ANSWERS & EXPLANATIONS
GENERAL STUDIES (P) TEST – 4129 (2024)

Q 1.A

- **The world's richest monazite** deposits are found in the coastal regions of India, particularly in the **state of Kerala**. The monazite sands along the **coast of Kerala are estimated to contain about 15% of the world's monazite reserves. Hence option (a) is the correct answer.**
- India has one of the world's largest reserves of monazite, with deposits estimated to be around 12 million tonnes. However, the use of monazite in India is largely restricted due to its radioactive content, as thorium is a radioactive element.
- **About Monazite:**
  - Monazite is a **rare earth element** that is typically found in association with other minerals such as i**lmenite, rutile, and zircon.**
  - **It is valued for its high concentrations of thorium** and rare earth metals, which are used in a variety of industrial applications, including the production of **nuclear fuel, superconductors, and permanent magnets.**
  - It is composed mainly of the elements cerium, lanthanum, neodymium, and thorium.
- **In India,** monazite is primarily used for the extraction of thorium, **which is an important fuel for nuclear reactors.** India has a significant nuclear energy program, and thorium-based reactors are being developed as a safer and more efficient alternative to traditional uranium-based reactors. Other countries with significant monazite deposits include Brazil, Australia, Malaysia, Vietnam, and South Africa.

Q 2.D

- Zaid is a **short-duration summer cropping season** beginning after the harvesting of **Rabi crops**. **Hence, statement 1 is correct.**
- In between the rabi and the kharif seasons, there is a short season during the summer months known as the Zaid season. Some of the crops produced during 'zaid' are **watermelon, muskmelon, cucumber, vegetables, and fodder crops**. Sugarcane takes almost a year to grow. **Hence, statement 2 is correct.**
- The Zaid crops require warm dry weather for major growth periods and longer day length for flowering and fruiting. However, this type of distinction in the **cropping season does not exist in southern parts of the country**. **Hence, statement 3 is correct.**

Q 3.A

- The growth rate of population in India over the last century has been caused by the annual birth rate, death rate, and rate of migration, and thereby shows different trends. There are four distinct phases of growth identified within this period:
- **Phase I:** The period from 1901-1921 is referred to as a period of stagnant or stationary phase of growth of India's population, since in this period the growth rate was very low, even recording a negative growth rate during 1911-1921. Both the birth rate and death rate were high, keeping the rate of increase low. Poor health and medical services, the widespread illiteracy of the population, and an inefficient distribution system for food and other basic necessities were largely responsible for the high birth and death rates in this period. **Hence statement 1 is correct.**
- **Phase II: The decades 1921-1951 are referred to as the period of steady population growth.** An overall improvement in health and sanitation throughout the country brought down the mortality rate. At the same time, better transport and communication systems improved the distribution system. The crude birth rate remained high in this period, leading to a higher growth rate than the previous phase. This is impressive against the backdrop of the Great Depression,1920s and World War II. **Hence statement 2 is not correct.**

- **Phase III: The decades 1951-1981 are referred to as the period of population explosion in India,** which was caused by a rapid fall in the mortality rate but a high fertility rate of the population in the country. The average annual growth rate was as high as 2.2 percent. It is in this period, after the Independence, that developmental activities were introduced through a centralised planning process and the economy started showing up, ensuring the improvement of living conditions for the general population. Consequently, there was a high natural increase and a higher growth rate. Besides, increased international migration bringing in Tibetans, Bangladeshis, Nepalies and even people from Pakistan contributed to the high growth rate.
- **Phase IV:** From 1981 until present, the growth rate of the country's population though remained high, has started slowing down gradually. A downward trend in the crude birth rate is held responsible for such population growth. This was, in turn, affected by an increase in the mean age at marriage, improved quality of life particularly education of females in the country.

Q 4.C

- The **Keeladi excavation site**, located **along the Vaigai River**, is an **ancient settlemen**t dating back to the **Sangam age.** It is currently under excavation by the **Tamil Nadu State Department of Archaeology and the Archaeological Survey of India**. **Hence statement 2 is correct.**
- Located about 12 km southeast of the temple city of **Madurai,** the site has revealed evidence that supports the existence of an **urban civilization** during the Sangam age providing valuable insights into the ancient history of **Tamil Nadu. Hence statement 1 is correct.**
- **The Keeladi excavation site holds great significance as it has helped to push back the timeline of the Sangam age to 800 BCE based on the archaeological findings. This is a significant discovery as it provides new insights into the ancient history of Tamil Nadu.**
- Moreover, the excavation site has the potential to provide vital evidence that can help to **bridge the gap between** the **Iron Age (12th century BCE to 6th century BCE) and the Early Historic Period (6th century BCE to 4th century BCE)**. The findings from the Keeladi site can help shed light on the cultural developments and societal changes that occurred during this critical period in ancient Tamil Nadu's history.

Q 5.B

- On the basis of the main source of moisture for crops, farming can be classified as irrigated and rainfed (barani).
- **Rainfed farming** is further classified on the basis of the adequacy of soil moisture during the cropping season into dryland and wetland farming. In India, **Dryland farming** is largely confined to regions having an annual rainfall of **less than 75 cm**. **Hence, statement 1 is not correct.**
- These regions grow hardy and drought-resistant crops such as **ragi, bajra, moong, gram and guar (fodder crops)** and practice various measures of soil moisture conservation and rainwater harvesting. **Hence, statement 2 is correct.**
- In **Wetland farming**, the rainfall is in excess of the soil moisture requirement of plants during the rainy season. Such regions may face flood and soil erosion hazards. These areas grow various water-intensive crops such as rice, jute, and sugarcane and practice aquaculture in the freshwater bodies.

Q 6.C

- The **annual event** called the **Great Backyard Bird Coun**t, which began in **1998**, is organized by the **Cornell Lab of Ornithology and the National Audubon Society.** It is a community science project, that includes **students, bird watchers, and nature enthusiasts**, who can participate in observing and counting birds in their backyard every year. **Hence statement 1 is not correct.**
- **Bird Count India** is a collaborative initiative among various organizations and groups to enhance our understanding of birds' distribution and population**.** It encourages and facilitates the **listing and monitorin**g of birds in India, ranging from individuals keeping track of their bird sightings to groups of students and bird watchers observing the local avian fauna. Additionally, it supports large-scale projects that document the prevalence and geographic range of different species across India. It also helped Great Backyard Bird Count conduct the annual bird count event in India. **Hence**, **statement 2 is correct.**
- According to the Great Backyard Bird Count (GBBC) 2023, **West Bengal** recorded the **highest number of bird species (489)**, followed by Uttarakhand (426), Arunachal Pradesh (407), Assam (397), and Karnataka (371). Tamil Nadu and Kerala secured the eighth and ninth positions, respectively, with 349 and 325 species. The survey reveals that India's avian population is thriving in various habitats, ranging from **urban to rural areas**. The country has witnessed a significant **surge in participation**, resulting in I**ndia ranking second** in the number of checklists submitted, just **after the United States of Americ**a.

Additionally, I**ndia ranked third in the total number of species reporte**d by any country during the GBBC event. **Hence statement 3 is correct.**

- The 2022 edition of GBBC engaged over 3,782 birders who uploaded over 40,000 checklists and recorded 1,017 species whereas this year, it was over 46,000 checklists and 1067 species.

Q 7.D

- Fishing activity is well developed in Japan than in any other place in the world due to numerous factors:
- The scarcity of meat as there are few pastures for livestock rearing and **religious reasons has popularised fish as a principal item of diet and chief protein food of the Japanese.**
- The lack of lowlands and pastures means that only a few animals can be kept to supply meat and other protein food. Fish, in all its varied forms, fresh, canned, dried, frozen, and in the form of fish pastes, fish sauce and spiced condiments takes the place of meat as Japan's primary source of protein food. **Hence option 1 is correct.**
- The **indented coastline of Japan provides sheltered fishing ports**, calm waters and safe landing places, ideal for the fishing industry, In Hokkaido, where the Laurentian type of climate is too cold for active agriculture, fishing takes first place. Hakodate and Kushiro are large fishing ports, complete with refrigeration facilities. **Hence options 2 and 3 are correct.**
- The **continental shelves around the islands of Japan** are rich in plankton, due to the meeting of the **warm Kuroshio and the cold Oyashio currents** and provide excellent breeding grounds for all kinds of fish including herring, cod, mackerel, bonito, salmon, sardine and tuna, as well as crabs and lobsters. **Hence option 4 is correct.**
- There is a great demand for it locally, and for export to other east Asiatic neighbors that lack the techniques of large-scale commercial fishing.

Q 8.D

- The **Hoysaleswara temple** also referred to simply as the **Halebidu temple**, is a **12th-century Hindu temple** dedicated to **Lord Shiva**. It is the **largest monument in Halebidu**, a town in the state of **Karnataka**, India, and the former capital of the Hoysala Empire.
- The temple was built on the **banks of a large man-made lake** and **sponsored by King Vishnuvardhana** of the Hoysala Empire. Its construction started around 1121 CE and was completed in 1160 CE.
- The Hoysaleswar is mainly a **Shaivite monument**, yet reverentially includes many themes from **Vaishnavism** and **Shaktism** traditions of Hinduism. In fact, it even has **some images from Jainism. Hence statement 1 is correct.**
- It is a **twin temple dedicated to Hoysaleswara and Santaleswara Shiva lingas**, named after the masculine and feminine aspects. **Hence statement 2 is correct.**
- India's famed **Hoysala Temples in Belur, Halebid, and Somanathapura** could soon be included in the list of **UNESCO World Heritage Sites.** According to the latest reports, India has filed for the nomination of the temples for the year 2022-2023. **Hence statement 3 is correct.**
- The temples are situated in the Indian state of Karnataka and are collectively called **The Sacred Ensembles of Hoysala**. These have been on the t**entative list of UNESCO since 2014**.

Q 9.C

- An important aspect of population growth in India is the growth of its adolescents. The share of adolescents i.e., those up to the age group of 10–19 years is **about 20.9 percent** (2011), among which **male adolescents constitute 52.7 percent a**nd female adolescents constitute 47.3 percent. **Hence both statements 1 and 2 are correct.**
- The adolescent population, though, is regarded as the youthful population having high potentials, but at the same time they are quite vulnerable if not guided and channelised properly.
- There are many challenges for the society as far as these adolescents are concerned, some of which are lower age at marriage, illiteracy—particularly female illiteracy, school dropouts, low intake of nutrients, a high rate of maternal mortality among adolescent mothers, a high rate of HIV and AIDS infections, physical and mental disability or retardedness, drug abuse and alcoholism, juvenile delinquency and commission of crimes, etc.
- In view of these, the Government of India has undertaken certain policies to impart proper education to the adolescent groups so that their talents are better channelised and properly utilised. The National Youth Policy is one example that has been designed to look into the overall development of our large youth and adolescent population.

Q 10.D

- **Mixed Farming is a form of agriculture** found in the **highly developed parts of the world**, e.g. North-Western Europe, Eastern North America, parts of Eurasia and the temperate latitudes of Southern continents.
- Crop rotation and intercropping play an important role in maintaining soil fertility. Equal emphasis is laid on crop cultivation and animal husbandry. Animals like cattle, sheep, pigs and poultry provide the main income along with crops.
- Mixed farming is characterized by high capital expenditure on farm machinery and building, extensive use of chemical fertilizers and green manures and also the skill and expertise of the farmers. **Hence, statement 1 is correct.**
- **The system in which the farmers specialize in vegetables is known as truck farming**. The distance of truck farms from the market is governed by the distance that a truck can cover overnight, hence the name truck farming. Such a type of farming is developed in densely populated industrial districts of northwest Europe, the northeastern United States of America and the Mediterranean regions. It is both labor and capital-intensive and lays emphasis on the use of irrigation, HYV seeds, fertilizers, insecticides, greenhouses and artificial heating in colder regions. **Hence, statement 2 is correct.**
- **Collective Farming or the model of Kolkhoz** was introduced in the erstwhile **Soviet Union** to improve upon the inefficiency of the previous methods of agriculture and to boost agricultural production for self-sufficiency. The farmers used to pool in all their resources like land, livestock and labor. However, **they were allowed to retain very small plots to grow crops in order to meet their daily requirements. Hence, statement 3 is correct.**

Q 11.B

- The vegetation in the Mediterranean lands is not luxuriant. Trees are widely spaced and smaller in height. Though trees have branches they are short and carry few leaves. Thus**, there is an absence of shade.** The absence of shade is a distinctive feature of the Mediterranean lands. **Hence statement 1 is correct.**
- The **savanna vegetation is characterized by tall grass and short trees**. The lack of water makes the savanna a difficult place for tall plants such as trees to grow. Grasses and trees that grow in the savanna have adapted to life with little water and hot temperatures. Hence, the terms p**arklands, and bush-veld are used to describe the Savanna grasslands.**
- The **term Selvas is used to characterize the dense forest/vegetative growth in the tropical rainforest** in the Amazon Basin. High temperatures and abundant rainfall support luxuriant tropical rainforests. **Hence statement 2 is not correct.**
- **Steppe vegetation' refers the temperate grassland all over the world**. Trees are very scarce in such grasslands because of the scant rainfall and severe winters. **Towards the Poles**, an increase in precipitation gives rise to a transitional zone of **wooded steppes** in the form of conifers. Towards the equator, **the stepper grass becomes shorter and sparser**, till it merges with the desert with thorny scrub. **Hence statement 3 is correct.**

Q 12.D

- **Petroleum is also called 'black gold' or 'liquid gold'.** It is second to coal in terms of sources of energy. It is an essential source of energy for all internal combustion engines in automobiles, railways and aircraft. **Crude petroleum occurs in sedimentary rocks of the tertiary period.** It is formed when large quantities of dead organisms, usually zooplankton and algae, are buried underneath sedimentary rock and subjected to intense heat and pressure. **Hence statement 1 is not correct.**
- **Petroleum (and natural gas) are born and accumulate in the sedimentary mantle of the Earth.** Small amounts of these hydrocarbons are present throughout the mantle, but large accumulations are encountered less frequently. About 600 sedimentary basins, characterized by oil and gas occurrence, are found on the Earth.
- **Unlike coal, Petroleum is not distributed evenly around the world. More than half of the world's proven oil reserves are located in the Middle East. Following the Middle East are Canada and the United States, Latin America, Africa, and the region occupied by the former Soviet Union. Each of those regions contains less than 15 percent of the world's proven reserves. Hence statement 2 is not correct.**
- The two largest classes of fields are the super-giants, fields with 5 billion or more barrels of ultimately recoverable oil, and world-class giants, fields with 500 million to 5 billion barrels of ultimately recoverable oil. **Fewer than 40 supergiant oil fields have been found worldwide. The Arabian-Iranian sedimentary basin in the Persian Gulf region contains two- thirds of these supergiant fields.**

The remaining super-giants are distributed as follows: two in the United States, two in Russia, two in Mexico, one in Libya, one in Algeria, one in Venezuela, and two in China.

