



Cooch Behar Panchanan Barma University

**Structure & Detailed Syllabus for  
Four-year Undergraduate Program  
(UGNCCF) with Multiple Exit Options in  
IN  
GEOGRAPHY**

**Under NEP - 2020**

**Cooch Behar Panchanan Barma University**

**Cooch Behar, West Bengal**



**COOCH BEHAR PANCHANAN BARMA UNIVERSITY**  
 PANCHANAN NAGAR, VIVEKANANDA STREET, COOCH BEHAR – 736101  
 SUBJECT: GEOGRAPHY  
 4 YEAR UG COURSE UNDER NCCF

**4 Year Under Graduate Degree (Honours)**  
**in**  
**-----Geography (UG-CER-GEO) -----**

**Course Structure: Geography (Certificate)**

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/Seminar/Assignment (Marks)	CE (Marks)	ATT. (Marks)				
1st	I	MAJOR-1	GEO-MAJ1T	Physical Geography (Theory)	50	-	10	10	5	100	4	6	100
			GEO-MAJ1-P	Basic Cartographic Techniques and Map Reading (Practical)	-	25					2		
		MDC-1	GEO-MDC1	Fundamentals of Physical Geography (Theory)	35	-	-	10	5	50	3	3	100
	II	MAJOR-2	GEO-MAJ2T	Fundamentals of Human Geography (Theory)	50	-	10	10	5	100	4	6	100
GEO-MAJ2-P			Elementary Instrumental Observation and Map Reading (Practical)	-	25	2							



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**4 Year Under Graduate Degree (Honours)**  
**in**  
**-----Geography (UG-CER-GEO) -----**

**Course Structure: Geography (Diploma)**

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/ Seminar/ Assignment (Marks)	CE (Marks)	ATT. (Marks)				
2nd	III	MAJOR-3	GEO-MAJ 3T	Hydrology and Oceanography (Theory)	50	-	10	10	5	100	4	6	200
			GEO-MAJ 3P	Hydrographic and Geological mapping (Practical)	-	25					2		
		MAJOR 4	GEO-MAJ 4T	Soil Geography and Biogeography (Theory)	50	-	10	10	5	100	4	6	200
			GEO-MAJ 4P	Soil and Biogeography Techniques and Surveying and Levelling (basic) (Practical)	-	25					2		
		MINOR 3	GEO-MIN-3T	<b>Physical Geography (Theory)</b>	50	-	10	10	5	100	4	6	200
			GEO-MIN-3P	<b>Scale and Map Projection (Practical)</b>	-	25					2		
	MDC-2	GEO-MDC 2	Fundamentals of Human Geography (Theory)	35	-	-	10	5	50	3	3	200	
	IV	MAJOR-5	GEO-MAJ 5T	Settlement and Population Geography (Theory)	50	-	10	10	5	100	4	6	200
			GEO-MAJ 5P	Settlement and Population Geography (Practical)	-	25					2		
		MAJOR-6	GEO-MAJ 6T	Economic and Industrial Geography (Theory)	50	-	10	10	5	100	4	6	200
			GEO-MAJ 6P	Economic and Industrial Geography (Practical)	-	25					2		
		MINOR 4	GEO-MIN-4T	Economic and Human Geography (Theory)	50	-	10	10	5	100	4	6	200
GEO-MIN-4P			Topographical Map and Weather Map (Practical)	-	25	2							



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**4 Year Under Graduate Degree (Honours)**  
**in**  
**-----Geography (UG- Degree-GEO) -----**

**Course Structure: Geography (3-Year Degree)**

Year	Sem.	Course	Paper Code	Title of Paper	Theory (Marks)	Practical (Marks)	Internal Assessment			Total Marks	Credit	Total Credit	Level
							Project/ Seminar/ Assignment (Marks)	CE (Marks)	ATT. (Marks)				
3RD	V	MAJOR-7	GEO-MAJ 7T	Geography of India and West Bengal	50	-	10	10	5	100	4	6	300
			GEO-MAJ 7P	Geography of India and Statistical Methods in Geography	-	25					2		
		MAJOR 8	GEO-MAJ 8T	Geographical Thought	50	-	10	10	5	100	4	6	300
			GEO-MAJ 8P	Statistical Methods in Geography (Inferential) and Identification of Rocks and Minerals	-	25					2		
		MAJOR 9	GEO-MAJ 9T	Regional Planning and Transport Geography	50	-	10	10	5	100	4	6	300
			GEO-MAJ 9P	Regional Planning and Transport Geography	-	25					2		
	MDC-3	GEO-MDC 3	Fundamentals of Economic Geography (Theory)	35	-	-	10	5	50	3	3	300	
	VI	MAJOR-10	GEO-MAJ 10T	Development Geography and Regional Geography of North Bengal	50	-	10	10	5	100	4	6	300
			GEO-MAJ 10P	Map Projection and Inferential Statistics (Advanced)	-	25					2		
		MAJOR-11	GEO-MAJ 11T	Political Geography and Geography of Sustainability	50	-	10	10	5	100	4	6	300
			GEO-MAJ 11P	Advanced Surveying and Computer Application	-	25					2		
		MAJOR 12	GEO-MAJ 12T	Environmental Geography	50	-	10	10	5	100	4	6	300
GEO-MAJ 12P			Field Report	-	25	2							



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 SUBJECT: GEOGRAPHY  
 4 YEAR UG COURSE UNDER NCCF

**Paper Code (UG-Geo) NEP (2023-2024)**

Programme Name	Year	Semester	Course	Title of Paper	Paper Code
4 Year Under Graduate Degree (Honours) in Geography	1st Year (Certificate)	1st Semester	Major 1	Physical Geography (Theory)	GEO-MAJ-1T
				Basic Cartographic Techniques and Map Reading ( Practical)	GEO-MAJ-1P
		MDC 1	Fundamentals of Physical Geography (Theory)	GEO-MDC1	
		2nd Semester	Major 2	Fundamentals of Human Geography (Theory)	GEO-MAJ-2T
			Elementary Instrumental Observation and Map Reading (Practical)	GEO-MAJ-2P	
	2nd Year (Diploma)	3rd Semester	Major 3	Hydrology and Oceanography (Theory)	GEO-MAJ-3T
				Hydrographic and Geological mapping (Practical)	GEO-MAJ-3P
			Major 4	Soil Geography and Biogeography	GEO-MAJ-4T
				Soil and Biogeography Techniques and Surveying and Levelling (basic) (Practical)	GEO-MAJ-4P
		Minor 3	<b>Physical Geography (Theory)</b>	GEO-MIN-3T	
			<b>Scale and Map Projection (Practical)</b>	GEO-MIN-3P	
		MDC 2	Fundamentals of Human Geography (Theoretical)	GEO-MDC2	
		4th Semester	Major 5	Settlement and Population Geography (Theory)	GEO-MAJ-5T
			Settlement and Population Geography (Practical)	GEO-MAJ-5P	
	Major 6		Economic and Industrial Geography (Theory)	GEO-MAJ-6T	
			Economic and Industrial Geography (Practical)	GEO-MAJ-6P	
	Minor 4		<b>Economic and Human Geography (Theory)</b>	GEO-MIN-4T	
			<b>Topographical Map and Weather Map (Practical)</b>	GEO-MIN-4P	
	3rd Year (Degree)	5th Semester	Major 7	Geography of India and West Bengal (Theory)	GEO-MAJ 7T
				Geography of India and Statistical Methods in Geography (Practical)	GEO-MAJ 7P
			Major 8	Geographical Thought (Theory)	GEO-MAJ 8T
				Statistical Methods in Geography (Inferential) and Identification of Rocks and Minerals (Practical)	GEO-MAJ 8P
		Major 9	Regional Planning and Transport Geography (Theory)	GEO-MAJ 9T	
			Regional Planning and Transport Geography (Practical)	GEO-MAJ 9P	
MDC 3		Fundamentals of Economic Geography (Theory)	GEO-MDC3		
6th Semester		Major 10	Development Geography and Regional Geography of North Bengal (Theory)	GEO-MAJ 10T	
			Map Projection and Inferential Statistics (Practical)	GEO-MAJ 10P	
		Major 11	Political Geography and Geography of Sustainability (Theory)	GEO-MAJ 11T	
		Advanced Surveying and Computer Application (Practical)	GEO-MAJ 11P		
Major 12	Environmental Geography (Theory)	GEO-MAJ 12T			
	Field Report (Practical)	GEO-MAJ 12P			



**Course: Major 3**

**Semester-III**

**Paper Name: Hydrology and Oceanography (Theory)**

**Course Code: GEO-MAJ-3T**

**Full Marks-50**

**Time-2 hrs**

Programme Objectives:

- i. To understand hydrology's systems approach and the global hydrological cycle.
- ii. To differentiate runoff types, factors, and measurement methods.
- iii. To grasp evaporation, evapotranspiration, and their measurement.
- iv. To learn about artificial rainmaking principles and water harvesting.
- v. To define oceanography, explore oceanic features, and understand movements and phenomena.
- vi. To study ocean temperature, salinity, sea level change, and coral reefs.
- vii. To classify marine resources and address ocean pollution issues.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Demonstrate a comprehensive understanding of hydrology and oceanography principles.
- ii. Apply various methods to measure runoff, evapotranspiration, and groundwater occurrence.
- iii. Implement techniques for artificial rainmaking and water harvesting.
- iv. Analyze oceanic features, movements, and phenomena.
- v. Assess marine resources and propose solutions to ocean pollution issues.

### **Unit I**

#### **Hydrology**

- 1.1. Hydrology: Definition, Nature and Scope (5)
- 1.2. System approach in hydrology and Global hydrological cycle (5)
- 1.3. Runoff: Types, Controlling factors and Runoff cycle. (5)
- 1.4. Evaporation and Evapotranspiration: Concept, Factors, and Measurement. (5)
- 1.5. Groundwater: Occurrence and storage. Factors controlling groundwater recharge, discharge, and movement. (5)
- 1.6. Concept of Rain Water Harvesting. (5) **20 Marks**

### **Unit II**

#### **Oceanography**

- 2.1. Oceanography: Definition, Nature and Scope. (5)
- 2.2. Oceanic Movements: Currents (Atlantic, Pacific and Indian Ocean). (5)
- 2.3. Ocean temperature and salinity: Distribution and determinants; T-S Diagram. (5)
- 2.4. Sea level change: Types, causes, and implications. (5)
- 2.5. Coral Reefs: Types and Theories of Origin; Coral Bleaching. (5)
- 2.6. Marine resources: Classification and sustainable utilization. (5) **30 marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\* CE= Class Test

#### **Suggested Readings**

1. Dingman, S. L. (2015). Physical hydrology (3rd ed.). Macmillan Publishing Co.
2. Garrison, T. (1998). Oceanography. Wordsworth Company.



