.K. Bhumiruper Udbhab O Prakiti, Volumes 1 & 2, West Bengal State Book Board

Saha, P. Adhunik jalabauibidya, West Bengal State Book Board.

Sidhartha K: Biogeography

Singh, S : Physical Geography, Prayag Pustak Bhawan, Allahabad

Singh, S. Geomorphology, Prayag Pustak Bhavan, Allahabad: 390p.

/// PAPER-II:

Bandyopadhyay, T. and Mallik, G. Arthanaitik Sampad Samiksha, Chhaya Prakashani

Bhattacharyya, A and Bhattacharyya, B. Samaj Bijniya Bhugol, West Bengal State Book Board.

Chattopadhyay, A. Sampad Samiksha / Arthanaitik Bhugol O Sampad Shastrer Parichay, TD Publications

Guha, J .L. and Chatteraj, P.R. 1998. A New Approach to Economic Geography: A Study of Resources, 15th edition, World Press, Calcutta.

Hartshorn, T.A. and Alexander, J.W. 1988. Economic Geography, 3rd edition, Prentice- Hall India Ltd., New Delhi.

Khullar, D.R. 1999. A Comprehensive Geography of India, Kalyani Publishers, New Delhi.

Leong, G.C. and Morgan, G.C. 1982. Human and Economic Geography, 2nd edition, Oxford University Press, Oxford.

/// PAPER-III (Practical):

Das D and Hazra J. Snotok Byaboharik Bhugol. Chhaya Prokashoni

Sarkar A. Practical Geography. Revised edition. Orient Blackswan Private Ltd.

/// PAPER-IV:

Group-A (Theoretical):

Sen Jyotirmoy. Janabasati Bhugol

Rajan, M.S. Space Today, 2nd edition, National Book Trust, New Delhi.

De N.K. Land – multifaceted appraisal and management

Pradhan N and Bhattacharya D. Adhunik Bhu-bigyan

Group-B (Practical):

Das D and Hazra J. Snotok Byaboharik Bhugol. Chhaya Prokashoni

Sarkar A. Practical Geography. Revised edition. Orient Blackswan Private Ltd.

Honours Papers

Section 1: Course Structure

Part	Type	Paper	Subject	Marks	Exam Time
I	Theoretical	I	Geotectonics, Geomorphology & Hydrology	100	4 hours
		II	Economic & Population Geography	100	4 hours
II	Theoretical	III	Climatology, Soil Geography & Biogeography	100	4 hours
	Practical	IV	Applied Geographical Techniques	100	6 hours
III	Theoretical	V	Social, Political and Regional Geography	100	4 hours
		VI	Philosophy of Geography and Contemporary Issues in Geography	100	4 hours
	Practical	VII	Applied Geographical Techniques and Field Report	100	6 hours
		VIII	Statistical Techniques and Practical on Contemporary issues in Ggeography	100	6 hours

Section 2: Syllabus with Details of Marks Division

Part-I Papers

/// PAPER-I: GEOTECTONICS, GEOMORPHOLOGY & HYDROLOGY

Full Marks: 100

Examination Time: 4 hours.

Number of Questions to be answered

Marks division of each group	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 30 Marks	10 + 20	1 out of 4	4 out of 7
Gr B = 40 Marks	20 + 20	2 out of 4	4 out of 7
Gr C = 30 Marks	10 + 20	1 out of 2	4 out of 7

GROUP A: GEOTECTONICS

(30 MARKS)

1. Geological timescale
2. Structure of the earth: crust and interior.
3. Isostasy: concepts postulated by Pratt and Airy.
4. Continental Drift, Sea Floor Spreading.
5. Plate Tectonics as explanation of mountain building, volcanism and earthquakes.

GROUP B: GEOMORPHOLOGY

(40 MARKS)

1. Processes of weathering and mass wasting and their impact on landforms
2. Influence of lithology on landforms: Granite and Basaltic landforms.
3. Definition and classification of folds and faults.
4. Evolution of landforms in Uniclinal, Folded and Faulted Structures.
5. Development of landforms: Fluvial, Glacial, and Coastal.
6. Cyclic and non-cyclic concepts of landscape evolution: Davis, Penck and Hack.

