

## ANSWERS & EXPLANATIONS GENERAL STUDIES (P) TEST – 4142 (2024)

### Q 1.A

- Foreign Tourist Arrivals (FTAs) during the period January- December, 2022 were 61,91,399 as compared to 15,27,114 in January-December, 2021 and 1,09,30,355 in January-December, 2019.
- **Top 10 Source Countries for Foreign Tourist Arrivals (FTAs) in India during 2022.**

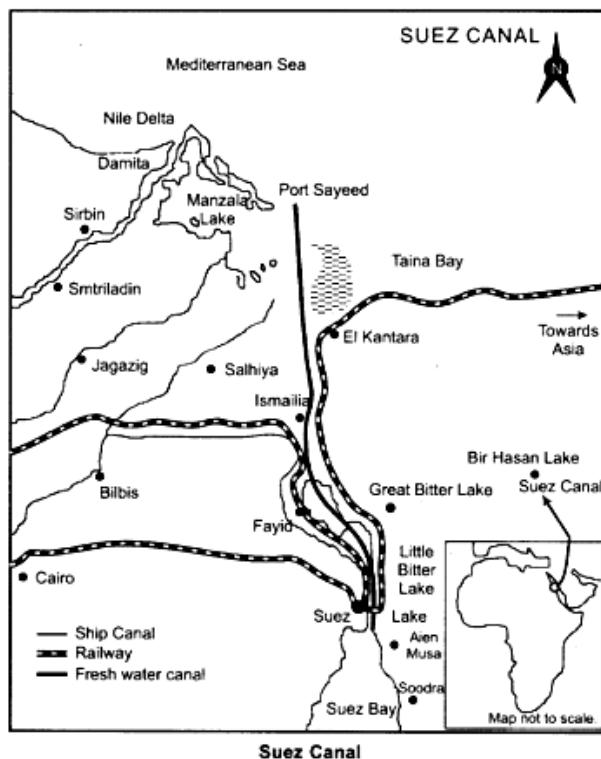
S.No	Source Country	FTAs	Percentage Share
1	UNITED STATES	13,73,817	22.19
2	BANGLADESH	12,55,960	20.29
3	UNITED KINGDOM	6,17,768	9.98
4	AUSTRALIA	3,69,023	5.96
5	CANADA	2,77,291	4.48
6	SRI LANKA	1,77,652	2.87
7	NEPAL	1,35,347	2.19
8	GERMANY	1,24,496	2.01
9	SINGAPORE	1,17,195	1.89
10	MALAYSIA	1,16,523	1.88
Total of top 10 Country		45,65,072	73.73
Others		16,26,327	26.27
<b>Grand Total</b>		<b>61,91,399</b>	<b>100</b>

- Hence option (a) is the correct answer.

### Q 2.C

- The Suez and the Panama Canals are two vital man-made navigation canals or waterways which serve as gateways of commerce for both the Eastern and Western worlds.
- **The Suez Canal:**
  - This canal had been constructed in 1869 in Egypt between Port Said in the north and Port Suez in the south linking the Mediterranean Sea and the Red Sea. **Hence statement 1 is correct.**
  - 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 (Panama Canal is 72 km long)** and 11 to 15 m deep. About 100 ships travel daily and each ship takes 10-12 hours to cross this canal. The tolls are so heavy that some find it cheaper to go by the longer Cape Route whenever the consequent delay is not important. **Hence statement 3 is correct.**
  - A railway follows the canal to Suez, and from Ismailia, there is a branch line to Cairo. A navigable fresh-water canal from the Nile also joins the Suez Canal in Ismailia to supply fresh water to Port Said and Suez.
- **The Panama Canal:**
  - This canal connects the **Atlantic Ocean in the east to the Pacific Ocean in the west**. **Hence statement 2 is correct.**
  - It has been constructed across the Panama Isthmus between Panama City and Colon by the U.S. government which purchased 8 km of area on either side and named it the Canal Zone.
  - The Canal is about 72 km. long and involves a very deep cutting for a length of 12 km. **It has a sixlock system and ships cross the different levels (26 m up and down) through these locks** before entering the Gulf of Panama.

- It shortens the distance between New York and San Francisco by 13,000 km by sea. Likewise the distance between Western Europe and the West-coast of U.S.A.; and North-eastern and Central U.S.A. and East and South-east Asia is shortened.
- The economic significance of this Canal is relatively less than that of the Suez. However, it is vital to the economies of Latin America.



### Q 3.A

- India has overtaken China as the world's most populous nation, according to UN data. India's population surpassed 1.428 billion, slightly higher than China's 1.425 billion people.
- The growth rate of India's population has not always been very high. Between 1901-1951 the average annual growth rate did not exceed 1.33%, a modest rate of growth.
- In fact, between 1911 and 1921 there was a negative rate of growth of - 0.03%. This was because of the influenza epidemic during 1918 -19 which killed about 12.5 million persons or 5% of the total population of the country.
- **The population decreased from 252 million to 251 million. Hence statement 2 is correct.**

Year	Total Population (in millions)	Average Annual Growth Rate (%)	Decadal Growth Rate (%)
1901	238	-	-
1911	252	0.56	5.8
1921	251	-0.03	-0.3
1931	279	1.04	11.0
1941	319	1.33	14.2
1951	361	1.25	13.3
1961	439	1.96	21.5
1971	548	2.22	24.8
1981	683	2.20	24.7
1991	846	2.14	23.9
2001	1028	1.93	21.3

- The decadal population growth of India was recorded highest during the 1961-1971 census decade, with a growth rate of 24.80%. **Hence statement 1 is not correct.**
- India's population has officially crossed the 1 billion mark. The birth of the billionth child-a girl called Aastha who was symbolically selected--occurred at Delhi's Safdarjung Hospital on May 10, 2000. **Hence statement 3 is not correct.**

**Q 4.B**

- Recent Context:** UNESCO published the new list of 55 creative cities on World Cities Day (Oct 31st), in which two Indian cities Kozhikode and Gwalior were included.
  - The aim of UNESCO Creative Cities Network (UCCN) is to strengthen cultural activities, goods, services, and international cooperation for sustainable development.**
  - Kozhikode is the first Indian city to get the City of Literature tag. Hence statement 2 is correct.**
  - The selected cities will participate in the UCCN annual conference in 2024 in Braga, Portugal, under the theme ‘Bringing youth to the table for the next decade’.
  - Eligibility:** UNESCO’s member states and associate members. **Hence statement 1 is not correct.**

7 Creative Fields of UCCN	Indian Cities in UCCN
Crafts and Folk Arts	Jaipur (2015), Srinagar (2021)
Design	-
Film	Mumbai (2019)
Gastronomy	Hyderabad (2019)
Literature	Kozhikode (2023)
Media Arts	-
Music	Chennai (2017), Varanasi (2015), Gwalior (2023)