Q 13.C

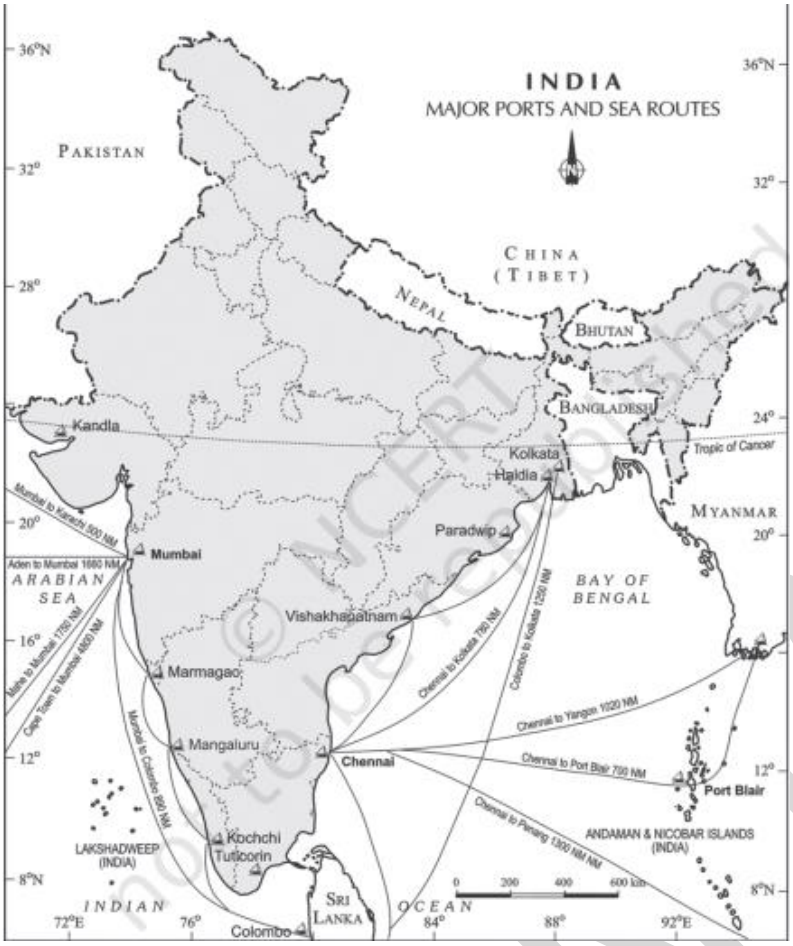
- **Market Gardening and Horticulture:** Market gardening and horticulture specialize in the **cultivation of high-value crops** such as vegetables, fruits, and flowers, s**olely for urban markets.**
- **Farms are small** and are located where there are good transportation links with the urban center where a high-income group of consumers is located. **Hence option (c) is the correct answer.**
- It is **both labor and capital-intensive** and lays emphasis on the use of irrigation, HYV seeds, fertilizers, insecticides, greenhouses, and artificial heating in colder regions.
- This type of agriculture is well developed in densely populated industrial districts of northwest Europe, the northeastern United States of America, and the Mediterranean regions.
- The Netherlands specializes in growing flowers and horticultural crops, especially tulips, which are flown to all major cities of Europe.
- In the regions where farmers specialize in vegetables only, the farming is known as truck farming. The distance of truck farms from the market is governed by the distance that a truck can cover overnight, hence the name truck farming.

Q 14.A

- In the **Mediterranean region the term 'haciendas' refer to large farm holdings**. Though in general farms are small in the Mediterranean region. Large holdings (haciendas) can be found in Spain. These haciendas engage a large number of paid laborers.
- The Mediterranean type of climate is characterized by highly developed orchard farming methods. These lands are also known as the world's orchard lands. A wide range of citrus fruits such as oranges, lemons, and grapefruit are grown.
- **Hence option (a) is the correct answer.**

Q 15.D

- India is surrounded by sea from three sides and is bestowed with a long coastline. Water provides a smooth surface for very cheap transport provided there is no turbulence. Though ports have been in use since ancient times, the emergence of ports as gateways of international trade became important after the coming of European traders and the colonisation of the country by the British. At present, India has 12 major ports and more than 200 minor or intermediate ports. In the case of the major ports, the central government decides the policy and plays regulatory functions. The minor ports are there whose policies and functions are regulated by state governments. The major ports handle a larger share of the total traffic. Some of the important ports **are explained below:**
    - **Kandla, now officially Deendayal Port Authority,** is a seaport and town in the Kutch district of Gujarat state in Western India, near the city of Gandhidham. Located on the Gulf of Kutch, it is one of India's major ports on the west coast.
    - **Visakhapatnam Port** in Andhra Pradesh is a land-locked harbour, connected to the sea by a channel cut through solid rock and sand. An outer harbour has been developed for handling iron ore, petroleum and general cargo. Andhra Pradesh and Telangana are the main hinterlands for this port.
    - **Tuticorin Port** in Tamil Nadu was developed to relieve the pressure of Chennai port. It deals with a variety of cargo, including coal, salt, food grains, edible oils, sugar, chemicals and petroleum products.
    - **Mormugao Port,** commissioned in 1885 is one of the oldest ports on the west coast of India in the state of Goa and is blessed with a protected open type natural harbour.
    - **New Mangalore Port** is a deep-water, all-weather port at Panambur, Mangalore in Karnataka state in India, which is the deepest inner harbour on the west coast. This port is operated by New Mangalore Port Trust.



- **Hence, option (d) is the correct answer.**

Q 16.B

- **Major coalfields of the world are:**
- **North America**
  - Pennsylvania anthracite field
  - Appalachian bituminous field
  - Eastern Illinois field – Illinois, Indiana and Kentucky
  - Western interior field – Iowa, Missouri, Oklahoma
  - Gulf province – Texas, Alabama and Arkansas
  - Rocky mountain province- Utah, Colorado, Wyoming, Montana, new Mexico
  - Canada – Prairies, British Columbia coalfields, Nova Scotia Coal fields
  - The largest coal mine in the world by reserves is the North Antelope Rochelle coal mine in the Powder River Basin of Wyoming, US. The mine was estimated to contain more than 1.7 billion tonnes of recoverable coal as of December 2018. **Hence pair 1 is not correctly matched.**
- **Europe**
  - Donetz coal basin (anthracite and high grade bituminous coal)
  - Moscow-Tula coalfields
  - Kuznetsk coal basin
  - Karaganda field
  - Silesia coal fields
  - **Ruhr area of Germany. Hence pair 2 is correctly matched.**
  - Other coal fields in Urals, Taimyr fields of the Arctic, deposits of the Caucasus mountains.
- **Asia**
  - **China – Shanxi, Fushun,** Inner Mongolia, Kansu. **Hence pair 4 is not correctly matched.**
  - Japan – Chikugo coalfield, Ishikari coalfield
  - India – Damodar valley, Raniganj, Bokaro, Jharia, Singareni. Singareni is in Telangana.
  - Pakistan - Quetta, Kalabagh and Thar coalfields
- **Australia – Bowen Basin coalfield,** Galilee Basin coalfield, South Maitland coalfield, Sydney Basin coalfield, and Latrobe valley coalfield. **Hence pair 3 is correctly matched.**

Q 17.B

- **Environmental determinism** is the study of how the physical environment predisposes societies and states toward particular development trajectories. In the early stages of their interaction with their natural environment or physical environment, humans were greatly influenced by it. They adapted to the dictates of Nature. It is environmental determinism. **Hence option (b) is the correct answer.**
- With social and cultural development, humans develop better and more efficient technology. They move from a state of necessity to a state of freedom. They create possibilities with the resources obtained from the environment. Human activities create a cultural landscape. This is called possibilism.

Q 18.B

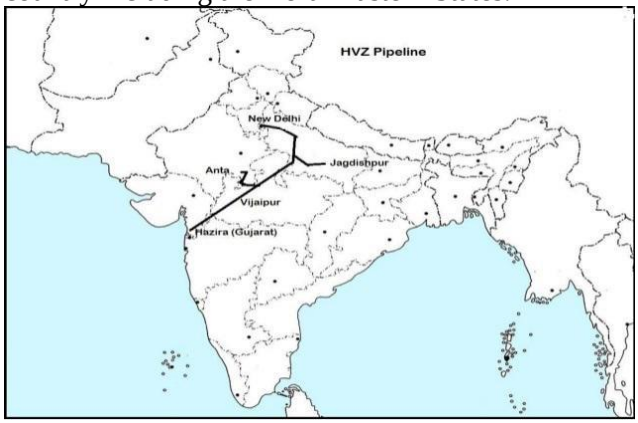
- The footloose industry is a general term for an industry that can be placed and located at any location without effect from factors such as resources or transport. Computer chips and mobile manufacturing are some main examples of the footloose industries.
- Footloose industries can be located in a wide variety of places. They are not dependent on any specific raw material, weight loss or otherwise. They **largely depend on component parts** that can be obtained anywhere. They produce in small quantities and also **employ a small labor force.** These are generally **not polluting industries.** The important factor in their location is **accessibility by road network**. **Hence, option (b) is the correct answer.**

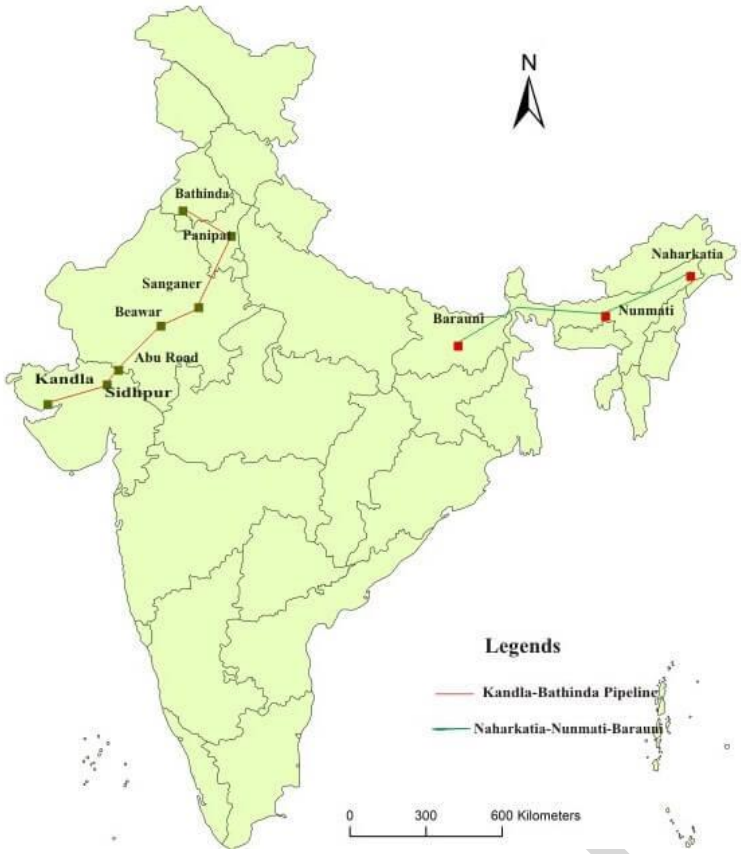
Q 19.C

- **Recent Context:** A newly identified tsetse fly pheromone reveals new insights into how the insects communicate—and may help in reducing disease spread.
- **Tsetse, are large, biting flies that inhabit much of tropical Africa. Tsetse flies are exclusively found in sub-Saharan Africa between latitudes 14° N and 20 ° S. Hence, statement 2 is correct.**
- Tsetse flies include all the species in the genus Glossina, which are placed in their own family, Glossinidae. **The tsetse is an obligate parasite, which lives by feeding on the blood of vertebrate animals.**
- Tsetse flies are known to **carry parasites** called African trypanosomes.
- **When the insects bite humans or animals, they transmit these parasites, spreading diseases such as African sleeping sickness, which can be fatal to humans, and nagana, a disease that affects livestock and other animals. Hence, statement 1 is correct.**

Q 20.C

- Pipelines are the most convenient and efficient mode of transporting liquids and gases over long distances. Even solids can also be transported by pipelines after converting them into a slurry.
- Oil India Limited (OIL) under the administrative setup of the Ministry of Petroleum and Natural Gas is engaged in the exploration, production, and transportation of crude oil and natural gas. It was incorporated in 1959 as a company. **Asia's first cross-country pipeline covering a distance of 1,157 km was constructed by OIL from the Naharkatiya oilfield in Assam to the Barauni refinery in Bihar.** It was further extended up to Kanpur in 1966. **Hence, statement 1 is correct.**
- GAIL (India) Ltd. was set up in 1984 as a public sector undertaking to transport, process, and market natural gas for its economic use. The first 1,700 km long Hazira-VijaipurJagdishpur (HVJ) cross-country gas pipeline, constructed by GAIL (India), linked Mumbai High and Bassein gas fields with various fertilizer, power, and industrial complexes in western and northern India. **Hence, statement 2 is correct.**
- This artery provided an impetus to the Indian gas market development. Overall, India's gas infrastructure has expanded over ten times from 1,700 km to 18,500 km of cross-country pipelines and is expected to soon reach over 34,000 km as Gas Grid by linking all the gas sources and consuming markets across the country including the North Eastern States.





Q 21.D

- **Equity** refers to making **equal access to opportunities available to everybody**. The opportunities available to people must be equal irrespective of their gender, race, income, and in the Indian case, caste. **Hence pair 1 is correctly matched.**
- **Empowerment** means having the **power to make choices. Such power comes from increasing freedom and capability.** Good governance and people-oriented policies are required to empower people. **Hence pair 2 is correctly matched.**
- **Sustainability** means **continuity in the availability of opportunities. To have sustainable human development,** each generation must have the same opportunities. **Hence pair 3 is correctly matched.**
- **Productivity** is the **measure of output per unit of input**. Human labor productivity or productivity in terms of human work means efforts to increase their knowledge or provide better health facilities ultimately leading to better work efficiency. **Hence pair 4 is correctly matched.**
- **Hence option (d) is the correct answer**.

Q 22.A

- **Mariupol, is located in southeastern Ukraine.** It lies along the estuary of the Kalmius and Kalchik rivers, 6 miles (10 km) from the Sea of Azov. recently Russian forces invaded Mariupol. **Hence pair 1 is correctly matched.**

- **Adana, city, south-central Turkey.** It is situated in the plain of Cilicia, on the Seyhan River (the ancient Sarus River). An agricultural and industrial centre and the country's fourth largest city, Recently city of Adana was worst hit by earthquake. **Hence pair 2 is not correctly matched.**

- **Riyadh is the capital city of Saudi Arabia,** located in the central region of the country. It is the largest city in the kingdom and serves as a political, financial, and administrative center of the country. The economy is primarily based on **oil and gas exports,** as well as other industries such as finance, technology, and tourism. **Hence pair 3 is not correctly matched.**

Q 23.B

- The Border Road Organisation (BRO) **was established in May 1960** for accelerating economic development and strengthening defense preparedness through the rapid and coordinated improvement of strategically important roads along the northern and northeastern boundaries of the country. It is a premier multifaceted construction agency. It has constructed roads in high altitude mountainous terrain joining Chandigarh with Manali (Himachal Pradesh) and Leh (Ladakh). This road runs at an average altitude of 4,270 meters above the mean sea level. **Hence, statement 1 is not correct.**
- Apart from the construction and maintenance of roads in strategically sensitive areas, the BRO also undertakes snow clearance in high-altitude areas. The international highways are meant to promote a harmonious relationship with the neighboring countries by providing effective links with India.
- Atal Tunnel (9.02 Km) has been built by Border Road Organisation. This tunnel connects Manali to Lahaul-Spiti valley throughout the year. Earlier the valley was cut off for about 6 months each year owing to heavy snowfall. The Tunnel is built with ultra-modern specifications in the Pir Panjal range of the Himalayas at an altitude of 3000 meters from the Mean Sea Level. **Hence, statement 2 is correct.**

Q 24.A

- **Intensive-subsistence farming is practiced in regions where the land is limited.** And as land is passed on from one generation to the next, it is fragmented into smaller plots to divide among the offspring of the farmers. This type of agriculture is largely found in densely populated regions of monsoon Asia. Paddy, wheat and millet are the important crops grown in this type of agriculture.
- In agriculture dominated by wet paddy cultivation rice crop is a dominant crop. Land holdings are very small due to the high density of the population. Farmers work with the help o**f family labor leading to intensive use of land**. However, **labor productivity is low**. **Hence, option 2 is not correct.**
- The **use of machinery is limited** and most of the agricultural operations are done by manual labor. **Hence, 3 option is not correct. Farmyard manure is used** to maintain the fertility of the soil. **Hence, option 1 is correct.**
- In this type of agriculture**, the yield per unit area is high**. **Hence, option 4 is correct.**

Q 25.A

- **Recent Context: Karnataka's cultural capital Mysuru is set to host the Centre's ambitious Bharat Shared Repository of Inscriptions (Bharat SHRI) project that was announced by finance minister Nirmala Sitharaman in her Union Budget speech.**
- The project to be launched at the digital epigraphy museum aims to digitise one lakh ancient inscriptions in the first phase. While all inscriptions have been published in annual reports of Indian Epigraphy (ARIE), digital copies are unavailable to researchers and historians

- Currently, the Archaeological Survey of India's (ASI) epigraphy division headquartered at Mysuru has more than one lakh estampages of several prominent inscriptions which will soon be digitised for widespread use by historians and researchers.
- **Hence option (a) is the correct answer.**

Q 26.D

- Nomadic herding or pastoral nomadism is a primitive subsistence activity, in which the herders rely on animals for food, clothing, shelter, tools and transport.
- Pastoral nomadism is associated with three important regions. The core region extends from the Atlantic shores of **North Africa** Eastwards across the Arabian peninsula into Mongolia and Central China. The second region extends over the **tundra region of Eurasia**. In the southern hemisphere, there are small areas in South-west Africa and on the **island of Madagascar.**
- In **mountain regions, such as Himalayas, Gujjars, Bakarwals, Gaddis and Bhotiyas migrate** from the plains to the mountains in summers and to the plains from the high-altitude pastures in winters. Similarly, in the tundra regions, the nomadic herders move from south to north in the summers and from north to south in winter. This process is called transhumance**. Hence, option (d) is correct.**