3. Garrison, T., & Ellis, R. (2021). Oceanography: An invitation to marine science (10th ed.). Cengage Learning.
4. Karanth, K. R. (1988). Groundwater: Exploration, assessment and development. Tata McGraw Hill.
5. Kershaw, S. (2000). Oceanography: An Earth Science Perspective. Stanley Thornes.
6. Nicolas, R. (2020). Introducing Hydrogeology (2nd ed.). Dunedin Academic Press.
7. Pinet, P. R. (2019). Invitation to oceanography (8th ed.). Jones and Bartlett Learning.
8. Raghunath, H. M. (2006). Hydrology: Principles, analysis, design (3rd ed.). New Age International Publishers.
9. Ramaswamy, C. (1985). Review of floods in India during the past 75 years: A perspective. Indian National Science Academy.
10. Rao, K. L. (1982). India's water wealth (2nd ed.). Orient Longman.
11. Reddy, P. J. R. (2014). A textbook of hydrology. University of Science Press.
12. Singh, V. P. (1995). Environmental hydrology. Kuwar Academic Publications.
13. Subramanya, K. (2013). Engineering hydrology. McGraw Hill Education.
14. Sverdrup, K. A., & Armbrust, E. V. (2008). An introduction to the world's oceans (10th ed.). McGraw Hill.

**Course: Major 3 Semester-III**

**Paper Name: Hydrographic and Geological Mapping (Practical)**

**Course Code: GEO-MAJ-3P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. To interpret rating curves and hydrographs for streamflow analysis.
- ii. To derive the phi index and W index for hydrological assessment.
- iii. To analyze ombrothermic graphs and hyetographs.
- iv. To interpret geological maps depicting structural features.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Interpret rating curves and hydrographs for streamflow analysis effectively.
- ii. Derive the phi index and W index for hydrological assessment accurately.
- iii. Analyze ombrothermic graphs and hyetographs proficiently.
- iv. Interpret the geological maps depicting structural features with competence.

**Unit I:**

**Hydrographic mapping**

- 1.1. Construction and interpretation of rating curves (10)
- 1.2. Construction and interpretation of hydrographs and unit hydrographs. (10)
- 1.3. Construction and interpretation of ombrothermic graph and hyetograph. (10) 10 Marks



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**Unit II:**

**Geological mapping**

- 2.1. Drawing of Geological sections and interpretation of geological maps with Horizontal, Uniclinal structure, folded, Faulted structure and intrusions from Platt 1 and Platt -2 Books (30) **15 Marks**

**Note-2: Value in the parenthesis indicates contact hours per semester**

\* CE= LNB

**Suggested reading:**

1. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
2. Monkhouse, F. J., & Wilkinson, H. R. (1971). Maps and diagrams: Their compilation and construction (3rd ed.). Alphaneumera-Kolkata.
3. Platt, J. I. (1951). Selected exercises upon geological maps. London: Murby (George Allen and Unwin).
4. Platt, J. I. (1974). A series of elementary exercises upon geological maps. London: Murby.
5. Raghunath, H. M. (2006). Hydrology: Principles, analysis, design (3rd ed.). New Age International Publishers.
6. Sen, P. K. (1989). Geomorphological analysis of drainage basin: An introduction to morphometric and hydrological parameters. University of Burdwan.

*Course: Major4*

*Semester-III*

**Paper Name: Soil Geography and Biogeography (Theoretical)**

**Course Code: GEO-MAJ-4T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. To learn the fundamentals of soil science and biogeography.
- ii. To understand the formation, properties, and classification of soil.
- iii. To analyze soil erosion and degradation processes and management strategies.
- iv. To explore concepts of ecosystem structure, energy flow, and biodiversity.
- v. To study different biomes and their ecological characteristics.
- vi. To understand the importance of biodiversity conservation and its degradation factors.

**Programme Outcome:**

**Upon completion of this course, students will be able to:**

- i. Demonstrate proficiency in the fundamentals of soil science and biogeography.
- ii. Analyze the formation, properties, and classification of soil accurately.
- iii. Evaluate soil erosion and degradation processes and propose effective management strategies.
- iv. Identify and describe ecosystem structure, energy flow, and biodiversity concepts.
- v. Describe the ecological characteristics of different biomes comprehensively.
- vi. Implement measures for biodiversity conservation and address factors contributing to its degradation effectively.





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**Unit I:**

**Soil Geography**

- 1.1. Soil Geography: Definition, Nature and Scope. (5)
- 1.2. Physical and Chemical Properties of Soil: Texture, structure, Colour and moisture; Soil Reaction(pH), organic matter. (5)
- 1.3. Origin and profile characteristics of Soil: Laterite, Podzol, and Chernozem soils. (5)
- 1.4. Principles of soil classification: Genetic (Dokuchaev, Marbut) and USDA. (5)
- 1.5. Concept of land capability and its classification. (5)
- 1.6. Soil erosion and degradation: Factors, processes and management measures. (5) **25 Marks**

**Unit II: Biogeography**

- 2.1. Biogeography: Definition, Nature and Scope. (5)
- 2.2. Concepts of Biosphere, Ecology, Biome, ecotone, community, Habitat, Species Structure, Ecological Niche, Homeostatic mechanism, Limiting Factor, and Dispersal of Plants. (5)
- 2.3. Ecosystem: Components, Trophic structure, Productivity and Energy flow in Ecosystem; Ecological Pyramids. (5)
- 2.4. Plant Succession: Types, Stages, Theories of Climax. (5)
- 2.5. Bio-geo-chemical cycles: Nitrogen, Oxygen and Carbon. (5)
- 2.6. Concept of Biodiversity: Definition, types, importance and its degradation and conservation. (5) **25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= Seminar

**Suggested reading**

1. Buckman, H. R., & Brady, N. C. (1974). Nature and Properties of Soil. McMillan.
2. Bunting, A. (1965). Geography of Soil. Hutchinson.
3. Chapman, J. L., & Reiz, M. J. (1993). Ecology: Principles and Applications. Cambridge University Press
4. Chiras, D. D., & Reganold, J. P. (2009). Natural Resource Conservation: Management for a Sustainable Future (10th ed.). Pearson.
5. Cox, B., Moore, P. D., & Ladle, R. (2016). Biogeography: An Ecological and Evolutionary Approach (9th ed.). Wiley-Blackwell.
6. Daji, J. A., Kadam, J. R., & Patil, N. D. (1996). A Textbook of Soil Science. Media Promoters and Publishers.
7. Dash, M. C. (2001). Fundamentals of Ecology (2nd ed.). Tata McGraw-Hill.
8. De, N. K., & Ghosh, P. (1993). India: A Study in Soil Geography. Sribhumi Pub Co.
9. De, N. K., & Sarkar, M. K. (1994). MrittikaBhu-vidya. PaschimBangaRajyaPustakParshad.
10. Franzmeier, D. P., McFee, W. W., Graveel, J. G., & Kohnke, H. (2016). Soil Science Simplified (5th ed.). Waveland Press.
11. Gerrard, J. (2000). Fundamentals of Soils. Routledge.
12. Huggett, R. (1998). Fundamentals of Biogeography. Routledge.
13. Lomolino, M. V., Riddle, B. R., & Whittaker, R. J. (2016). Biogeography (5th ed.). Oxford University Press.
14. MacDonald, G. (2001). Biogeography: Introduction to Space, Time and Life. Wiley.
15. Morgan, R. P. C. (2005). Soil Erosion and Conservation (3rd ed.). Wiley-Blackwell.
16. Nebel, J. B. (1981). Environmental Science. Prentice Hall.
17. Odum, F. P. (1971). Fundamentals of Ecology. W.B. Sanders.
18. Santra, A. (2006). Handbook on Wild and Zoo Animals. International Book Distributing Co.
19. Sharma, P. D. (2011). Ecology and Environment. Rastogi Publications.
20. Shukla, R. S., & Chandel, P. S. (1930). Plant Ecology and Soil Science. S Chand.



**Paper Title: Soil and Biogeography Techniques and Surveying and Levelling (basic) (Practical)**

**Course Code: GEO-MAJ-4P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. To determine soil colour, pH, and NPK levels using a field kit.
- ii. To identify soil type through ternary diagram textural plotting.
- iii. To assess plant species diversity using the matrix method.
- iv. To understand Field Surveying with a Prismatic Compass.
- v. To prepare longitudinal and cross-sectional profiles using a Dumpy Level.

**Programme Outcome:**

**Upon completion of this course, students will be able to:**

- i. Utilize field kits to determine soil colour, pH, and NPK levels accurately.
- ii. Identify soil types through ternary diagram textural plotting effectively.
- iii. Assess plant species diversity using the matrix method proficiently.
- iv. Understand and apply Field Surveying techniques with a Prismatic Compass competently.
- v. Prepare longitudinal and cross-sectional profiles using a Dumpy Level accurately.

**Unit I:**

**Soil and Biogeography Techniques**

- 1.1. Determination of soil Colour, pH, and NPK using field kit. (10)
- 1.2. Determination of soil type by ternary diagram textural plotting. (10)
- 1.3. Plant species diversity determination by matrix method. (10)

**10 Marks**

**Unit II:**

**Surveying and Levelling (basic)**

- 2.1. Definition of basic terminologies related to Prismatic Compass Surveying and Field Survey with Prismatic Compass. (15)
- 2.2. Definition of basic terminologies related to levelling and Preparation of Longitudinal and cross-sectional profiles using Dumpy Level. (15)

**15 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\* CE=LNB**

**Suggested reading**

1. Basak, N. N. (2017). Surveying & Levelling (2nd ed.) [Paperback]. McGraw Hill Education.
2. Rao, P. V., & Akella, V. (2015). Textbook of Surveying [Paperback]. PHI Learning Private Limited.
3. Soil Survey Investigations Report No. 51.
4. Stohlgren, T.J. 2007. Measuring Plant Diversity: Lessons from the Field. Oxford University Press.  
USDA: United States Department of Agriculture. 2014. Soil Survey and Laboratory Methods Manual,
5. Walters, M., Scholes, R.J. (Eds.) 2017. The GEO Handbook on Biodiversity Observation Networks, Springer International Publishing.
6. Weil, R.R. and Brady, N.C. 2022. The Nature and Properties of Soil, 15th ed, Pearson. Xiao, M. 2009. Soil Testing Laboratory Manual, Bent Tree Press.



**Course: Major 5 Semester-IV**

**Paper Name: Settlement Geography and Population Geography (Theoretical)**

**Course Code: GEO-MAJ-5T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. To define settlement geography and its scope, examining both rural and urban settlements.
- ii. To explore the evolution, patterns, and morphology of the settlements.
- iii. To analyze urban settlement concepts and models of urban morphology.
- iv. To classify towns according to various frameworks.
- v. Examining factors influencing population distribution to elucidate the Nature and scope of population geography.
- vi. To discuss theories of population growth and analyze population structure.
- vii. To address key issues in Population Geography.

**Programme Outcome:**

**Upon completion of this course, students will be able to:**

- i. Define settlement geography and its scope, with a focus on both rural and urban settlements.
- ii. Analyze the evolution, patterns, and morphology of settlements comprehensively.
- iii. Explore urban settlement concepts and models of urban morphology effectively.
- iv. Classify towns according to various frameworks accurately.
- v. Examine factors influencing population distribution to elucidate the nature and scope of population geography.
- vi. Discuss theories of population growth and analyze population structure proficiently.
- vii. Address key issues in Population Geography competently.