**Q 5.C**

- Recent Context:** A recent study has identified a link between COVID-19 infection and an increased probability of receiving a diagnosis of Guillain-Barre syndrome (GBS) within a six-week timeframe.
- Guillain-Barré syndrome (GBS) is a rare disorder where the body's immune system damages nerves.** The damage to the nerves causes muscle weakness and sometimes paralysis. While its cause is not fully understood, the syndrome often follows infection with a virus or bacteria. **Hence, statement 1 is correct.**
- It is believed that the nerve cells are damaged by a person's own immune system. Many types of infections, and in very rare cases vaccines, may activate the immune system to cause damage to the nerve cells. A recent study conducted has identified a link between COVID-19 infection and an increased probability of receiving a diagnosis of Guillain-Barre syndrome (GBS) within a six-week timeframe. **Thus, vaccination can increase the risk of a person getting infected by GBS. Hence, statement 2 is correct.**
- GBS does not have a cure;** however, there are two treatments available that can reduce the severity of the disease and speed up the recovery process. These include plasma exchange (PE) and intravenous immunoglobulin therapy (IVIg). **Hence, statement 3 is correct.**

**Q 6.D**

- Government of India in the interest of meeting the objective of the country's energy security, decided on 7th January 2004 to construct Strategic Petroleum Reserves (SPRs) facilities as well as a Special purpose vehicle (SPV) to build and operate the strategic crude reserves.
  - In the year 2006, ownership of Indian Strategic Petroleum Reserve Limited (ISPRL) was transferred to OIDB as per the decision of CCEA in its meeting held on 6th Jan 2006 and it was decided to construct the SPR's through funds available with OIDB.
- Today, ISPRL is a wholly owned subsidiary (WOS) of Oil Industry Development Board (OIDB), which is a Body Corporate.
- Under Phase-I of SPR program, ISPRL completed the construction and filling of strategic crude oil in underground rock caverns with 5.33 MMT capacity at three locations namely Visakhapatnam (1.33 MMT) in Andhra Pradesh and Mangalore (1.5 MMT) & Padur (2.5 MMT) in Karnataka which can be used in emergencies particularly from serious disruptions in global crude oil supply chain. These three SPRs can meet approximately 9.5 days of national demand.

- Further, the Union Cabinet also accorded approval for establishing additional 6.5 MMT of Strategic Petroleum Reserves at two locations **Chandikhol (4 MMT) in Odisha** and at Padur (2.5 MMT) in Karnataka on 8th July 2021 along with two dedicated SPMs for Padur and Chandikhol with associated pipelines, under Public Private Partnership (PPP) model under Phase-II.
- Hence option (d) is the correct answer.

#### **Q 7.A**

- India saw the highest migration flows to Organisation for Economic Co-operation and Development (OECD) countries in 2021 and 2022, according to the ‘International Migration Outlook 2023’. Hence option (a) is the correct answer.
  - India replaced China as the main country of origin of new migrants( excluding students) to OECD countries in 2020. In 2021, for the second consecutive year, India, with 0.41 million new migrants, was the top country of origin. According to partial data, it was at the top in 2022 as well, according to the report.
  - China, with 0.23 million new migrants, was at a distant second, followed by Romania with around 200,000 new migrants.
  - Meanwhile, in terms of nationalities, 0.13 million Indian citizens acquired the nationality of an OECD country in 2021.
  - As in previous years, these acquisitions took place mostly in the United States (56,000), Australia (24,000) and Canada (21,000). Mexico again ranked second in 2021, with 0.19 million Mexicans granted the nationality of another OECD country, virtually all of them becoming US citizens.
  - Inflows of refugees from Ukraine reached the highest level on record, OECD-wide, due to the ongoing Russia-Ukraine war; more than 10 million people have become either internally displaced or refugees in the OECD region.
  - In terms of workers, migration flows from India (+172 percent), Uzbekistan (+122 percent), and Turkey (+240 percent) rose sharply, making them the primary countries of origin after Ukraine.
  - **Organization for Economic Cooperation and Development**
    - ✓ The OECD is an intergovernmental economic organization, founded to stimulate economic progress and world trade.
    - ✓ Most OECD members are high-income economies with a very high Human Development Index (HDI) and are regarded as developed countries. **It was founded in 1961 with its Headquarters in Paris, France.**
    - ✓ Currently, it has **36 Members. India is not a member, but a key economic partner.**
    - ✓ **Reports and Indices by OECD**
      - International Migration Outlook.
      - OECD Better Life Index.
      - OECD Economic Outlook
      - OECD Communication Outlook
      - OECD Internet Economy Outlook

#### **Q 8.B**

- Crude oil may be referred to as **sweet if it contains relatively little sulfur (0.5%) or sour if it contains substantial amounts of sulfur**. Sweet crude requires less energy to be extracted and once extracted, yields higher quality gasoline as well as larger quantities of it. Iraq is one of the leading producers of sweet crude. **Hence, statement 1 is correct.**
- **Sour crudes are usually cheaper than sweet crudes** and newer and high-complexity refineries are equipped to process them. **Hence, statement 2 is correct.**
- Major locations where **sweet crude is found include the Appalachian Basin** in Eastern North America, Western Texas, the Bakken Formation of North Dakota and Saskatchewan, the North Sea of Europe, North Africa, **Australia**, and the Far East including Indonesia. Sour crude, on the other hand, has a high level of impurities in it, namely sulfur, which must first be removed before being processed into gas and other petroleum-based products. **Venezuela is a leading producer of sour crude oil. Hence, statements 3 and 4 are not correct.**

#### **Q 9.B**

- Oil shale is a type of sedimentary rock that is rich in kerogen. Kerogen is a part of the rock that breaks down and releases hydrocarbons when heated. Hydrocarbons are substances made entirely of hydrogen and carbon. Petroleum and natural gas are probably the most familiar hydrocarbons. The hydrocarbons in oil shale can be used as an alternative to petroleum or natural gas.

- Recently, Vaca Muerta, which is a shale formation that rivals the United States' Permian Basin was in the news due to being at risk due to infrastructural bottlenecks. **The formation, in Argentina's Patagonian south, is the size of Belgium. It holds the world's second-largest shale gas reserves and the fourth-largest shale oil deposits.** It could become a key global supplier of gas as the world looks for alternatives to Russia, whose energy industry has been heavily sanctioned over its invasion of Ukraine. **Hence, statement 1 is not correct.**
- Sichuan has some of China's largest shale gas reserves. The Sichuan project, which is drilling more than 10,000 meters deep into the earth, aims to find ultra-deep reserves of natural gas.** Ultra-deep wells, which are more than 9,000 meters deep, are considered to be the most technically challenging drilling projects in the oil and gas engineering industry. **Hence, statement 2 is correct.**
- The largest estimated resources are in China (31.6 tcm),** followed by Argentina (22.7 tcm), Algeria (20 tcm), the United States (17.6 tcm) and Canada (16.2 tcm). In Europe the largest estimated resources lie in Poland (4.1 tcm) and France (3.9 tcm), with 0.7 tcm for the United Kingdom. **Hence, statement 3 is not correct.**