GROUP C: HYDROLOGY AND OCEANOGRAPHY

(30 MARKS)

1. Global hydrological cycle and its significance.
2. Aspects of runoff, infiltration, evaporation and transpiration, Runoff cycle.
3. Factors influencing ground water movement and storage.
4. Ocean sediments: origin, classification.
5. Salinity and temperature of ocean water.

/// PAPER-II : ECONOMIC & POPULATION GEOGRAPHY

Full Marks: 100

Examination Time: 4 hours.

Number of Questions to be answered

Marks division of each group	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 60 Marks	20 + 40	2 out of 4	8 out of 11
Gr B = 40 Marks	20 + 20	2 out of 4	4 out of 7

GROUP A: ECONOMIC GEOGRAPHY

(60 MARKS)

1. Resource: Concept and classification. Economic and environmental approaches of resource utilisation.
2. Different sources of energy resources, production and consumption with special reference to coal, petroleum, solar and wind.
3. Characteristic of economies:
 - a) Fishing, b) Agricultural, c) Manufacturing
4. Selected production systems:
 - a) Intensive rice farming: India and South East Asia.

- b) Extensive wheat farming: USA and Canada.
 - c) Plantation farming: Tea in India and rubber in SE Asia.
 - d) Cotton textile industry: India and USA.
 - e) Iron and Steel industry: India and Japan.
 - f) Petrochemical industry: India and USA.
 - g) Paper industry: India and Canada.
5. Economic models:
- a) Agricultural: Von Thunen
 - b) Industrial: A. Weber
 - c) Developmental: S. Myrdal

GROUP B: POPULATION GEOGRAPHY

(40 MARKS)

1. Concept of Human resources.
2. Population structure — a) age and b) sex.
3. Population composition — a) economic and b) linguistic.
4. Population distribution and density: World and India.
5. Population growth and its related problems: India and China.
6. Fertility and Mortality.
7. Migration : Types, causes and consequences
8. Theories of population growth: a) Malthus, b) Marx, c) Demographic transition
9. Concept of optimum population, overpopulation and under-population. Population explosion and its impact on physical and cultural environment

Part-II Papers

/// PAPER-III: CLIMATOLOGY, SOIL GEOGRAPHY & BIOGEOGRAPHY

Full Marks: 100

Examination Time: 4 hours.

Number of Questions to be answered

Marks division of each group for examination	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 40 Marks	20 + 20	2 out of 4	4 out of 7
Gr B = 30 Marks	10 + 20	1 out of 2	4 out of 7
Gr C = 30 Marks	10 + 20	1 out of 2	4 out of 7

GROUP A: CLIMATOLOGY

(40 MARKS)

1. Nature, composition and layering of the atmosphere.
2. Factors affecting insolation & heat budget of the atmosphere.

3. Horizontal and vertical distribution of temperature, inversion of temperature.
4. Green house effect on global environment, importance of ozone layer.
5. Planetary wind system with special reference to tri-cellular model, Rossby Waves, Jet Streams
6. Genesis of Monsoon and its relation with Jet Stream, El Nino and La Nina.
7. Processes of condensation and mechanism of precipitation: Bergereon-Fiendison, Collision-Coalescence theories. .
8. Tropical and mid latitude cyclones.
9. Climatic classification after Koppen and Thornthwaite.