**Unit I:**

**Settlement Geography**

- 1.1. Settlement Geography: Definition, Nature and Scope. (5)
- 1.2. Rural settlements: Site and situation, Types and patterns. (5)
- 1.3. Urban Settlements: Classification of Towns (C.D. Harris, Nelson, Lewis Mumford, Ashok Mitra). (5)
- 1.4. Morphology of Settlements: Rural and Urban (Burgess, Hoyt, and Harris & Ullman). (5)
- 1.5. Some Concepts: Primate city, Rank-size rule, Metropolis and Megalopolis, Conurbation, Satellite Town, Smart city, PURA. (5)
- 1.6. Problems of rural and urban settlements in India. (5)

**25 Marks**

**Unit II:**

**Population Geography**

- 2.1. Population Geography: Definition, Nature and Scope. (5)
- 2.2. Theories of Population Growth: Malthus and Marx, Demographic Transition Theory. (5)
- 2.3. Population structure and composition: Age- and sex-specific, occupational and ethnic. (5)
- 2.4. Fertility and Mortality: Determinants and Measures. (5)
- 2.5. Population Migration: Types, Determinants, Theories (Stoufer, Lee, Ravenstein, Zelinsky, Gravity model). (5)
- 2.6. Issues in Population Geography: Child labour, Unemployment, Ageing of Population, Human Trafficking, Population-Resource Region. (5)

**25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\* CE= Group Discussion (GD)



### **Suggested reading**

#### **A) Settlement Geography**

1. Banerjee Guha, S. (Ed.). (2004). Space, Society and Geography. Rawat Publication.
2. Carter, H. (1995). The Study of Urban Geography, 4th ed. Arnold.
3. Fern, R.L. (2002). Nature, God and Humanity. Cambridge University Press.
4. Fouberg, E.H., Murphy, A.B., de Blij H.J. (2015). Human Geography: People, Place, and Culture, 11th ed. Wiley.
5. Ghosh, S. (1998). Introduction to Settlement Geography. Sangam Books Ltd.
6. Gottdiener, M., Budd, M. Lehtovuori, P. (2016). Key Concepts in Urban Studies, 2nd ed. Sage.
7. Gregory, D., Johnston, R., Pratt, G., Watts, M., Whatmore, S. (Eds). (2009). The Dictionary of Human Geography, 5th ed. Wiley.
8. Haggett, P. (1975). Geography: A Modern Synthesis. Harper and Row Publishers.
9. Hudson, F.S. (1970). Geography of Settlements. Macdonald and Evans Ltd.
10. Hussain, M. (2007). Models in Geography. Rawat Publication.
11. Mandal, R.B. (2001). Introduction to Rural Settlement, 2nd ed. Concept Publishing Company.
12. Singh, R.Y. (2000). Geography of Settlements. Rawat Publication.

#### **B) Population Geography**

13. Barrett, H.R. (1995). Population Geography. Oliver and Boyd.
14. Bhende, A.A., & Kanitkar, T. (2008). Principles of Population Studies. Himalaya Publications.
15. Chandna, R.C. (2022a). Geography of Population Part-1: Concepts, Determinants and World Patterns. Kalyani Publications.
16. Chandna, R.C. (2022b). Geography of Population Part-2: India – Population and Patterns. Kalyani Publications.
17. Clarke, J. (1972). Population Geography. Elsevier.
18. Hussain, M. (1994). Population Geography, Vol. 1 & 2. Anmol Publications.
19. Jones, H. (1990). Population Geography. SLE Pound.
20. Nag, P., & Debnath, G.C. (2021). Population Geography. Bharati Prakashan.
21. Newbold, K.B. (2017). Population Geography: Tools and Issues. Rowman and Littlefield.
22. Srivastava, O.S. (Ed) (1994). Demography and Population Studies. Vikas Pub.
23. Trewartha, G.T. (1969). A Geography of Population: World Patterns. John Wiley & Sons.
24. William, F.H. (1993). An Introduction to Population Geography. Cambridge University Press.
25. Wood, R. (1979). Population Analysis in Geography. Longman

**Course: Major 5**

**Semester-IV**

**Paper Title: Settlement and Population Geography (Practical)**

**Course Code: GEO-MAJ-5P**

**Full Marks-25**

**Time-2:30 hrs**

#### **Programme Objectives:**

- i. Identify settlement types using Survey of India maps.
- ii. Map accessibility using detour index from Survey of India maps.
- iii. Conduct Nearest Neighbour Analysis using Survey of India maps.
- iv. Represent the population density of Indian states of West Bengal districts with the Choropleth method.
- v. Learn the use of Dot and Sphere.
- vi. Construct and interpret age-sex pyramids, distinguishing progressive and regressive patterns.



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**Programme Outcome:**

**Upon completion of this course, students will be able to:**

- i. Identify settlement types accurately using Survey of India maps.
- ii. Map accessibility utilizing the Detour index from Survey of India maps effectively.
- iii. Conduct Nearest Neighbour Analysis proficiently with Survey of India maps.
- iv. Represent the population density of Indian states and West Bengal districts using the Choropleth method competently.
- v. Utilize Dot and Sphere methods appropriately for population representation.
- vi. Construct and interpret Age-Sex pyramids, distinguishing progressive and regressive patterns accurately.

**Unit I:**

**Practical of Settlement Geography**

- 1.1. Identification and interpretation of types of settlements according to “Site” from Survey of India 1:50k topographical maps. (10)
- 1.2. Nearest Neighbour analysis from Survey of India 1:50k topographical maps. (10)
- 1.3. Determination of Urban centres as per Indian Census criteria (1991).
- 1.4. Graphical Representation of Urban Centre Distribution According to Zipf's Rank-Size Rule (10)

**10 Marks**

**Unit II:**

**Practical of Population Geography**

- 2.1. Representation and interpretation of population density of Indian states of West Bengal districts by choropleth method (Equal Step, Mean & Standard Deviation, and Nested Mean Method and measurement of Accuracy. (10)
- 2.2. Dots and Spheres (representing rural and urban population). (5)
- 2.3. Construction and interpretation of Progressive and Regressive Age-Sex Pyramid. (7)
- 2.4. Population projection: Arithmetic and Exponential method. (8)

**15 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= LNB**

**Suggested reading**

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd.



Course: Major 6

Semester-IV

**Paper Name: Economic and Industrial Geography (Theoretical)**

Course Code: GEO-MAJ-6T

Full Marks-50

Time-2 hrs

**Programme Objectives:**

- i. Gain an understanding of the different classifications and types of economic activities.
- ii. Comprehend the theories and models used to explain the spatial distribution of industries.
- iii. Analyze specific examples of industries in various countries and regions to understand their characteristics and significance

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Understand the classifications and types of economic activities comprehensively.
- ii. Comprehend the theories and models explaining the spatial distribution of industries effectively.
- iii. Analyze specific examples of industries in various countries and regions to understand their characteristics and significance proficiently.

**Unit I:**

**Economic Geography**

- 1.1. Economic Geography: Definition, Nature and Scope. (5)
- 1.2. Economy: Types and indicators. (5)
- 1.3. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (5)
- 1.4. Locational theory of economic activities Von Thünen. (5)
- 1.5. Classification of agricultural regions by Whittlesey. (5)
- 1.6. Key Concepts: Special Economic Zones (SEZ), Exclusive Economic Zones (EEZ), Export Processing Zones (EPZ), Free Trade Zones (FTZ). (5)

**25 Marks**

**Unit II:**

**Industrial Geography**

- 2.1. Industrial Geography: Definition, Nature and Scope. (5)
- 2.2. Industrial Location Theory: Alfred Weber's Model, Profit Maximization Theory of August Losch; Geographic and Dynamic Location Theory of Allan Pred (1967); Types of Industries. (5)
- 2.3. Agro-based Industry: Cotton Textile (U.S.A, India), Paper Industry (Canada, India). (5)
- 2.4. Mineral Based Industry: Metal - Iron & Steel (Japan, India); Non-metal - Petrochemical (Middle-East Countries, India) (5)
- 2.5. Automobile Industry: (U.S.A., India). (5)
- 2.6. Industrial regionalization in India. (5)

**25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE = Project Report**

Students will visit any local industry, agricultural field, or MGNREGA project sites and note down their observations in their own words, either in English or their mother tongue, spanning 8-10 pages. They will explain what they have learned or their understanding based on their observations. The teacher will mentor the entire process. **(This is an Internal Assessment (CE) Part (10). 10 marks**



### **Suggested reading**

1. Anderson, W.P. (2012). Economic Geography. Routledge.
2. Aoyama, Y., Murphy, J.T., & Hanson, S. (2010). Key Concepts in Economic Geography. Sage.
3. Coe, N. M., Kelly, P.F., & Yeung, H.W. (2019). Economic Geography: A Contemporary Introduction, 3rd ed. Wiley-Blackwell.
4. Combes, P., Mayer, T., & Thisse, J.F. (2008). Economic Geography: The Integration of Regions and Nations. Princeton University Press.
5. Hamilton, I. (Ed.). (1992). Resources and Industry. Oxford University Press.
6. MacKinnon, D., & Cumbers, A. (2019). An Introduction to Economic Geography: Globalisation, Uneven Development and Place, 3rd ed. Routledge.
7. Willington, D.E. (2008). Economic Geography. Husband Press.
8. Wood, A., & Roberts, A. (2010). Economic Geography: Places, Networks and Flows. Routledge.

*Course: Major 6*

*Semester-IV*

**Paper Title: Economic and Industrial Geography (Practical)**

**Course Code: GEO-MAJ-6P**

**Full Marks-25**

**Time-2:30 hrs**

### **Programme Objectives:**

- i. Develop skills in creating and interpreting proportional Pie diagrams to visualize economic data.
- ii. Understand how to construct and analyze ergographs to evaluate labour productivity patterns.
- iii. Gain proficiency in using Nelson's functions to identify dominant and distinctive economic functions.
- iv. Learn techniques for conducting time series analysis and interpreting industrial production trends.
- v. Understand the concept of Location Quotient and its application in identifying zones of industrial concentration.
- vi. Acquire knowledge of Z-scores and their use in assessing industrial performance based on various criteria.

### **Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Create and interpret proportional pie diagrams for economic data visualization.
- ii. Analyze labour productivity patterns using ergographs.
- iii. Identify economic functions using Nelson's functions.
- iv. Conduct time series analysis of industrial production trends.
- v. Apply Location Quotient to identify industrial concentration zones.
- vi. Assess industrial performance using Z-scores.

### **Unit I:**

#### **Practical of Economic Geography**

- 1.1. Proportional Pie Diagrams (showing variation in occupational structure or areal coverage under different crops) (10)
- 1.2. Construction and interpretation of ergograph and Crop Calendar. (10)
- 1.3. Construction and interpretation of Nelson's Dominant and Distinctive Functions. (10) **15 Marks**



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**Unit II:**

**Practical of Industrial Geography**

- 2.1. Time series analysis of industrial production of India using Semi-Average, Moving Average and Least Square Methods. (10)
  - 2.2. Zones of concentration represented by Location Quotient. (10)
  - 2.3. Z-Score (single criterion and two criteria). (10)
- 10 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\* CE= LNB

**Suggested reading**

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd

*Course: Major 7*

*Semester-V*

**Paper Name: Geography of India and West Bengal (Theoretical)**

**Course Code: GEO-MAJ-7T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Understand India's diverse physiographic divisions, including the Himalayas and Peninsular Plateau, and associated climate, soil, and vegetation regions.
- ii. Analyze the transformative impacts of the Green and White Revolutions on Indian agriculture alongside major industrial regions and agro-ecological zones.
- iii. Evaluate India's mineral and power resources in the context of industrial policy and globalization, considering their implications for economic development.
- iv. Investigate West Bengal's geographical characteristics, including physiography, climate, soil, vegetation, major industries, and SEZ development.
- v. Examine population dynamics, migration patterns, and tourism prospects in West Bengal.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Understand India's diverse physiographic divisions and their implications.
- ii. Analyze the impacts of agricultural revolutions and industrial regions in India.
- iii. Evaluate India's mineral and power resources for economic development.
- iv. Investigate West Bengal's geographical characteristics and industrial development.
- v. Examine population dynamics and tourism prospects in West Bengal.





