ANSWER THE FOLLOWING- GEOGRAPHY

**Disclaimer*: The answer may or may not contain proper keywords. To score full marks for an answer, use proper keywords recognized by the CISCE Board, updated 2025 Version.*

Climate of India

1) Name any four factors affecting the climate of India.
2) Explain the role of Himalayas in the origin of climate of India.
3) What are western disturbances?
4) Explain the term burst of monsoon
5) Which type of climate is experienced in the northern plains of India? State one main characteristic of this type of climate.
6) There are great variations in the climate of India. Justify the statement.
7) Define monsoons. Why do they prevail?
8) With reference to local winds, answer the following questions:
   a) Where does Loo and Kali Baisakhi prevail?
   b) Mention their effects.
9) Give one geographical reason of why Punjab experiences three sources of rainfall.

10) Why don't the NE monsoons bring rain to most of India?
11) Bring out two differences between rainfall experienced in northwest India and southeast India.

Soils of India

1) What is Leaching? Give an example of a leached soil.
2) What is soil conservation? State any 4 methods in which one can reduce soil erosion.
3) Name the major soils found in India.
4) Write 3 differences of alluvial soil, categorized according to the texture.
5) How are Black soils formed?
6) How is Laterite soil formed?
7) Differentiate between Sheet and Gully erosion.
8) What is the advantage of porous soil for the plantation crops like tea and coffee?
9) What are the characteristics of red soil?
10) Differentiate between Red soil and Laterite soil.
11) How is soil formed? Mention its components.
12) What do you mean by the term soil profile? Name the typical horizons that constitute the soil profile.
13) What are the soils found in the summits of the western and eastern ghats? Write its characteristics.

Natural Vegetation

1) Define national vegetation. State the factors that determine the growth of natural vegetation.
2) Give three suitable causes for shrinkage in forest covered in India.
3) Differentiate between tropical evergreen forests and tropical monsoon forests.
4) Enumerate the temperature and rainfall conditions required for the growth of following types of forests:
   a) Tropical evergreen
   b) Tropical desert
   c) Tropical deciduous
5) Explain the following terms
   a) Evergreen vegetation
   b) Xerophytes
   c) Afforestation
   d) Chipko movement
6) Explain three govt initiatives that have been introduced to conserve the forest cover in India.
7) Explain Van Mahotsav and state its significance.
8) Explain any two forest conservation methods.
9) Write two main characteristics of deciduous monsoon forest.

Water Resources

1) Well irrigation is the most popular mode of irrigation. Why?
2) What are the suitable conditions for tank irrigation
3) Silting is the process of tanks getting deposited with silt. State the disadvantages and advantages of silting.
4) What are the necessary conditions for the perennial canal irrigation?
5) Give to geographical reasons why Punjab and Haryana have one of the best networks of canal systems in India.
6) Give two points of difference between canal irrigation and tank irrigation.
7) What are the ideal conditions for drilling of tube wells?
8) Mention two advantages of tube well irrigation over well irrigation.
9) Why is irrigation necessary in India?
10) Differentiate between inundation canals and perennial canals.
11) Explain the significance of
    a) Neeru-Meeru
    b) Hariyali.
12) What is an aquifer?

Minerals and Energy Resources

1) Explain Smelting.
2) Mention three uses of iron ore.
3) Write three advantages of non-conventional sources of energy.
4) Mention the state that leads in the production of each of the following:
   a) Iron ore
   b) Call
   c) Bauxite
   d) Copper
5) Name the three types of iron ore and mention their respective iron content.
6) Classify coal on the basis of carbon content.
7) What is geothermal energy? write its significance.

Transport

1) What is meant by golden quadrilateral? What are the major benefits of highway network?
2) Answer the following in one word:
   a) National highways are maintained by which department?
   b) Yamuna Expressway connects which two cities?
   c) The longest national waterway of India is from?

d) The width of the narrow gauge is?

3) Why is rail transport common in use?
4) If budget is not a constraint, what would be an alternative mode of transport instead of train and why?
5) Mention two advantages and one disadvantage of waterways.
6) State one economic benefit of the Golden Quadrilateral project.
7) State one important difference between an expressway and a highway.
8) Explain the power-hans helicopter project.
9) Discuss some factors that affect the transportation by water.
10) Even though all means of transport are well developed in India, yet, road transport remains the most popular means of transport. Justify this statement.
11) Why is inland transport not well developed in India?