Q 27.B

- Migration is usually defined as a geographical movement of people involving a change from their usual place of residence.
- It is the third component of population change, the other two being mortality and fertility. However, migration is different from the other two processes, in the sense that it is not a biological factor like the other two but a human response to economic, social and demographic forces in the environment.
- Migration may be permanent, temporary or seasonal. It may take place from rural to rural areas, rural to urban areas, urban to urban areas and urban to rural areas. There are two sets of factors that influence migration.
- **The push factors** are those that compel or force a person, due to various reasons, to leave that place and go to some other place. For example, unemployment, poor living conditions, **political turmoil**, an unpleasant climate, **natural disasters**, epidemics and socio-economic backwardness may compel people to leave their native place in search of better opportunities.
- **Pull factors** refer to those factors that attract migrants to an area, such as opportunities for better employment, higher wages, better working conditions and better amenities of life, peace and stability, security of life and property, a pleasant climate, etc.
- There is generally cityward migration when rapid expansion of industry, commerce and business takes place. However, pull factors operate not only in the rural-urban migration, but also in other types of internal as well as international migration.
- This classification of motives for migration into push and pull factors is very useful in analysing determinants of migration, but all migratory movements cannot be explained by these factors alone. Moreover, sometimes migration may occur not because of push or pull factors alone but as a result of the combined effect of both.
- **Hence option (b) is the correct answer.**

Q 28.B

- **Inland Waterways:** Rivers, canals, lakes, and coastal areas have been essential waterways since time immemorial. Boats and steamers are used as means of transport for cargo and passengers. The development of inland waterways is dependent on the navigability width and depth of the channel, continuity in the water flow, and transport technology in use.
    - **The Rhine Waterways:** The Rhine flows through Germany and the Netherlands. It flows from two small headways in the Alps of east-central Switzerland north and west to the **North Sea, into which it drains** through the Netherlands. The Ruhr river joins the Rhine from the east. It flows through a rich coalfield and the whole basin has become a prosperous manufacturing area. Dusseldorf is the Rhine port for this region. This waterway is the world's most heavily used. **Hence pair 1 is correctly matched.**
    - **The Danube Waterway:** This important inland waterway serves Eastern Europe. The Danube river rises in the Black Forest and flows eastwards through many countries. It is navigable up to Taurna Severin. The chief export items are wheat, maize, timber, and machinery.
    - **The Volga Waterway:** Russia has a large number of developed waterways, of which the Volga is one of the most important. It drains into the **Caspian S**ea. The Volga-Moscow Canal connects it with the

Moscow region and the Volga-Don Canal with the Black Sea. **Hence pair 2 is not correctly matched.**

- **The Great Lakes – St. Lawrence Seaway:** The Great Lakes of North America Superior, Huron Erie, and Ontario are connected by Soo Canal and Welland Canal to form an inland waterway. The estuary of the St. Lawrence River, along with the Great Lakes, creates a unique commercial waterway in the northern part of North America. The ports on this route like Duluth and Buffalo are equipped with all facilities of ocean ports. As such large oceangoing vessels are able to navigate up the river deep inside the continent to Montreal.
- **The Mississippi Waterways:** The Mississippi-Ohio waterway connects the interior part of the U.S.A. with the Gulf of Mexico in the south. Large steamers can go through this route up to Minneapolis. **Hence pair 3 is correctly matched.**

Q 29.B

- **Recent Context:** Famous Yakshagana singer and screenwriter Balipa Narayan Bhagwat passed away at the age of 85. He had mastered a unique style of singing, due to which fans have given it the name of **'Balipa Style**'. Rich in voice, Bhagwat has written more than 30 Yakshagana 'Prasanga' (scripts). He was well versed in over 100 Yakshagana episodes, which he composed by heart. He had served in the field of Yakshagana for about 60 years. He was the chief Bhagwat of Kateel Durgaparameshwari Prasadita Yakshagana Mandali (Kateel Mela)·
- **Yakshagaana is a traditional theatre, developed in Dakshina Kannada, Udupi, Uttara Kannada, Shimoga and western parts of Chikmagalur districts, in the state of Karnataka and in Kasaragod district in Kerala.**
  - It combines dance, music, dialogue, costume, make-up, and stage techniques with a unique style and form.
  - It is believed to have evolved from pre-classical music and theatre during the period of the Bhakti movement. **Hence, statement 1 is not correct.**
  - **Elaborate and colorful costumes, makeup, and masks constitute some of the most striking features of the art form. Hence, statement 3 is correct.**
  - Traditionally, yakshagana was performed in the open air by all-male troupes sponsored by various Hindu temples. Since the mid-20th century, however, many performances have been held on indoor stages, and women began to train in the tradition in the 1970s.
  - With roots in Sanskrit literature and theatre, yakshagana emerged as a form of dance-drama in the 16th century.
  - The narratives are drawn primarily from the great Hindu epics Ramayana and Mahabharata as well as from the tales of the youthful god Krishna as recounted in the Bhagavata-Purana. **Hence, statement 2 is correct.**
  - Historically, the cities of Tanjore (now Thanjavur) and Madura (now Madurai), both in the state of Tamil Nadu, and Mysore, in Karnataka, were centers of yakshagana composition.

Q 30.B

- **India has a diverse range of coal deposits and is the world's second-largest producer of coal after China.** The coal found in India can be broadly classified into four types based on its carbon content, heating value, and other properties. These types of coal are:
  - **Anthracite Coal:** This is **hard, black coal with a high carbon content of 86-98% and a low volatile matter content.** Anthracite coal is found in Jammu and Kashmir and is primarily used for heating and industrial processes.
  - **Bituminous Coal: This is the most common type of coal found in India,** and **accounts for over 80% of the country's** coal reserves. Bituminous coal **has a carbon content of 45-86% and a higher volatile matter** content than anthracite coal. It is found in the states of Jharkhand, Chhattisgarh, Odisha, West Bengal, Madhya Pradesh, and Maharashtra. Bituminous coal is used primarily for electricity generation, for making coke for steel production, and for heating.
  - **Sub-bituminous Coal:** This type of coal **has a lower carbon content than bituminous coal**, typically ranging from 35-45%. It has a higher moisture content and a lower heating value than bituminous coal. Sub-bituminous coal is found in the states of Madhya Pradesh, Odisha, and Chhattisgarh, and is primarily used for electricity generation.
  - **Lignite Coal:**
    - ✓ This is a **low-grade coal with a carbon content ranging from 25-35%, and a high moisture content of around 20-50%. I**t has a **low heating value** and is found in the states of Tamil Nadu,

Gujarat, and Rajasthan. Lignite coal is used primarily for electricity generation and for industrial processes. **Hence statement 1 is not correct.**

- ✓ The lignite reserves in India stand at a level of 41.96 billion tonnes as of 1.4.2012, of which 90% occur in the southern State of Tamil Nadu. Other states where lignite deposits have been located are Rajasthan, Gujarat, Kerala, Jammu & Kashmir, and the union territory of Puducherry. The largest lignite deposits of the country are at **Neyveli in the state of Tamil Nadu. Hence statement 2 is correct.**

Q 31.D

- The **Maasai tribe is a Nilotic ethnic group** they are known for their distinctive dress, which includes brightly colored shukas (cloths) and beaded jewelry, as well as their unique customs and traditions. **Maasai society is organized into clans, with each clan having its own territory** and leadership. Men traditionally serve as warriors and protectors, while women are responsible for household duties, such as cooking, cleaning, and caring for children.
- The **Masai are a nomadic tribe** who once wandered with their herds of cattle in the central **highlands of East Africa – in Kenya,** Tanzania and Uganda. They are now mainly confined to the 15,000 square miles of Masai reserves in Kenya and Tanzania. **Hence statement 1 is correct.**
- The cattle reared by the Masai are **Zebu cattle with humps and long horns**. They are treated with great respect and affection and are never slaughtered for food or for sale. Cattles are reared by every Masai family. They are considered far more valuable than anything else. They are symbol of wealth. **Hence statement 2 is correct.**
- The **Masai tribe build circular huts with sticks,** bushes and mud for temporary shelter. **Hence statement 3 is correct.**
- **Hence option (d) is the correct option.**

Q 32.C

- **Recent context:** A projected 400,000 to 800,000 tonnes of Indonesian palm oil are expected to be blocked from the global market over the next three months after the government said it would suspend two-thirds of palm oil exports in order to shore up domestic cooking oil supplies, according to a Global Agricultural Information Network report from the Foreign Agricultural Service o the US Department of Agriculture (USDA) in the month of February.
- Palm oil is an edible vegetable oil derived from the mesocarp of the fruit of the oil palms. The oil is used in food manufacturing, in beauty products, and as biofuel. **Palm oil accounted for about 33% of global oils produced from oil crops in 2014.**
- In the year 2021, **India was the leading importer of palm oil worldwide, with an import value of about 9.6 billion U.S. dollars. Hence, statement 2 is correct.**
- The biggest producers of palm oil are Indonesia, Malaysia, Thailand, and Nigeria. Indonesia produces biodiesel primarily from palm oil.
- **Andhra Pradesh is the major Oil Palm growing State in India with a production capacity of 20 lakh tons. Andhra Pradesh (83.5 percent) along with Telangana accounts for about 97 percent of India's 278,000 tonnes of crude palm oil production. Hence, statement 1 is correct.**

Q 33.B

- This is the population pyramid of Australia.
- **It is bell shaped and tapered towards the top.**
- **This shows birth and death rates are almost equal leading to a near constant population. Hence, option (b) is the correct answer.**
  - Whereas, Japan pyramid has a narrow base and a tapered top showing low birth and death rates.
- The age-sex pyramid of Nigeria is a triangular shaped pyramid with a wide base and is typical of less developed countries.
- These have larger populations in lower age groups due to high birth rates.
- If you construct the pyramids for Bangladesh and Mexico, it would look the same.

Q 34.D

- **Minerals** are naturally occurring inorganic substances that have a definite chemical composition and physical properties. They are formed by geological processes over millions of years and are found in rocks, soil, and water. These minerals can be broadly classified into two main categories: **metallic and non-metallic minerals.**

- They are usually found in "**ores**". The term ore is used to describe an accumulation of any mineral mixed with other elements. The mineral content of the ore must be in sufficient concentration to make its extraction commercially viable.
- **The mode of occurrence of minerals** refers to the way in which minerals are distributed or concentrated in the earth's crust. There are several modes of occurrence of minerals, **including veins, disseminations, stratiform deposits, and placers.**
    - **Copper**: Copper is a metallic mineral that is widely distributed in the earth's crust. It is commonly found in the form of sulfide and oxide minerals, such as chalcopyrite, bornite, and malachite. **Copper deposits are typically formed in igneous and metamorphic rocks minerals** which occur in the cracks, crevices, faults, or joints. The smaller occurrences are called **veins** and the larger are called **lodes**. **In most cases**, **they are formed when minerals in liquid/ molten and gaseous forms are forced upward through cavities toward the earth's surface. They cool and solidify as they rise.** Copper can also occur in sedimentary rocks as a result of chemical weathering and leaching **but is generally found in veins and lodes. Hence pair 1 is correctly matched.**
    - **Bauxite**: Bauxite is a non-metallic mineral that is the **primary source of aluminum.** It is typically found in tropical and subtropical regions, where it is formed through the **weathering of aluminum-rich rocks such as granite and shale.** Bauxite deposits are typically formed in residual soils and are often found on hillsides and plateaus. The mineral is commonly found as a mixture of gibbsite, boehmite, and diaspore. **Hence pair 3 is correctly matched.**
    - **Coal:** Coal is a **non-metallic mineral** that is formed from the remains of ancient plants and trees. It is **typically found in sedimentary rocks,** where it is formed through a process known as **coalification**. This process involves the transformation of plant material into coal through the application of heat and pressure over millions of years. Coal deposits are typically found in sedimentary basins, where they can occur as seams or layers of varying thicknesses. **Hence pair 2 is correctly matched.**

Q 35.A

- Sex ratio refers to the **number of females to males in a given population or group.** Sex ratio can vary widely depending on a number of factors, including geography, culture, and demographics. In most human populations, the sex ratio at birth is slightly biased towards males.
- In India, the sex ratio is worked out using the formula: **(Female Population/Male Population) *1000** or the **number of females per thousand males. Hence statement 1 is correct.**
- Literacy rate is the percentage of the population who are able to read and write with understanding. It is a measure of a country's educational level and human development**. In India, literacy rate denotes the percentage of the population above 7 years** of age, who is able to read, write and have the ability to do arithmetic calculations with understanding. **Hence statement 2 is not correct.**
- **The literacy rate in rural India is 67.77% compared to 84.11% in urban India.**
- **Hence option (a) is the correct answer.**

Q 36.B

- **Recent Context:** Russia invaded and occupied parts of Ukraine in a major escalation of the Russo-Ukrainian War, which began in 2014. The invasion has resulted in many deaths on both sides and instigated Europe's largest refugee crisis since World War II. Buildings and infrastructure were hit in **Kyiv, Odesa and Kharkiv,** with power blackouts in several areas. Ukraine said Russia had fired missiles, the largest number in a single wave for several weeks.
    - **Odesa is a UNESCO World Heritage Site and is located near the Black sea and is 500 km from the capital of Ukraine, Kyiv Hence, pair 1 is correctly matched.**
- **Mount Aso, is also known as Aso Volcano and in this sense is the largest active volcano in Japan,** and is among the largest in the world. Mount Aso volcano in Japan, erupted on October 20, 2021 and emitted a giant column of ash to about thousands of metres into the sky. **Hence, pair 2 is not correctly matched**.
- **Nicosia, also known as Lefkosia, is the divided capital city of Cyprus.** Former f**oreign minister Nikos Christodoulides was elected as the new president of Cyprus** in a runoff election in 2023. **Hence, pair 3 is correctly matched.**

Q 37.B

- The Union **Cabinet has approved National Green Hydrogen Mission** with an initial outlay of Rs.19,744 crore, including an outlay of **Rs.17,490 crore for the SIGHT programme**, Rs.1,466 crore for pilot projects, Rs.400 crore for R&D, and Rs. 388 crores towards other Mission components.

- The **MNRE will formulate the scheme guidelines** for the implementation of the respective components to help achieve the following outcomes by 2030:
    - Development of **green hydrogen production capacity** of at least **5 MMT (Million Metric Tonne**) per annum with an associated r**enewable energy capacity addition of about 125 GW** in the country.
    - Over **Rs. Eight lakh crore in total investments**.
    - Creation of over **Six lakh jobs.**
    - The cumulative **reduction in fossil fuel imports** of **over Rs. One lakh crore.**
    - **Abatement of** nearly **50 MMT of annual greenhouse gas emissions.**
- The Mission will have wide-ranging **benefits**-
    - Creation of **export opportunitie**s for Green Hydrogen and its derivatives
    - **Decarbonization** of industrial, mobility, and energy sectors
    - **Reduction in dependence on imported fossil fuels** and feedstock
    - Development of **indigenous** manufacturing capabilities
    - Creation of **employment** opportunities; and
    - Development of cutting-edge **technologies**.
- The Mission will facilitate demand creation, production, utilization, and export of Green Hydrogen.
- Under the **Strategic Interventions for Green Hydrogen Transition Programme (SIGHT**), two distinct **financial incentive mechanisms** – t**argeting domestic manufacturing of electrolyzers** and **production of Green Hydrogen** – will be provided.
- The Mission will also support pilot projects in emerging end-use sectors and production pathways. Regions capable of supporting large-scale production and/or utilization of Hydrogen will be identified and developed as Green Hydrogen.
- **Hence option (b) is the correct answer.**

Q 38.A

- Nomadic herding or pastoral nomadism is a primitive subsistence activity, in which the herders rely on animals for food, clothing, shelter, tools, and transport. They move from one place to another along with their livestock, depending on the amount and quality of pastures and water.
- A wide variety of animals is kept in different regions. In tropical Africa, cattle are the most important livestock, while in Sahara and Asiatic deserts, sheep, goats, and camels are reared. In the mountainous areas of Tibet and the Andes, yak, and llamas, and in the Arctic and Sub-Arctic areas, reindeer are the most important animals.
- Movement in search of pastures is undertaken either over vast horizontal distances or vertically from one elevation to another in the mountainous regions. The process of migration from plain areas to pastures on mountains during summers and again from mountain pastures to plain areas during winters is known as transhumance.
- In mountain regions, such as the Himalayas, **Gujjars, Bakarwals, Gaddis and Bhotiyas** migrate from plains to the mountains in summers and to the plains from the high-altitude pastures in winters. **Hence option (a) is the correct answer.**
- Similarly, in the tundra regions, the nomadic herders move from south to north in summer and from north to south in winter.
- **NOTE:** The Five hill Tribes of the Nilgiris are: **Irulas, Badagas, Todas, Kotas and Kurumbas.**

Q 39.B

- **General Motors, Ford Motor Company, and Chrysler Stellantis North America** are often referred to as the "Big Three", being the largest automakers in the United States of America. All three have their **headquarters in the Detroit area.**
- **Chennai is nicknamed "The Detroit of India",** with more than one-third of India's automobile industry being based in the city. Chennai is also referred to as the 'Detroit of India' with the Indian operations of Ford, Hyundai, Renault, and Nissan headquartered in the city and BMW having an assembly plant on the outskirts. Chennai accounts for 35% of the country's automobile component industry and 60 percent of the country's automotive exports.
- **Hence option (b) is the correct answer.**

Q 40.C

- **Tehri Dam:** Tehri Dam is a hydroelectric dam located on the **Bhagirathi River in the state of Uttarakhand.** It was built in 2006 and has a storage capacity of 4.0 billion cubic meters of water. The dam is one of the tallest in the world, standing at a height of 260 meters. It is used for hydroelectric power

generation and flood control, and also provides drinking water to nearby towns and cities. The dam has become a popular tourist attraction in the region.