GROUP B: SOIL GEOGRAPHY

(30 MARKS)

1. Soil: Definition, factors and processes of formation.
2. Concept of zonal, azonal and intra-zonal soils, profile development under different conditions – Podzols, Chernozems and Laterites.
3. Physical properties of soil: texture, structure, colour and moisture.
4. Chemical properties of soil: pH and organic matter.
5. Soil erosion: types, factors and management.
6. Principles of soil classification: Genetic and Taxonomical – with special reference to India.
7. Principles of land classification: USDA

GROUP C: BIO-GEOGRAPHY

(30 MARKS)

1. Definitions of biosphere and biogeography. Concept of ecosystem – basic ecological principles – ecotone, communities, niche, succession, and habitat.
2. Ecosystem and energy: Energy sources, laws of energy exchange, food chains and food web.
3. Concept of Biomes: study of Tropical rainforest, Taiga, Savannah, Desert, Tundra and Temperate grasslands.
4. Spatial distribution of world fauna.
5. Concept of Biodiversity and wildlife conservation in India, Projects and their importance – Project Tiger and Man and Biosphere Programme.

/// PAPER-IV (PRACTICAL): APPLIED GEOGRAPHICAL TECHNIQUES

Full Marks: 100.

Examination Time: 6 hours. Pattern of setting Questions: • *Topic 1 to 6:* Six compulsory questions are to be set, one from each topic • *Topic 7:* Evaluation of Practical Notebook: 5 marks. Viva-voce: 5 marks.

1. **Scales:** Linear, diagonal and vernier, enlargement and reduction of map (10 Marks)
2. **Megascopic analysis of minerals and rocks :** (10 marks)
 - a) Rocks – Granite, Basalt, Dolerite, Shale, Sandstone, Limestone, Conglomerate, Slate, Phyllite, Schist, Marble, Quartzite, Gneiss.
 - b) Minerals and ores – Talc, Gypsum, Calcite, Mica, Feldspar, Quartz,

Chalcopyrite, Hematite, Magnetite, Bauxite, Galena.

3. **Interpretation of topographical maps of Plateau region with R.F 1: 50,000:** (20 marks)
- a) Demarcation of drainage basin (not more than 4th order, based on Strahler)
 - b) Construction of profiles: superimposed, projected, composite and long profile of river (length of the river not more than 10 km).
 - c) The morphometric analysis to be done in 10 X 12cm grid
 - i Drainage density (to be shown by isopleth)
 - ii Average slope (Wentworth's method to be shown by isopleth)
 - iii Relative Relief (to be shown by isopleth)
 - d) Road density (to be shown gridwise).
 - e) Interpretation of relief, drainage and vegetation characteristics.
 - f) Interpretation of settlement, transport and communication systems.
 - g) Relationship between physical and cultural elements (Transect Chart, not more than 8 km).
4. **Cartograms and thematic mapping :** (10 Marks)
- a) Choropleth showing density of population
 - b) Dots and Spheres diagram showing distribution of rural and urban population.
 - c) Proportional pie-diagrams representing economic data and landuse data.
5. **Projections:** (20 Marks)
- a) Concept, classification, constructions and suitability
 - b) Construction and properties of:
Zenithal Gnomonic and Stereographic (Polar Case), Simple Conic (with one standard parallel), Bonne's, Sinusoidal, Polyconic, Cylindrical Equal Area and Mercator's Projections.
6. **Survey:** (20 Marks)
- a) Closed traverse survey by Prismatic Compass.
 - b) Levelling by Dumpy Level with at least one change point: Drawing of profile and determination of gradient.
7. **Laboratory Note Book + Viva voce** (5 + 5 = 10 Marks)

Part-III Papers

/// PAPER-V: SOCIAL, POLITICAL AND REGIONAL GEOGRAPHY

Full Marks: 100

Examination Time: 4 hours.

Number of Questions to be answered

Marks division of each group	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr A = 60 Marks	20 + 40	2 out of 4	8 out of 11
Gr B = 40 Marks	20 + 20	2 out of 4	4 out of 7

GROUP A: SOCIAL, CULTURAL AND POLITICAL GEOGRAPHY

(60 MARKS)

Social and Cultural Geography

1. Concept of culture and its components with special emphasis on India: language, religion and ethnicity.
2. Social geography of rural India: caste structure and social stratification; tribe – Santhals and Lepcha.
3. Urban social Geography — Social ecology and social space.
4. Rural settlements – its forms, site and situations.
Urban settlement – morphology and hierarchy.

