

NARUMALAR ACADEMY – ONLINE COACHING CENTRE

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COLLEGE TRB – GEOGRAPHY

DEMO FILE

UNIT – 1: GEOMORPHOLOGY

1. When two continental plates converge, crustal material cannot subduct due to similar densities. This collision leads to extensive folding, metamorphism, and crustal thickening. Over millions of years, the region uplifts into a vast orogenic belt. Which mountain range represents this process?

- A) Andes
- B) Rockies
- C) Alps
- D) Himalayas

Answer: D) Himalayas

Explanation: The Himalayas formed when the Indian and Eurasian plates collided about 50 million years ago. Compression caused crustal shortening and folding instead of subduction. The rocks were thrust upward forming fold mountains. This process still continues, raising the Himalayas each year.

2. The geomorphic cycle of Davis assumes time-bound stages of landform evolution. However, it fails to explain landscapes experiencing constant uplift and denudation together. Modern geomorphologists emphasize dynamic equilibrium instead of sequential stages. Which model best represents this view?

- A) Penck's model
- B) Hack's dynamic equilibrium theory
- C) Strahler's cyclic model
- D) Gilbert's profile law

Answer: B) Hack's dynamic equilibrium theory

Explanation: Hack proposed that landforms maintain a steady-state balance between erosion and tectonic uplift. Instead of passing through fixed stages, slopes and rivers adjust continuously. The system evolves toward equilibrium under active forces. This dynamic view modernized geomorphic thought.

3. Temperature inversion layers in basins trap pollutants below warmer air aloft. Industrial cities surrounded by hills experience frequent smog accumulation during calm winter nights. The situation worsens when wind velocity declines and humidity rises. Which phenomenon best describes this event?

- A) Photochemical smog
- B) Acid rain
- C) Radiation inversion
- D) Advection fog

Answer: C) Radiation inversion

Explanation: During night, ground cooling by radiation chills near-surface air. Warm air above prevents vertical mixing, forming a stable inversion layer. Pollutants accumulate, increasing aerosol concentration. This causes dense smog episodes in industrial valleys.

4. ENSO events originate from abnormal warming or cooling of the Pacific Ocean surface. These temperature anomalies modify pressure gradients and trade winds across the tropics. As a result, global rainfall and wind systems shift dramatically. Which part of India is most affected during El Niño years?

- A) Central and Northern India
- B) Peninsular plateau
- C) Western Ghats
- D) Coastal Odisha

Answer: A) Central and Northern India

Explanation: El Niño weakens the Walker circulation, reducing monsoon strength over India. Droughts frequently occur in central and northern regions. Rain-bearing winds shift eastward, depriving interior India of moisture. Historical droughts like 1982–83 align with El Niño years.

5. Oceanic salinity variations depend on evaporation, precipitation, and freshwater inflow. In subtropical latitudes, high temperatures and descending air enhance evaporation. Conversely, equatorial and polar regions show lower salinity values. Which ocean zone records maximum salinity?

- A) Subtropical belt
- B) Equatorial belt
- C) Temperate zone
- D) Polar front

Answer: A) Subtropical belt

Explanation: Between 20°–35° latitudes, evaporation exceeds precipitation creating saline waters. The Mediterranean Sea and Red Sea are examples. Low humidity and clear skies promote salinity concentration. This pattern aligns with Hadley Cell subsidence zones.

6. Deep Ecology advocates that all organisms have intrinsic value, not just utilitarian worth. It calls for restructuring of human relationships with nature through moral inclusion. The philosophy challenges development driven solely by profit and consumption. Which concept best summarizes its central idea?

- A) Environmental stewardship
- B) Ecocentrism
- C) Sustainable capitalism
- D) Ecofeminism

Answer: B) Ecocentrism

Explanation: Ecocentrism regards ecosystems as ethically significant beyond human interests. It moves away from anthropocentric approaches in policy-making. Deep Ecology thus promotes equality of all life forms. Its vision demands spiritual and ethical transformation of human society.

7. The Demographic Transition Model assumes that declining mortality precedes fertility decline. However, in developing nations, fertility often remains high despite improved healthcare. Socio-cultural inertia and gender norms delay demographic stabilization. Which factor mainly causes this deviation?

- A) Industrial growth
- B) Economic inequality
- C) Cultural resistance to family planning
- D) Technological diffusion

Answer: C) Cultural resistance to family planning

Explanation: Fertility decline depends not only on modernization but also social acceptance. Many developing nations retain traditional family norms. Despite falling death rates, large families remain culturally valued. This widens the gap between population and resource growth.

8. Von Thunen's agricultural model assumes uniform soil, market access, and transport cost. In the modern era, refrigerated logistics and global trade erase distance-based constraints. Crops are grown where subsidies and technology favor production. Which principle of Von Thunen fails first in this scenario?

- A) Economic rent
- B) Transportation gradient
- C) Isotropic surface
- D) Labor uniformity

Answer: B) Transportation gradient

Explanation: Technological advances nullify distance cost between farm and market. The model's spatial rent pattern collapses when transport ceases to be limiting. Crops are chosen by profitability, not location. This makes agriculture globally flexible and dynamic.