- **Gandhi Sagar:** Gandhi Sagar is a reservoir located on the **Chambal River in the states of Madhya Pradesh and Rajasthan.** It was built in 1960 and has a storage capacity of 7,322 million cubic meters of water. The dam is used for irrigation, hydroelectric power generation, and flood control.
- **Nagarjuna Sagar:** Nagarjuna Sagar is a reservoir located on the **Krishna River in the state of Telangana and Andhra Pradesh.** It is one of the largest man-made lakes in the world, with a storage capacity of 11,472 million cubic meters of water. The dam was built in 1967 and is used for irrigation, hydroelectric power generation, and drinking water supply.
- **Mettur Dam:** Mettur Dam is a large dam located on the **Cauvery River in the state of Tamil Nadu**. It was built in 1934 and has a storage capacity of 93.47 thousand million cubic feet of water. The dam is used for irrigation, hydroelectric power generation, and drinking water supply. It is also a popular tourist destination.

Q 41.A

- Shifting cultivation is a Primitive Subsistence Agriculture in which the vegetation is usually cleared by fire,and the ashes add to the fertility of the soil. It is also called as slash and burn agriculture. The cultivated patches are very small and cultivation is done with very primitive tools such as sticks and hoes. After some time (3 to 5 years) the soil loses its fertility and the farmer shifts to other parts and clears other patches of the forest for cultivation.
- It is prevalent in tropical regions with different names, e.g. **Jhuming in the Northeastern states** of India, **Milpa in Central America** and Mexico and **Ladang in Indonesia** and Malaysia, **Taungya in Myanmar**, **Chena in Sri Lanka** and Caigin in the Philippines. **Hence, only pair 3 is correctly matched.**

Q 42.D

- **Packet Stations are also known as ferry ports.** These packet stations are exclusively concerned with the transportation of passengers and mail across water bodies covering short distances. These stations occur in pairs located in such a way that they face each other across the water body, e.g. Dover in England and Calais in France across the English Channel. **Hence option (d) is the correct answer.**
- **Entrepot Ports** are collection centers where goods are brought from different countries for export. Singapore is an entrepot for Asia. Rotterdam for Europe, and Copenhagen for the Baltic region.
- **Out Ports** are deep water ports built away from the actual ports. These serve the parent ports by receiving those ships which are unable to approach them due to their large size. A classic combination, for example, is Athens and its outport Piraeus in Greece.
- **Ports of Call** are the ports that originally developed as calling points and main sea routes where ships used to anchor for refueling, watering and taking food items. Later on, they developed into commercial ports. Aden, Honolulu and Singapore are good examples.

Q 43.B

- **Recent Context:** Research has shed light on the Agasthiyar Observatory which was one of the few magnetic observatories in the world during the 19th century.
- Agasthyarkoodam, the misty peak, and trekkers destination on the **Western Ghats straddling Tamil Nadu and Kerala** were once home to a forgotten and long-lost 19th-century observatory **established by Scottish meteorologist John Allan Broun.**
- The Agasthyarkoodam Observatory is an astronomical research observatory in Kerala, India.
- **The Indian Institute of Astrophysics owns and operates it.**
- **Magnetic observatories** continuously measure and record Earth's magnetic field at a number of locations.
    - In an observatory of this sort, magnetized needles with reflecting mirrors are suspended by quartz fibers.
    - Light beams reflected from the mirrors are imaged on a photographic negative mounted on a rotating drum.
    - Variations in the field cause corresponding deflections on the negative.
    - **Applications of magnetic observatories** include the **creation of world magnetic maps for navigation and surveying; correction of data obtained in air, land, and sea surveys for mineral and oil deposits; and scientific studies of the interaction of the Sun with Earth, etc**
- **Hence, option (b) is the correct answer.**

Q 44.A

- Industries are not evenly distributed in the country. They tend to concentrate on certain locations because of favourable locational factors. Several indices are used to identify the clustering of industries, important among them are:
    - Number of industrial units,
    - Number of industrial workers,
    - Quantum of power used for industrial purposes,
    - Total industrial output,
    - Value added by manufacturing, etc.

Industrial Regions and Districts

Major Industrial Regions (8)

1. Mumabi-Pune Region, 2. Hugli Region, 3. Bengaluru-Tamil Nadu Region, 4. Gujarat Region, 5. Chotanagpur Region, 6. Vishakhapatnam-Guntur Region, 7. Gurugram-Delhi-Meerut Region, and 8. Kollam-Thiruvananthapuram Region.

Minor Industrial Regions (13)

1. Ambala-Amritsar, 2. Saharanpur-Muzaffarnagar-Bijnor, 3. Indore-Dewas-Ujjain, 4. Jaipur-Ajmer, 5. Kolhapur-South Kannada, 6. Northern Malabar, 7. Middle Malabar, 8. Adilabad-Nizamabad, 9. Allahabad-Varanasi-Mirzapur, 10. Bhojpur-Munger, 11. Durg-Raipur, 12. Bilaspur-Korba, and 13. Brahmaputra Valley.

Industrial Districts (15)

1. Kanpur, 2. Hyderabad, 3. Agra, 4. Nagpur, 5. Gwalior, 6. Bhopal, 7. Lucknow, 8. Jalpaiguri, 9. Cuttack, 10. Gorakhpur, 11. Aligarh, 12. Kota, 13. Purnia, 14. Jabalpur, and 15. Bareilly.

Q 45.A

- **Life and development in the Equatorial Regions:** The Equatorial Regions are generally sparsely populated. In the forests, most primitive people live as hunters and collectors and the more advanced ones practice shifting cultivation.
- In the **Amazon basin, the Indian tribes collect wild rubber, in the Congo Basin the Pygmies gather nuts and in the jungles of Malaysia, the Orang Asli make all sorts of cane products** and sell them to people in villages and towns. **Hence option (a) is the correct answer.**
- In the clearings for shifting cultivation, crops like manioc (tapioca), yams, maize, bananas, and groundnuts are grown.
- When the fertility is exhausted, the clearing is abandoned and they move on to a new plot.

Q 46.B

- The location of an industry depends on many factors such as raw material, power, labor, transport facilities, etc. Industries using weight-losing raw materials are located in the regions where raw materials are located. Following are some of the industries which depend on weight-losing raw materials.
- **The raw materials required for iron and steel industries are iron ore,** coking coal, limestone, dolomite, manganese, and fire clay. **All these raw materials are gross (weight loss)**, therefore, the best location for the iron and steel plants is near the source of raw materials.
- **The sugar industry** is the second most important agro-based industry in the country. **Sugarcane is a weight-losing crop**. The ratio of sugar to sugarcane varies between 9 to 12 percent depending on its variety. Its sucrose content begins to dry during haulage after it has been harvested from the field. Better recovery of sugar is dependent upon its being crushed within 24 hours of its harvesting. Sugar factories hence are located within the cane-producing regions.
- Copper smelting, pig iron, and pulp industry also depend on weight losing raw material.
- Cotton is a "pure" raw material that does not lose weight in the manufacturing process. so other factors, like, power to drive the looms, labor, capital, or market may determine the location of the industry. Similarly,
- The computer chip-making industries depend on silicon, Germanium, metals, etc which do not lose weight in the process.
- **Hence, option (b) is the correct answer.**

Q 47.D

- The population density is the concentration of the individuals within a specific geographic location.
- **It is influenced by many factors**.
- **Physical factors** such as favorable landforms like river valleys have a higher concentration of population. E.g. Ganga-Brahmaputra Plains in India.
- **Fertile soil areas have high density across the globe. Hence option 2 is correct.**
- **Economic factors also influence population density.** Regions with little or no economic opportunities tend to be sparsely populated. The industrial regions across the world are densely populated. Osaka in Japan and Mumbai in India are good examples. **Hence option 1 is correct.**
- **Emigration** is the outward movement of people from a particular area, it will **lead to a reduction in population.**
- Immigration will lead to an increase in population density. **Hence option 3 is correct.**

Q 48.C

- Under the internal migration, four streams are identified: (a) rural to rural (R-R); (b) rural to urban (R-U); (c) urban to urban (U-U); and (d) urban to rural (U-R).
- In India, during 2011, out of 455.0 million migrants, enumerated on the basis of the last residence, 141.9 million had changed their place of residence in the last ten years. Out of these, 118.7 million were intra-state migrants. T**he stream was dominated by female migrants. Most of these were migrants related to marriage.**
- **Though the intra-state migration is a major proportion of migration in India but the major reason for this has been marriage. Marriage accounts for about 33% of intra-state migrant population which is 51% for female intra-state migrant.**

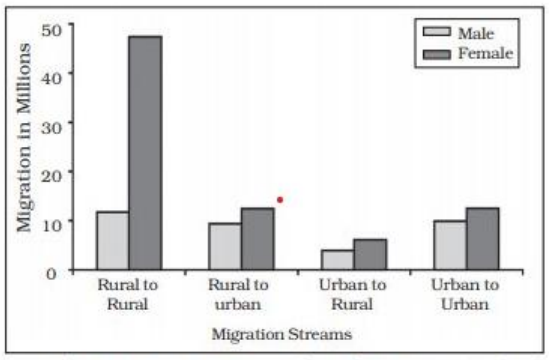


Fig. 2.1 a : Intra-state Migration by Place of Last Residence Indicating Migration Streams India, 2011

Source: Census of India, 2011

- **Hence option (c) is the correct answer.**

Q 49.B

- Patterns of population distribution and density help us to understand the demographic characteristics of any area. Broadly, 90 per cent of the world population lives in about 10 per cent of its land area. The 10 most populous countries of the world contribute about 60 per cent of the world's population. Of these 10 countries, 6 are located in Asia.

Table 2.1: Region wise Density of Population

Region	Population (2017)	Land Area (Km^2)	Density (P/Km^2)	World Share (in percentage)
Asia	4,478,315,164	31,034,755	144	59.6%
Africa	1,246,504,865	29,678,687	42	16.6%
Europe	739,207,742	22,131,968	33	9.8%
Latin America and the Caribbean	647,565,336	20,110,725	32	8.6%
Northern America	363,224,006	18,626,872	20	4.8%
Oceania	40,467,040	8,430,633	5	0.5%

- **Hence option (b) is the correct answer.**

Q 50.C

- **Types of Urban Settlements Depending on the size and the services available and functions rendered, urban centers are designated as towns, cities, million cities, conurbations, and megalopoleis.**
- Town The concept of 'town' can best be understood with reference to 'village'. Population size is not the only criterion. Functional contrasts between towns and villages may not always be clear-cut, but specific functions such as manufacturing, retail and wholesale trade, and professional services exist in towns.
- City: A city may be regarded as a leading town, which has outstripped its local or regional rivals. In the words of Lewis Mumford, " the city is in fact the physical form of the highest and most complex type of associative life". Cities are much larger than towns and have a greater number of economic functions. They tend to have transport terminals, major financial institutions, and regional administrative offices. When the population crosses the one million mark it is designated as a million city.
- **Conurbation: The term conurbation was coined by Patrick Geddes in 1915 and applied to a large area of urban development that resulted from the merging of originally separate towns or cities. Greater London, Manchester, Chicago, and Tokyo are examples.**
- Megalopolis This Greek word meaning "great city", was popularised by Jean Gottman (1957) and signifies 'super- metropolitan' region extending, as the union of conurbations. The urban landscape stretching from Boston in the north to south of Washington in the U.S.A. is the best-known example of a megalopolis.
- **Hence, option (c) is the correct answer.**

Q 51.C

- **India is one of the largest producers of iron ore in the world,** and there are several major iron ore mines located in the country. Some of the major iron ore mines in India, along with their locations and features, are as follows:

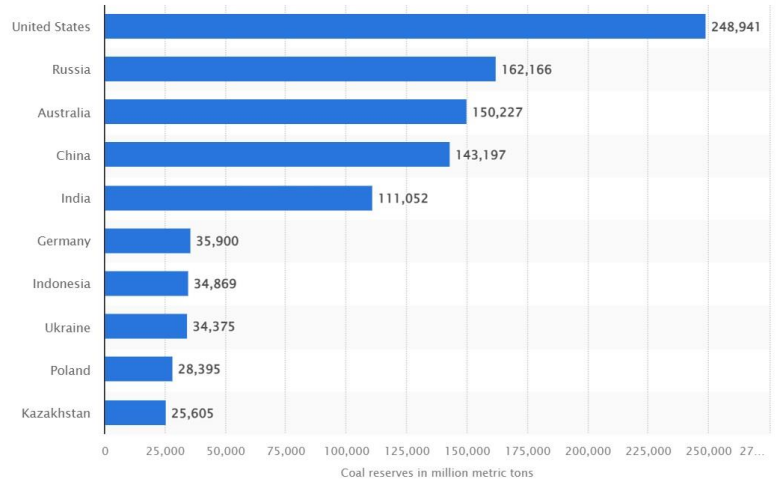
- **The Gurumahisani iron ore mine: It is located in the Mayurbhanj district of Odisha, India.** It is India's first iron ore mine, and widely dubbed as the 'mother mine' for the empire of Tata Steel that has grown to a global steel behemoth having a crude steel capacity of 34 million tonnes per annumThe Gurumahisani mine has an estimated reserve of around 67 million tonnes of iron ore, and is known for its high-grade iron ore with low impurities. The iron ore from this mine is ideal for use in steel production and is in high demand by steel plants in India and abroad. **Hence pair 1 is not correctly matched.**
- **Noamundi Iron Ore Mine**: **It is located in the West Singhbhum district of Jharkhand** and is owned by Tata Steel. The mine has an estimated reserve of around 310 million tonnes and supplies iron ore to Tata Steel's Jamshedpur plant. **Hence pair 2 is correctly matched.**
- **Badampahar iron ore Mine: It is located in the Mayurbhanj district of Odisha, India.** The Badampahar iron ore deposit is one of the largest iron ore reserves in the state of Odisha and is estimated to contain around 200 million tonnes of high-grade iron ore. The iron ore from Badampahar is known for its superior quality and high iron content, which makes it ideal for use in steel production. **Hence pair 3 is correctly matched.**