#### **Q 10.A**

- Recent Context:** According to the **World Bank's Commodity Market Outlook Report**, the global economy is better placed than in the 1970s, but the escalation of the West Asian conflict with disruptions from the Russian invasion of Ukraine could lead to a dual shock.
  - The World Bank's Commodity Markets Outlook is **published quarterly**, in January, April, July and October.
  - The report **provides a detailed market analysis for major commodity groups, including energy, metals, agriculture, precious metals and fertilizers.**
  - Price forecasts to 2025 for 46 commodities are presented along with historical price data.
  - A commodity market is a place that involves trading i.e., buying and selling of various commodities and their derivative products.**
- Hence option (a) is the correct answer.**

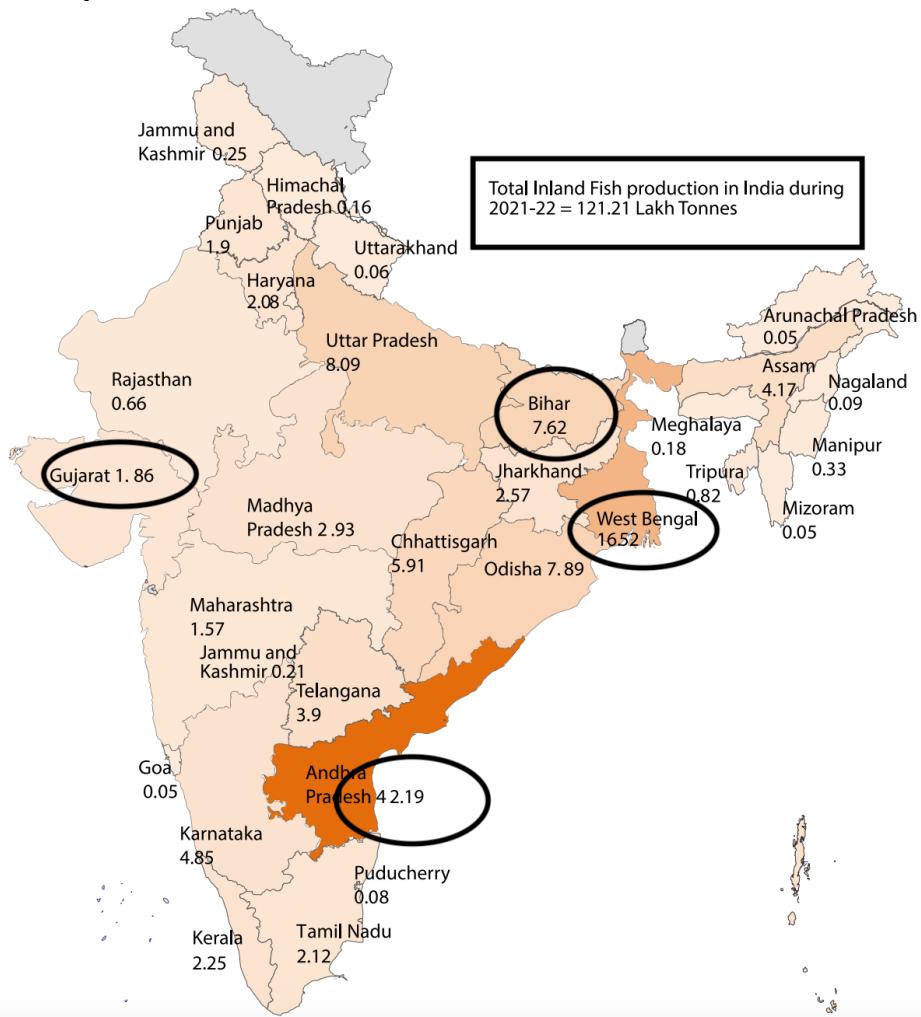
#### **Q 11.B**

- Recent context:** The International Coral Reef Initiative (ICRI), in collaboration with the Global Fund for Coral Reefs (GFCR) and the High-Level Climate Champions (HLCC), has launched the Coral Reef Breakthrough. This initiative aims to safeguard at least 125,000 square kilometres of shallow-water tropical coral reefs by 2030 through investments of at least US\$12 billion.
- The International Coral Reef Initiative (ICRI) is an informal partnership between Nations and organizations which strives to preserve coral reefs and related ecosystems around the world. **Hence statement 1 is correct.**
- ICRI was launched at the United Nations Global Conference on Sustainable Development of Small Islands Developing States in Barbados in 1994. ICRI is a joint initiative of several countries in partnership with other coral reef nations around the world, non-governmental organizations (NGOs), international organizations, multilateral development banks, and private sector businesses. **Hence statement 2 is not correct.**
- The ICRI Secretariat is hosted for a determined term (usually two years) by State members, on a voluntary basis (France 2016-2018). The Secretariat progresses ICRI's objectives through a specific Plan of Action; and organizes General Meetings of Members at least annually. The Secretariat can also choose to organize side events at major international summits and conferences to raise ICRI's profile and promote its work.
- The Initiative was founded in 1994 by eight governments: Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom, and the United States of America. It has 101 members (including India). 45 countries are custodians of 75% of the world's coral reefs. **Hence statement 3 is correct.**

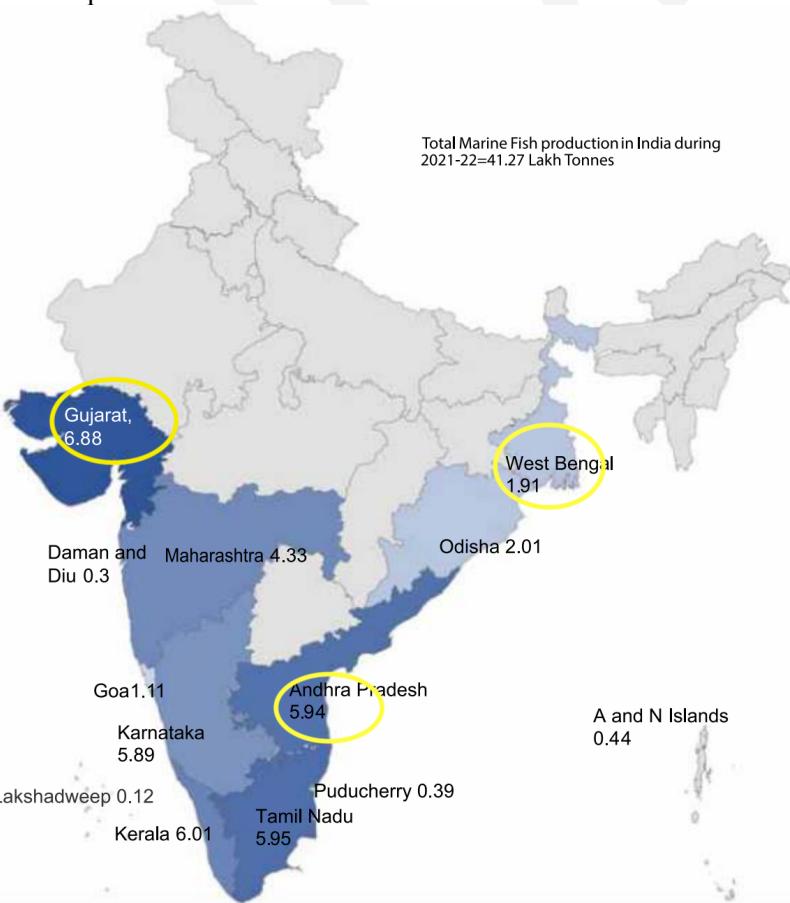
#### **Q 12.B**

- India is the third largest fish-producing country, contributing 8 percent to global fish production, and ranks second in aquaculture production. The fish production in 2021-22 is 16.24 Million Tonnes comprising of marine fish production of 4.12 Million Tonnes and 12.12 Million Tonnes from Aquaculture.