Answers

Climate of India

1. The four major factors affecting the climate of India are latitude, altitude, distance from the sea, and the presence of mountain ranges like the Himalayas. Latitude

influences the tropical nature of the Indian climate, altitude causes temperature variations (especially in hilly areas), proximity to the sea moderates coastal climates, and the Himalayas block cold northern winds, impacting weather patterns.

2. The Himalayas play a crucial role in shaping India's climate by acting as a barrier to the cold, dry winds from Central Asia, keeping northern India warmer during winter. They also force the moisture-laden southwest monsoon winds to rise, causing heavy rainfall on the windward side and creating dry conditions in the leeward regions. Without the Himalayas, the climate of northern India would be much colder.
3. Western disturbances are low-pressure weather systems that originate in the Mediterranean region and travel eastwards, bringing rain and snow to northern India during the winter months. These disturbances are essential for winter crop irrigation, particularly in Punjab and Haryana, and help increase water levels in rivers and reservoirs in the north.
4. The "burst of monsoon" refers to the sudden and dramatic onset of heavy monsoon rainfall, typically around June. This is a key characteristic of the Indian monsoon system, where after a prolonged dry season, monsoon winds bring intense and widespread rainfall, especially on the western coast and northern plains. This burst is crucial for agricultural activities.
5. The northern plains of India experience a humid subtropical climate, characterized by extremely hot

summers and cold winters. This type of climate is marked by a significant variation in temperatures between seasons, and most of the rainfall occurs during the monsoon season, crucial for the region's agriculture.

6. India experiences a wide range of climatic variations due to its vast geographic diversity. For example, while Mawsynram in Meghalaya receives the highest annual rainfall, regions like the Thar Desert remain dry and arid. Similarly, coastal areas like Mumbai have moderate temperatures year-round, while northern regions face extreme summers and cold winters, highlighting the climatic diversity.
7. Monsoons are seasonal winds that reverse direction between summer and winter, bringing significant changes in weather. During the summer, they blow from the Indian Ocean towards the Indian subcontinent, bringing heavy rains. Monsoons prevail due to the differential heating of land and sea, which creates pressure differences that drive the winds inland during summer and out to sea during winter.
8. a) Loo prevails in northern India, particularly in the states of Rajasthan, Uttar Pradesh, and parts of Madhya Pradesh. Kali Baisakhi is experienced in West Bengal and Assam during the pre-monsoon period.
   b) Loo is a hot, dry wind that causes extreme heat conditions and can lead to heat strokes, while Kali Baisakhi brings thunderstorms and rain, offering relief from the heat but causing damage to crops due to strong winds.

9. Punjab experiences three sources of rainfall: southwest monsoon rains during summer, western disturbances bringing winter rain, and occasional rainfall from the northeast monsoon. This ensures that Punjab has year-round access to water, supporting its agricultural productivity.
10. The northeast monsoons do not bring significant rain to most parts of India because these winds blow from the land to the sea, making them dry. However, Tamil Nadu and parts of southeastern India receive rainfall from these winds as they pick up moisture while passing over the Bay of Bengal.
11. Northwest India, particularly Rajasthan and Gujarat, experiences scanty and irregular rainfall due to the influence of desert conditions and the distance from the coast. In contrast, southeast India, especially Tamil Nadu, receives rainfall from both the southwest and northeast monsoons, making the rainfall more reliable and spread out over different seasons.

Soils of India

1. Leaching is the process by which nutrients are washed away from the topsoil due to heavy rainfall, making the soil less fertile. Laterite soil, found in regions with high rainfall like Kerala and Karnataka, is an example of leached soil. The heavy rains wash away minerals, making the soil acidic and poor in organic matter.
2. Soil conservation refers to the practices aimed at preventing soil erosion and maintaining soil fertility. Methods include afforestation (planting trees), contour

plowing (tilling along the natural contours of the land), building check dams to control water flow, and using cover crops to protect the soil. These methods help prevent the degradation of fertile land, essential for sustainable agriculture.