Q 52.C

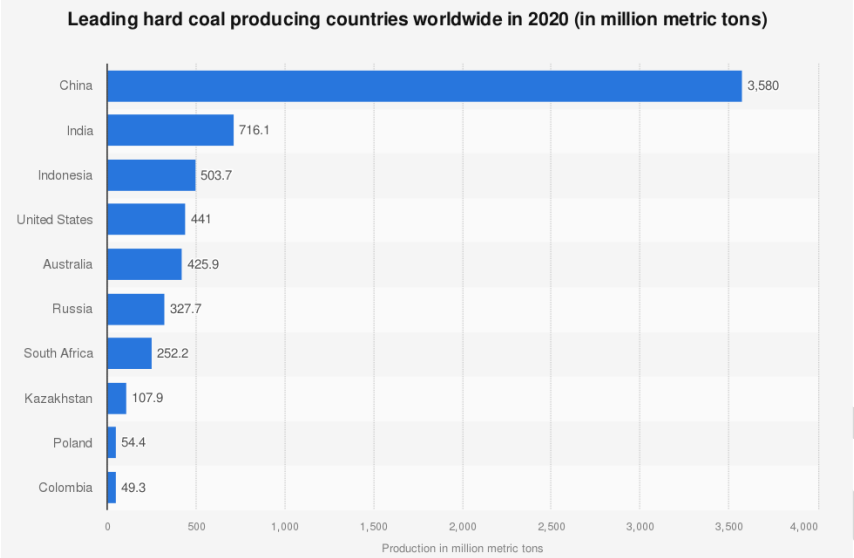
- The Sino-Tibetan languages are **mostly spoken by the tribal groups** residing in the geographical area extending from Ladakh to the North-eastern frontier regions of India.
- **This family is divided into the sub-families of Siamese-Chinese and Tibeto-Myanmari** (Tibeto-Burman). The first group does not belong to India except for the Khamti speech.
- The Tibeto-Myanmari (Tibeto-Burman) sub-family is divided into three branches: Tibeto-Himalayan, North Assam and Assam-Myanmari (Assam-Burmese).
- The Tibeto-Himalayan branch is again divided into Tibetan, or Bhotia and Himalayan groups. They are spread over the states of Jammu and Kashmir, Himachal Pradesh, Punjab, West Bengal and Sikkim.
- Languages like Bhotia, Tibetan, Balti, Ladakhi and Lahul belong to the Bhotia group. The Himalayan group includes the Chhambba, Limba and Lepcha.
- **North Assam branch includes Dafla, Miri, Mishmi and Mishing of Arunachal Pradesh.**
- Assam-Myanmari (Assam-Burmese) language is spoken by Bodo, Naga and Kuki-chin. Important languages of the area are Bodo, Garo, Tripuri, Reang, Kachari, Rabha and Dimasa. In Naga groups are Sema, Angami, Lotha, Tangkhul and Konyak. Other important languages of this group are Manipuri, Mizo,Thado, Hmar and Kuki.
- **Hence option (c) is the correct answer.**

Q 53.A

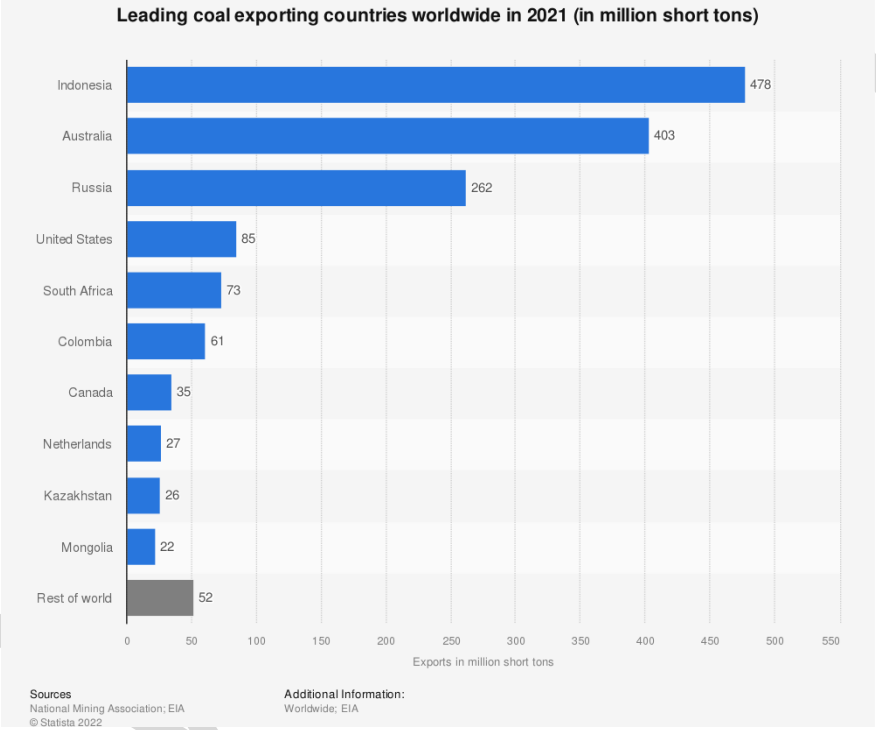
- **Coal is a one of the important minerals which is mainly used in the generation of thermal power and smelting of iron ore.** It is the one of the most mined mineral from the earth. According to one estimate, proven coal reserves are 860, 938 million tonnes.
- Of the three fossil fuels (Petroleum, natural gas and coal), **coal has the most widely distributed reserves;** coal is mined in over 100 countries, and on all continents except Antarctica. The largest proved reserves are found in the United States, Russia, China, Australia and India. **The United States is the country with the world's largest proven coal reserves. As of 2020, coal reserves in the country amounted to nearly 248.9 billion metric tons. Russia ranked second, having proved coal reserves of 162.2 billion metric tons. Hence statement 1 is correct.**



- A proved recoverable reserve is the tonnage of coal that has been proved by drilling etc. and is economically and technically extractable. **Coal is found majorly in forms of Lignite and Anthracite.**
- **In terms of production, China is the top coal producer since 1983**. In 2011 China produced 3,520 millions of tonnes (mt) of coal – 49.5% of 7,695 million tonnes world coal production. In 2011 other large producers were United States (993 mt), India (589 mt), European Union (576 mt) and Australia (416 mt). **Hence statement 2 is correct.**



- **Top coal exporting countries are Indonesia and Australia. Hence statement 3 is not correct.**



Q 54.C

- **San Francisco** is a commercial, financial, and cultural center of Northern California. The city proper is the fourth most populous in California. It is **located on the West Coast of the United States** at the north end of the San Francisco Peninsula and includes significant stretches of the Pacific Ocean and San Francisco Bay within its boundaries. **Hence option 1 is correct.**
- **Vladivostok is a major Pacific port city in Russia** overlooking Golden Horn Bay, near the borders with China and North Korea. It's known as the terminus of the Trans-Siberian Railway, which links the city to Moscow in a 7-day journey. **Hence option 2 is correct.**
- **Wuhan is the sprawling capital of Central China's Hubei province,** is a commercial center divided by the Yangtze and Han rivers. It is not located on the sea coast. **Hence option 3 is not correct.**
- **Melbourne is the capital** and most populous city of the **Australian state of Victoria**, and the second-most populous city in both Australia and Oceania. The metropolis occupies much of the **northern and eastern coastlines of Port Phillip Bay. Hence option 4 is correct.**

Q 55.B

- The **Rhine** is a significant European river that **originates in the south-eastern Swiss Alps** in the Swiss canton of Graubünden, and flows through the borders of Switzerland, Liechtenstein, Austria, and Germany. It Flows through six countries: Switzerland, Liechtenstein, Austria, Germany, France, and the Netherlands. It has a total length of approximately 1,233 km. **Hence pair 1 is not correctly matched**.
- **The Danube** is Europe's second-longest river Stretching through a significant part of Central and South-eastern Europe. The river's source is in **Donaueschingen, a town situated in the Black Forest of Germany**, which ends up in the Black Sea. **Hence pair 2 is correctly matched.**
- The Volga originates in Russia, and flows through Central and Southern Russia, eventually reaching the Caspian Sea. It is the longest river of Europe. **Hence pair 3 is correctly matched.**

Q 56.C

- '**Mangrove Initiative for Shoreline Habitats & Tangible Incomes', MISHTI**, is a scheme launched in the recent **budget**. Under this scheme, multiple activities will be taken up focusing on **mangrove plantations** along the coastline, on saltpan lands, and wherever feasible. The **funds** for the same would be sourced from the convergence between **MGNREGS, CAMPA Fund,** and others. **Hence, option (c) is the correct answer.**
- Mangroves have been the focus of conservationists for years and it is difficult to overstate their importance in the global climate context. It provides **multidimensional benefits** as-
  - **Ecological**- Biodiversity conservation, Groundwater recharge, habitat for multiple species including the Royal Bengal tigers, etc.
  - **Economical**- Mangrove forests offer a good ground for fisheries, these also provide access to minor forest produce as well as timber.
  - **Social**- Mangroves form a part of many cultures, they bind the community, host the local forest deities and also provide avenues for tourism.
  - **Disaster Managemen**t- Mangroves and their roots can successfully moderate the speed of incoming waves and storms thus protecting the shorelines, communities, and precious lives.

Q 57.A

- **The Securities and Exchange Board of India (SEBI) strengthened the framework for green bonds by introducing the concept of 'blue' and 'yellow' bonds as new modes of sustainable finance. Yes Bank issued India's first green bond in 2015 to raise INR 5 billion. Hence, statement 1 is correct.**
- The **main objective** of this amendment is to expand the definition of '**green debt security**' and incidental matters. It has also included new modes of sustainable finance in relation to pollution prevention and control and eco-efficient products.
- These actions were taken against the backdrop of growing interest in sustainable finance both in India and around the world. They also aim to align the existing framework for green debt securities (GBP) with the updated Green Bond Principles, which are recognized by IOSCO.
- **Blue bonds** are modes of **sustainable finance raised for sustainable maritime sector including sustainable fishing, sustainable water management etc.**
- **Yellow bonds** are modes of **sustainable finance raised for solar energy generation and the associated upstream and downstream industries. Hence, statement 2 is not correct.**

Q 58.B

- **Maize** is a food as well as a fodder crop grown under semi-arid climatic conditions and over inferior soils. It requires **50-100 cm** of rainfall and a temperature ranging from **21°C to 27°C.**
- Maize is sown all over India except in eastern and northeastern regions. The leading producers of maize are the states of Madhya Pradesh, Andhra Pradesh, Karnataka, Rajasthan, and Uttar Pradesh. Yield level of maize is higher than other coarse cereals. It is high in southern states and declines towards central parts. **Hence, option (b) is the correct answer.**
- In India, maize is the third most important food crop after rice and wheat. According to advanced estimates, it is cultivated in 8.7 m ha (2010-11) mainly during the Kharif season which covers 80% area. Maize in India contributes nearly 9 % of the national food basket and more than Rs. 100 billion to the agricultural GDP at current prices apart from generating employment to over 100 million man-days at the farm and downstream agricultural and industrial sectors.
- In addition to staple food for human being and quality feed for animals, maize serves as a basic raw material as an ingredient in thousands of industrial products that includes starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceutical, cosmetic, film, textile, gum, package, and paper industries, etc.

Q 59.D

- In a recent move aimed at improving the organ donation and transplantation system in India, the Ministry of Health and Family Welfare (MoH&FW) has introduced several changes to the National Organ Transplantation Guidelines.
- **New Guidelines:**
  - **No domicile requirement: A citizen can now register for organ donation in any state, previous requirement of registering in the state of domicile has been removed. Hence statement 1 is correct.**
  - **Upper limit age: New Guidelines allow even those above 65 years of age to register to receive an organ for transplantation from deceased donors. Hence statement 2 is correct.**
    - ✓ Under the previous guidelines established by the National Organ and Tissue Transplant Organization (NOTTO), patients over the age of 65 suffering from end-stage organ failure were prohibited from registering to receive an organ for transplantation.
  - **No registration fees: Centre has asked states to stop governments to stop taking fees to register a patient for organ transplants. Hence statement 3 is correct.**
- These developments come in the backdrop of when MoH&FW is working on One Nation-One Policy for organ donation and transplantation.

Q 60.C

- **Recent Context:** NSE Indices Ltd., an NSE (National Stock Exchange) arm has introduced the country's first ever municipal bond index.
- **About Nifty India Municipal Bond Index:**
  - **Role of the index:** The new Nifty India Municipal Bond Index **will track the performance of municipal bonds** issued by Indian municipal corporations across maturities and having investment grade credit rating. **Hence statement 1 is correct.**
  - **Index constituents**: Presently, the index has 28 municipal bonds issued by 10 issuers all having credit rating in the AA category. The index constituents are assigned weights based on their outstanding amount.
  - **Base for Index:** The index has a base date of January 1, 2021, and a base value of 1,000.
  - **Review: The index will be reviewed quarterly. Hence statement 2 is correct.**

- **Municipal Bond Market in India**
  - **Municipal Bond Market is regulated by the Securities and Exchange Board of India (SEBI) in India.**
  - The Indian municipal bond market has seen a resurgence of issuances after **SEBI's Issue and Listing of Municipal Debt Securities Regulations, 2015** came into effect.
  - **The Government of India has also provided incentives in the form of a lump-sum grant-in-aid for municipal bond issuances.**
  - Largely investment-grade rating: 59% of municipal bonds issued received a rating of investment grade or above, highlighting the underutilized potential for bond financing by Indian municipalities.

Q 61.B

- A population pyramid, also called an **age-sex pyramid**, is a graphical illustration that shows the distribution of various age groups in a population (typically that of a country or region of the world), which normally forms a pyramid. It typically consists of two back-to-back bar graphs, with the population **plotted on the X-axis and age on the Y-axis,** one showing the number of males and one showing females in a particular population in five-year age groups. **Hence option (b) is the correct answer.**
- Males are conventionally shown on the left and females on the right, and they may be measured by a raw number or as a percentage of the total population. The age–sex structure reflects the demographic and

socioeconomic history of a population over a period of time and, even their prospects for the future. It is the result of various factors, such as fertility, mortality, and migration.

- Four main types of age-sex pyramids have been identified:
  - A **progressive age structure** is one in which **both birth and death rates are high.** Such a structure is common in developing countries where social, cultural, and perhaps religious and economic conditions lead to high fertility and poor living conditions, bad diets, and little medical aid lead to high levels of mortality.
  - A **regressive age structure** is one in which **birth and death rates are low and declining.** This pattern is common in developed countries (especially those in Western Europe), where high living standards, education and social awareness are accompanied by good food and medicine.
  - A **stationary age structure** is one in which birth and death rates are both low, children account for about 35–40 percent of the total population, and the aged for about 10 percent. This pattern may remain the same for many years.
  - An **intermediate age structure** may vary in character and is most common in countries that are passing through stages of development. Such countries may once have had progressive structures and may, in the future, have regressive structures.

Q 62.C

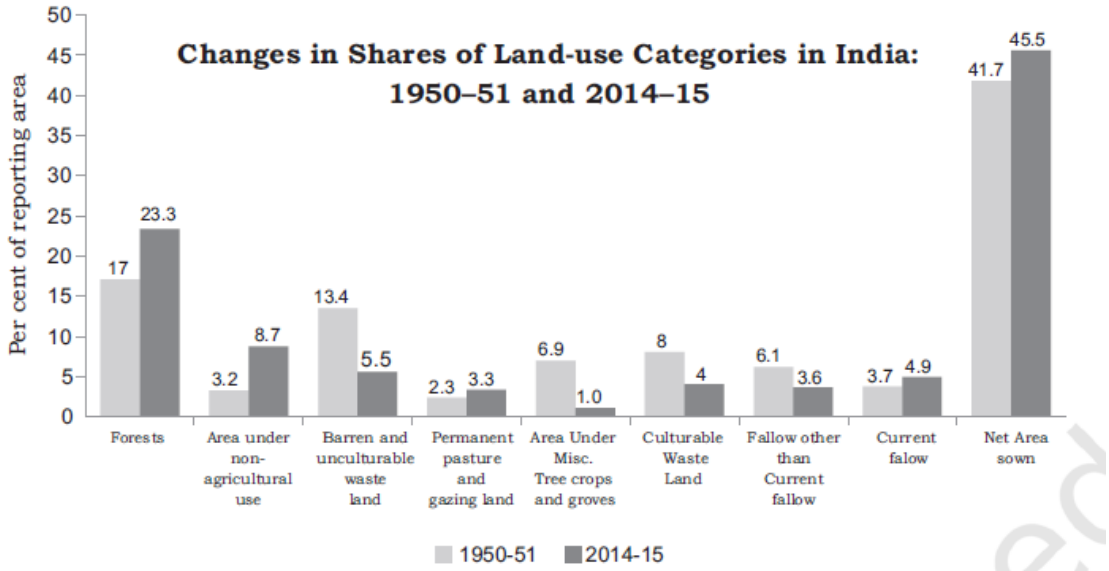
- The **Ruhr Coal field is located in Germany.** It is responsible for 80 per cent of Germany's total steel production. **Hence, pair 1 is correct.**
- **Duluth is located in northeastern Minnesota in the United States of America**. It is one of the important iron and steel-producing centres in the U.S. Besides this, most of the production in the U.S.A. comes from the northern Appalachian region (Pittsburgh), Great Lake region (Chicago-Gary, Erie, Cleveland, Lorain, Buffalo) and the Atlantic Coast (Sparrows Point and Morrisville). **Hence, pair 2 is not correct.**
- **Port Talbot** is an important iron and steel centre in the **United Kingdom.** Other centres in the U.K. are Scun Thorpe, Port Talbot, Birmingham and Sheffield. **Hence, pair 3 is correct.**
- Kryvyi Rih, also known as **Krivoi Rog, is a city in central Ukraine**. It is part of the Kryvyi Rih Metropolitan Region. **Hence, pair 4 is correct.**
- Important iron and steel centres in Russia are Le Creusot and St. Ettiennein France; and Moscow, St. Petersburgh, Lipetsk, and Tula.
- In Asia, the important centres include Nagasaki and Tokyo-Yokohamain Japan; Shanghai, Tienstin and Wuhan in China; and Jamshedpur, Kulti-Burnpur, Durgapur, Rourkela, Bhilai, Bokaro, Salem, Visakhapatnam and Bhadravati in India.