- Inland fish production**



- Marine fish production**



State/UT	2017-18		2018-19		2019-20		2020-21		2021-22	
	Inland	Marine								
Andhra Pradesh	28.45	6.05	33.91	6	36.1	5.64	40.7	5.54	42.19	5.94
Arunachal Pradesh	0.04	0	0.05	0	0.05	0	0.05	0	0.05	0.00
Assam	3.27	0	3.31	0	3.73	0	3.93	0	4.17	0.00
Bihar	5.88	0	6.02	0	6.41	0	6.83	0	7.62	0.00
Chhattisgarh	4.57	0	4.89	0	5.72	0	5.77	0	5.91	0.00
Goa	0.06	1.18	0.05	1.15	0.04	1.01	0.05	1.06	0.05	1.11
Gujarat	1.38	7.01	1.42	6.99	1.58	7.01	1.57	6.83	1.86	6.88
Haryana	1.9	0	1.8	0	1.91	0	2.03	0	2.08	0.00
Himachal Pradesh	0.13	0	0.13	0	0.14	0	0.15	0	0.16	0.00
Jharkhand	1.9	0	2.08	0	2.23	0	2.38	0	2.57	0.00
Karnataka	1.88	4.14	1.98	3.9	2.29	4.03	2.61	3.47	4.85	5.89
Kerala	1.89	4.84	1.92	6.09	2.05	4.75	2.24	3.92	2.25	6.01
Madhya Pradesh	1.43	0	1.73	0	2	0	2.49	0	2.93	0.00
Maharashtra	1.31	4.75	1	4.68	1.18	4.43	1.25	3.99	1.57	4.33
Manipur	0.33	0	0.32	0	0.32	0	0.33	0	0.33	0.00
Meghalaya	0.12	0	0.13	0	0.14	0	0.16	0	0.18	0.00
Mizoram	0.08	0	0.07	0	0.07	0	0.05	0	0.05	0.00
Nagaland	0.09	0	0.09	0	0.09	0	0.09	0	0.09	0.00
Odisha	5.34	1.51	6	1.59	6.6	1.58	7.01	1.72	7.89	2.01
Punjab	1.37	0	1.35	0	1.51	0	1.65	0	1.90	0.00
Rajasthan	0.54	0	0.55	0	1.16	0	0.6	0	0.66	0.00
Sikkim	0	0	0	0	0	0	0	0	0.00	0.00
Tamil Nadu	1.85	4.97	1.7	5.2	1.74	5.83	1.75	5.48	2.12	5.95
Telangana	2.7	0	2.84	0	3	0	3.49	0	3.90	0.00
Tripura	0.77	0	0.7	0	0.78	0	0.82	0	0.82	0.00
Uttar Pradesh	6.29	0	6.62	0	6.99	0	7.46	0	8.09	0.00
Uttarakhand	0.05	0	0.05	0	0.05	0	0.06	0	0.06	0.00
West Bengal	15.57	1.85	16.19	1.63	16.19	1.63	16.69	1.55	16.52	1.91
A and N Islands	0	0.39	0	0.4	0	0.4	0	0.43	0.00	0.44
Chandigarh	0	0	0.01	0	0.01	0	0	0	0.00	0.00
D & Nagar Haveli and Daman and Diu	0	0.24	0	0.28	0	0.32	0	0.3	0.00	0.30

- Hence option (b) is the correct answer.

#### Q 13.A

- Project UDBHAV** is a collaboration between the Indian Army and the United Service Institution of India (USI), and is an endeavor to revisit the roots of India's ancient military thoughts.
- 'Udbhav', which translates to 'origin' or 'genesis', acknowledges the vintage scriptures and writings of our Nation, that span centuries in the past and contain profound knowledge that can benefit modern military strategies.
- The objective of the Project is to synthesize ancient wisdom with contemporary military practices, forging a unique and holistic approach to address modern security challenges. It is a visionary initiative by the Indian Army that seeks to integrate age-old wisdom with contemporary military pedagogy.
- Hence option (a) is the correct answer.

#### Q 14.D

- Beach sand minerals are primarily of 6 types - Ilmenite, Rutile, Zircon, Garnet, Monazite, and Sillimanite. Whereas, Chalcopyrite is a copper iron sulfide mineral and the most abundant copper ore mineral. Hence only options 1, 2, and 4 are correct.
- Resistant and heavy minerals with a specific gravity higher than 2.78 generally constitute beach placers which are formed along the coast by wave and windaction.
- The placers usually contain ilmenite, zircon, rutile, monazite, garnet, and sillimanite.

- These placers are also referred to as ‘black sands’ in view of the significant concentration of ilmenite, magnetite, and monazite which gives it a black color.
- Ilmenite ( $\text{FeTiO}_3$ ) and rutile ( $\text{TiO}_2$ ), the important ores of titanium, are mostly produced from these placers.
- Titanium, a very light metal, is an important strategic metal and finds its use in a wide range of applications including the aerospace industry, electrical industry, and paints.
- Zircon ( $\text{ZrSiO}_4$ ), the source of zirconium is used mostly in foundry sands and refractory paints.
- Monazite, an important ore of thorium, is a phosphate of rare earth elements of Ce, La and Nd.
- Garnet and sillimanite ( $\text{Al}_2\text{SiO}_5$ ) are mainly used in the abrasive and refractory industry, respectively.