Political Geography

5. Concept of Political Geography and geo-politics; concept of frontier and boundary
6. Concept of cold war; bi-polarisation and unipolarisation.
7. Political geography of India: Administrative settings of India, problem of border states, partition and its geo-political implications.

GROUP B: REGIONAL GEOGRAPHY

(40 Marks)

1. Concepts of regions; basis of regionalization with reference to India physical, economic and planning.
2. a) Physiographic Regions of India with special reference to Kashmir Himalaya
b) Agricultural Region of India of India with special reference to Punjab-Haryana
c) Industrial Region of India with special reference to Mumbai-Pune industrial belt
3. Regional disparities in India: causes and implications

/// PAPER-VI: PHILOSOPHY OF GEOGRAPHY AND CONTEMPORARY ISSUES

FULL MARKS: 100

Examination Time: 4 hours.

Number of Questions to be answered

Marks division of each group	Category wise marks	Number of questions to be answered	
		Category A (10marks)	Category B (5 marks)
Gr B = 40 Marks	20 + 20	2 out of 4	4 out of 7
Gr A = 60 Marks	20 + 40	2 out of 4	8 out of 11

GROUP A: PHILOSOPHY OF GEOGRAPHY

(40 MARKS)

1. Definition and nature of Geography.
2. Selected contributors in the evolution of geographical thought Humboldt, Vidal de la Blache, Carl Sauer and David Harvey
3. Major postulates: Determinism, Possibilism, Regional differentiation, location, time and space.
4. Changing approaches and methodology: Positivism, Quantitative Revolution, Welfare-Behavioural approach, Structural and radical approach

GROUP B: CONTEMPORARY ISSUES IN GEOGRAPHY

(60 marks)

Section -1: Natural hazards and their management in the Indian Sub-continent:

5. Concept of hazards and disasters: Natural, quasi-natural and man-made hazards, different approaches in hazard management.
6. Climatic hazards: Flood, drought and cyclone mechanism – environmental impact and management.
7. Geomorphic hazards: landslide, river bank erosion, coastal erosion environmental impact and management.
8. Edaphic and biotic hazards: Deforestation, desertification, loss of bio-diversity — environmental impact and management.

Section-2: Economic and human development in the Third World

9. Concept of third world, concept of development and under development: Basic indicators of economic, human and gender development.
10. Problems of third world – Poverty, Population explosion, food security and hunger, unemployment, malnutrition and child labour.
11. Globalization and sustainable development.
12. Problem of urbanization.

PAPER VII: APPLIED GEOGRAPHICAL TECHNIQUES (PRACTICAL)

FULL MARKS: 100

Examination Time: 6 hours.

13. Interpretation of geological maps and drawing of sections: Uniclinal, folds with unconformity and igneous intrusions (20 marks)
14. Interpretation of Indian Daily Weather Maps – Monsoon and Post Monsoon. (15 marks)
15. Remote Sensing (15 marks)
 - a. Basic concept of remote sensing, EMR, Band
 - b. Types of satellites and sensors with special reference to IRS series of satellites; types of resolutions and their applicability
 - c. Principles of preparing standard false colour composite, landuse and land cover mapping from standard FCC with header information.
 - d. Interpretation of aerial photograph – basic principles of aerial photography, side lap, end lap, flight line, air base, fiducial marks, Principle Point, Nadir Point, Conjugate Principal Point,
 - e. Preparation of aerial photo mosaics, demarcation of effective area, extraction of cultural and physiographic features within this area with preparation of interpretation key.
16. Geographical Information System. (15 marks)
 - a. Concept of GIS and its applicability: Spatial and attribute data, raster and vector data structure and concept of information layers in GIS.
 - b. Georeferencing of scanned maps and ascribing projection (Polyconic/ UTM)
 - c. Digitisation of point, line and polygon layers; Attachment of appropriate attribute tables.
 - d. Preparation of thematic maps from attached data: choropleth, pie chart and bar graphs.
17. Field Report: (10 report + 15 viva = 25 marks)

