



Geography Optional (UPSC Mains)

Paper I - Section A

**Physical Geography**

**I. UNIT 1: Geomorphology**

**Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth's crust; Fundamentals of geomagnetism; Physical conditions of the earth's interior; Geosynclines; Continental drift; Isostasy; Plate tectonics; Recent views on mountain building; Vulcanicity; Earthquakes and Tsunamis; Concepts of geomorphic cycles and Landscape development ; Denudation chronology; Channel morphology; Erosion surfaces; Slope development ; Applied Geomorphology : Geohydrology, economic geology and environment.**

**2017**

42. Write a note on pseudovolcanic features (10)
43. The knowledge of slope analysis has limited field application in the slope management. Explain. (15)
44. Discuss the concept of Periglacial cycle as propounded by Peltier. (20)
45. "Climate, slope gradient and rock structure influence the avulsion of channels." Explain. (15)

**2018**

46. "Landscape is a function of structure, process and stage." Critique the statement. (10)
47. Evaluate how far Kober's geosynclinals theory explains the mountain building process. (20)

**2019**

48. Describe phreatic eruptions and their consequences. (10)
49. How are sandspits and tombolos formed? (10)
50. Compare and contrast different types of plate boundaries. (15)
51. Discuss the methods of measuring the intensity and magnitude of earthquakes. How are seismic zones demarcated? (20)

**2020**

52. Why is mapping important for analyzing geo-hydrological investigations? Explain with relevant examples. (10)

**9003777380**

53. Write an essay on the evolution of continents and oceans using various theories and models. (20)

54. Discuss the problems of erosional surfaces and explain the different methods to identify them with suitable diagrams. (20)

**2021**

55. Describe the concept of Altiplanation (10)

56. The concept of Plate Tectonics has been derived from the Isostasy and Continental Drift Theory. Elaborate citing suitable examples (20)

57. Stream basins and drainage divides are important components to delineate a watershed area. Explain. (15)

**2022**

58. Define 'speleothem'. Discuss the various forms and features of speleothems. 10

59. Explain how various aspects of channel morphology are used in transportation, settlement and land use planning flood control and flood management? 15

60. Discuss the role of Slope, Altitude and Relief (SAR) in landscape development. 15

61. With the help of suitable sketches describe the mountain genesis and mountain types. Give suitable examples from various mountain systems of the world. 15

## **II. Climatology**

**Temperature and pressure belts of the world; Heat budget of the earth; Atmospheric circulation; atmospheric stability and instability. Planetary and local winds; Monsoons and jet streams; Air masses and fronto genesis, Temperate and tropical cyclones; Types and distribution of precipitation; Weather and Climate; Koppen's, Thornthwaite's and Trewartha's classification of world climates; Hydrological cycle; Global climatic change and role and response of man in climatic changes, Applied climatology and Urban climate.**

**2017**

39. Discuss the forces which govern the air movement on the earth's surface. (20)

40. "Climate change is a reality." Explain with suitable examples. (20)

**2018**

41. Explain the role of evaporation in the hydrologic cycle. (10)



42. Critically examine the basis and scheme of climatic classification proposed by G.T.Trewartha. (15)

43. Explain the origin, progress and retreat of the Indian monsoon and discuss its impact on the Indian economy. (20)

**2019**

44. Explain the techniques to calculate potential evapo-transpiration suggested by Thornthwaite. (10)

45. Discuss in detail the tri-cellular model of atmospheric circulation. (20)

**2020**

46. Write a geographical note on Halloween storm (10)

47. Explain how various factors influence the origin and development of the Indian monsoon system. (20)

48. Explain the characteristic features of frontogenesis and frontolysis. (15)

**2021**

49. What are the important factors responsible for Airmass modifications? (10)

50. Examine major influencing factors for varied patterns of precipitations on the continents. (20)

51. With suitable examples describe the impacts of movement of air masses on weather and winds in different parts of the continents. 15

**2022**

52. Rise of surface temperature brings severe consequences. Elaborate the potential changes and threats associated with it in the world. 20

53. Describe how short term variations in temperature are related to the processes of receiving energy from the sun to the Earth's surface and dissipating it to the atmosphere. 15

### **III. Oceanography**

**Bottom topography of the Atlantic, Indian and Pacific Oceans; Temperature and salinity of the oceans; Heat and salt budgets, Ocean deposits; Waves, currents and tides; Marine resources: biotic, mineral and energy resources; Coral reefs, coral bleaching; sea-level changes; law of the sea and marine pollution.**