3. The major soils found in India include alluvial soil, black soil, red soil, laterite soil, and desert soil. Alluvial soil is fertile and found in river basins, black soil is rich in clay and ideal for cotton cultivation, red soil is poor in organic matter but supports crops like millets, laterite soil is leached and found in tropical areas, and desert soil is sandy with low fertility.
4. Alluvial soil can be categorized into two types based on texture: khadar (new alluvium) and bhangar (old alluvium). Khadar soil is finer, more fertile, and found in floodplains, making it suitable for agriculture. Bhangar soil, found in higher areas, is coarser, less fertile, and contains kankar (calcareous concretions), making it less productive.
5. Black soils, also known as regur or cotton soils, are formed from the weathering of volcanic rocks. These soils are rich in clay and have high moisture retention properties, making them ideal for cotton cultivation. They are primarily found in the Deccan Plateau region, including parts of Maharashtra, Gujarat, and Madhya Pradesh.
6. Laterite soil is formed in areas with heavy rainfall and high temperatures, where intense leaching removes most nutrients from the soil, leaving behind iron and aluminum

oxides. This soil is found in tropical regions, including the Western Ghats, and is typically acidic and poor in organic matter, but it can be used for crops like tea and coffee with proper fertilization.

7. Sheet erosion occurs when a thin layer of soil is removed uniformly over a large area by surface water runoff, whereas gully erosion happens when water concentrates in channels and removes soil, forming deep gullies. Gully erosion is more destructive, leading to the loss of large amounts of topsoil and rendering the land infertile.
8. Porous soil is ideal for crops like tea and coffee because it allows excess water to drain away, preventing waterlogging. These crops require well-drained soils as stagnant water can damage the roots and affect the growth and quality of the plants.
9. Red soil is typically poor in organic matter but rich in iron oxide, giving it a characteristic reddish color. It is found in regions with low rainfall and is generally less fertile, requiring proper fertilization to support crops like millets, pulses, and groundnuts.
10. Red soil is found in regions with lower rainfall and is rich in iron oxide but poor in humus, whereas laterite soil is found in areas of heavy rainfall and high temperatures, leading to leaching. Laterite soil is acidic and low in fertility, but it is used for growing crops like tea, coffee, and cashew nuts with the help of fertilizers.
11. Soil is formed through the process of weathering, where rocks break down over time due to natural forces like wind, water, and temperature changes. Soil consists

of minerals, organic matter, water, and air, and it provides essential nutrients for plant growth.

12. A soil profile is the vertical section of soil layers, known as horizons, from the surface down to the unweathered rock. The typical horizons are O (organic material), A (topsoil), B (subsoil), and C (parent material). Each layer has different characteristics in terms of composition and fertility.
13. Laterite soils are found at the summits of the Western and Eastern Ghats. They are heavily leached due to high rainfall, resulting in poor fertility and acidic nature. However, these soils are porous and well-drained, making them suitable for plantation crops like tea and coffee with appropriate soil management.

Natural Vegetation

1. Natural vegetation refers to plant life that grows naturally in a region without human interference. The growth of natural vegetation is determined by factors such as climate, soil type, and topography. Rainfall, temperature, and altitude are critical climatic factors that influence the type of vegetation in an area.
2. Shrinkage in forest cover in India is due to deforestation for agricultural expansion, urbanization, and industrialization. Forests are also being cleared for infrastructure development like roads and railways. Illegal logging, forest fires, and overgrazing further contribute to the loss of forest cover.
3. Tropical evergreen forests receive heavy rainfall and remain green throughout the year, making them dense

and difficult to exploit commercially. In contrast, tropical monsoon forests experience seasonal rainfall and shed their leaves during the dry season, making them easier to access for timber and other resources.

4. a) Tropical evergreen forests require temperatures above 22°C and receive more than 200 cm of rainfall annually, found in regions like the Western Ghats.
   b) Tropical desert forests thrive in extreme temperatures of 30-50°C and very low rainfall of less than 25 cm annually.
   c) Tropical deciduous forests grow in areas with temperatures between 20°C and 30°C and receive 100-200 cm of rainfall, shedding their leaves in the dry season to conserve water.
5. a) Evergreen vegetation refers to plants that retain their leaves throughout the year and do not shed them seasonally.
   b) Xerophytes are plants adapted to arid environments; they have long roots and thick, fleshy leaves or spines to minimize water loss.
   c) Afforestation is the process of planting trees in barren lands to create new forests, helping in soil conservation and carbon sequestration.
   d) The Chipko movement was a grassroots environmental movement in India, where villagers, particularly women, protected trees from being cut by physically embracing them.
6. Government initiatives to conserve forests include the Forest Conservation Act of 1980, which regulates the

diversion of forest land for non-forestry purposes, and the National Afforestation Programme aimed at increasing forest cover. The Joint Forest Management Program involves local communities in forest conservation and management.