9. Myrdal's cumulative causation theory highlights self-reinforcing regional inequalities. Core areas attract investment, labor, and innovation, while peripheries lose resources. When backwash effects dominate, spatial disparity widens continuously. Which mechanism can reverse this cycle?

- A) Polarization
- B) Circular flow of capital
- C) Spread effects through infrastructure
- D) Spatial concentration of industries

Answer: C) Spread effects through infrastructure

Explanation: Spread effects occur when core development diffuses outward via transport and education. Improved accessibility allows peripheries to share economic momentum. Government policy and regional planning can stimulate this balance. It's essential to curb persistent geographic inequalities.

10. In modern geopolitics, global air routes and naval dominance have reduced the strategic value of the Eurasian heartland. Coastal regions and sea lanes now control global trade and defense networks. This shift redefines power distribution in world politics. Which theory reflects this transformation?

- A) Heartland theory
- B) Rimland theory
- C) Domino theory
- D) Organic state theory

Answer: B) Rimland theory

Explanation: Spykman's Rimland theory emphasized the geopolitical importance of coastal fringes. He argued that control of the maritime periphery ensures global dominance. This view gained relevance in the post-World War II era. Air-sea power replaced land-based territorial control as the key factor.

11. Spatial interaction models explain movement of goods, people, or ideas between places. When barriers to movement are reduced, interaction intensity increases exponentially. Yet, overconnectivity can lead to spatial congestion and inequality. Which model best quantifies such interaction?

- A) Central place model
- B) Core-periphery model
- C) Christaller's principle
- D) Gravity model

Answer: D) Gravity model

Explanation: The gravity model measures interaction proportional to mass and inversely to distance. It mirrors Newton's law in social space. Overconnected regions accumulate flow and power, increasing spatial imbalance. This model forms the base for accessibility and trade analysis.

12. Regional development theories aim to explain uneven economic progress. When peripheral areas depend on external capital and technology, autonomy weakens. This dependency maintains global inequality rather than reducing it. Which theory explains this imbalance?

- A) Polarization theory
- B) Dependency theory
- C) Diffusion model
- D) Growth pole theory

Answer: B) Dependency theory

Explanation: Dependency theory states that global capitalism favors developed "core" nations. Peripheral regions export raw goods and import value-added products. This structural linkage sustains underdevelopment. True growth demands internal restructuring and policy independence.

13. Transport corridors can transform economic landscapes through improved accessibility. However, uneven development arises when investment clusters only along major routes. This selective advantage generates core–periphery patterns at the regional scale. Which concept explains this phenomenon?

- A) Spatial diffusion
- B) Agglomeration economy
- C) Balanced regional development
- D) Growth pole theory

Answer: D) Growth pole theory

Explanation: Perroux’s Growth Pole theory shows how development radiates from powerful economic centers. Transport networks accelerate growth concentration around poles. Peripheral neglect produces imbalance unless deliberate diffusion policies exist. It is a core principle in spatial planning.

14. Cultural landscapes evolve through continuous interaction between humans and environment. Over time, cultural traits imprint themselves as visible patterns on land. These landscapes represent history, adaptation, and symbolism. Who introduced this interpretive concept?

- A) Carl Ritter
- B) Vidal de la Blache
- C) Carl Sauer
- D) Ratzel

Answer: C) Carl Sauer

Explanation: Sauer’s “cultural landscape” emphasized how human culture transforms natural terrain. Geography thus became a study of human–environment interaction. It connected physical processes with social meaning. His approach founded the Berkeley School of Cultural Geography.

15. The spatial segregation of social groups in cities reflects both economic and cultural processes. Segregation often deepens due to housing policies, caste, or income disparity. Such differentiation produces internal urban mosaics and inequality. Which model studies this pattern analytically?

- A) Burgess concentric model
- B) Hoyt's sector model
- C) Social area analysis
- D) Central place theory

Answer: C) Social area analysis

Explanation: Social area analysis uses quantitative indices to map social segregation. It links demographic variables to urban zones. The method identifies patterns of class, ethnicity, and occupation. It reveals the socio-spatial fabric within modern cities.

16. The concept of "Heartland" described inner Eurasia as the strategic pivot of global power. However, with technological advances, sea routes and airbases gained importance. Control of rimland belts became more decisive than the interior. Which scholar advanced this opposing idea?

- A) Nicholas Spykman
- B) Alfred Mahan
- C) Halford Mackinder
- D) Haushofer

Answer: A) Nicholas Spykman

Explanation: Spykman's Rimland Theory emphasized coastal zones encircling Eurasia. He argued that dominance of the Rimland ensures control of the World Island. The idea integrated naval and air power into geopolitics. It redefined strategy during World War II and beyond.

17. Electoral geography studies spatial voting behavior within political systems. If a state exhibits consistent regional voting divisions, it reveals socio-economic polarization. The pattern of constituencies can thus indicate underlying geographic inequalities. Which process best describes such analysis?