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**Unit I:  
Geography of India**

- 1.1. Physiographic Divisions of India: Physiography of the Himalayas and Peninsular Plateau. (5)
- 1.2. Climate, Soil, and Vegetation regions. (5)
- 1.3. Green, White and Blue Revolution and their impacts. (5)
- 1.4. Agro-climatic and agro-ecological regions. (5)
- 1.5. Mineral (Iron ore and Copper) and power resources (Coal, Hydel power and Petroleum) of India; Industrial Policy. (5)
- 1.6. Geopolitical importance of India. (5) **25 Marks**

**Unit II:  
Geography of West Bengal**

- 2.1. West Bengal: Physiography, Climate, Soil, Vegetation. (5)
- 2.2. Drainage system. (5)
- 2.3. Major Industries. (5)
- 2.4. Development of SEZs. (5)
- 2.5. Population: Growth, distribution and migration. (5)
- 2.6. Tourism: Problem and Prospect. (5) **25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= MCQ Test

**Suggested reading**

1. Chand, M., & Puri, V.K. (2013). Regional Planning in India. Allied Publishers.
2. Chattopadhyay, A. (2020). Bharat O Paschimonger Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications.
3. Johnson, B.L.C. (Ed). (2001). Geographical Dictionary of India. Vision Books.
4. Khullar, D.R. (2011). India: A Comprehensive Geography. Kalyani Publishers.
5. Rudra, K. (2018). Rivers of the Ganga-Brahmaputra-Meghna Delta: A Fluvial Account of Bengal. Springer.
6. Sarkar, B.C. (2019). Bharoter Bhugol [Geography of India] (First Edition). Concept Publishing Company Pvt. Ltd.
7. Sharma, T.C. (2012). Economic Geography of India. Rawat Publications.
8. Singh, J. (2003). India: A Comprehensive & Systematic Geography. Gyanodaya Prakashan.
9. Singh, R.L. (1971). India: A Regional Geography. National Geographical Society of India.
10. Spate, O.H.K., & Learmonth, A.T.A. (1967). India and Pakistan: A General and Regional Geography. Methuen.
11. Tiwari, R.C. (2007). Geography of India. Prayag Pustak Bhawan.
12. Vaidyanadhan, R. (Ed). (Year). Rejuvenation of Surface Water Resources of India: Potential, Problems and Prospects. Geological Society of India Special Publication.
13. Valdiya, K.S. (2010). The Making of India: Geodynamic Evolution. Macmillan India.
14. Wadia, D.N. (1926). Geology of India. Macmillan and Co. Ltd.
15. West Bengal Pollution Control Board. (2021). State of Environment Report: West Bengal, Vol I and II. GoWB.



Course: Major 7

Semester-V

**Paper Title: Geography of India and Statistical Methods in Geography (Descriptive) (Practical)**

**Course Code: GEO-MAJ-7P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. Interpret monthly temperature and rainfall graphs for different Indian regions.
- ii. Calculate the mean centre of population for West Bengal across census years.
- iii. Analyze regional disparity using Sopher's Index.
- iv. Construct and interpret frequency distributions.
- v. Understand measures of central tendencies like mean, median, and mode.
- vi. Calculate and interpret quartiles, deciles, and percentiles.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Interpret monthly temperature and rainfall graphs for various Indian regions effectively.
- ii. Calculate the mean centre of population for West Bengal across census years accurately.
- iii. Analyze regional disparity using Sopher's Index proficiently.
- iv. Construct and interpret frequency distributions competently.
- v. Understand measures of central tendencies such as mean, median, and mode appropriately.
- vi. Calculate and interpret quartiles, deciles, and percentiles with competence.

**Unit I:**

**Practical Geography of India**

- 1.1. Monthly temperature and rainfall graphs from different physiographic regions of India. (10)
- 1.2. Mean centre of population for any district of West Bengal over any three census years. (10)
- 1.3. Analysis of Regional Disparity after Sopher's Index. (10) **13 Marks**

**Unit II:**

**Statistical Methods in Geography (Descriptive)**

- 2.1. Frequency Distribution: Histogram, Frequency Polygon, Frequency Curve, Ogives. (10)
- 2.2. Measures of Central Tendencies: Mean, Median, Mode. (10)
- 2.3. Partition Values: Quartiles, Deciles and Percentiles. (10) **12 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB

**Suggested reading**

1. Basu, P. (2021). Advanced Practical Geography — A Laboratory Manual (4th ed.). Books and Allied.
2. Census of India. (1991, 2001, 2011). Table H-3A: Census Houses by Predominant Material of the Roof (H2A).
3. Monkhouse, F.J., & Wilkinson, H.R. (1971). Maps and Diagrams, Their Compilation and Construction (3rd ed., 2017)
4. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd



**Course: Major 8**

**Semester-V**

**Paper Title: Geographical Thought (Theoretical)**

**Course Code: GEO-MAJ-8T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Explore ancient, medieval, and modern geography.
- ii. Analyze classical geographers and their contributions.
- iii. Investigate dualisms and dichotomies in geography.
- iv. Understand the impact of the quantitative revolution.
- v. Examine the systems approach in geography.
- vi. Discuss Radicalism, Positivism, and Behavioural approaches.
- vii. Compare absolute and relative space concepts.
- viii. Explore the man-environment relationship.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

1. Explore the development of geography from ancient to modern times comprehensively.
2. Analyze the contributions of classical geographers effectively.
3. Investigate dualisms and dichotomies present in geographical thought proficiently.
4. Understand the impact of the quantitative revolution on geography accurately.
5. Examine the systems approach in geography competently.
6. Discuss Radicalism, Positivism, and Behavioural approaches in geographical thought with depth.
7. Compare and contrast absolute and relative space concepts appropriately.
8. Explore the dynamic relationship between humans and the environment comprehensively.

**Unit I:**

**Evolution of Geography**

- 1.1. Ancient Geography: Greek, Roman, Indian and Chinese contribution (8)
- 1.2. Medieval Geography: Arab Geographers (2)
- 1.3. Modern Age: i) Pre-classical: Age of Discovery, Varenus and Kant; (5) ii) Classical: Humboldt and Ritter (3) iii) Post-Classical: a) 19<sup>th</sup> Century: Ratzel, Richthofen, Vidal de la Blache, Hettner b) 20<sup>th</sup> century: Mackinder, Geddes, Davis, Sauer (8)
- 1.4. Recent Developments: Geo-informatics, Emotional Geography and Welfare Geography. (4) (25 Marks)

**Unit II:**

**Approaches to the Study of Geography**

- 2.1. Dualism and Dichotomy: Physical vs. Human, Regional vs. Systematic, Environmental Determinism vs. Possibilism (6)
- 2.2. Materialism, Rationalism, Radicalism, Positivism, Behaviouralism and Humanism (8)
- 2.3. Location & Space, Areal Differentiation (4)
- 2.4. Man-environment Relationship (2)
- 2.5. System Approach in Geography and Quantitative Revolution and its Impact (6)
- 2.6. Structuralism and Post-Modernism (4) (25 Marks)

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= Report Writing on the contribution of any Geographer/ Geographical approach



### **Suggested Reading**

1. Adhikari, S. (2015). Fundamentals of Geographical Thought. Orient Blackswan.
2. Couper, P. (2015). A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies. Sage.
3. Cresswell, T. (2013). Geographic Thought: A Critical Introduction. Wiley-Blackwell.
4. Dickinson, R.E. (2015). The Makers of Modern Geography. Routledge.
5. Dikshit, R.D. (2004). Geographical Thought: A Contextual History of Ideas. Prentice Hall India.
6. Holt-Jensen, A. (2018). Geography: History and Concepts: A Student's Guide (5th ed.). Sage.
7. Husain, M. (2015). Evolution of Geographical Thought (6th ed.). Rawat Publications.
8. Jeffrey, A., & Nayak, A. (2013). Geographical Thought: An Introduction to Ideas in Human Geography. Routledge.
9. Lahiri Dutta, K. (2010). Bhugol Chintar Bikash [Bengali], The World Press Pvt. Ltd, Kolkata:
10. Maiti, R., & Maiti, M. M. (2021). Development of Geographical Thought: Contextualization and Synthesis of Philosophies (2nd ed.). Nabodaya Publications.
11. Peet, P. (1998). Modern Geographical Thought. Wiley-Blackwell.

*Course: Major 8*

*Semester-V*

**Paper Title: Statistical Methods in Geography (Inferential) and Megascopic Identification of Rocks and Minerals (Practical)**

**Course Code: GEO-MAJ-8P**

**Full Marks-25**

**Time-2:30 hrs**

### **Programme Objectives:**

- i. Apply measures of dispersion and correlation coefficients for geographical data analysis.
- ii. Perform simple Bivariate analysis techniques, including regression trend lines and residual mapping.
- iii. Identify various minerals and rocks through megascopic analysis.

### **Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Apply measures of Dispersion and Correlation Coefficients proficiently for geographical data analysis.
- ii. Perform simple bivariate analysis techniques, including regression trend lines and residual mapping effectively.
- iii. Identify various minerals and rocks through megascopic analysis accurately.

### **Unit I:**

#### **Statistical Methods in Geography (Inferential)**

1.1. Measures of Dispersion: Range, Mean Deviation, Quartile Deviation, Standard Deviation, Coefficient of Variation and Variance. (12)

1.2. Rank Co-relation (Spearman's Method) and Pearson's Product Moment Co-relation coefficient. (8)

1.3. Simple Bi-variate Analysis: Fitting of Regression Trend Line by Least Square Method; Residual Mapping. (10)

**15 Marks**



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**Unit II:**

**Megascopic Identification of Rocks and Minerals**

2.1. **Minerals:** Quartz, Feldspar, Mica (Biotite & Muscovite), Talc, Graphite, Calcite, Dolomite, Bauxite, Magnetite, Haematite, Chalcopyrite, Calcite, Galena. (15)

2.2. **Rocks:** Basalt, Dolerite, Granite, Pegmatite, Laterite, Sandstone, Limestone, Conglomerate, Shale, Slate, Phyllite, Schist, Quartzite, Gneiss, Marble. (15) **10 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB

**Suggested reading**

1. Acevedo, M.F. (2012). Data Analysis and Statistics for Geography, Environmental Science and Engineering. CRC Press.
2. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
3. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
4. Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.
5. Fitzsimons, C., Frampton, S., & Fejer, E. (2007). Rocks & Minerals: Identification Guide (Identification Guides) [Paperback]. Flame Tree Publishing.
6. Harris, R., & Jarvis, C. (2011). Statistics for Geography and Environmental Science. Prentice Hall.
7. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasitotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
8. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
9. McGrew Jr., J.C., Lembo Jr., A.J., & Monroe, C.B. (2014). An Introduction to Statistical Problem Solving in Geography (3rd ed.). Waveland Press.
10. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
11. Rogerson, P.A. (2015). Statistical Methods for Geography: A Student's Guide (4th ed.). Sage.
12. Sarkar, A. (2015). Practical Geography: A Systematic Approach (3rd ed.). Orient Blackswan.