**2017**

25. Distinguish between low energy coasts and coral coasts (10)

26. Discuss the impacts of ocean currents on airmass behaviour (10)



27. Describe the configuration of the Pacific Ocean floor. (15)

**2018**

28. Describe the causes and consequences of sea level changes. (10)

29. Describe the potential marine energy resources with reference to their benefits, harvestability and environmental impacts. (20)

**2019**

30. How are ocean waves formed? Distinguish between a wave of oscillation and a wave of translation.

**2020**

31. Marine resources are economically very significant. Discuss citing suitable examples. (10)

32. Discuss the concept of coral bleaching, its recovery and microalgal regime shifts due to this process. (15)

33. Explain the currents of the North Atlantic Ocean and their significant role in the climate of western Europe. (15)

**2021**

34. Discuss the hazards associated with the rising of sea surface temperature. (10)

35. Give a detailed account of the bottom topography of the Pacific Ocean (15)

36. Maritime security is being neglected. Indicate the major challenges and suggest solutions in the context of the Law of Sea. (15)

**2022**

37. When corals are affected by stress it cause them to turn completely white. Explain the reasons of such an occurrence. (10)

38. What is the relationship between ocean currents and global surface wind systems? Explain with examples how does the gyre in the Northern Hemisphere differ from the one in the Southern Hemisphere. 15

#### **IV. Biogeography**

**Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Factors influencing world distribution of plants and animals; Problems of deforestation and conservation measures; Social forestry; agro-forestry; Wild life; Major gene pool centres.**

**2017**

23. Explain the concept of micro carbon sink and its relevance. (10)
24. Discuss the Perception, Attitude, Value and Emotion (PAVE) Theory of environmental management. (15)

**2018**

25. Explain the natural and anthropogenic causes and mitigation measures of frequent flooding in Mumbai. (10)
26. Discuss the objectives and principles of environmental education. Describe the basic concerns of formal and non-formal environmental education in India.(15)
27. "Controlling population growth is the sustainable solution to environmental problems." Express your views with suitable arguments. (15)
28. Explain the ecosystem approach to environmental management and highlight its advantages and disadvantages. (15)
29. Discuss the causes of degradation of tropical rainforests and suggest remedial measures for their prevention, conservation and development. (15)

**2019**

30. Amensalism is a biotic factor that determines the geographic limits of species. Explain. (10)
31. How do mountaineers constitute a threat to Mount Everest? (10)
32. Explain the nature of urban climates and their impact on global environmental change.(15)
33. "The web of life is seamless and the consequences of disruption to one part of the ecosystem ripple throughout the whole." Elaborate. (15)
34. The impact of floods on life and property can be most effectively reduced by hazard mapping. Comment (15)

**2020**

35. Discuss the problems associated with the living environment in million-plus cities in India. How can these be managed? (10)
36. Discuss the human response to and management of hazards and disasters in India (15)

**2021**

37. Describe How ecosystem services of Himalaya are essential for Highland-Lowland sustainability in Asia. (10)

**9003777380**

38. Explaining the concept of carbon neutrality, describe the measures taken by carbon positive and negative nations. (15)
39. With suitable examples, elaborate human ecological adaptations. Explain its impacts on ecology and the environment in various parts of the world. (20)
40. Indicating the causes of lightning, describe the threats associated with it. (15)

**2022**

41. What are the high altitude environmental hazards? Explain with suitable examples. (10)
42. What is pollution dome? Discuss its formation and impacts. (10)
43. Sequential changes in land use and land cover have brought global and regional ecological changes and imbalances. Elucidate. (20)

## **SECTION B**

### **Human Geography**

#### **I. Perspectives in Human Geography**

**Areal differentiation; regional synthesis; Dichotomy and dualism; Environmentalism; Quantitative revolution and locational analysis; radical, behavioural, human and welfare approaches; Languages, religions and secularisation; Cultural regions of the world; Human development index.**

**2017**

1. Explain the concept of Time-Geography. (10)
2. Discuss the contemporary paradigms of Geography. (20)

**2018**

3. "Geography is a contested and multiparadigmatic discipline with a strong eurocentricity that has only recently been challenged." Comment. (10)
4. "Areal differentiation has provided the theoretical justification for studying, regions and regional geography. Comment. (20)
5. Comment upon the contributions of D.M Smith in outlining „welfare as a key focus in the geographies of social well-being. (15)
6. Elaborate upon the influence of Marxist philosophy on geographical research outlining key theme addressed by Marxist geographers since the 1970's. (15)



**9003777380**

7. Discuss critically the manner in which quantitative revolution provided the methodological foundation for models and modeling in geography. (15)