Guidelines for field report on rural mouza

 - One rural mouza is to be selected and the followings are to be done:
 - Landuse survey and preparation of landuse map
 - Collection of socio-economic and physical data
 - Classification and tabulation of data
 - Preparation of maps and diagrams showing broad Physiography, drainage, settlement, demographic characteristics etc.
 - The report is to be prepared preferably under the following sections:
 - Introduction: Objective, extent and space relations, sources of information, methodology.
 - Physical components: drainage, surface condition, slope, climate, soil vegetation, etc.
 - Population: Number, literacy, occupational structure, religious composition, language, media exposure, per capita income (based on availability of data).
 - Settlement: Number of houses, building materials, number and size of rooms, amenities (based on availability of data)
 - Agriculture: irrigational facilities, general landuse, cropping intensity, production and marketing (based on availability of data).
 - Other economic activities: Fishing, horticulture, brick-making industries (based on availability of data).

- Problems, prospects, suggestions and conclusion.
- Bibliography.
- Appendix

Guidelines for field report on urban area

- One urban area is to be selected and the followings are to be done:
- Landuse survey and preparation of urban landuse map
- Collection of socio-economic data
- Classification and tabulation of data
- Preparation of maps and diagrams showing urban morphology, communication networks, traffic flow, demographic characteristics, cultural and economic zonation etc.
- The report is to be prepared preferably under the following sections:
- Introduction: Objective, extent and space relations, sources of information, methodology etc.
- Physical components: Surface conditions, slope, drainage, climate etc.
- Population: Number, literacy, occupational structure, religious composition, language, media exposure, per capita income (based on availability of data).
- Town morphology: sectors of landuse.
- Economy: Economic individuality of the town, production and marketing patterns, spatial differences in occupation and per capita income characteristics (based on availability of data).
- Urban waste and its management: Types of wastes generated, network of drains, efficiency of waste removal and sewage treatment. peoples' perception of pollution problem (based on availability of data).
- Bibliography
- Appendix
- Maps and diagrams can be hand-drawn or done in computer
- Field report can be hand-written or computer printed.
- Page limit: maps/diagrams excluding photographs not to exceed 20 pages, text not to exceed 5000 words.

18. Laboratory Note Book and viva-voce

(5 + 5 = 10 Marks)

PAPER-VIII: STATISTICAL TECHNIQUES AND CONTEMPORARY ISSUES IN GEOGRAPHY (PRACTICAL)

FULL MARKS: 50 + 50 = 100

Group-A: Statistical Techniques

(50 Marks)

1. Nature of statistical data: discrete, continuous, parametric and non-parametric data.
2. Tabulation and classification of statistical data.
3. Frequency distribution: histogram, frequency polygon, ogive, normal and skewed distribution, measures of skewness.
4. Measures of central tendency: mean, median, mode, partition values : quartile, decile, percentile.
5. Measures of dispersion: mean deviation, quartile deviation, semi-quartile range, standard deviation and co-efficient of variation.

6. Simple bivariate correlation and regression trend line.
7. Time series analysis.
8. Laboratory Note Book and viva-voce (5+5=10 Marks)

Group-B: Contemporary issues in Geography (50Marks)

Section-A : Representation of climatic and hydrological data of the Indian Sub-continent.

1. a) Preparation and Interpretation of a climatic chart showing relationship between rainfall, temperature, pressure and relative humidity of a station for three months, preparation and interpretation of Taylor's Climograph and Hythergraph.
b) Preparation of station models for different meteorological stations of India with the help of Synoptic chart.
2. Preparation and interpretation of rating curves, hydrographs and unit hydrographs of rivers flowing through the Indian Sub-continent.

Section-B: Economic and Human Development in Third World.