**Q 15.A**

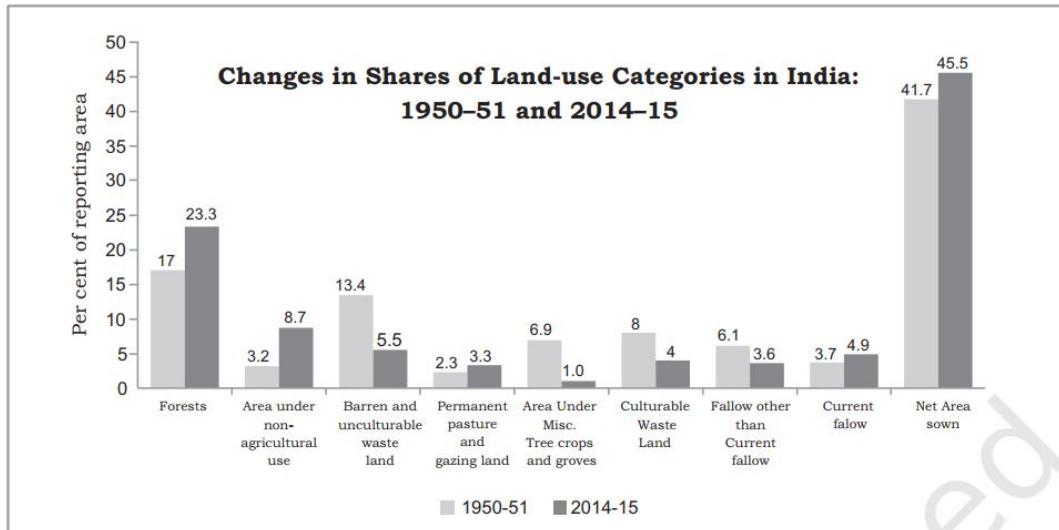
- In North America, highway density is high, about 0.65 km per sq km. Every place is within 20 km distance from a highway. Cities located on the Pacific coast (west) are well-connected with those of the Atlantic Coast (east). Likewise, the cities of Canada in the north are linked with those of Mexico in the south.
- The Trans-Canadian Highway links Vancouver in British Columbia (west coast) to St. John’s City in Newfoundland (east coast). **Hence statement 1 is correct.**
- The Alaskan Highway links Edmonton (Canada) to Anchorage (Alaska). **Hence statement 2 is not correct.**
- The Pan-American Highway, a large portion of which has been constructed, will connect the countries of South America, Central America and U.S.A.-Canada.
- The Trans-Continental Stuart Highway connects Darwin (north coast) and Melbourne (South Coast) via Tennant Creek and Alice Springs in Australia. **Hence statement 3 is correct.**

**Q 16.B**

- **The indigenous tribe that resides in the Amazon rainforest of South America is the Yanomami.**
  - **The Yanomami are a well-known indigenous tribe native to the Amazon rainforest, primarily inhabiting the border regions of Brazil and Venezuela.** They are one of the largest and most isolated indigenous tribes in South America. The Yanomami people are known for their unique cultural practices, traditional ways of life, and their deep connection to the rainforest. **Hence option (b) is the correct answer.**
- **Some key characteristics and aspects of the Yanomami tribe include:**
  - **Lifestyle:** The Yanomami people traditionally live in small, remote villages in the dense Amazon rainforest. They rely on subsistence farming, hunting, and gathering for their sustenance.
  - **Social Structure:** The Yanomami have a communal and egalitarian social structure, with decisions made collectively within their villages. They are known for their communal living arrangements and communal childcare practices.
  - **Challenges:** Over the years, the Yanomami have faced numerous challenges, including encroachment on their land, health issues, and exposure to external influences. Efforts have been made to protect their rights and preserve their way of life.
  - **Rainforest Guardians:** The Yanomami are integral to the preservation of the Amazon rainforest. They play a vital role in maintaining the biodiversity and ecological balance of the region.
- **The other options**
  - **Inuit:** Indigenous people of the **Arctic regions**, including parts of Canada, Alaska, and Greenland.
  - **Apache:** Indigenous people of **North America**, primarily known for their historical presence in the southwestern United States.
  - **Maori:** Indigenous people of **New Zealand**, known for their unique culture and language.

**Q 17.A**

- Land use in a region, to a large extent, is influenced by the nature of economic activities carried out in that region. However, while economic activities change over time, land, like many other natural resources, is fixed in terms of its area.
- India has undergone major changes within the economy over the past four or five decades, and this has influenced the land-use changes in the country. These changes between **1950–51 and 2014–15** have been shown in the figure.



**Fig. 5.1**

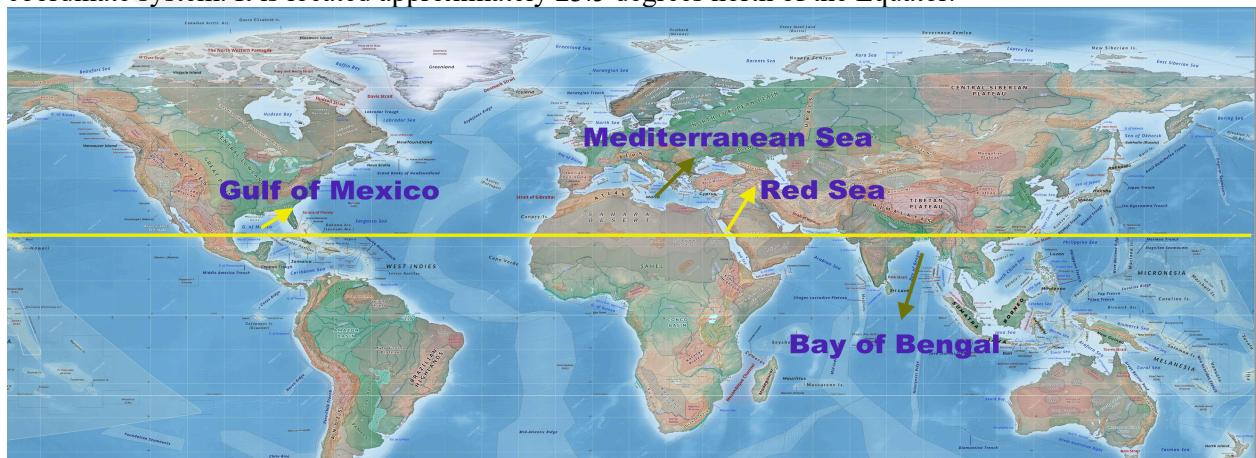
- Hence option (a) is the correct answer.

#### **Q 18.C**

- Most farmers practice the nursery bed method. Nursery beds are made occupying about 1/20th of the total field area. The paddy seeds are sown in the bed. They are ready within 25 days of sowing in lowland areas while in higher altitudes they take about 55 days to become ready for transplantation. There are four different practices of cultivation of rice, viz. transplantation method, drilling method, broadcast method, and Japanese method.
- Transplantation is the most commonly used method** wherein seeds are first sown in a nursery and the seedlings are transplanted to the main field once they show 3-4 leaves. Although this is the best-yielding method, it requires heavy labor.
- The drilling method is exclusive to India. In this method, one person ploughs a hole in the land and the other person sows the seed. Ox is the most commonly used ‘person’ to plow the land.
- The broadcast method generally involves scattering the seeds manually over a large area or in the entire field. The labor involved is much less and so is the precision. This method produces very little yield as compared to others.**
- The Japanese method has been adopted for the high-yielding variety of rice and those that need a high amount of fertilizers. Seeds are sown in nursery beds and then transplanted to the main field. It has shown tremendous success for the high-yielding varieties.**
- Another new way of rice cultivation is the System of Rice Intensification. It involves cultivating rice with as much organic manure as possible, starting with young seedlings planted singly at wider spacing in a square pattern; and with intermittent irrigation that keeps the soil moist but not inundated, and frequent inter-cultivation with a weeder that actively aerates the soil.
- Hence, option (c) is the correct answer.