**2019**

8. "A language originates at a particular place and diffuses to other locations through the migration of its speakers." Examine this statement in the context of language hot spots and endangered language hot spots. (10)
9. Globalization can often subsume folk culture. What are its positive and negative effects? (15)

**2020**

10. Analyze India's food security in the context of population growth. (10)
11. "Human ecology is the study of the mutual relationship of people and their environment both natural and social." Discuss in detail using ecological concepts. (15)

**2021**

12. The interrelationships between the social and spatial structure are complex. Explain in the context of socio-spatial dialectic. (10)
13. Why is radicalism seen as major a paradigm shift in geography? Explain its causes, approaches, and criticism. (20)

**2022**

14. Analyse the effects of Globalisation on languages. 10
15. "Culture is a dynamic concept". Elucidate with examples. 20
16. Critically examine the significance of the Quantitative Revolution and its influence in the development of Geography. 15

## **II. Economic Geography: World economic development**

**Measurement and problems; World resources and their distribution; Energy crisis; the limits to growth; World agriculture: typology of agricultural regions; agricultural inputs and productivity; Food and nutrition problems; Food security; famine: causes, effects and remedies; World industries: locational patterns and problems; patterns of world trade.**

**2017**

25. "The intensity of energy crisis varies regionally." Explain. (15)

**2018**



**9003777380**

26. Discuss the degree of importance of transportation costs as a factor of industrial location with respect to “footloose industries”. (10)
27. Citing examples from Asia and Europe, comment upon the contexts within which pronatalist population policies are advanced what could be the implications of these policies on women's workforce participation. (15)
28. “Famine is a social phenomena rooted in institutional and political economic arrangements, which determine access to food by different classes and strata.” Comment. (15)
29. Discuss in brief the main thesis in “Limits to Growth” (1972) and also provide a critique of the same. (15)

**2019**

30. Define stunting and wasting. Why are these more prevalent among children in developing countries? (10)
31. "A large-scale global shift in manufacturing is the outcome of deindustrialization in the developed world matched by industrialization in the developing world." Analyze this statement. (15)

**2020**

32. Identify the causes and effects of energy crisis, and suggest suitable measures to solve the problem. (10)
33. “Land degradation is a threat to productivity and sustainable resource management” Explain with suitable examples from India. (15)

**2021**

34. How is energy transition seen as an instrument for achieving zero carbon by 2050? (10)
35. Describe the role of accessibility and affordability in the food security of the developing world. (15)

**2022**

36. “Shifting global trade patterns create new opportunities.” Examine this statement. 10
37. “Automation is rapidly changing the economies of labour and will affect trade patterns in significant ways”. Clarify. 15
38. Climate change is a serious problem to global food security and poverty eradication”. Critically examine. 20



### **III. Population and Settlement Geography**

**Growth and distribution of world population; demographic attributes; Causes and consequences of migration; concepts of over-under-and optimum population; Population theories, world population problems and policies, Social well-being and quality of life; Population as social capital.**

**Types and patterns of rural settlements; Environmental issues in rural settlements; Hierarchy of urban settlements; Urban morphology: Concepts of primate city and rank-size rule; Functional classification of towns; Sphere of urban influence; Rural - urban fringe; Satellite towns; Problems and remedies of urbanization; Sustainable development of cities.**

#### **2017**

29. Examine the causes and consequences of forced migration of 15 population in the present context. (15)
30. "There are considerable demographic similarities between West European nations and Japan." Explain. (15)
31. Define the quality of life and explain its parameters with adequate examples. (15)
32. Explain the concept of social capital in relation to India. (15)

#### **2018**

33. Explain the concepts of "megalopolis" and "exopolis" with regard to the growth of cities indicating whether the two can and do overlap. (10)

#### **2019**

34. Explain the relationship between net reproductive rate (NRR) and true replacement level of population. (10)
35. HDI has brought about a paradigm shift in the way people think about the development process. Critically examine the inherent limitations of HDI. (20)
36. What do you mean by 'climate migrants'? Suggest appropriate policies and programmes for their resettlement. (15)
37. Assess the challenges for countries with the largest shares of aged populations. (15)

#### **2020**

38. Distinguish between mobility and migration. What are the causes and consequences of rural to urban migration in India? (10)
39. Write an essay on gender equity and equality in India in the context of balanced human development. (15)

40. Provide an account of world population transition in the context of fertility decline and socio-economic development. (15)