**Course: Major 9**

**Semester-V**

**Paper Name: Regional Planning and Transport Geography (Theoretical)**

**Course Code: GEO-MAJ-9T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Introduce key concepts in regional planning, including region types, delineation methods, and planning hierarchy.
- ii. Familiarize students with regional planning models and their application in addressing development challenges.
- iii. Provide an understanding of transport geography, covering modes of transport, importance in regional development, and network analysis.
- iv. Enable students to analyze transportation systems using indices and metrics to assess efficiency and connectivity.



### **Programme Outcomes:**

**Upon completion of this course, students will be able to**

- i. Demonstrate comprehension of regional planning principles for effective analysis and decision-making.
- ii. Apply regional planning models to address real-world development issues critically.
- iii. Recognize the significance of transportation in regional development and spatial connectivity.
- iv. Proficiently analyze transport networks to evaluate efficiency and propose optimization strategies.

#### **Unit I: Regional Planning**

- 1.1. Region: Definition, Types, and Characteristics of Natural, Formal, Functional and Planning Regions. (5)
  - 1.2. Methods of delineation of region: Gravity model and composite Index Method. (5)
  - 1.3. Hierarchy of Planning Regions (Macro, Meso, Micro, Nuclear. (5)
  - 1.4. Schemes of Regionalization in India: Natural Region, Planning Region, Economic Region. (5)
  - 1.5. Regional Planning: Definition, Basic Principles, Types of Planning. (5)
  - 1.6. Model of Regional Planning: Circular Circulation Causation by Gunnar Myrdal and Growth Pole Theory' Francois Perroux. (5)
- 25 Marks**

#### **Unit II: Transport Geography**

- 2.1. Transport Geography: Definition, Nature and Scope. (5)
  - 2.2. Modes of transport and their characteristics. (5)
  - 2.3. Importance of Transportation and its significance in regional development. (5)
  - 2.4. Models of Transportation (Taaffe, Morrill and Gould Model; Vance Model; and The Rimmer model). (5)
  - 2.5. Concept of Accessibility and Connectivity. (5)
  - 2.6. Structural Analysis of Transport Network: 1. Alpha Index, 2. Beta Index, 3. Gamma Index 4. Cyclomatic Number 5. Aggregate Transportation Score (ATS). (5)
- 25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= Traffic Survey and Report**

### **Suggested reading**

#### **A) Regional Planning**

1. Chand, M., & Puri, V.K. (2000). Regional Planning in India. Allied Publishers Ltd.
2. Chandana, R.C. (2016). Regional Planning and Development (6th ed.). Kalyani Publishers.
3. Glasson, J. (2017). Contemporary Issues in Regional Planning. Routledge.
4. Hall, P., & Tewdwr-Jones, M. (2010). Urban and Regional Planning. Routledge.
5. Higgins, B., & Savoie, D.J. (2017). Regional Development: Theories and Their Application. Routledge.
6. Kulshetra, S.K. (2012). Urban and Regional Planning in India: A Handbook for Professional Practitioners. Sage.
7. Misra, R.P. (1992). Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Pub Co.
8. Ray, J. (2001). Introduction to Development & Regional Planning. Orient Blackswan.

#### **B) Transport Geography**

1. Bamford, C.G., & Robinson, H. (1978). Geography of Transport. Macdonald and Evans.
2. Basu Roy, P. (2015). A Handbook of Transport Geography. Reader Service. Kolkata.
3. Bhaduri, S. (1992). Transport and Regional Development. Concept Publishing Company.
4. Bhaduri, S. (1992). Transport and Regional Development. Concept Pub. Co.



5. Hoyle, B., & Knowles, R. (2000). Modern Transport Geography. John Wiley and Sons.
6. Hoyle, B.S. (1973). Transport and Development. Macmillan.
7. Hurst, E. (1974). Transport Geography-Comments and Readings. McGraw Hill.
8. Rodrigue, J.-P. (2020). The Geography of Transport Systems (5th ed.). Routledge.
9. Saxena, H. M. (2010). Transport Geography. Rawat Publications

**Course: Major 9**

**Semester-V**

**Paper Title: Regional Planning and Transport Geography (Practical)**

**Course Code: GEO-MAJ-9P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. Understanding measures of inequalities such as the Lorenz Curve and Gini's Coefficient.
- ii. Applying the Shortest Path Matrix, specifically the Shimbel Index, for transportation analysis.
- iii. Analyzing transportation networks using the Cyclomatic Number, Alpha, Beta, Gamma, Eta Indices, and Aggregate Transportation Score.
- iv. Developing practical skills in conducting field research, including data collection, analysis, and presentation, to address socio-economic or environmental issues.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Understand measures of inequalities such as the Lorenz Curve and Gini's Coefficient proficiently.
- ii. Apply the Shortest Path Matrix, particularly the Shimbel Index, for transportation analysis effectively.
- iii. Analyze transportation networks using the Cyclomatic Number, Alpha, Beta, Gamma, Eta Indices, and Aggregate Transportation Score accurately.
- iv. Develop practical skills in conducting field research, including data collection, analysis, and presentation, to address socio-economic or environmental issues competently.

**Unit I:**

**Regional Planning**

- 1.1. Measures of Inequalities: Lorenz Curve and Gini's Co-efficient. (10)
- 1.2. Crop Combinations by J.C Weaver and K Doi, Social regionalization based on Mean and SD. (10)
- 1.3. Standard Distance Measure of population. (10) **13 Marks**

**Unit II:**

**Transport Geography**

- 2.1. Breakpoint Analysis and Detour Index. (10)
- 2.2. Shortest Path Matrix (Shimbel Index). (10)
- 2.2. Cyclomatic Number Alpha, Beta, Gamma, Eta Index and Aggregate Transportation Score. (10) **(12 Marks)**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB

**Suggested Reading**

1. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
2. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.



3. Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.
4. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasitotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
5. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
6. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
7. Rogerson, P.A. (2015). Statistical Methods for Geography: A Student's Guide (4th ed.). Sage.
8. Sarkar, A. (2015). Practical Geography: A Systematic Approach (3rd ed.). Orient Blackswan.

**Course: Major 10**

**Semester-VI**

**Paper Title: Development Geography and Regional Geography of North Bengal (Theoretical)**

**Course Code: GEO-MAJ-10T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Define and grasp the scope of Development Geography.
- ii. Identify and analyze indicators of economic, social, and environmental development.
- iii. Understand human development concepts and measurements.
- iv. Explore issues like rural development and urban planning for sustainable development.
- v. Understand the physiography, drainage patterns and vegetation types of North Bengal.
- vi. Explore biodiversity and conservation efforts, as well as ethnic cultures and heritage.
- vii. Evaluate tourism status, challenges, prospects, and major environmental issues.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Define and comprehend the scope of Development Geography effectively.
- ii. Identify and analyze indicators of economic, social, and environmental development accurately.
- iii. Understand human development concepts and measurements proficiently.
- iv. Explore issues like rural development and urban planning for sustainable development competently.
- v. Understand the physiography, drainage patterns, and vegetation types of North Bengal comprehensively.
- vi. Explore biodiversity and conservation efforts, as well as ethnic cultures and heritage adeptly.
- vii. Evaluate tourism status, challenges, prospects, and major environmental issues competently.

**Unit I:**

**Development Geography**

- 1.1. Development Geography: Definition, Nature and Scope. (5)
- 1.2. Key indicators of Development: Economic, social and environmental. (5)
- 1.3. Human Development: Concept and Measurements. (5)
- 1.4. Issues in Development Geography: Rural development, Urban planning. (5)
- 1.5. Need and measures of balanced development in India. (5)
- 1.6. Concept of Sustainable development. (5)

**25 Marks**





**Unit II:**  
**Regional Geography of North Bengal**

- 2.1. Physiography. (5)
- 2.2. Drainage and Vegetation. (5)
- 2.3. Biodiversity of North Bengal. (5)
- 2.4. People, Culture and Heritage: Rajbanshi, Rava, Toto, Oraon, Drukpa. (5)
- 2.5. Tourism: Major Tourist Spots, Present status, Problems and Prospects. (5)
- 2.6. Major issues in North Bengal: Flood, Flash flood, Landslide, Hailstorm, Human-Wildlife conflict. (5)

**25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= Focus Group Discussion (FGD)**

**Suggested reading**

1. Bagchi, A. (2013). India's uneven development: Geography, history, and politics. Oxford University Press.
2. Brenner, N., & Lazarus, M. (2010). Uneven development: Global geography of inequality (2nd ed.). Oxford University Press.
3. Chakraborty, N. (Year of Publication). Regional Planning & Development ( Anchalik Porikalpona O Unnayan ) CBCS Syllabus [Paperback, Bengali]. Nabodaya Publication.
4. Chattopadhyay, A. (2020). Bharat O Paschim Bongor Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications.
5. Desai, A. R. (2010). Planning for balanced development. Concept Publishing Company.
6. Escobar, A. (1995). The concept of development. Verso.
7. Gould, P. (1986). The geography of development (3rd ed.). Prentice Hall.
8. Hodder, R. (2000). Development geography. Routledge.
9. Mishra, S., & Hanif, Md. (2023). North Bengal: Geographical and historical perspectives. Mittal Publications.
10. Pink, S. (2013). Emotional geographies (2nd ed.). Routledge.
11. Simon, D., & Kobayashi, A. (2017). Geographies of development: An introduction to development studies (4th ed.). Routledge.
12. United Nations Development Programme (UNDP). (Various years). Human development report. Retrieved from <https://hdr.undp.org/>
13. United Nations Development Programme (UNDP). (Various years). Human development report. Retrieved from <https://hdr.undp.org/>
14. World Bank. (2023). World development indicators [Database]. Retrieved from <https://data.worldbank.org/>
15. Dasgupta, S.P. (1998). The geography of North Bengal. Books & Allied Publishers
16. Blanford, E.A. (1879). North Bengal: Drainage, vegetation and climate. Calcutta Central Press.
17. Mukherjee, T.K. (2005). People, culture and heritage of North Bengal. Mittal Publications.
18. Singh, A.K. (2012). Tourism potential of North Bengal. Concept Publishing Company.
19. Das, M.C. (2017). Natural disasters in North Bengal: Floods, flash floods, landslides and hailstorms. Academic Publishers.