- A) Political demarcation
- B) Spatial voting analysis
- C) Gerrymandering
- D) Geopolitical zoning

Answer: B) Spatial voting analysis

Explanation: Spatial voting analysis maps election data to interpret behavior. It connects political preference with regional characteristics. This method reveals alignment between territory and ideology. It aids in assessing representation and equity in democratic systems.

18. The evolution of geographic thought shows shifts from description to quantitative modeling. The quantitative revolution introduced mathematical, statistical, and spatial logic. Yet, later critics emphasized human perception and experience over numbers. Which perspective marked this shift?

- A) Structuralism
- B) Positivism
- C) Feminism
- D) Behaviouralism

Answer: D) Behaviouralism

Explanation: Behavioural geography reacted against mechanistic positivism. It highlighted decision-making and perception in spatial behavior. The approach humanized geography by integrating psychology. This created balance between quantitative rigor and human experience.

19. In GIS, converting analog maps into digital coordinate systems is crucial for analysis. This process ensures data alignment with Earth's spatial reference framework. Without it, overlay operations and accuracy suffer drastically. Which step performs this function?

- A) Geocoding
- B) Georeferencing
- C) Map digitizing
- D) Projection correction

Answer: B) Georeferencing

Explanation: Georeferencing assigns spatial coordinates to scanned maps or images. It links them to geographic locations using control points. Proper georeferencing enables multi-layer spatial analysis. It forms the foundation for all GIS applications.

20. Remote sensing identifies Earth's features by interpreting reflected electromagnetic energy. The accuracy depends on sensor resolution and atmospheric clarity. When clouds or shadows distort the spectral response, classification errors occur. Which technique minimizes this problem?

- A) Radiometric correction
- B) Image fusion
- C) Principal component analysis
- D) Contrast stretching

Answer: A) Radiometric correction

Explanation: Radiometric correction adjusts sensor-recorded values for atmospheric interference. It normalizes brightness and removes noise. This ensures true reflectance consistency across images. Accurate correction enhances image interpretation reliability.

21. Statistical techniques in geography transform complex spatial data into interpretable patterns. When multiple correlated variables exist, redundancy must be reduced systematically. This dimensional simplification reveals the most influential factors. Which method achieves this?

- A) Regression analysis
- B) Chi-square test
- C) Time-series smoothing
- D) Principal component analysis

Answer: D) Principal component analysis

Explanation: PCA condenses interrelated variables into independent components. It identifies dominant patterns in multivariate data. This reduces complexity while retaining maximum variance. It's widely applied in regional and environmental geography.

22. In India, monsoon circulation dominates seasonal climate behavior. Orographic barriers such as the Western Ghats and Himalayas control rainfall intensity. When jet streams shift southward, winter rain occurs in northwest India. What type of rainfall results from such interaction?

- A) Orographic rainfall
- B) Frontal rainfall
- C) Cyclonic rainfall
- D) Convectonal rainfall

Answer: B) Frontal rainfall

Explanation: Western disturbances produce frontal rainfall in northwestern India. These temperate cyclones form along polar fronts in winter. The Himalayas deflect and enhance precipitation over northern plains. This process contributes to Rabi-season rainfall.

23. India's Green Revolution improved yield but widened regional inequality. Technological packages concentrated in irrigated, resource-rich states. Rainfed regions lagged behind due to poor input access. Which planning approach emerged to address this disparity?

- A) Command area planning
- B) Integrated rural development
- C) Agro-climatic regional planning
- D) Watershed management

Answer: C) Agro-climatic regional planning

Explanation: Agro-climatic planning classifies regions by climate, soil, and resource potential. It promotes balanced agricultural investment across varied zones. The method reduces spatial inequality in productivity. It underpins India's regional agricultural policy framework.

24. Industrial clusters in India often develop near mineral belts and power sources. The Chota Nagpur plateau exemplifies this concentration due to resource synergy. However, environmental degradation now threatens sustainability. Which industrial location theory first highlighted cost minimization?

- A) August Losch theory
- B) A. Weber's least-cost theory
- C) D. M. Smith model
- D) Hoover's modification

Answer: B) A. Weber's least-cost theory

Explanation: Weber's theory minimizes total transport, labor, and agglomeration costs. It explains why industries locate near raw material or market centers. The Chota Nagpur region fits his cost-reduction logic. Modern industries still adapt these spatial principles.

25. The Himalayas influence India's hydrology, monsoon, and seismicity profoundly. Their uplift traps monsoon winds, feeds perennial rivers, and causes frequent earthquakes. The region also shapes India's biodiversity and settlement distribution. Which process initiated their formation?

- A) Subduction of Pacific plate
- B) Collision of Indian and Eurasian plates
- C) Movement along transform fault
- D) Rifting in Gondwana land

Answer: B) Collision of Indian and Eurasian plates

Explanation: About 50 million years ago, the northward-drifting Indian plate struck Eurasia. The immense compressional force folded sediments into towering ranges. Continuous convergence sustains tectonic uplift even today. This makes the Himalayas one of the youngest active mountains.