**2021**

41. Protected cultivation assists in healthier and larger produce. Justify with examples. (10)

42. Development-induced displacement poses serious challenges. Mention its causes, consequences, and solutions. (20)

43. Small number of mega-cities are playing a key role in organization of global economics and culture. Explain. (15)

44. Aging population has adverse social and economic consequences. Explain with examples. (15)

**2022**

45. Examine the morphological factors that influence the origin and growth of towns. 10

46. "Over crowding leads to chronic problem of shortage of housing in Indian cities". Explain citing relevant examples. 15

47. How migration is affected by push and pull factors? Explain how these factors play a role in understanding new settlement patterns. 20

#### **IV. Regional Planning**

**Concept of a region; Types of regions and methods of regionalisation; Growth centres and growth poles; Regional imbalances; regional development strategies; environmental issues in regional planning; Planning for sustainable development.**

**2017**

28. "The traditional cultural identities are at loss with the of growth global connectivity." Explain. (10)

29. Give an account on sustainable development and its components. (10)

30. Examine the role of small towns in the regional development process. (15)

**2018**

31. Write a note on "forward and backward linkages" in Perroux's thesis of economic growth and regional development. (10)

32. "Welfare geography emphasizes spatial inequality and territorial justice." Comment with reference to the main ideas and scope of the subfield. (20)



**9003777380**

33. Provide a brief outline of ideas related to “sense of place” as propounded by Yi-Fu Tuan and Relph in humanistic geography that emerged in the 1970's. (15)

**2019**

34. What are natural regions? How are they different from planning regions? (10)

35. What changes in the current planning, management and governance of human settlements are needed to face the changing environment including climate change and disaster vulnerabilities in cities? (15)

36. "Growth is not uniform in different places." Critically examine this statement in the context of the growth pole theory. (15)

**2020**

37. “Where economic growth is sustained over long time periods, its incidence works towards a progressive integration of the space economy.” Elucidate. (10)

38. Discuss the concept of urban resilience in the context of planning for sustainable development with reference to towns and cities of India. (20)

**2021**

39. Explain the processes of contagion and hierarchical diffusion in addressing regional imbalances. (10)

40. The environmental issues are not adequately addressed in the regional planning. Comment. (15)

41. Suggest criteria, indicators, and techniques for delimitation of formal regions. (20)

**2022**

42. Discuss the role of transportation accessibility in regional development. 10

43. Explain in detail the impact of regional disparities on economic development. 15

## **V. Models, Theories & Laws in Human Geography**

**Systems analysis in Human geography; Malthusian, Marxian and demographic transition models; Central Place theories of Christaller and Losch; Perroux and Boudeville; Von Thunen’s model of agricultural location; Weber’s model of industrial location; Ostov’s model of stages of growth. Heartland and Rimland Theories; Laws of international boundaries and frontiers.**

**2017**

1. "Whittlesey's agricultural regions are relevant even today." Discuss. (10)

2. Write an explanatory note on geographical systems. (10)



3. Discuss the applicability of Christaller's Central Place Theory. (20)
4. "The Heartland Theory is gaining importance once again." Comment. (20)

**2018**

5. Outline briefly the "age of mass consumption" as described by Rostow in his „multi-stage theory of growth. (10)

**2019**

6. Discuss the genetic classification of boundaries suggested by Hartshorne. (10)
7. Distinguish between 'isodapanes' and isotimes'. Critically examine the least cost theory of industrial location given by Alfred Weber. (20)
8. Examine the relevance of the 'rimland theory' in the contemporary world. (15)

**2020**

9. Write a note on the relevance of Von Thunen's agricultural location theory in the present context. (10)
10. Compare and contrast the Malthusian and Neo-Malthusian perspectives in the context of population growth, resource use, and environmental impact. (20)
11. In the modern world, most of the frontiers have been replaced by boundaries. Explain the reasons. (15)
12. Analyse the dynamics of industrial location in the metropolitan cities of India. (15)
13. Discuss how and why Mackinder modified his concept of Pivot Area after the World Wars. (20)

**2021**

14. Examine the relevance of the Central Place Theory of Christaller in the present context. (10)
15. Boundaries are important in geopolitics. Explain. What issues develop from the inclusionary and exclusionary aspects of borders. (15)
16. Present a critical account of Alfred Weber Theory of Industrial location. (15)

**2022**

17. Explain the geometrical boundaries with examples. 10
18. Explain the relevance and applicability of Von Thunen theory of Agriculture-location in today's world. 15
19. Discuss the concept of 'Rank-size-Rule' given by G K Zipf. Is this rule relevant in Indian context? 15