7. Van Mahotsav, meaning "Tree Festival," is celebrated annually in India to encourage the planting of trees and raise awareness about the importance of forest conservation. It is significant in combating deforestation, increasing green cover, and addressing environmental issues like air pollution and soil erosion.
8. Forest conservation methods include afforestation (planting new trees), reforestation (replanting trees in deforested areas), and controlled grazing to prevent overgrazing of forest lands. Other methods include enforcing strict laws against illegal logging and promoting sustainable forest management practices to maintain biodiversity.
9. Deciduous monsoon forests are found in areas with seasonal rainfall, and they shed their leaves during the dry season to reduce water loss. These forests contain valuable hardwood trees like teak, sal, and sandalwood, which are used for furniture, construction, and handicrafts, making them commercially important.

Water Resources

1. Well irrigation is popular in India due to its relatively low cost, ease of installation, and accessibility. Wells can be dug in areas with high groundwater levels and are particularly common in regions like Uttar Pradesh, Bihar,

and Tamil Nadu. This method is widely used by small-scale farmers for irrigation.

2. Tank irrigation is suited for areas with rocky terrain, where constructing large dams or canals is not feasible. It is commonly found in peninsular India, especially in Tamil Nadu, Karnataka, and Andhra Pradesh. Tanks are built by collecting rainwater in reservoirs and are particularly effective in regions with seasonal rainfall.
3. Silting is a natural process where fine soil particles carried by water settle at the bottom of tanks or reservoirs, gradually reducing their water-holding capacity. While silting can enhance soil fertility by depositing nutrient-rich sediments on agricultural fields, it also requires regular desilting to maintain tank irrigation efficiency.
4. Perennial canal irrigation depends on rivers that have a continuous flow of water throughout the year, such as those fed by glaciers or consistent monsoon rains. It requires a well-maintained network of canals to distribute water across large agricultural areas. Regions like Punjab and Uttar Pradesh benefit from this form of irrigation.
5. Punjab and Haryana have an extensive canal network due to their proximity to perennial rivers like the Sutlej and Yamuna, as well as their flat terrain, which facilitates the construction of large canal systems. These canals play a crucial role in irrigating the fertile agricultural lands of the region, supporting the cultivation of crops like wheat and rice.

6. Canal irrigation involves diverting river water through a system of canals and distributing it to farmlands, whereas tank irrigation relies on collecting rainwater in large reservoirs or tanks. Canals cover vast areas, providing a more reliable water supply, while tanks are effective for small, localized areas and are dependent on seasonal rainfall.
7. Tube well irrigation is best suited for regions with a high water table and non-rocky subsoil, as the water needs to be accessed from deep underground sources. These wells are often powered by electric or diesel pumps and are prevalent in states like Punjab, Haryana, and Uttar Pradesh, where groundwater is abundant.
8. Tube well irrigation offers a more reliable and consistent water supply than traditional open wells, especially in areas with deeper water tables. Tube wells are often used in regions where surface water is scarce or unreliable, helping farmers maintain their crops during dry spells.
9. Irrigation is essential in India due to the country's dependence on agriculture and the irregular distribution of rainfall. Many regions experience drought or insufficient rainfall, making irrigation systems necessary to ensure consistent water availability for crop growth. This is especially important for food security and the rural economy.
10. Inundation canals draw water only during floods and are temporary, whereas perennial canals provide a year-round water supply from rivers with continuous flow. Perennial canals are more reliable and cover a larger area,

but they require significant infrastructure and maintenance compared to the simpler, temporary inundation canals.

11. a) Neeru-Meeru is a water conservation program implemented in Andhra Pradesh aimed at improving water availability by constructing check dams and water harvesting structures. It encourages community participation in conserving water resources.
    b) Hariyali is a government initiative focused on watershed development, promoting water conservation and soil fertility improvement through afforestation and sustainable land management practices.
12. An aquifer is an underground layer of rock or sediment that holds water and allows it to flow through its pores. Aquifers are a vital source of groundwater, which can be extracted through wells or tube wells for irrigation, drinking water, and industrial use. The water in aquifers is replenished by rainwater percolating through the soil.