Q 63.A

- **Footloose industries:** Footloose industries can be located in a wide variety of places. They are not dependent on any specific raw material, weight loss or otherwise. **Hence, statement 1 is correct.**
  - They largely depend on component parts which can be obtained anywhere. They produce in small quantities and also employ a small labour force. **Hence, statement 2 is not correct.**
  - These are generally not polluting industries. The important factor in their location is accessibility by road network.
  - These are called footloose as these types of industries are prone to relocation. For example, diamond and computer chips belong to the footloose industry.
  - **Important characteristics of footloose industries:**
    - ✓ **Location:** Footloose industries can be established at any place. These industries are affected by component parts and they are available in all places.
    - ✓ **Less labour force:** These industries produce their products in small numbers and they do not require a large labour force.
    - ✓ **Eco-friendly:** These are environment-friendly industries as the process involved in these industries have a negligible carbon footprint. These industries emit less or no pollution.
    - ✓ **Less transport cost:** Their products are having very high-value addition and are smaller in size and so transportation cost is only a small fraction of the total cost.
    - ✓ **Small plant size:** These industries require a small plant size compared to heavy and small industries.
    - ✓ **Less raw material dependence:** These are less dependent on specific raw materials, especially weight-losing ones. Most of the raw materials are small and light and can be transported easily.
    - ✓ **Skilled workers:** It needs skilled workers as the industrial process is advanced and major work needs high-quality precision.

Q 64.A

- The land-use categories as maintained in the Land Revenue Records are as follows:
  - **Forests**: According to the Survey of India report, a forest area is one that is notified by the department as land under forests, irrespective of whether it has any tree cover or not. The land under forest cover is the land exceeding one-hectare area having a minimum of 10 percent tree cover irrespective of any other land use. Thus, the area under actual forest cover may be different from the area classified as forest. Hence, there may be an increase in this category without any increase in the actual forest cover.
  - **Barren and Wastelands**: The land classified as a wasteland such as barren hilly terrains, desert lands, ravines, etc. normally can not be brought under cultivation with the available technology. They remain non-suitable for agriculture and generally remain fallow.
  - **Current Fallow**: The land which has been left without cultivation for one or less than one agricultural year is known as current fallow. The practice adopted for giving rest to the culturable land is called the following. The land recoups the lost fertility through natural processes over a time duration.
  - **Net Area Sown**: Net area sown represents the area sown with crops at least once in any of the crop seasons of the year counting area sown more than once in the same year, only once.Net sown area is of crucial importance for India because it is the land actually under cultivation of crops and India has the highest percentage of Net Sown Area.



- **Hence, option (a) is the correct answer.**

Q 65.C

- In India, Land-use records are maintained by the Land revenue department. The land use categories add up to **Reporting area**, which refers to the total area reported by the **Land Revenue department**. **Hence**, **statement 2 is not correct.**
- The **Reporting area** stands for the area for which data on land use classification are available. In areas where land utilization figures are based on land records, reporting area is the area according to village papers, i.e. the papers prepared by the village accountants. In some cases, the village papers may not be maintained in respect of the entire area of the State. For example, village papers are not prepared for the forest areas but the magnitude of such areas is known. Also, there are tracts in many States for which no village paper exists. In such cases, estimates of classification of the area from the agricultural census, 1995-96 and 2000-01 are adopted to complete the coverage.
- The land uses categories add up to reporting area, which is somewhat different from the geographical area. **The Survey of India is responsible for measuring the geographical area of administrative units in India. Hence, statement 1 is not correct.**
- The latest figures of the geographical area of the State/Union Territories are as provided by the Office of the Surveyor General of India **and remain fixed** as per the **international boundaries.**

Q 66.B

- **Development means a qualitative change** that is **always value positive**. Development occurs when positive growth takes place. Yet, **positive growth does not always lead to development. Hence statement 1 is correct.**

- The **growth is quantitative and value-neutral.** It may have a **positive or a negative sign**. This means that the **change may be either positive (showing an increase) or negative** (indicating a decrease). **Hence statement 2 is correct.**
- If the population of a city grows from one lakh to two lakhs over a period of time, which can be said to grow. However, if facilities like housing, provision of basic services, and other characteristics remain the same, then this growth has not been accompanied by development. Thus growth (including population growth does not always lead to development). **Hence statement 3 is correct**.

Q 67.D

- The term **population distribution refers to the way people are spaced over the earth's surface.** Broadly, 90 per cent of the world population lives in about 10 per cent of its land area.
- **Factor that influence population distribution are Landforms:** People prefer living on flat plains and gentle slopes. This is because such areas are favourable for the production of crops and to build roads and industries. The mountainous and hilly areas hinder the development of transport network.
- **Climate:** An extreme climate such as very hot or cold deserts are uncomfortable for human habitation. Areas with a comfortable climate, where there is not much seasonal variation attract more people.
- **Availability of water**: Water is the most important factor for life. So, people prefer to live in areas where fresh water is easily available. Water is used for drinking, bathing and cooking – and also for cattle, crops, industries and navigation.
- **Minerals:** Areas with mineral deposits attract industries. Mining and industrial activities generate employment. So, skilled and semi–skilled workers move to these areas and make them densely populated.
- **Urbanisation:** Cities offer better employment opportunities, educational and medical facilities, better means of transport and communication.
- **Hence option (d) is the correct answer.**

Q 68.D

- Rural settlements may be classified on the basis of forms or shapes of the settlements: These may be a number of geometrical forms and shapes such as Linear, rectangular, circular star like, T-shaped village, double village, cross-shaped village etc.
- (a) Linear pattern: In such settlements houses are located along a road, railway line, river, canal edge of a valley or along a levee.
- (b) **Rectangular pattern: Such patterns of rural settlements are found in plain areas or wide inter montane valleys. The roads are rectangular and cut each other at right angles. Hence statement 1 is correct.**
- (c) Circular pattern: Circular villages develop around lakes, tanks and sometimes the village is planned in such a way that the central part remains open and is used for keeping the animals to protect them from wild animals.
- (d) Star like pattern: Where several roads converge, star shaped settlements develop by the houses built along the roads.
- (e) T-shaped, Y-shaped, Cross-shaped or cruciform settlements: **T -shaped settlements develop at tri-junctions of the roads (T) while Y-shaped settlements emerge as the places where two roads converge on the third one and houses are built along these roads. Hence statement 2 is correct.**
- **Cruciform settlements develop on the cross-roads and houses extend in all the four direction. Hence statement 3 is correct.**

Q 69.A

- Coffee is a tropical plantation crop. Its seeds are roasted, and ground and are used for preparing a beverage. There are three varieties of coffee i.e. arabica, robusta and liberica.
- Coffee is **cultivated in the highlands of Western Ghats in Karnataka, Kerala, and Tamil Nadu**. Karnataka alone accounts for more than two-thirds of the total production of coffee in the country. **Hence, statement 1 is correct**.
- Coffee is largely produced in the southern part of India. Karnataka is the largest producer accounting for about 70% of the total coffee production in India. Kerala is the second-largest producer of coffee but lags far behind, accounting only for about 23% of the total production. Tamil Nadu is the third-largest producer, where India's 6% of the coffee is produced. Nearly half of Tamil Nadu's coffee is made in the Nilgiri district, a major Arabica growing region. Orissa and the northeastern areas have a smaller proportion of production.
- There are three varieties of coffee i.e. arabica, robusta, and liberica. India **mostly grows superior quality coffee, arabica**, which is in great demand in the International market. Indian coffee is one of the best

coffees in the world due to its high quality and gets a high premium in the international markets. India produces two types of coffee: Arabica and Robusta. Arabica has high market value than Robusta coffee due to its mild aromatic flavor. Robusta coffee is mainly used in making various blends due to its strong flavor. Robusta is the majorly manufactured coffee with a share of 72% of the total production. The industry provides direct employment to more than 2 million people in India. Since coffee is mainly an export commodity for India, domestic demand and consumption do not drastically impact the prices of coffee. **Hence, statement 2 is not correct.**

- India is among the top 10 coffee-producing countries, with **about 3%** of the global export in 2020, and ranks **seventh** after Brazil, Vietnam, Colombia, Indonesia, Ethiopia, and Mexico. **Hence, statement 3 is not correct.**

Q 70.A

- It is widely accepted that settlements can be differentiated in terms of rural and urban, but there is no consensus on what exactly defines a village or a town.
- Although population size is an important criterion, it is not a universal criterion since many villages in densely populated countries of India and China have population exceeding that of some towns of Western Europe and United States.
- At one time, people living in villages pursued agriculture or other primary activities, but presently in developed countries, large sections of urban populations prefer to live in villages even though they work in the city.
- The basic difference between towns and villages is that in towns the main occupation of the people is related to secondary and tertiary sectors, while in the villages most of the people are engaged in primary occupations such as agriculture, fishing, lumbering, mining, animal husbandry, etc.
- Sub Urbanisation:
  - **It is a new trend of people moving away from congested urban areas to cleaner areas outside the city in search of a better quality of living. Hence statement 1 is correct.**
  - **Important suburbs develop around major cities and everyday thousands of people commute from their homes in the sub urbs to their work places in the city. Hence statement 2 is not correct.**

Q 71.D

- The Rhine flows through Germany and the Netherlands. It is navigable for 700 km from Rotterdam, at its mouth in the Netherlands to Basel in Switzerland. Ocean-going vessels can reach up to Cologne. The Ruhr river joins the Rhine from the east. It flows through a rich coalfield and the whole basin has become a prosperous manufacturing area. Dusseldorf is the Rhine port for this region. Huge tonnage moves along the stretch south of the Ruhr. This waterway is the world's most heavily used.
- It connects the **industrial areas of Switzerland, Germany, France, Belgium, and the Netherlands with the North Atlantic Sea Route**. **Hence, statement 1 is correct.**
- The **Mississippi-Ohio waterway** connects the interior part of U.S.A. with the Gulf of Mexico in the south. Large steamers can go through this route up to Minneapolis. **Hence, statement 2 is correct.**

Q 72.A

- **Recent context:** The National Green Hydrogen Mission, approved by the Union Cabinet in January 2023, identifies a significant role for green hydrogen in decarbonizing the steel sector to meet India's climate goals.
- **Steel is a key sector of the Indian economy. India is the world's second-largest producer of crude steel and second-largest consumer of finished steel.** In FY 21-22, the sector contributed approximately 2% to the country's GDP and provided approximately 20 lakh jobs. Moreover, the sector is set for significant growth: the National Steel Policy has set a target to reach 300 million tonnes (MT) of annual production by 2030 from the existing level of 120 MT. **Hence, statement 1 is correct.**
- The availability of scrap is a major issue in India and in 2017 the deficit was to the tune of 7 million Tons. This was imported at the cost of more than Rs. 24,500 crores (approx.) in 2017-18. The gap between demand and supply is can be reduced in the future and the country may be self-sufficient by 2030. This is mainly because, with the increase in consumption of steel in the recent past and end-of-life vehicles (ELV), the generation of scrap is likely to be increased considerably. This scrap has to be channelized so that the same can be utilized for steel production in an environmentally friendly manner.
- **Steel Authority of India Limited (SAIL) is the largest steel-making company in India** and one of the seven Maharatnas of the country's Central Public Sector Enterprises. **Hence, statement 2 is correct.**
- **National Steel Policy 2017 (NSP-2017)** aims to develop a globally competitive steel industry by creating 300 Million Tonnes Per Annum (TPA) Steel production capacity by 2030 with a contribution of 35-40% from the Electric Arc Furnaces (EAF)/Induction Furnaces (IF) route. Although, scrap is the main raw material for the secondary sector primary sector also uses Scrap in the charge mix of BOF to the tune of 15% to improve efficiency, and minimize the cost of production and other process needs. The availability of raw materials at competitive rates is imperative for the growth of the steel industry and to achieve the NSP-2017 target. Thus, the availability of the right quality of scrap, in adequate quantity is one of the critical factors for the future growth of both the EAF/IF sector & primary sector. **Hence, statement 3 is not correct.**

Q 73.A

- **Dispersed Settlements: In these settlements, houses are spaced far apart and often interspersed with fields. A cultural feature such as a place of worship or a market, binds the settlement together.**
- Compact or Nucleated settlements: These settlements are those in which large number of houses are built very close to each other. Such settlements develop along river valleys and in fertile plains. Communities are closely knit and share common occupations.
- On the basis of forms or shapes of the settlements: These may be a number of geometrical forms and shapes such as Linear, rectangular, circular star like, T-shaped village, double village, cross-shaped village etc.
- **Hence, option (a) is the correct answer.**

Q 74.C

- **Recent Context:** Union Minister of State for Science and Technology has said that North India's first nuclear power plant will come up in Haryana in the village of Gorakhpur in Fatehabad district, 150 km north of the national capital.
- India plans to commission 20 nuclear power plants by 2031, adding nearly 15,000 MW in power generating capacity.
- The first of these 20 nuclear power plants, a 700 MW unit, is expected to be commissioned in 2023 at **Kakrapar in Gujarat**, which already has three atomic power generating units operational.
- According to a written reply by Minister of State in the PMO, the 500 MW Prototype Fast Breeder Reactor at **Kalpakkam** is likely to be operational in 2024, followed by two 1,000 MW units at **Kudankulam** in 2025.
    - Two 700 MW units at **Rawatbhata in Rajasthan** are likely to be completed by 2026, while another two 1,000 MW units are likely to be completed at Kudankulam by 2027,
    - Two 700 MW units are **expected to be completed at Gorakhpur in Haryana** by 2029.
- Nuclear power is the fifth-largest source of electricity in India after coal, gas, hydroelectricity and wind power. As of November 2020, India has 22 nuclear reactors in operation in 8 nuclear power plants, with a total installed capacity of 7,380 MW.
- **Rawatbhata Plant is situated in Rajasthan**, **Tarapur Plant is situated in Maharashtra** and **Tamil Nadu has Kalapakkam Nuclear power plant**..
- **Hence, option (c) is the correct answer.**

Q 75.C

- The Survey of India is responsible for measuring the geographical area of administrative units in India. The land-use categories as maintained in the Land Revenue Records are as follows:
- Forests, Land put to Non-agricultural Uses, Barren and Wastelands, Area under Permanent Pastures and Grazing Lands, Area under Miscellaneous Tree Crops and Groves(Not included is Net sown Area), Culturable Waste-Land, Current Fallow, Fallow other than Current Fallow, and Net Area Sown.
- **Current Fallow** is the land that is **left without cultivation for one or less than one agricultural year**. It is a cultural practice adopted for giving land rest. The land recoups the lost fertility through natural processes.
- **Fallow other than Current Fallow** is the cultivable land that is **left uncultivated for more than a year but less than five** years. If the land is left uncultivated for more than five years, it would be categorized as a culturable wasteland. **Hence, statement 1 is not correct.**
- **Culturable Waste-Land is any land that is left fallow (uncultivated) for more than five years** and is included in this category. Thus, if the land is left uncultivated for more than five years, it is categorized as Culturable Waste-Land and not Barren and Wasteland. **Hence, statement 2 is not correct.**
- **Barren and Wastelands** includes wasteland such as barren hilly terrains, desert lands, ravines, etc**.** While the **Culturable Waste-Land can be brought under cultivation after improving it through reclamation practices the** Barren and Wastelands cannot be brought under cultivation with the available technology. **Hence, statement 3 is correct.**
- The physical extent of land on which crops are sown and harvested is known as net sown area.

Q 76.A

- **Components of Population Change**
  - There are three components of population change – births, deaths, and migration. **Hence option (a) is the correct answer.**
  - The crude birth rate (CBR) is expressed as the number of live births in a year per thousand of the population. Death rate plays an active role in population change. Population growth occurs not only by increasing birth rate but also due to decreasing death rate.
  - Crude Death Rate (CDR) is a simple method of measuring mortality in any area. CDR is expressed in terms of the number of deaths in a particular year per thousand of the population in a particular region
  - By and large mortality rates are affected by the region's demographic structure, social advancement, and levels of economic development.
  - Apart from birth and death migration is another way by which the population size changes.