#### **Q 19.B**

- The Tropic of Cancer is one of the five major circles of latitude that are part of the Earth's geographical coordinate system. It is located approximately 23.5 degrees north of the Equator.



- Tropic of Cancer does not pass through the Bay of Bengal and the Mediterranean Sea.
- Hence option (b) is the correct answer.

#### **Q 20.D**

- The Census 2011 is the 15th National census survey conducted by the Census Organization of India. Mr. C. Chandramouli is the Commissioner & Registrar General of the Indian 2011 Census.
  - The 2011 Indian National Census has been conducted in 2 phases - house listing and population. The national census survey covered all the 28 states of the country and 8 Union territories.
- **Least populated states of India**

Rank	State	Population	Density per sqkm
1	<a href="#">Lakshadweep</a>	64 Thousands	2149
2	<a href="#">Daman and Diu</a>	2.43 Lakhs	2191
3	<a href="#">Dadra and Nagar Haveli</a>	3.44 Lakhs	700
4	<a href="#">Andaman and Nicobar Islands</a>	3.81 Lakhs	46
5	<a href="#">Sikkim</a>	6.11 Lakhs	86
6	<a href="#">Chandigarh</a>	10.55 Lakhs	9258
7	<a href="#">Mizoram</a>	10.97 Lakhs	52
8	<a href="#">Puducherry</a>	12.48 Lakhs	2547
9	<a href="#">Arunachal Pradesh</a>	13.84 Lakhs	17
10	<a href="#">Goa</a>	14.59 Lakhs	394

- Sikkim is the least populated state of India. Hence pair one is not correctly matched.
- Highest Populated states
  - Uttar Pradesh
  - Maharashtra
  - Bihar
- **Top 10 states by density**

Rank	State	Area(Km <sup>2</sup> )	Density	Population
1	<a href="#">Delhi</a>	1483	11320	16787941
2	<a href="#">Chandigarh</a>	114	9258	1055450
3	<a href="#">Puducherry</a>	490	2547	1247953
4	<a href="#">Daman and Diu</a>	111	2191	243247
5	<a href="#">Lakshadweep</a>	30	2149	64473
6	<a href="#">Bihar</a>	94163	1106	104099452
7	<a href="#">West Bengal</a>	88752	1028	91276115
8	<a href="#">Kerala</a>	38852	860	33406061
9	<a href="#">Uttar Pradesh</a>	240928	829	199812341
10	<a href="#">Dadra and Nagar Haveli</a>	491	700	343709

- Bihar is the most densely populated state of India. Hence pair 2 is not correctly matched.
- States with large urban population.
  - Maharashtra has the largest urban population in India. Hence pair 3 is not correctly matched.
    - ✓ It has a population of 5,08,18,259.
  - Uttar Pradesh has the second-largest urban population in India.
- Goa is the most urbanized state in India in terms of percentage of population.
  - 62.18% of the population of Goa is urbanized.

**Q 21.C**

- **High technology**, or simply high-tech, is the latest generation of manufacturing activities. It is best understood as the application of intensive research and development (R and D) efforts leading to the manufacture of products of an advanced scientific and engineering character. The high-tech industrial landscapes in present times are neatly spaced, low, modern, dispersed, office-plant-lab buildings rather than massive assembly structures, factories, and storage areas. Planned business parks for high-tech start-ups have become part of regional and local development schemes.
- Such high-tech industries which are **regionally concentrated, self-sustained, and highly specialized** are called **technopolies**. Hence, statement 1 is correct.
- **Silicon Valley** near San Francisco and **Silicon Forest** near Seattle in the USA are examples of **technopolies**. The city of Bangalore in Karnataka India has attained fame in the Silicon Valley of India and is thus one of the technopolies in India. Hence, statement 2 is correct.

**Q 22.B**

- Niger is the world's seventh-biggest producer of uranium, according to the World Nuclear Association (WNA). Recently, it was in the news due to the coup in the country and its possible impact on the nuclear energy capacity of European countries, especially France. **Niger, which has Africa's highest-grade uranium ores, produced 2,020 metric tons of uranium in 2022, about 5% of world mining output, according to the WNA**. Hence, statement 1 is correct.
- About two-thirds of the world's production of uranium from mines is from Kazakhstan, Canada and Australia. **In 2022 Kazakhstan produced the largest share of uranium from mines (43% of world supply), followed by Canada (15%) and Namibia (11%)**. Hence, statement 2 is correct.
- **Iran recently started the exploitation of its biggest nuclear reserve in Narigan. It is estimated to hold 650 tons of Uranium and 4600 tons of Molybdenum**. Hence, statement 3 is not correct.

**Q 23.A**

- **Recent Context:** The Government of India has recently notified the constitution of the National Turmeric Board.
- The National Turmeric Board will provide leadership on turmeric-related matters, augment the efforts, and facilitate greater coordination with the Spices Board and other Government agencies in the development and growth of the turmeric sector.
- **The Board shall have a Chairperson to be appointed by the Central Government, members from the Ministry of AYUSH, Departments of Pharmaceuticals, Agriculture & Farmers Welfare, Commerce and industry of the Union Government, senior State Government representatives from three states (on a rotation basis), select national/state institutions involved in research, representatives of turmeric farmers and exporters, and have a Secretary to be appointed by the Department of Commerce.** Hence statement 1 is correct and statement 2 is not correct.
- **The Ministry of Commerce will be the nodal department providing funds and infrastructure for the NTB**, which will look into increased demand, usage, production, research, market linkage, exports, and so on. Hence statement 3 is not correct.