**Course: Major 10**

**Semester-VI**

**Paper Title: Map Projection and Inferential Statistics (advanced) (Practical)**

**Course Code: GEO-MAJ-10P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. Understand map projection fundamentals, terminology, and purpose.
- ii. Explore classification methods for map projections.
- iii. Learn mathematical/graphical construction and properties of specific projections.
- iv. Grasp the roles and definitions of null and alternative hypotheses.
- v. Differentiate between parametric and non-parametric tests and their applications.
- vi. Learn about Type I and Type II errors in hypothesis testing.
- vii. Apply statistical tests like Student's t-test, Chi-Squared, and One-way ANOVA for data analysis.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Understand map projection fundamentals, terminology, and purpose effectively.
- ii. Explore classification methods for map projections proficiently.
- iii. Learn mathematical/graphical construction and properties of specific projections accurately.
- iv. Grasp the roles and definitions of null and alternative hypotheses competently.
- v. Differentiate between parametric and non-parametric tests and their applications appropriately.
- vi. Understand Type I and Type II errors in hypothesis testing comprehensively.
- vii. Apply statistical tests like Student's t-test, Chi-Squared, and One-way ANOVA for data analysis proficiently.

**Unit I:**

**Map Projections**

1.1. Map projection: Definition, key terminologies, classification (10)

1.2. Mathematical/graphical construction, properties and uses of i) Polar Zenithal Orthographic and Equal Area, Simple Conical Projection with one Standard Parallel, Bonne's Projection, Polyconic Projection, Simple Conical Projection of two Standard Parallels, Interrupted Sinusoidal, Cylindrical Equal Area, Mercator's Projection. (20) **13 Marks**

**Unit II:**

**Inferential Statistics (Advanced)**

2.1. Basic concept of hypothesis: Null and alternative; Parametric and Non-parametric; Type-I and Type-II Errors. (10)

2.2. Application of some Statistical Tests: Student's T-test, Chi-Squared test, One- and Two-way ANOVA. (20) **12 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB



### **Suggested reading**

1. Acevedo, M.F. (2012). Data Analysis and Statistics for Geography, Environmental Science and Engineering. CRC Press.
2. Basu, P. (2021). Advanced Practical Geography — a Laboratory Manual (4th ed.). Books and Allied.
3. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI
4. Das, N. (2017). Statistical Methods (Combined edition volume 1 & 2). McGraw Hill Education: Noida, India.
5. Hazra, Y., & Banik, G. C. (Publisher). (Year). Bhugol Rasiotter Prayog (Application of Statistics In Geography) CBCS Geography Syllabus [Paperback]. Nabodaya Publication.
6. Mahmood, A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications.
7. Pal, S.K. (1998). Statistics for Geoscientists: Techniques and Applications. Concept Pub Co.
8. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd.

*Course: Major 11*

*Semester-VI*

**Paper Title: Political Geography and Geography of Sustainability (Theoretical)**

**Course Code: GEO-MAJ-11T**

**Full Marks-50**

**Time-2 hrs**

### **Programme Objectives:**

- i. Understand the concepts, Nature, and Scope of Political Geography.
- ii. Examine the attributes of the state, including frontiers, boundaries, and sovereignty.
- iii. Analyze global strategic views such as the Heartland and Rimland theories.
- iv. Define sustainability and its principles, emphasizing its importance.
- v. Explore the Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs).
- vi. Investigate sustainable agriculture, urban sustainability, and tourism, including their meanings, implementations, and future strategies.

### **Programme Outcome:**

#### **Upon completion of this course, students will be able to**

- i. Understand the concepts, nature, and scope of political geography effectively.
- ii. Examine the attributes of the state, including frontiers, boundaries, and sovereignty accurately.
- iii. Analyze global strategic views such as the Heartland and Rimland theories proficiently.
- iv. Define sustainability and its principles, emphasizing its importance competently.
- v. Explore the Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs) comprehensively.
- vi. Investigate sustainable agriculture, urban sustainability, and tourism, including their meanings, implementations, and future strategies adeptly.



**Unit I:**

**Political Geography**

- 1.1. Political Geography: Concepts, Nature and Scope. (5)
- 1.2. Concept of Nation, State and Nation-State. (5)
- 1.3. Global strategic views: Heartland and Rimland theories. (5)
- 1.4. Boundaries and frontiers, Importance of Buffer State. (5)
- 1.5. World Political Blocks: UN, NATO, SEATO, BRICS, SAARC, ASEAN (5)
- 1.6. Major Geopolitical Issues: Climate Change, Rich-Poor Gap, Health Issues (5)

**25 Marks**

**Unit II:**

**Geography of Sustainability**

- 2.1. Sustainability: Meaning, Principles and Importance. (5)
- 2.2. Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs). (5)
- 2.3. Sustainable Agriculture: Concept and strategies. (5)
- 2.4. Urban Sustainability: Concept and strategies. (5)
- 2.5. Sustainable Tourism: Concept and Strategies. (5)
- 2.6. Environmental Sustainability: Concept and strategies. (5)

**25 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= Group Discussion (GD)**

**Suggested Reading**

1. Buttel, F. H., & McMichael, P. (Eds.). (2015). New Directions in the Sociology of Global Development, Volume 11, Research in Rural Sociology and Development. Emerald Group Publishing Limited.
2. Castree, N., Adams, W. M., Barry, J., Brockington, D., Büscher, B., Corbera, E., ... & Fischer, A. (2018). Changing the intellectual climate. *Nature Climate Change*, 8(9), 763-768.
3. Dobson, A. (2003). *Citizenship and the Environment*. Oxford University Press.
4. Goodall, C. (Ed.). (2002). *Ethics and the Environment: An Introduction*. Cambridge University Press.
5. Goudie, A. (2018). *The Human Impact on the Natural Environment: Past, Present, and Future* (8th ed.). Wiley-Blackwell.
6. Holden, E. (2017). *Environment and Sustainability: A Political Introduction*. Routledge.
7. Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (Eds.). (2019). *Climate Change in the American Mind: Data, Tools, and Trends*. Routledge.
8. Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. (2004). *Limits to Growth: The 30-Year Update*. Chelsea Green Publishing.
9. Robbins, P. (2017). *Political Ecology: A Critical Introduction* (3rd ed.). Wiley.
10. Spaargaren, G., Lamers, M., & Weenink, D. (Eds.). (2005). *Sustainable Consumption: The Implications of Changing Infrastructures of Provision*. Edward Elgar Publishing.



**Course: Major 11**

**Semester-VI**

**Paper Title: Advanced Surveying and Computer Application (Practical)**

**Course Code: GEO-MAJ-11P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. Learn how to use a Dumpy Level to create a contour plan.
- ii. Understand the methods for determining the height and distance of objects using a Transit Theodolite.
- iii. Learn the radiation, intersection, and traversing techniques in plane table survey.
- iv. Gain knowledge of recording points using GPS technology.
- v. Learn MS-Excel skills for processing Demographic, Weather, Climatic, and Socio-economic data, creating thematic diagrams like Bar, Pie, and Line graphs, and performing basic calculations and interpretations.
- vi. Develop skills in creating PowerPoint slides for presenting geographical data and information.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Utilize a Dumpy Level proficiently to create contour plans accurately.
- ii. Understand methods for determining the height and distance of objects using a Transit Theodolite effectively.
- iii. Apply Radiation, Intersection, and Traversing techniques in plane table survey competently.
- iv. Gain knowledge of recording points using GPS technology accurately.
- v. Apply MS-Excel skills for processing demographic, weather, climatic, and socio-economic data proficiently, including creating thematic diagrams like bar, pie, and line graphs, and performing basic calculations and interpretations.
- vi. Develop skills in creating PowerPoint slides for presenting geographical data and information effectively.

**Unit I:**

**Advanced Surveying**

- 1.1. Preparation of Contour Plan by Dumpy Level. (7)
- 1.2. Determination of Height and Distance of an object (Base accessible and Inaccessible) with a Transit Theodolite (Same instrument height and different Instrument height). (8)
- 1.3. Plane Table Survey: Radiation, Intersection and Traversing method. (10)
- 1.4. Global Positioning System (GPS): Only recording of Points. (5) **15 Marks**

**Unit II:**

**Computer Application**

- 2.1. Computer Application in Geography: Demographic data, Weather and Climatic data and Socio-economic data processing and Thematic Diagrams using Basic Calculations and interpretation (Bar, Pie and Line Graph, Regression) by MS–Excel. (10)
- 2.2. Preparation of PowerPoint slides. (10)
- 2.3. Preparation of posters (in Computer or manual). (10) **10Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= LNB**



**Suggested reading**

1. Basak, N. N. (2017). Surveying & Levelling (2nd ed.) [Paperback]. McGraw Hill Education.
2. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
3. Kanetkar, T. P. (2015). Surveying and Levelling Part I. Pune Vidyarthi Griha Prakashan.
4. Rao, P. V., & Akella, V. (2015). Textbook of Surveying [Paperback]. PHI Learning Private Limited.
5. Sarkar, A. (2015). Practical Geography: A Systematic Approach. Orient Blackswan Pvt. Ltd.

**Course: Major 12**

**Semester-VI**

**Paper Title: Environmental Geography (Theoretical)**

**Course Code: GEO-MAJ-12T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Understand environmental geography and its significance.
- ii. Identify environmental components: physical and socio-cultural
- iii. Explore human adaptation in different biomes
- iv. Analyze global and Indian environmental programs
- v. Define hazards, disasters, risk, vulnerability, and susceptibility
- vi. Examine various types of disasters in India and their management
- vii. Discuss response and mitigation measures
- viii. Emphasize capacity building for disaster management.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Understand environmental geography and its significance comprehensively.
- ii. Identify environmental components, including physical and socio-cultural aspects, accurately.
- iii. Explore human adaptation in different biomes proficiently.
- iv. Analyze global and Indian environmental programs effectively.
- v. Define hazards, disasters, risk, vulnerability, and susceptibility accurately.
- vi. Examine various types of disasters in India and their management competently.
- vii. Discuss response and mitigation measures comprehensively.
- viii. Emphasize capacity building for disaster management adeptly.

**Unit I:**

**Environmental Geography**

- 1.1. Environmental Geography: Definition, Nature and Scope. (5)
- 1.2. Components of Environment: Physical and Socio-cultural Environment. (5)
- 1.3. Environmental programmes in the World: Kyoto Protocol, Rio-Summit, Montreal Protocol, Chipko and Narmada Bachao Movement. (5)
- 1.4. Wetland: Definition, Wetland Services, Wetland Degradation and Management, Ramsar Sites (5)
- 1.5. Environmental programmes in India: Swachh Bharat Mission, Mission Nirmal Bangla, and Ganga Action Plan. (5)
- 1.6. Environmental Pollution: Water, Soil, Air. (5)

**25 Marks**



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**Unit II:**  
**Environmental Issues in Geography**

- 2.1. Definition and Concepts: Hazards, Disasters; Risk, Vulnerability, Susceptibility. (5)
- 2.2. Disasters in India: Factors, Vulnerability, Consequences, and Management: Drought. (5)
- 2.3. Disasters in India: Factors, Vulnerability, Consequences, and Management: Tropical Cyclone. (5)
- 2.4. Disasters in India: Factors, Vulnerability, Consequences, and Management: Riverbank erosion. (5)
- 2.5. Disasters in India: Factors, Vulnerability, Consequences, and Management: Manmade disasters. (5)
- 2.6. Response and Mitigation to Disasters. (5) **25 Marks**

\*CE= Tree Plantation / Environmental Awareness Programme

Note: Value in the parenthesis indicates contact hours per semester

**Suggested reading**

**A) Environmental Geography**

1. Cunningham, W. P., & Cunningham, M. A. (2004). Principles of Environmental Science: Inquiry and Applications. Tata Macgraw Hill.
2. Goudie, A. (2001). The Nature of the Environment. Blackwell.
3. Jones, G., & Hollier, G. (1997). Resources, Society, and Environmental Management. Paul Chapman.
4. Klee, G. (1991). Conservation of Natural Resources. Prentice Hall.
5. Mather, A. S., & Chapman, K. (1995). Environmental Resources. John Wiley and Sons.
6. Miller, G. T. (2004). Environmental Science: Working with the Earth. Thomson Brooks Cole.
7. Mitchell, B. (1997). Resource and Environmental Management. Longman Harlow.
8. Owen, S., & Owen, P. L. (1991). Environment, Resources, and Conservation. Cambridge University Press.
9. Saxena, H. M. (2017). Environmental Geography (Third Edition). Rawat Publications.
10. Sharma, P. D. (2011). Ecology and Environment. Rastogi Publications.
11. Singh, R. B. (Ed.). (2009). Biogeography and Biodiversity. Rawat Publication.
12. Singh, S. (2023). Environmental Geography [English]. Pravalika Publications.
13. Shil, A.K. (2024). Manabiyo Bhugol (Human Geography) [Bengali Edition]. The Himalayan Books.