Q 77.C

- Quaternary activities involve the collection, production and dissemination of information or even the production of information. Quaternary activities center around research, and development and may be seen as an advanced form of services involving specialized knowledge and technical skills.
- The **Quaternary Sector along with the Tertiary Sector** has replaced most of the primary and secondary employment as the basis for economic growth. Over half of all workers In developed economies are in the 'Knowledge Sector'. **Personnel working in office buildings, elementary schools** and university classrooms, hospitals and doctors' offices, theatres, and **accounting and brokerage firms** all belong to this category of services. **Hence, points 1 and 4 are correct.**
- **Quinary activities** are services that focus on the creation, re-arrangement and interpretation of new and existing ideas; data interpretation and the use and evaluation of new technologies. **Often referred to as 'gold collar' professions**, they represent another subdivision of the tertiary sector representing special and highly paid skills of senior business executives, government officials, research scientists, financial and legal consultants, etc. **Hence, point 2 is not correct.**
- **Home shoring is a new trend in Quinary activities**. It has emerged as an alternative to outsourcing. Home shoring is an organizational operational model in which employees work and perform all official tasks from a home or external office. Homeshoring is the hiring, management and tasking of employees remotely, usually over the Internet, although it may include other forms of digital communication. **Hence, point 3 is not correct.**

Q 78.B

State/UT Code	India/State/ Union Territory	Population		Percentage of Urban Population
		Rural	Urban	
	India	**833087662**	**377,105,760**	**31.16**
01	Jammu & Kashmir	9,134,820	3,414,106	27.21
02	Himachal Pradesh	6,167,805	688,704	10.04
03	Punjab	17,316,800	10,387,436	37.49
04	Chandigarh	29,004	1,025,682	97.25
05	Uttarakhand	7,025,583	3,091,169	30.55
06	Haryana	16,531,493	8,821,588	34.79
07	NCT of Delhi	419,319	16,333,916	97.50
08	Rajasthan	51,540,236	17,080,776	24.89
09	Uttar Pradesh	155,111,022	44,470,455	22.28
10	Bihar	92,075,028	11,729,609	11.30
11	Sikkim	455,962	151,726	24.97
12	Arunachal Pradesh	1,069,165	313,446	22.67
13	Nagaland	1,406,861	573,741	28.97
14	Manipur	1,899,624	822,132	30.21
15	Mizoram	529,037	561,977	51.51
16	Tripura	2,710,051	960,981	26.18
17	Meghalaya	2,368,971	595,036	20.08
18	Assam	26,780,516	4,388,756	14.08
19	West Bengal	62,213,676	29,134,060	31.89
20	Jharkhand	25,036,946	7,929,292	24.05
21	Orissa	34,951,234	6,996,124	16.68
22	Chhattisgarh	19,603,658	5,936,538	23.24
23	Madhya Pradesh	52,537,899	20,059,666	27.63
24	Gujarat	34,670,817	25,712,811	42.58
25	Daman & Diu	60,331	182,580	75.16
26	Dadra & Nagar Haveli	183,024	159,829	46.62
27	Maharashtra	61,545,441	50,827,531	45.23
28	Andhra Pradesh	56,311,788	28,353,745	33.49
29	Karnataka	37,552,529	23,578,175	38.57
30	Goa	551,414	906,309	62.17
31	Lakshadweep	14,121	50,308	78.08
32	Kerala	17,455,506	15,932,171	47.72
33	Tamil Nadu	37,189,229	34,949,729	48.45

- **Hence, option (b) is the correct answer.**

Q 79.A

- Since 1990, the United Nations Development Programme (UNDP) has been publishing the Human Development Report every year. This report provides a rank-wise list of all member countries according to the level of human development. The Human Development Index and the Human Poverty index are two important indices to measure human development used by the UNDP. **Hence statement 1 is correct**.

Table 4.2: Human Development: Categories, Criteria and Countries

Level of Human Development	*Score in Development Index*	*Number of Countries*
Very High	above 0.800	66
High	between 0.700 up to 0.799	53
Medium	between 0.550 up to 0.699	37
Low	below 0.549	33

Source: Human Development Report, 2020

- Countries with very high human development index are those which have a score of over 0.800. **Hence statement 3 is not correct.**
- The concept of human development was introduced by Dr. Mahbub-ul-Haq. Dr. Haq has described human development as development that enlarges people's choices and improves their lives. People are central to all development under this concept. These choices are not fixed but keep on changing. The basic goal of development is to create conditions where people can live meaningful lives. A man of vision and compassion, Pakistani economist Dr. Mahbub-ul-Haq created the Human Development Index in 1990. **Hence statement 2 is not correct.**

Q 80.D

- The process by which fertility rates eventually decline to low and stable levels has been called demographic transition. The fertility rate is defined as the average number of children per woman in the reproductive age group. Demographic transition postulates three-stage sequences of birth and death rates that are associated with economic development.
- **First Stage of Demographic Transition or High Fluctuating Stage**
  - In this stage, the death rates are high due to the absence of effective medical aid, primitive sanitation, and poor diets. The birth rates are also high on account of the lack of knowledge about family planning techniques, the early age of marriage, illiteracy and deep-rooted social beliefs, and customs about the size of the family, including as an insurance against high child mortality rates.
  - The actual rate of growth of the population is low since a high birth rate is balanced by a high death rate.
- **Second Stage of Demographic Transition or Expanding Stage**
  - With economic development resulting in high incomes and improvements in public health facilities, there is a marked decline in mortality that raises life expectancy from under 40 years to 60 years.
  - However, the decline in death rate is not immediately accompanied by a decline in fertility. In this stage of demographic transition, with a declining death rate, the birth rate does not fall correspondingly.
  - This leads to the transition from a stable or slow-growing population to one with a rapidly increasing population. The second stage is further classified into Early Expanding Stage and Late Expanding Stage.
- **Third Stage of Demographic Transition or Low Fluctuating Stage**
  - The forces and influences of modernisation (including an increase in female work participation rate and a move towards nuclear families) and economic development cause the fertility rate to decline so that the falling birth rate eventually converges with the death rate, leaving little or no population growth.
  - The characteristics of the third stage are a low birth rate, a low death rate, a small family size, and a low growth rate of the population.
  - This demographic transition has been witnessed in contemporary developed nations as they developed and one can identify the developing nations as they move through the different stages of this transition.

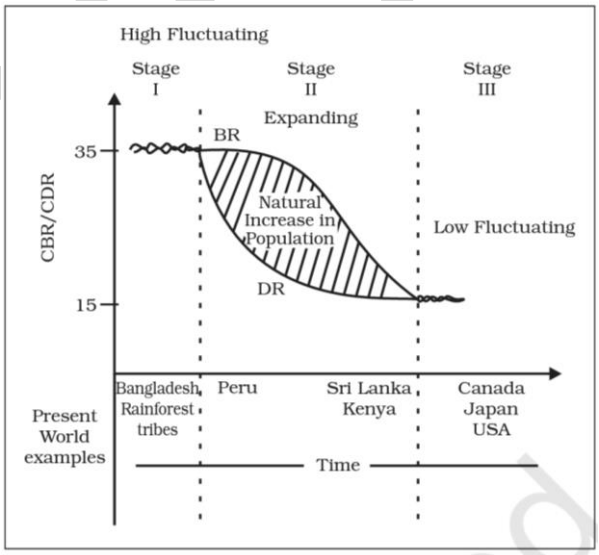


Fig. 2.3: Demographic Transition Theory

- **Hence option (d) is the correct answer.**

Q 81.B

- **Iron and Steel Industry:** The iron and steel industry forms the base of all other industries and, therefore, is called a basic industry. It is basic because it provides the raw materials for other industries such as machine tools used for further production. It may also be called a heavy industry because it uses large quantities of bulky raw materials and its products are also heavy.
    - **Distribution:**
        - ✓ The industry is one of the most complex and capital-intensive industries and is concentrated in the advanced countries of North America, Europe, and Asia.
        - ✓ In the U.S.A, most of the production comes from the northern Appalachian region (Pittsburgh), Great Lake region (Chicago-Gary, Erie, Cleveland, Lorain, Buffalo, and Duluth), and the Atlantic Coast (Sparrows Point and Morrisville).
        - ✓ The industry has also moved towards the southern state of Alabama. **Pittsburg** area is now losing ground. It has now become the **"rust bowl" of the U.S.A. Hence pair 2 is not correctly matched.**
        - ✓ In Europe, the U.K., Germany, France, Belgium, Luxembourg, the Netherlands, and Russia are the leading producers. The important steel centers are Scun Thorpe, Port Talbot, Birmingham, and Sheffield in the U.K.; Duisburg, Dortmund, Dusseldorf, and Essen in Germany; Le Creusot and St. Ettienne in France; and Moscow, St. Petersburgh, Lipetsk, Tula, in Russia and Kryvyi Rih, and **Donetsk in Ukraine. Hence pair 1 is correctly matched.**
        - ✓ In Asia, the important centers include Nagasaki and Tokyo-Yokohama in Japan; Shanghai, **Tienstin, and Wuhan in China**; and Jamshedpur, Kulti-Burnpur, Durgapur, Rourkela, Bhilai, Bokaro, Salem, Visakhapatnam and Bhadravati in India. **Hence pair 3 is correctly matched.**

Q 82.D

- Madrid is the capital city of Spain.
- Lisbon is the capital city of Portugal.
- Brussels is the capital city of Belgium.
- Vienna is the capital city of Austria.

- **Hence option (d) is the correct answer.**

Q 83.B

- India is surrounded by sea from three sides and is bestowed with a long coastline. Water provides a smooth surface for very cheap transport provided there is no turbulence. India has a long tradition of seafaring and developed many ports with place names suffixed with pattan meaning port. An interesting fact about ports in India is that its **west coast has more ports than its east coast. Hence, statement 1 is correct.**
- **Kochchi Port,** situated at the head of Vembanad Kayal, popularly known as the 'Queen of the Arabian Sea', is also a natural harbor. This port has an advantageous location being close to the Suez-Colombo route. It caters to the needs of Kerala, southern Karnataka and southwestern Tamil Nadu. **Hence, statement 2 is correct.**
- **Haldia Port i**s located 105 km downstream from Kolkata on the Hooghly river. It has been constructed to reduce the congestion at Kolkata port. It handles bulk cargo like iron ore, coal, petroleum, petroleum products and fertilizers, jute, jute products, cotton and cotton yarn, etc. **Hence, statement 3 is not correct.**

Q 84.D

- The **aim of the India-Maldives-Sri Lanka Tri-Lateral Exercise 'DOSTI'** is to further fortify the friendship, enhance the mutual operational capability, exercise interoperability, and to build cooperation between the Coast Guards of Maldives, India, and Sri Lanka.
- The Exercises carried out over the past ten years have focused on exercises and drills on providing assistance in sea accidents, eliminating sea pollution, and the Coast Guard's procedure and conduct during situations such as oil spills.
- **Exercise Dosti was initiated in 1991, between the Indian and Maldives Coast Guard. Sri Lanka joined the exercise for the first time in 2012.**
- **Hence, option (d) is the correct answer.**

Q 85.B

- The polar type of climate and vegetation are found **mainly north of the Arctic Circle in the northern hemisphere**. The ice caps are confined to Greenland and to the highlands of these high-latitude regions, where the ground is permanently snow-covered**. The lowlands, with a few months ice-free, have tundra vegetation.**
- In such an **adverse environment as the tundra, few plants survive**. The greatest inhibiting factor is the region's deficiency in heat. With a growing season of fewer than three months and the warmest month not exceeding 50°F. (the tree-survival line), there are no trees in the tundra. S**uch an environment can support only the lowest form of vegetation, mosses, lichens and sedges.** Drainage in the tundra is usually poor as the subsoil is permanently frozen. **Hence statement 2 is correct.**
- **Despite the deficiency of heat Tundra vegetation does support a few species of mammals**. This includes **herbivorous animals like reindeer, wolves, foxes, musk-ox, Arctic hares, etc.**
- In the brief summer, when the snows melt and the days are warmer and longer, berry-bearing bushes and Arctic flowers bloom. Though short-lived, they brighten the monotonous tundra landscape into Arctic prairies'. In the summer, the tundra is full of activities. Birds migrate north to prey on the numerous insects which emerge when the snow thaws. **Hence statement 1 is not correct.**

Q 86.B

- Indian Railways has launched an extensive programme to convert the metre and narrow gauges to broad gauges since 1992.
- The gauge of a railway track is defined as the clear minimum perpendicular distance between the inner faces of the two rails.
- On the basis of the width of the track of the Indian Railways, three categories have been made:
  - Broad gauge: The distance between rails in broad gauge is 1.676 metres. **The total length of broad gauge lines was 86526 km. Hence statement 1 is not correct.**
  - Metre gauge: The distance between rails is one metre. Its total length was 15529 km.
  - Narrow gauge: The distance between the rails in this case is 0.762 metres or 0.610 metres. The total length of the narrow gauge was 3651 km. It is generally confined to hilly areas.
- Narrow gauge railways usually cost less to build because they are usually lighter in construction, using smaller cars and locomotives (smaller loading gauge), as well as smaller bridges, smaller tunnels (smaller structure gauge) and tighter curves. **Narrow gauge is thus often used in mountainous terrain, where the savings in civil engineering work can be substantial. Hence statement 2 is correct.**
- It is also used in sparsely populated areas, with low potential demand, and for temporary railways that will be removed after short-term use, such as for construction, the logging industry, the mining industry, or large-scale construction projects, especially in confined spaces.
- Broader gauge railways are generally more expensive to build but are able to handle heavier and faster traffic.

Q 87.C

- **Recently, Indian Space Research Organisation (ISRO) received the NASA-ISRO SAR (NISAR) satellite from the U.S. space agency.**
- NASA-ISRO SAR (NISAR) **is a Low Earth Orbit (LEO) observatory being jointly developed by NASA and ISRO. Hence statement 1 is correct.**
  - NISAR will map the entire globe in 12 days and provide spatially and temporally consistent data for understanding changes in Earth's ecosystems, ice mass, etc.
  - **The 2,800 kilograms satellite consists of both L-band and S-band synthetic aperture radar (SAR) instruments, which makes it a dual-frequency imaging radar satellite. Hence statement 2 is correct.**

- The SAR payloads mounted on Integrated Radar Instrument Structure (IRIS) and the spacecraft bus are together called an observatory.
- **NASA is to provide the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem. ISRO is to provide the S-band radar, the GSLV launch system, and spacecraft for the mission.**
  - ✓ After the commissioning period, the mission will conduct science operations with the **L- band radar to satisfy NASA's requirements for a minimum of three years**, while the **S-band radar will be used by India for its specific needs for a period of five years.**
- NISAR will **acquire data over the Indian Coasts and monitor annual changes in the bathymetry along the deltaic regions.**
- The NISAR mission will **observe sea ice characteristics over the seas surrounding India's Antarctic polar stations,** which can be used to detect marine oil spills and disseminate the spill location during accidental oil seepage for preventive measures.
- It will provide a means of disentangling and clarifying spatially and temporally complex phenomena, ranging from ecosystem disturbances, to ice sheet collapse and natural hazards including earthquakes, tsunamis, volcanoes, and landslide.