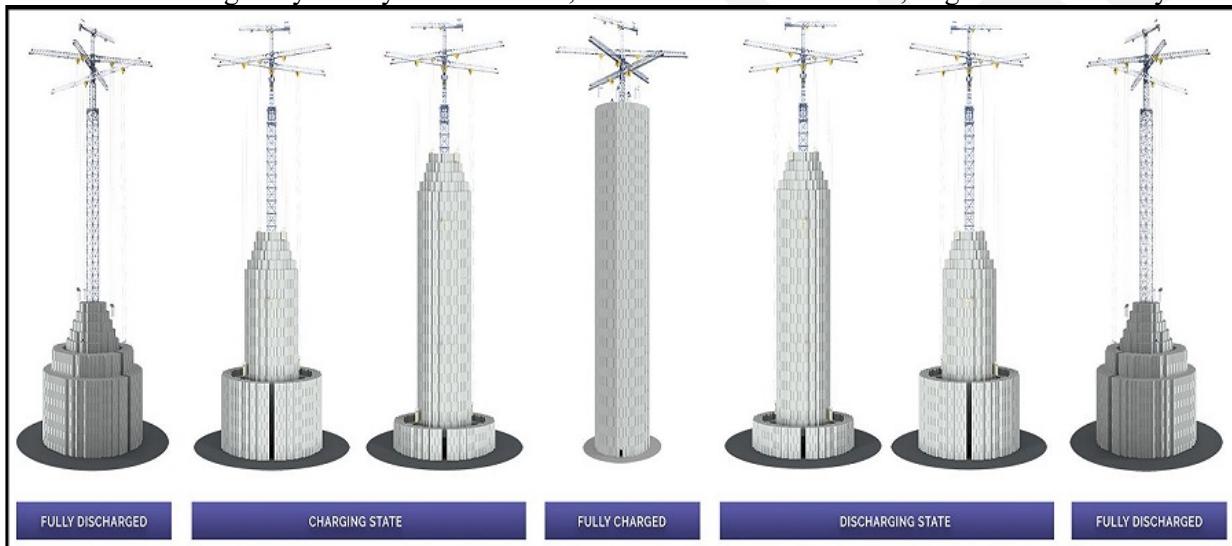
**Q 24.B**

- The Law of Primate City was first proposed by Mark Jefferson in 1939. **He defined primate city as the largest city which is at least twice as large as the second largest city and more than twice as significant, socially and economically**. According to him the primate city or the largest city shall be super eminent not merely in size but in national influence.
- According to this concept, there is one city that has the dominance of the whole economic, social and political scene of that country.
- **Characteristics of Primate City**
  - The primate city of a country is the largest in population size. Its population size is disproportionately larger than the second-largest city.
  - Such cities are generally the first city of the country in terms of origin.
  - A primate city possesses economic dominance, cultural and political significance.
  - It presents itself as a centre for national identity.
  - It has all the functions and services of the largest urban centre related to trade, transportation, market, recreation, tourism etc.
  - It controls the media, creates jobs, circulates currency and sets trends.
  - Its influence is experienced throughout the entire country.

- A large number of primate cities of the world are generally the national capital city of that country, e.g. Kuala Lumpur, Mexico City, Lima, Seoul, Vienna, Budapest, Sao Paulo and Tokyo.
  - Bangkok is said to be "the most primate city on the Earth" because its population is approximately forty times larger than the population of the second largest city of Thailand.
- Hence option (b) is the correct answer.

#### **Q 25.C**

- **Recent context:** Energy Vault, a developer of utility-scale storage technology backed by Japan's SoftBank Group and the venture arm of Saudi Aramco, is offering a solution that promises to deploy utility-scale energy storage solutions, including proprietary gravity-based storage. After US & China, energy companies are in talks with Indian firms.
- **A gravity battery is a type of electricity storage device that involves lifting (charging) and lowering (discharging) a heavyweight. Hence Statement-I is correct.**
- **The energy is stored in an object resulting from a change in height due to gravity. It is also called potential energy.** A gravity battery works by using excess energy (usually from sustainable sources) to raise a mass to generate gravitational potential energy. Which is then lowered to convert potential energy into electricity through an electric generator. **Hence Statement-II is not correct.**
- The most common gravity battery is used in pumped-storage hydroelectricity (PSH), where water is pumped to higher elevations to store energy and released through water turbines to generate electricity. Another form of a gravity battery lowers a mass, such as a block of concrete, to generate electricity.



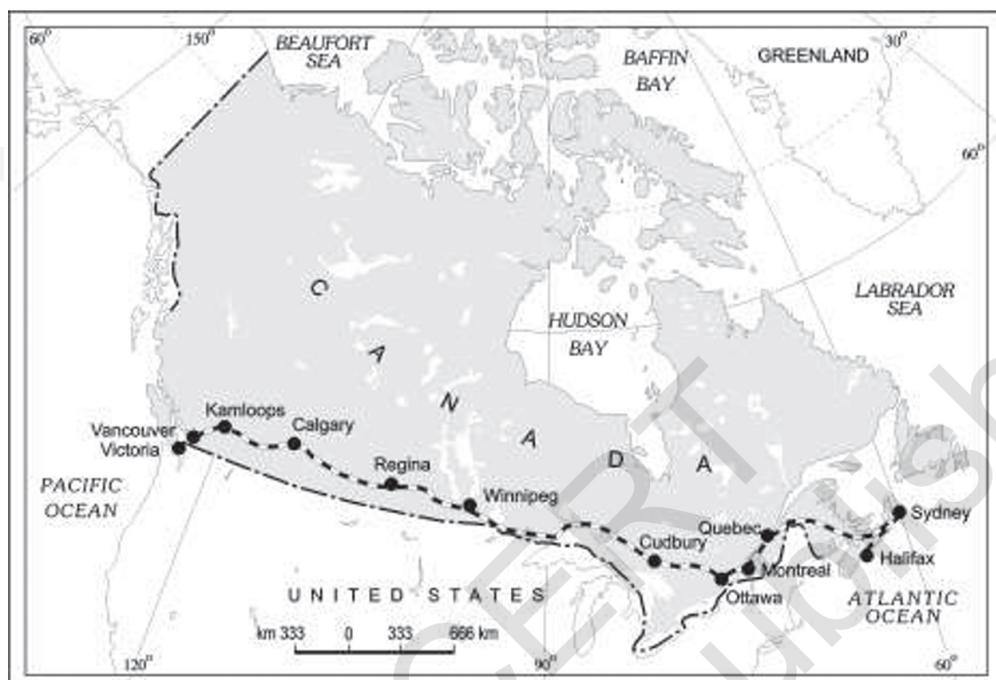
#### **Q 26.D**

- Trans-continental railways run across the continent and link its two ends. They were constructed for economic and political reasons to facilitate long runs in different directions. The following are the most important of these:
- **Trans-Siberian Railway:** This is a trans-siberian Railways major rail route of Russia runs **from St. Petersburg in the west to Vladivostok on the Pacific Coast** in the east passing through Moscow, Ufa, Novosibirsk, Irkutsk, Chita and Khabarovsk. **It is the most important route in Asia and the longest (9,332 km) double-tracked and electrified transcontinental railway in the world. Hence statement 1 and 2 are not correct.**



**Fig. 8.5: Trans-Siberian Railway**

- **The Union and Pacific Railway:** This rail-line connects New York on the Atlantic Coast to San Francisco on the Pacific Coast passing through Cleveland, Chicago, Omaha, Evans, Ogden and Sacramento. The most valuable exports on this route are ores, grain, paper, chemicals and machinery.
- **Trans-Canadian Railways:** This 7,050 km long rail-line in Canada runs from Halifax in the east to Vancouver on the Pacific Coast passing through Montreal, Ottawa, Winnipeg and Calgary. It was constructed in 1886, initially as part of an agreement to make British Columbia on the west coast join the Federation of States. Later on, it gained economic significance because it connected the Quebec-Montreal Industrial Region with the wheat belt of the Prairie Region and the Coniferous Forest region in the north. Thus each of these regions became complementary to the other.