Questions to be set on any two items of the following exercises:

3. Computation of Human and Gender Development Index and ranking of countries/states/districts based on HDI and GDI.
4. Preparation of questionnaire schedule for assessment of development and for perception survey.
5. Measures of Spatial and size-class distribution.
6. a) Dominant-distinctive function.
b) Rank-size rule.
c) Lorenz curve.
7. Laboratory Note Book and via-voce (5+5=10 Marks)

Section 3: Suggested Readings

PAPER-I: GEOTECTONICS, GEOMORPHOLOGY & HYDROLOGY

Geotectonics

- Cox, A. and Hart, R.B. 1986. *Plate Tectonics: How it Works*, Blackwell Scientific Publications, Oxford.
- Duff, P.M.D. (Editor) 1994. *Holmes' Principles of Physical Geology*, English Language Book Society / Chapman & Hall, London.
- Keary, P. and Vine, M. 1997. *Global Tectonics*, 2nd edition. Blackwell Scientific Publications, Oxford: ix+302p.
- Powell, J. 2001. *Mysteries of Terra Firma: The Age and Evolution of the Earth*, Free Press, London: 272p.

Geomorphology

- Ahmad, E. 1990. *Geomorphology*, Kalyani Pub. New Delhi.
- Bloom, A.L. 1998. *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*, 3rd edition, Prentice Hall India Ltd. New Delhi.
- Dayal, P. 1990. *A Textbook of Geomorphology*, Shukla Book Depot, Patna.
- Fairbridge, S.W. *Encyclopaedia of Geomorphology*, Reinhold Corp. Ltd.
- Faniran, A. and Jeje, L.K. 1983. *Humid Tropical Geomorphology*, Longman, London.
- Kale, V.S. and Gupta, A. 2001. *Introduction to Geomorphology*, Orient Longman Ltd., Hyderabad.
- Selby, M.J. 1985. *An Introduction to Geomorphology*, Clarendon, Oxford.
- Singh, S. 2000: *Geomorphology*, 2nd edition, Prayag Pustak Bhavan, Allahabad..
- Stahler and Strahler 2002: *Geography and Man's Environment*, John Wiley, New York.
- Summerfield, M.A. (Editor) 1991. *Global Geomorphology : An Introduction to the Study of Landforms*, John Wiley and Sons Ltd., New York.
- Thornbury, W.D. 1969. *Principles of Geomorphology*, 2nd edition, Wiley Eastern Limited, New Delhi.
- Woolridge, S.W. and Morgan, R.S. 1959. *Outline of Geomorphology: The Physical Basis of Earth*, Longman, London.

Hydrology and Oceanography

- Chorley, R.J. and Kates, R.W. (Editors) 1969. *Water Earth and Man*, Methuen, London.
- Chow, V. T, Maidment, D. R. and Mays, L. W. 1988 : *Applied Hydrology*, McGraw Hill, New York
- Meinzer, O. E. 1942 : *Hydrology*, Dover Publication Inc. New York.
- Sharma, R.C. and Vatal, M. *Oceanography for Geographers*, Chaitanya Pub. House, Allahabad.
- Todd, D. K. 1959 : *Ground Water Hydro-logy*, John Wiley and Sons, New York.

PAPER-II: ECONOMIC GEOGRAPHY & POPULATION GEOGRAPHY

- Brock and Webb. *Geography of Mankind*.
- Chand and Puri: *Regional Planning*.
- Chandna, R.C. 2000. *Population*, Kalyani Publishers, New Delhi.
- Clark, G.L., Gertler, M.S. and Feldman, M.P. 2003. *The Oxford Handbook of Economic Geography*, Oxford University Press, Oxford.
- Guha, J. L. and Chattoraj, P.R. 1998. *A New Approach to Economic Geography: A Study of Resources*, 15th edition, World Press, Calcutta.
- Guha, J. L. and Charraraj, P. R. 1992 : *Human and Economic Geography*, World Press, Calcutta.
- Hartshorn, T.A. and Alexander, J.W. 1988. *Economic Geography*, 3rd edition, Prentice- Hall India Ltd., New Delhi.