Q 88.C

- **Clustered Settlements:** The clustered rural settlement is a compact or closely built-up area of houses. In this type of village, the general living area is distinct and separated from the surrounding farms, barns, and pastures.
  - The closely built-up area and its intervening streets present some recognizable pattern or geometric shape, such as rectangular, radial, linear, etc.
  - **Such settlements are generally found in fertile alluvial plains and in the northeastern states.** Sometimes, people live in compact villages for security or defense reasons, such as in the Bundelkhand region of central India and in Nagaland. In Rajasthan, scarcity of water has necessitated compact settlement for maximum utilization of available water resources. **Hence statement 1 is correct.**
- **Semi-Clustered Settlements:** Semi-clustered or fragmented settlements may result from the tendency of clustering in a restricted area of dispersed settlement. More often such a pattern may also result from segregation or fragmentation of a large compact village.
  - In this case, one or more sections of the village society choose or is forced to live a little away from the main cluster or village. In such cases, generally, the land-owning and dominant community occupies the central part of the main village, whereas people of lower strata of society and menial workers settle on the outer flanks of the village. Such settlements are widespread in the Gujarat plain and some parts of Rajasthan. **Hence statement 2 is correct.**

Q 89.B

- **Recent Context: The government has integrated Bhasini Mission's capabilities with the unified payment interface (UPI) ecosystem.**
- **Bhashini Mission is a local language translation mission that aims to break the barrier between various Indian tongues by using available technology. It aims to build a National Public Digital Platform for languages.**
- Bhashini, the National Language Translation Mission (NLTM), was launched by the Hon'ble Prime Minister in July 2022 to provide artificial intelligence (AI) and Natural Language Processing (NLP) based open-source language technology solutions for speech and text translation through the Bhashini platform to bridge the language barriers leveraging startup-academia ecosystem. These technologies would enable organizations to create innovative and artificial intelligence-based multilingual interfaces including voice-based interfaces in their websites and apps to provide better citizen services and digital resources. As of date, 289 pre-trained AI models for language translation in 10 Indian languages have been made available on the Bhashini platform.
- **Hence, option (b) is the correct answer.**

Q 90.D

- In finance, **being short on an asset** means investing in such a way that the **investor will profit if the value of the asset falls**. This is the opposite of a more conventional **"long" position,** where the **investor will profit if the value of the asset rises**.
- **Hence, short selling** means **borrowing a stock that you do not own**, **selling the borrowed stock, and then buying and returning the stock if and when the price drops**. Here, the **speculation** is that

the **value of the asset will decrease** in the near future thus ensuring profit for the investor. Thus, short selling is mostly done to earn in a **falling market** (**bearish**). **Hence, statement 2 is not correct.**

- For example, an investor borrows a certain number of shares from a broker and sells these shares in the market for Rs 100. In the future, when the price of the shares falls to Rs 80, then the investor can buy them at a lesser price, and return them to the broker, thereby making a profit of Rs 20. **Hence, statement 1 is correct.**
- At present, in a realistic sense, there is no short selling in India. It's done in the form of day trading, futures trading, etc. But actual short selling – which involves borrowing shares for a multi-day horizon – is absent in India.
- The **Hindenburg Research LLC** is an i**nvestment research firm** with a focus on **activist short-selling**. In a report, they said that the **Adani Group has "substantial debt"** and that the **stock prices of the listed companies are overvalued by 85%**. Such a forecast caused **panic selling** making the s**tocks hit the bottom of the marke**t. **Hence, statement 3 is correct.**
- It is speculated that **Hindenburg** is thus **involved in short selling of the Adani stocks (outside of India)** to make a profit.
- SEBI has said that it will conduct a detailed examination of the company's stocks.

Q 91.B

- **Russia shares borders with 14 countries**. They are **Norway, Finland, Estonia, Latvia, Lithuania, Poland, Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, Mongolia, China, and North Korea**. To the south, Russia borders North Korea, China, Mongolia, and Kazakhstan, Azerbaijan, and Georgia. To the southwest and west, it borders Ukraine, Belarus, Latvia, and Estonia, as well as Finland and Norway.
- **Russia does not share a border with Kyrgyzstan**. Kyrgyzstan is bounded by Kazakhstan on the northwest and north, by China on the east and south, and by Tajikistan and Uzbekistan on the south and west.
- **Hence option (b) is the correct answer.**

Q 92.D

- The density of population is expressed as the number of persons per unit area. It is a crude measure of the human-land relationship. It helps in getting a better understanding of the spatial distribution of population in relation to land.
- The density of population in India (2011) is 382 persons per sq km. There has been a steady increase of more than 200 persons per sq km over the last 50 years as the population density increased from 117 persons/ sq km in 1951 to 382 persons/sq km in 2011.
- The spatial variation of population densities in the country ranges from as **low as 17 persons per sq km in Arunachal Pradesh** to 11,297 persons in the National Capital Territory of Delhi.
- Among the northern Indian states, **Bihar (1102), West Bengal (1029) and Uttar Pradesh (828) have higher densities**, while Kerala (859) and Tamil Nadu (555) have higher densities among the peninsular Indian states.
- States like Assam, Gujarat, Andhra Pradesh, Haryana, Jharkhand, Odisha have moderate densities. The hill states of the Himalayan region and the north-eastern states of India (excluding Assam) have relatively low densities, while the Union Territories (excluding the Andaman and Nicobar Islands) have very high densities of population.
- **Hence option (d) is the correct answer.**

Q 93.A

- To promote Inland Water Transport (IWT) in the country, 111 waterways (including 5 existing and 106 new) have been declared National Waterways (NWs) under the National Waterways Act, 2016. The Inland Waterways Authority of India (IWAI) was constituted in October 1986 for the development and regulation of inland waterways for shipping and navigation.
- The Ganga - Bhagirathi - Hooghly river system from Allahabad to Haldia was declared National Waterway-1 (NW-1) vide the National Waterway (Allahabad-Haldia stretch of the Ganga Bhagirathi-Hooghly river) Act 1982. It became operative from 27th October 1986 after the formation of the IWAI. The waterway extends from Haldia to Allahabad for a distance of 1620 km. It is being used by tourism vessels, ODC carriers, and IWAI vessels. Many coal based plants are located along Ganga and thus, are potential revenue sources for the inland navigation sector. **Hence pair 1 is correctly matched.**
- The Brahmaputra from Dhubri to Sadiya was declared National Waterway-2 (NW-2) vide the National Waterway (Sadiya-Dhubri stretch of the Brahmaputra river) Act 1988. From Dhubri to Sadiya, the

waterway extends for a distance of 891 km. The river Brahmaputra flows down the centre of the Assam Valley. It is used by tourism vessels, Border security forces, Assam government, and private vessels. **Hence pair 2 is correctly matched.**

- The West Coast Canal from Kottapuram to Kollam was declared National Waterway-3 (NW-3) vide the National Waterway (Kollam-Kottapuram stretch of the West Coast Canal and Champakara and Udyogmandal Canals) Act 1992 and notified on 1st Feb. 1993. From Kottapuram to Kollam, including the Champakara and Udyogmandal canals, it has a navigable length of 205 km. This waterway comprises natural lakes, backwaters, river sections, and man-made canal sections. It is one of the most navigable and tourism potential areas in India. Raw material for fertilizer plants is a major part of movement. **Hence pair 3 is not correctly matched.**
- Kakinada-Puducherry canal stretch (767 km) along with the Godavari River stretch (171 km) between (Bhadrachalam and Rajahmundry) and the Krishna River stretch (157 km) between (Wazirabad and Vijayawada) is termed as National Waterway-4 (NW-4). The total length of the NW-4 is 1095 km. Coal on Godavari river, Cement on Krishna river and rice on both rivers, and other such food commodities are major transport on this waterway.

Q 94.D

- It is a 'slash and burn' agriculture. Farmers clear a patch of land and produce cereals and other food crops to sustain their families. When the soil fertility decreases, the farmers shift and clear a fresh patch of land for cultivation. This type of shifting allows Nature to replenish the fertility of the soil through natural processes; land productivity in this type of agriculture is low as the farmer does not use fertilizers or other modern inputs. It is known by different names in different parts of the country.

- It is jhumming in north-eastern states like Assam, Meghalaya, Mizoram and Nagaland; Pamlou in Manipur, Dipa in Bastar district of Chhattisgarh, and in Andaman and Nicobar Islands.
- Jhumming: The 'slash and burn' agriculture is known as 'Milpa' in Mexico and Central America, 'Conuco' in Venezuela, 'Roca' in Brazil, 'Masole' in Central Africa, 'Ladang' in Indonesia, 'Ray' in Vietnam.
- In India, this primitive form of cultivation is called '**Bewar**' or 'Dahiya' in **Madhya Pradesh**, '**Podu**' or 'Penda' in **Andhra Pradesh**, 'Pama Dabi' or 'Koman' or **Bringa**' in **Odisha**, 'Kumari' in Western Ghats, 'Valre' or 'Waltre' in South-eastern Rajasthan, 'Khil' in the Himalayan belt, '**Kuruwa**' in **Jharkhand**, and 'Jhumming' in the North-eastern region. **Hence, all the pairs are correctly matched.**

Q 95.C

- The British type of climate is also known as the cool temperate western climate. **The cool temperate western margins are under the permanent influence of the Westerlies all around the year.** From Britain, the climatic belt stretches far inland into the lowlands of North-West Europe, including such regions as northern and western France, Belgium, the Nether- lands, Denmark, western Norway and also north-western Iberia.
- There is so much **oceanic influence on both the temperature and the precipitation** that the climate is also referred to as the North-West European Maritime Climate. In North America, the high Rockies prevent the on-shore Westerlies from penetrating far inland and the British type of climate is confined mainly to the coastlands of British Columbia.
- The **natural vegetation of this climate type is a deciduous forest**. The trees shed their leaves in the cold season. Common species of this climate include oak, poplar, birch and hornbeam.
- **Market gardening is one of the highly developed activities** of the people of this region. Market gardening is the production of fruits, vegetables and flowers as cash crops on relatively small scales and sold directly to consumers. It is both labour and capital-intensive.
- The **annual temperature range in this type of climate is comparatively small.** The summers are never very warm and winters are abnormally mild. Thus the climate is considered **ideal for maximum comfort and mental alertness.** People can work for long hours without feeling drowsy and lethargic as they do in the tropics.
- **Hence option (c) is the correct answer.**

Q 96.D

- According to sources, it is believed that the world population reached the 8 billion mark in November 2022 though 2025 was the estimated year for the same.

Table 2.2: Doubling Time of World Population

Period	*Population*	*Time in which Population Doubles*
10,000 B.C.	5 million	
1650 A.D.	500 million	1,500 years
1804 A.D.	1,000 million	154 years
1927 A.D.	2,000 million	123 years
1974 A.D.	4,000 million	47 years
2025 A.D.	8,000 million projected figure	51 years

Source: Demographic Year Book, 2009–10

- From the above table, it is clear that the world population reached the 1 billion mark in 1804 AD. Also, it took nearly 123 years for the world population to reach from 1 billion to 2 billion. **Hence both statements 1 and 2 are not correct.**

Q 97.D

- **Bharmaur tribal area comprises Bharmaur and Holi tehsils of Chamba district of Himachal Pradesh.**
- **It is a notified tribal area since 21 November 1975.**
- **Bharmaur is inhabited by 'Gaddi', a tribal community who have maintained a distinct identity in the Himalayan region as they practised transhumance and conversed through Gaddiali dialect.**
- Bharmaur tribal region has harsh climate conditions, low resource base and fragile environment.
- These factors have influenced the society and Economy of the region.
- According to the 2011 census, the total population of Bharmaur sub-division was 39,113 i.e., 21 persons per sq km. It is one of the most (economically and socially) backward areas of Himachal Pradesh.

- Historically, the Gaddis have experienced geographical and political isolation and socio-economic deprivation.
- The economy is largely based on agriculture and allied activities such as sheep and goat rearing.
- This region lies between 32° 11' N and 32°41' N latitudes and 76° 22' E and 76° 53'E longitudes.
- Spread over an area of about 1,818 sq km, the region mostly lies between 1,500 m to 3,700 m above the mean sea level.
- This region popularly known as the homeland of Gaddis is surrounded by lofty mountains on all sides.
- **It has Pir Panjal in the north and Dhaula Dhar in the south.**
- In the east, the extension of Dhaula Dhar converges with Pir Panjal near Rohtang Pass.
- The river Ravi and its tributaries– the Budhil and the Tundahen, drain this territory, and carve out deep gorges.
- These rivers divide the region into four physiographic divisions called Holi, Khani, Kugtiand Tundah areas.
- **Bharmaur experiences freezing weather conditions and snowfall in winter. Its mean monthly temperature in January remains 4°C and in July 26°C.**
- **Hence, option (d) is the correct answer.**

Q 98.C

- Water is a cyclic resource with abundant supplies around the globe. Approximately, 71 percent of the earth's surface is covered with it but freshwater constitutes only about 3 percent of the total water. In fact, a very small proportion of freshwater is effectively available for human use. The availability of freshwater varies over space and time.
- **India accounts for about 2.45 percent of the world's surface area and 4 percent of the world's water resources and about 16 percent of the world's population. Hence statement 1 is correct.**
- The total water available **from precipitation** in the country in a year is about **4,000 cubic km.** The availability of **surface water and replenishable groundwater** is **1,869 cubic km**. Out of this, only 60 percent can be put to beneficial use. Thus, the total utilizable water resource in the country is only 1,122 cubic km.
    - **Reasons for higher water availability from Precipitation:**
        - ✓ **Firstly, India receives a large amount of precipitation**, mainly due to its monsoon climate. The southwest monsoon, which occurs from June to September, accounts for around 75% of India's annual rainfall. The northeast monsoon, which occurs from October to December, brings rainfall to the southern and eastern parts of the country. This high amount of rainfall contributes to the total water available from precipitation.
        - ✓ **Secondly, not all the water from precipitation flows as surface water.** A significant portion of the precipitation infiltrates the soil and recharges groundwater. In India, groundwater is a significant source of water for irrigation, drinking, and industrial purposes. The recharge of groundwater through precipitation is, therefore, an important component of the total water available in India.
        - ✓ **Lastly**, **India has significant water storage capacity through its dams and reservoirs.** This storage capacity allows for the capture and management of water from precipitation, which contributes to total water availability. **Hence statement 2 is correct.**

Q 99.B

- **Chuquicamata is the world's largest copper town** located in Chile in the **Atacama Desert.** Other towns in Chile known for copper production are Arica, Iquique and Antofagasta. **Hence, pair 1 is not correctly matched.**
- **Kalgoorlie is a gold mine located in Australia** and it is part of the Great Australian Desert. Another important town for gold mining in Australia is Coolgardie. Besides this, the Kalahari desert is also known for its diamond and copper reserves. **Hence, pair 2 is correctly matched.**
- **Utah is located in the Nevada desert** in the U.S.A. It is known for Uranium mining. **Hence, pair 3 is correctly matched.**

Q 100.B

- The **Suez Canal** had been constructed in 1869 in Egypt between Port Said in the north and PortSuez in the south linking the **Mediterranean Sea and the Red Sea.** It gives Europe a new gateway to the Indian Ocean and reduces the direct sea-route distance between Liverpool and Colombo compared to the Cape of Good Hope route. It is a sea-level canal without locks which is about 160 km and 11 to 15 m deep. About 100 ships travel daily and each ship takes 10-12 hours to cross this canal. **Hence option (b) is the correct answer.**

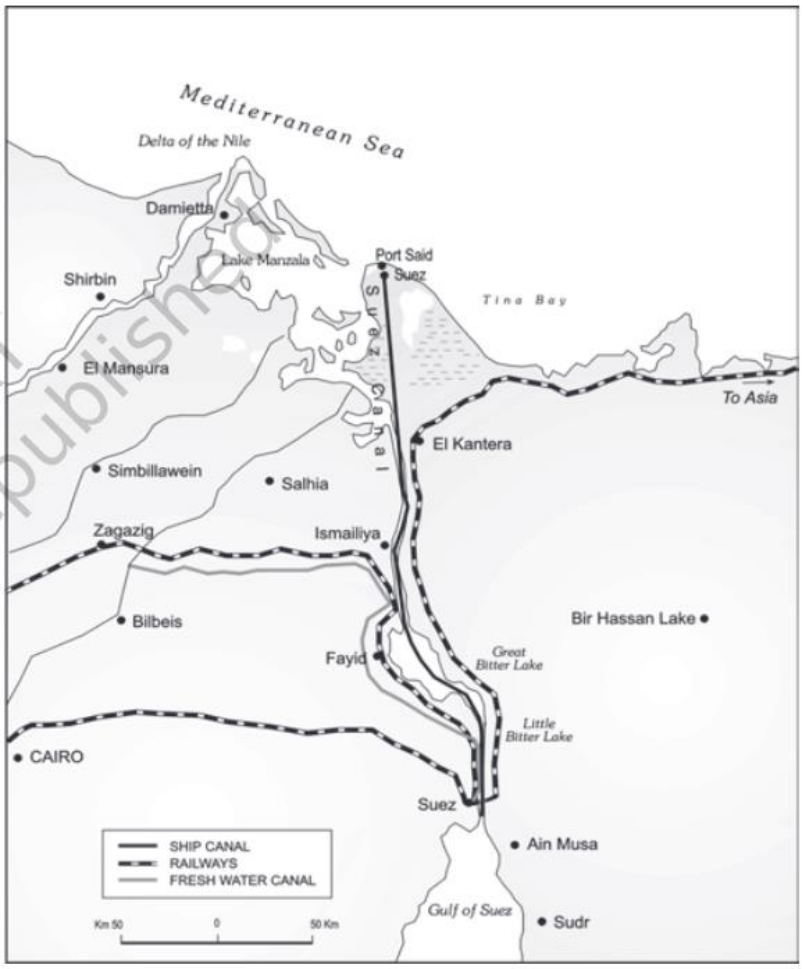


Fig. 8.10 : Suez Canal

- Image Source: NCERT