**B) Environmental Issues in Geography**

1. Basu, R., Bhaduri, S. (Eds) (2007). Contemporary Issues and Techniques in Geography. Progressive Pub.
2. Coch, N.K. (1994). Geohazards: Natural and Human. Pearson College.
3. Cutter, S.L. (2006). Hazards Vulnerability and Environmental Justice. Routledge.
4. Government of India. (1997). Vulnerability Atlas of India (Revised ed.). Building Materials & Technology Promotion Council, Ministry of Urban Development.
5. Gupta, H.K. (2013). Disaster Management. University Press.
6. Hyndman, D., & Hyndman, D. (2016). Natural Hazards and Disasters (5th ed.). Cengage Learning.
7. Kapur, A. (2010). Vulnerable India: A Geographical Study of Disasters. Sage.
8. Keller, E.A., & DeVecchio, D.E. (2014). Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes (4th ed.). Routledge.
9. Paul, B.K. (2011). Environmental Hazards and Disasters: Contexts, Perspectives and Management. Wiley-Blackwell.
10. Pine, J.C. (2014). Hazards Analysis: Reducing the Impact of Disasters (2nd ed.). CRC Press.
11. Robbins, P., Hintz, J., & Moore, S.A. (2014). Environment and Society: A Critical Introduction (2nd ed.). Wiley.
12. Smith, K. (2013). Environmental Hazards: Assessing Risk and Reducing Disaster (6th ed.). Routledge.



**Course: Major 12**

**Semester-VI**

**Paper Title: Field Report (Practical)**

**Course Code: GEO-MAJ-12P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. To collect Primary Data through direct observation and fieldwork techniques.
- ii. To facilitate spatial analysis for mapping, GIS, and spatial modeling.
- iii. To assess environmental conditions and impacts on air, water, soil, and biodiversity.
- iv. To study human activities, behaviours, and interactions within specific geographic contexts.
- v. To analyze land use and land cover changes over time.
- vi. To document geographical phenomena such as natural hazards, geological formations, and weather patterns.
- vii. To validate Remote Sensing data through ground-truthing.
- viii. To inform policy decisions and planning initiatives at various levels.
- ix. To serve educational purposes for students and public outreach.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Effectively collect Primary Data using direct observation and fieldwork techniques.
- ii. Conduct spatial analysis for mapping, GIS, and spatial modeling proficiently.
- iii. Assess environmental conditions and impacts on air, water, soil, and biodiversity accurately.
- iv. Analyze human activities, behaviours, and interactions within specific geographic contexts competently.
- v. Evaluate land use and land cover changes over time adeptly.
- vi. Document geographical phenomena such as natural hazards, geological formations, and weather patterns comprehensively.
- vii. Validate Remote Sensing data through ground-truthing effectively.
- viii. Provide valuable inputs for policy decisions and planning initiatives at various levels.
- ix. Serve educational purposes for students and public outreach proficiently.

**Field Report**

Prepare a field report within 50 pages (computer typed), including diagrams and photo pages, by conducting field visits in groups to address any one of the issues mentioned in the following. The topics selected for study should be divided into different parts, with each part assigned to groups of 5-10 students. This should be clearly mentioned in the report at the beginning. The report should be duly signed by the concerned teacher(s) for evaluation by the external expert(s), followed by a Viva-Voce. It must encompass a description of the study area, specific objectives, relevant research questions, results, discussions, recommendations, policy implications, and APA formatted references. The report should be based on primary and/or secondary data and typed on A4 pages, with spiral-bound/Hard-bound formatting on a transparent/clear cover. **(30)**





<b>A) Physical and Environmental Issues</b> <ul style="list-style-type: none"><li>i) Earthquake</li><li>ii) Landslide</li><li>iii) Thunderstorm/ hailstorm</li><li>iv) Tropical Cyclone</li><li>v) Flood</li><li>vi) Riverbank / Coastal erosion</li><li>vii) Forest Fire</li><li>viii) Structural collapse</li><li>ix) Environmental pollution</li><li>x) Biohazard</li></ul>	<b>B) Social and Cultural Issues</b> <ul style="list-style-type: none"><li>i) Tribal Development</li><li>ii) Employment</li><li>iii) Heritage and Folk Culture</li><li>iv) Rural Development</li><li>v) Urban problems</li><li>vi) Health problems</li><li>vii) Indigenous healthcare methods and practices</li><li>viii) Quality of Life</li><li>ix) Migration</li><li>x) Problems of Environmental refugee</li></ul>
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**(Report (15) + Viva Voce (10) = 25Marks)**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= Preparation of Questionnaire/ Schedule and Secondary Data Collection**

**Suggested reading**

1. Gomes, B., Jones III, J.P. (Eds) (2010). Research Methods in Geography: A Critical Introduction. Wiley-Blackwell.
2. Lenon, B., Cleves, P. (2015). Geography Fieldwork and Skills. Harper-Collins.
3. Montello, D.R, Sutton, P. (2012). An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed. Sage.
4. Murthy, K.L.N. (2004). Research Methodology in Geography: A Text Book. Concept Publishing Co.
5. Northey, N., Draper, D., Knight, D.B. (2015). Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed. Oxford University Press.
6. Parsons, T., Knight, P.G. (2015). How to Do Your Dissertation in Geography and Related Disciplines, 3rd ed. Routledge.
7. Phillips, R., Johns, J. (2012). Fieldwork for Human Geography. Sage.
8. Riordan, D. (2013). Technical Report Writing Today, 10th ed. Wadsworth Publishing.
9. Roy, T., Mandal, B., Bandyopadhyay, C., Maity, M., & Bishal, P. (2020). Bhogolik Gobeshona Paddhati O Kshetra Samikha (Bengali). Kalyani Publishers.



Course: *Minor 3*

*Semester-III*

**Paper Title: Physical Geography (Theory)**

**Course Code: GEO-MIN-3T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Understand the earth's internal structure, rocks, and geomorphic processes.
- ii. Analyze Continental Drift, Plate Tectonic Theory, and Weathering.
- iii. Explore oceanography, atmospheric dynamics, and soil geography.
- iv. Understand ecosystems, biodiversity, and conservation efforts.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Demonstrate a comprehensive understanding of geological processes and landforms.
- ii. Interpret oceanographic and atmospheric phenomena proficiently.
- iii. Analyze soil characteristics and ecosystem dynamics effectively.
- iv. Evaluate the importance of biodiversity and propose conservation strategies.

**Unit I:**

**Geotectonic and Geomorphology**

- 1.1. Internal structure of the earth; Rocks: Characteristics, types, and rock cycle,
- 1.2. Continental Drift and Plate Tectonic Theory
- 1.3. Geomorphic Processes and Resultant Landforms: Endogenetic (Fold & Fault) and Exogenetic (Fluvial, Sea Wave, Wind and Glaciers)
- 1.4. Weathering: meaning, types and controlling factors. **(20 Marks)**

**Unit II**

**Hydrosphere & Climatology**

- 2.1. Ocean: Bottom Relief features (Indian, Atlantic and Pacific Ocean), Deposits and Currents (Indian, Atlantic and Pacific)
- 2.2. Composition and structure of the atmosphere, Insolation, Pressure and Pressure Belts,
- 2.3. Winds: Planetary, Periodic, and Local **(15 Marks)**

**Unit III**

**Soil Geography & Biogeography**

- 3.1. Soil: Factors and Processes of Soil Formation; Physical Properties of Soil: Structure, Texture
- 3.2. Ecosystem: Concept, Types and components, Energy flow
- 3.3. Biodiversity: Importance and Conservation **(15 Marks)**

**Note: Value in the parenthesis indicates contact hours per semester**

**\*CE= Class test**

**Suggested Reading:**

1. Barry, R.G. and Chorley, R.J. (1998). Atmosphere, Weather and Climate. Routledge, London.
2. Bera, B., Bhattacharya, S., & Sengupta, N. (2016). Jib Bhugol O Poribesh. Navodaya Publications.
3. Bryant, H. Richard (2001). Physical Geography Made Simple. Rupa and Co., New Delhi.
4. Buckman, H. R., & Brady, N. C. (1974). Nature and Properties of Soil. McMillan.
5. Bunnnett, R.B. (2003). Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Pvt Ltd.



6. Bunting, A. (1965). Geography of Soil. Hutchinson.
7. Chapman, J. L., & Reiz, M. J. (1993). Ecology: Principles and Applications. Cambridge University Press
8. Chiras, D. D., & Reganold, J. P. (2009). Natural Resource Conservation: Management for a Sustainable Future (10th ed.). Pearson.
9. De, N. K., & Sarkar, M. K. (1994). Mrittika Bhu-vidya. Paschim Banga Rajya Pustak Parshad.
10. Garrison T (1998). Oceanography. Wordsworth Cp, Bedmont.
11. Gerrard, J. (2000). Fundamentals of Soils. Routledge.
12. Huggett, R. (1998). Fundamentals of Biogeography. Routledge.
13. MacDonald, G. (2001). Biogeography: Introduction to Space, Time and Life. Wiley.
14. Morgan, R. P. C. (2005). Soil Erosion and Conservation (3rd ed.). Wiley-Blackwell.
15. Odum, F. P. (1971). Fundamentals of Ecology. W.B. Sanders.
16. Santra, A. (2006). Handbook on Wild and Zoo Animals. International Book Distributing Co.
17. Singh, S. (2003). Physical Geography (English and Hindi Editions) Prayag Pustak Bhawan, Allahabad.
18. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York
19. Thornbury, W. D. (1954). Principles of Geomorphology. New York: John Wiley.
20. Wooldridge, S.W. and Morgan, R.S. (1959). The Physical Basis of Geography: An Outline of Geomorphology, Longman, London

**Course: Minor 3**

**Semester-III**

**Paper Title: Scale and Map Projection (Practical)**

**Course Code: GEO-MIN-3P**

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. To learn the function and use of Map scale
- ii. To learn the function and use of Map projection

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Effectively utilize map scales for accurate measurement and representation of distances on maps.
- ii. Apply appropriate map projections to accurately represent the curved surface of the Earth on flat maps.