Jones and Darkenwald: Economic Geography

Khullar India, Janasankha Bhugol. Rajya Pustak Parishad.

Leong, G. C. and Morgan, G. C. 1982 : Human and Economic Geography, Oxford University Press, Kuala-Lumpur.

Leong, G.C. and Morgan, G.C. 1982. Human and Economic Geography, 2nd edition, Oxford University Press, Oxford.

Mamoria, C. B. 1984 : Economic and Commercial Geography of India, Shivlal Agarwal Publication Co. Agra.

Sharma, T. C. and Coutinho, 1988 : Economic and Commercial Geography of India, Vikas Publishing House, New Delhi.

United Nations Populations Fund 1997. India Towards Population and Development Goals, Oxford University Press, New Delhi.

Weddell, B.J. 2002. Conserving Living Natural Resources in the Context of a Changing World, Cambridge University Press, Cambridge: 442p.

/// PAPER-III: CLIMATOLOGY, SOIL GEOGRAPHY & BIOGEOGRAPHY

Climatology

Barry, R.G. and Chorley, R.T. Atmosphere, Weather and Climate, 7th edition, Routledge, London.

Critchfield, H.J. 1983: General Climatology, 4th edition, Prentice Hall India Ltd., New Delhi..

Das, P.K. 1995. Monsoons, 2nd edition, National Book Trust, New Delhi..

Lal, D.S. 1993. Climatology, 3rd edition, Chaitanya Pub. House, New Delhi..

Sidhartha, K: Atmosphere, weather and climate

Trewartha, G.T: An Introduction to Climatology.

Soil Geography

Biswas, T.D. and Mukherjee, S.K. 1987. Textbook of Soil Science, Tata-McGraw-Hill..

Brady, N.C. and Weil, R.R. 1996. The Nature and Properties of Soil, 11th edition, Longman, London.

Floth, H.D. 1990. Fundamentals of Soil Science, 8th edition, John Wiley and Sons, New York.

Morgan, R.P.C. 1995. Soil Erosion and Conservation, 2nd edition, Longman, London.

Joffe J.S: ABC of soil, Pub Oxford Book Company

Biogeography

Chapman J.L. and Reiss, M.J. 1993. Ecology: Principles and Applications, Cambridge University Press, Cambridge.

Dash, M.C., 2001. Fundamentals of Ecology, 2nd edition, Tata McGraw-Hill, New Delhi.

Kormondy, E.J. 1996. Concepts of Ecology, 4th edition, Prentice-Hall, India, New Delhi.

Odum, E.P. 1997. Ecology: A Bridge between Science and Society, Sinaur Associates Inc. Publishers, Sunderland.

Sharma. P.D. 1996. Ecology and Environment, 7th edition, Rastogi Publications, Mirat..

Simmons I.J: Ecology of Natural Resource.

Simmons, I. G. 1980: Biogeographical Processes, George Alien and Unwin, London.

Spellerberg, I.F and Sawyer, J.W.D. 1999. An Introduction to Applied Biogeography, Cambridge University Press, Cambridge..

World Wide Fund for Nature-India (Eastern Region) 1995. Nature Conservation Handbook, Calcutta.

/// PAPER-IV (PRACTICAL) : CARTOGRAPHIC TECHNIQUES IN GEOGRAPHY

Kanetkar, T.P. and Kulkarni, S.V. 1988. Surveying and Levelling, Part I, Pune Vidyarthi Griha Prakashan, Pune: 608p.

Kellaway, G.P. 1979. Map Projections, 1st Indian edition, B.I. Publication, Delhi.

Monkhouse F.J. and Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi: 527p.

Roy, P. 1988. An Analytical Study of Map Projections, Volume 1, Pub?, Kolkata.

Sarkar, A.. Practical Geography: A Systematic Approach, Orient Longman Ltd., Hyderabad: p.

Suggested Readings for Part III under preparation