Minerals and Energy Resources

1. Smelting is a metallurgical process used to extract metals from their ores by heating them at high temperatures. The process involves melting the ore, separating impurities, and reducing the metal to a purified form. Smelting is used to extract metals like iron, copper, and aluminum, which are essential for various industrial purposes.
2. Iron ore is the primary raw material used in the production of steel, which is crucial for infrastructure development, construction, manufacturing, and transportation. Steel is

used in building structures, vehicles, machinery, and everyday tools, making iron ore one of the most important minerals for economic growth and industrialization.

3. Non-conventional energy sources, such as solar, wind, and hydropower, are renewable, environmentally friendly, and help reduce dependence on fossil fuels. These energy sources are abundant and do not contribute to greenhouse gas emissions, making them essential for sustainable energy production and combating climate change.
4. a) Odisha is the leading producer of iron ore in India, with large reserves in the districts of Sundargarh, Keonjhar, and Mayurbhanj.
   b) Jharkhand is the top coal-producing state, with extensive coalfields in Dhanbad, Bokaro, and Ramgarh.
   c) Odisha leads in bauxite production, with significant deposits in the Koraput and Rayagada districts.
   d) Rajasthan is the leading producer of copper, with large reserves found in the Khetri copper belt.
5. The three types of iron ore found in India are hematite, magnetite, and limonite. Hematite, with about 70% iron content, is the most commonly used ore in steel production. Magnetite has the highest iron content at 72%, and limonite, with around 60% iron, is the least rich but still used in various industries.
6. Coal is classified into four types based on its carbon content and energy-producing capacity:
   a) Anthracite: The highest grade of coal, with the highest carbon content and energy output, found in small

quantities in India.

b) Bituminous: The most commonly used coal, with a high heating value, primarily found in Jharkhand and West Bengal.

c) Sub-bituminous: A lower-grade coal used in power generation.

d) Lignite: The lowest grade, with the least carbon content, found in Tamil Nadu and Rajasthan.

Transport

1. The Golden Quadrilateral is a highway network that connects four major cities: Delhi, Mumbai, Chennai, and Kolkata. It is one of the largest highway projects in India, providing faster transportation and improving connectivity. The benefits include reduced travel time between cities, better trade routes, and improved economic development in surrounding regions.
2. a) National highways are maintained by the National Highways Authority of India (NHAI).

   b) Yamuna Expressway connects Delhi and Agra.

   c) The longest national waterway in India stretches from Allahabad to Haldia.

   d) The width of the narrow gauge is 0.762 to 0.610 meters.
3. Rail transport is widely used due to its cost-efficiency, capacity to carry large quantities of goods and passengers, and extensive network across the country. It plays a vital role in long-distance travel and in the transport of bulky goods like coal, iron, and agricultural

products, making it an indispensable part of India's transport infrastructure.

4. If budget is not a constraint, air transport is an excellent alternative to rail travel, particularly for long distances. Air transport is faster, more convenient, and provides better connectivity, especially between major cities and remote areas, reducing travel time significantly.
5. Two advantages of waterways are that they are environment-friendly and suitable for transporting bulky goods over long distances. One disadvantage is that waterways depend on navigable rivers and can be hindered by seasonal fluctuations in water levels or sediment deposition, reducing their reliability.
6. One economic benefit of the Golden Quadrilateral project is the boost it provides to the economy by facilitating faster movement of goods and services, reducing transportation costs, and encouraging regional trade. This has had a positive impact on industrial growth and employment generation.
7. The main difference between an expressway and a highway is that expressways are high-speed roads with limited access points, meant for faster travel, while highways connect towns and cities and may have slower traffic due to multiple access points and intersections.
8. The Pawan Hans helicopter project provides crucial helicopter services, especially in remote and inaccessible areas of India. It plays an essential role in emergency services, such as medical evacuations,

disaster relief, and connecting isolated regions that lack proper road or rail infrastructure.

9. Factors affecting transportation by water include the depth and navigability of rivers, seasonal variations in water levels, the presence of ports, and infrastructure for handling goods. Navigability can be affected by silting, lack of dredging, or obstacles like dams and locks.
10. Despite the development of air, rail, and water transport, road transport remains the most popular in India because it offers last-mile connectivity, flexibility, and access to rural and remote areas. Roadways are more adaptable to different terrains and provide faster door-to-door delivery of goods and passengers.
11. Inland water transport is not well-developed in India because of the seasonal variability of water levels in rivers, silting, lack of proper navigable channels, and the underdeveloped infrastructure for handling cargo. Additionally, many rivers are not suitable for large vessels due to their shallow depth and obstacles like dams and rapids.