**Unit I:**

**Scale**

1.1. Concept of Scale and Scale Conversion, Graphical Construction of Linear Scale and Diagonal Scale. (30) **10 Marks**

**Unit II**

**Map Projection**

2.1. Concept of Map Projection: Polar Zenithal Gnomonic Projection, Simple Conical projection with One Standard Parallel, and Cylindrical Equal Area Projection (Graphical Construction). (30) **15 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB



**Suggested Reading:**

1. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
2. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
3. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
4. Sharma, J.P. (2001). Prayogik Bhoogol. Rastogi Pub, Meerut.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
6. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.

**Course: Minor 4**

**Semester-IV**

**Paper Title: Economic and Human Geography (Theory)**

**Course Code: GEO-MIN-4T**

**Full Marks-50**

**Time-2 hrs**

**Programme Objectives:**

- i. Understand the concept and classification of resources, including forest and mineral resources.
- ii. Analyze economic activities and sectors, focusing on primary and secondary sectors.
- iii. Explore human geography, including human adaptations and ethnic diversity.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Demonstrate understanding of resource concepts and their conservation.
- ii. Analyze economic activities and sectors proficiently.
- iii. Interpret human adaptations and ethnic diversity accurately.

**Unit I:  
Geography of Resource**

- 1.1. Concept of Resource: Definition, Characteristics, Classification of Resource. (7)
- 1.2. Forest Resources: Types, Depletion and Conservation. (7)
- 1.3. Mineral and Power resources: Uses and distribution of Coal, Petroleum and Iron ore, Conventional and Non-Conventional energy resources; Depletion and Conservation of resources. (6)

**15 Marks**

**Unit II:  
Economic Geography**

- 2.1. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (7)
- 2.2. Primary activities: Definition and Types of Agriculture. (7)
- 2.3. Secondary activities: Definition and Types of Manufacturing Industries. (6)

**15 Marks**



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**Unit III:  
Human Geography**

- 3.1. Human Geography: Definition, Nature, and Scope; Approaches to Human Geography with special reference to Man-Environment relationship. (6)
- 3.2. Human Adaptations in different climatic regions: Pygmy, Masai, Bedouin, Kirghiz, Eskimo. (7)
- 3.3. Concept of Ethnicity and Tribe, Distribution and Characteristics of Major Tribes of India: Oraon, Gond, Santhal, Jarawa, Khasi. (7) **20 Marks**

**Note:** Value in the parenthesis indicates contact hours per semester.

**\*CE= MCQ Test**

**10 Marks**

**Suggested Reading:**

1. De Blij, H.J. Human Geography: Culture, Society and Space. John Wiley, New York.
2. Husain, Majid (2021): Human Geography, Rawat Publications, New Delhi.
3. Kaushik, S.D.& Sharma, A.K. (1996): Principles of Human Geography, Rastogi Pub. Meerut.
4. Maurya, S.D. (2018): Human Geography, Pravalika Publications, Allahabad.
5. Norton W. (1995). Human Geography. Oxford University Press, New York.
6. Patra, Punyatoya, et al. (2020): Perspectives in Human Geography, Concept Publishing Company, Ltd., New Delhi.
7. Saxena, H.M. (2018): Economic Geography, 2nd Edition, Rawat Publications, New Delhi.
8. Singh, L...R. (2018): Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad.

**Course:** *Minor 4*

**Semester:** *IV*

**Paper Title:** **Topographical Map and Weather Map (Practical)**

**Course Code:** GEO-MIN-4P

**Full Marks-25**

**Time-2:30 hrs**

**Programme Objectives:**

- i. Interpret topographical maps for Physiography, Drainage, Settlement, and Transportation.
- ii. Apply morphometric techniques for analyzing land features.
- iii. Learn about weather instruments and representing climatic data with climographs and Hythergraphs.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Interpret topographical maps comprehensively, identifying various geographic features accurately.
- ii. Apply morphometric techniques confidently to analyze and assess land features.
- iii. Utilize weather instruments effectively and represent climatic data accurately using climographs and Hythergraphs.



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**Unit I:**

**Topographical Map**

1.1. General Interpretation of Topographical Map: Broad Physiographic Divisions & Relief features, Drainage Pattern, Settlements Transport & Communication and Transect Chart. (15)

1.2. Morphometric Techniques: Relative Relief (Smith), Average Slope (Wentworth) and Drainage Density (Horton) (15) **15 Marks)**

**Unit II**

**Weather Map**

2.1. Weather instruments: Maximum and minimum Thermometer, Hygrometer and Rain gauge. (15)

2.2. Representation of climatic data: Climograph (According to Taylor) and Hythergraph (According to Taylor) (15) **10 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**

\*CE= LNB

**Suggested Reading**

1. Das, D., & Hazra, J. (2023). Snatok Byaboharik Bhugol [Bengali Edition] [Paperback]. CHAYA PRAKASHANI.
2. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London.
3. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
4. Sharma, J.P. (2001). Prayogik Bhoogol. Rastogi Pub, Meerut.
5. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
6. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.



**Course:** MDC 2 Semester-III

**Course Name:** Fundamentals of Human Geography (Theoretical)

**Course Code:** GEO-MDC 2

**Full Marks-35**

**Time-2 hrs**

**Programme Objectives:**

1. To learn the Meaning, Concept, Nature, Scope and development of Human Geography.
2. To understand the Culture and society of the World and India
3. To learn about the Nature of Population and Human Settlements.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Demonstrate understanding of Human Geography concepts.
- ii. Analyze human adaptation and cultural diversity effectively.
- iii. Evaluate societal progress using the Human Development Index.
- iv. Understand cultural and societal structures proficiently.
- v. Interpret population dynamics and migration accurately.
- vi. Analyze human settlement patterns competently.

**Unit I:**

**Introduction to Human Geography**

- 1.1. Human Geography: Definition, Scope, Elements. (2)
- 1.2. Human Adaptation to Environment with Special Reference to Eskimo, Kirghiz, Bushman, Masai, Gond, Jaroa and Santal (4)
- 1.3. Concept of Ethnicity and Tribe, Distribution and Characteristics of Major Tribes of India: Oraon, Gond, Santhal, Jarawa, Khasi. (4) **10 Marks**

**Unit II:**

**Cultural and Social Geography**

- 2.1. Concept of Culture, Cultural Hearths. (3)
- 2.2. Race: Definition and classification of major races of the World and India. (4)
- 2.3. Concept of Society and Community, Social Groups. (3) **10 Marks**

**Unit III:**

**Human Population and Settlements**

- 3.1. Population: Growth, Fertility, Mortality, Regional distribution of Density of Population in India. (3)
- 3.2. Population Movement: Definition of Migration and related terminologies, Types, Causes and Consequences of Migration. (3)
- 3.3. Human Settlements: Origin, Types and Patterns of Human Settlements, Characteristics of Rural and Urban Settlements, Functional Classification of Urban Settlements after Ashok Mitra. (4) **15 Marks**

**\*CE= Class Test**

**10 Marks**

**Note: Value in the parenthesis indicates contact hours per semester**



**Suggested Reading:**

1. De Blij, H.J. *Human Geography: Culture, Society and Space*. John Wiley, New York.
2. Husain, Majid (2021): *Human Geography*, Rawat Publications, New Delhi.
3. Kaushik, S.D.& Sharma, A.K. (1996): *Principles of Human Geography*, Rastogi Pub. Meerut.
4. Maurya, S.D. (2016): *Cultural Geography*, Sardha Pustak Bhawan, Allahabad.
5. Maurya, S.D. (2018): *Human Geography*, Pravalika Publications, Allahabad.
6. Patra, Punyatoya, et al. (2020): *Perspectives in Human Geography*, Concept Publishing Company, Ltd., New Delhi.
7. Shil, A.K. (2024). *Manobiyo Bhugol (Human Geography) [Bengali Edition]*. The Himalayan Books.
8. Singh, L.R. (2005). *Fundamentals of Human Geography*, Sharda Pustak Bhawan, Allahabad.

**Course:** MDC 3      Semester-V

**Paper Name:** Fundamentals of Economic Geography (Theory)

**Course Code:** GEO-MDC 3

**Full Marks-35**

**Time-2 hrs**

**Programme Objectives:**

- i. Gain an understanding of the different classifications and types of economic activities.
- ii. Comprehend the theories and models used to explain the spatial distribution of industries.
- iii. Analyze specific examples of industries in various countries and regions to understand their characteristics and significance.

**Programme Outcome:**

**Upon completion of this course, students will be able to**

- i. Identify various classifications and types of economic activities effectively.
- ii. Apply theories and models to explain the spatial distribution of industries proficiently.
- iii. Analyze specific examples of industries in various countries and regions accurately.

**Unit I:**

**Introduction to Economic Geography**

- 1.1. Economic Geography: Definition, Scope and Elements. (3)
- 1.2. Classification of economic activities: Primary, Secondary, Tertiary, Quaternary, and Quinary. (3)
- 1.3. Location of economic activities: Von Thünen. (4)      **10 Marks**

**Unit II:**

**Economic Activities**

- 2.1. Primary activities: Agriculture, Forestry, Fishing, and Mining. (3)
- 2.2. Secondary activities: Classification of manufacturing industries, Special Economic Zones and Technology Parks. (4)
- 2.3. Tertiary activities: Transport, Trade and Services. (3)      **10 Marks**





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**Unit III:  
Industrial Geography**

- 3.1. Nature and Scope of Industrial Geography. (2)
- 3.2. Industrial Location Theory: Alfred Weber's Model and Profit Maximization Theory of August Losch. (3)
- 3.3. Agro-based Industry: Cotton Textile (India), Paper Industry (Canada, India) (3)
- 3.4. Mineral Based Industry - Metal - Iron & Steel (India); Non-metal - Petrochemical (India) (2)

**15 Marks**

**\*CE= Project**

Students will visit any local industry, agricultural field, or MGNREGA project sites and note down their observations in their own words, either in English or their mother tongue, spanning 5-6 pages. They will explain what they have learned or their understanding based on their observations. The teacher will mentor the entire process. **(This is an Internal Assessment (CE) Part (10). 10 marks**

**Note: Value in the parenthesis indicates contact hours per semester**

**Suggested Reading:**

1. Anderson, W.P. (2012). Economic Geography. Routledge.
2. Aoyama, Y., Murphy, J.T., & Hanson, S. (2010). Key Concepts in Economic Geography. Sage.
3. Chattopadhyay, A. (2020). Bharat O Paschim Bonger Bhugol [Geography of India and West Bengal] (Jan 2020 ed.). Nabodaya Publications
4. Economic Geography: A Contemporary Introduction, 3rd ed. Wiley-Blackwell.
5. Combes, P., Mayer, T., & Thisse, J.F. (2008). Economic Geography: The Integration of Regions and Nations. Princeton University Press.
6. Hamilton, I. (Ed.). (1992). Resources and Industry. Oxford University Press.
7. MacKinnon, D., & Cumbers, A. (2019). An Introduction to Economic Geography: Globalization, Uneven Development and Place, 3rd ed. Routledge.
8. Willington, D.E. (2008). Economic Geography. Husband Press.