**Fig. 8.6: Trans-Canadian Railway**

**Q 27.A**

- **The North Antelope Rochelle Mine:** It is Located in the heart of Wyoming's Powder River Basin, USA. It is the world's largest coal mine with the cleanest coal in the United States. Coal quality averages approximately 8,800 BTU/lb. It has a world-class mining and technology focus, planning and advanced blending to meet customized customer requirements. Hence, pair 1 is correctly matched.
- **Xintai Coal Mine:** It is located in the city of Yanan in the mountainous Shaanxi province, China. Recently, it was in the news because of a coal explosion. Hence, pair 2 is not correctly matched.
- **Hambach Coal Mine:** The Hambach is a large open-pit coal mine in Germany. The mine is on the site of the ancient Hambach Forest. Hambach produces 40 million tons of lignite annually. Also known as brown coal, lignite is a soft sedimentary rock produced from peat, an organic material formed from decayed plants. Typically used to generate electricity, brown coal is considered the lowest grade of coal because of its high moisture content and low heating value. Hence, pair 3 is not correctly matched.

**Q 28.B**

- **The Tarbela Dam is one of the largest earth-filled dams in the world and a crucial water resource infrastructure in Pakistan.**
  - Tarbela Dam is located on the Indus River in the Haripur District of the Khyber Pakhtunkhwa province of Pakistan
- **The Bratsk Dam is a large hydroelectric dam located in Siberia, Russia.**
  - It is situated on the Angara River in the Irkutsk Oblast of Siberia, Russia.
- **The Grand Coulee Dam is a massive concrete gravity dam located in the state of Washington, USA.**
  - It is situated on the Columbia River in the northeastern part of the state of Washington.
- Other important dams of the world are
  - Kariba Dam, Zimbabwe
  - Akosombo Dam, Ghana
  - Daniel Johnson Dam, Canada
  - Guri Dam, Venezuela
  - Aswan High Dam, Egypt
  - Krasnoyarsk Dam, Russia
  - Zeya Dam, Russia
- **Hence option (b) is the correct answer.**

**Q 29.B**

- Following a detailed scientific review by the WHO's independent advisory body, the Strategic Advisory Group of Experts (SAGE) and the Malaria Policy Advisory Group (MPAG), the R21/Matrix-M malaria vaccine has been recommended for use.
- **The R21/Matrix-M™ malaria vaccine developed by the University of Oxford and the Serum Institute of India,** leveraging Novavax's adjuvant technology, has been recommended for use by the World Health Organization (WHO) after meeting required safety, quality and effectiveness standards. Hence statement 2 is correct.
- **The R21 vaccine is the second malaria vaccine recommended by WHO, following the RTS,S/AS01 vaccine, which received a WHO recommendation in 2021.** Both vaccines are shown to be safe and effective in preventing malaria in children. Hence statement 1 is not correct.
- **Malaria is caused by Plasmodium parasites, which are spread to people through bites of infected female Anopheles mosquitoes. The R21 and RTS,S vaccines act against P. falciparum, the deadliest malaria parasite and the most prevalent on the African continent.** Hence statement 3 is correct.

**Q 30.A**

- Rare earth elements, also known as rare earth metals or rare earth oxides, are a set of 17 heavy metals that have a wide range of commercial and industrial uses. They are of particular importance for the green transition, as they are needed for the production of wind turbines and electric vehicles.
- **China has by far the largest amount of rare earth reserves of any country in the world, followed by Vietnam, Brazil, and Russia.** However, in terms of refining and processing rare earths, China is further ahead: according to data from the US Geological Survey, it accounted for more than 60 percent of all rare earths production, followed by the US (16 percent), Myanmar (9 percent) and Australia (8 percent). Hence, statement 1 is not correct.
- **In Europe, there are heavy regulatory barriers to the mining and production of critical raw materials and it does not currently mine raw earths.** As a result, the EU is heavily dependent on China and other countries for them. recently, The Swedish state-owned mining company LKAB announced

**that it had found more than a million tons of rare earth oxides in Kiruna, northern Sweden. Hence, statement 2 is correct.**

- **Dong Pao mine is located in Vietnam.** Vietnam has the second-largest rare earth deposits, according to the US Geological Survey. But they have remained largely untapped, with investment discouraged by low prices that are effectively set by China because of its near-monopoly on the global market. **Vietnam is planning to reopen the Dong Pao mine amid ambitious plans to dent China's dominance in a sector that is key to tech production around the globe.** Hence, statement 3 is not correct.

**Q 31.A**

- **The Corinth Canal is located in Greece, connecting the Aegean Sea in the east with the Ionian Sea in the west.**
  - Specifically, it is situated in the narrow strip of land known as the Isthmus of Corinth, which separates the Greek mainland from the Peloponnese Peninsula.
  - The canal cuts through this isthmus, providing a shortcut for maritime traffic traveling between the eastern Mediterranean and the western Mediterranean, avoiding the longer journey around the southern tip of the Peloponnese.
- **The Kiel Canal is a major artificial waterway in Germany.** It connects the North Sea in the west with the Baltic Sea in the east.
- **The White Sea–Baltic Canal is located in Russia. It connects the White Sea, located in the far north of Russia, to the Baltic Sea, which is to the west of Russia.**
  - The canal begins near the city of Belomorsk on the White Sea and ends at the town of Petrokrepot on Lake Onega, which is part of the Baltic Sea basin.
  - The canal serves as an important transportation route, facilitating the movement of goods between these two bodies of water and providing access to the Baltic Sea from the Arctic regions.
- **Hence option (a) is the correct answer.**

**Q 32.C**

- **Recent Context:** The Competition Commission of India (CCI) has introduced a draft of revised lesser penalty regulations that include a “leniency plus” program to combat cartel activities.
- **Leniency Plus is a proactive antitrust enforcement strategy aimed at attracting leniency applications by encouraging companies already under investigation for one cartel to report other cartels unknown to the competition regulator.** Hence statement 1 is correct.
- In the “Leniency Plus” program, a cartel member cooperating with CCI for leniency can disclose the existence of another unrelated cartel during the original leniency proceedings in exchange for an additional reduction in penalties, thereby saving time and resources in cartel investigations.
- The “Leniency Plus” regime is already recognized in several other countries.
- **The “leniency plus” regime was introduced in the new Competition (Amendment) Act, 2023. However, several provisions of the Act are yet to be notified.** Hence statement 2 is correct.
- Experts believe that the “leniency plus” regime will strengthen the CCI’s leniency program and enable quicker and more effective market corrections.

**Q 33.A**

- **Iron ore:** In India, the main deposits of iron ore are located in the states of Odisha, Jharkhand, Chhattisgarh, Karnataka, and Goa, with **Odisha contributing about 50% of India's total production.** **Hematite and magnetite** are the two most important iron ores in India.
  - Haematite and magnetite are the most important iron ores in India. About 79% of haematite ore deposits are found in the Eastern Sector (Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, and Uttar Pradesh) while about 93% of magnetite ore deposits occur in the Southern Sector (Andhra Pradesh, Goa, Karnataka, Kerala, and Tamil Nadu).
  - **Important mines of iron ore are**
    - ✓ Odisha-Barabil-Koira Valley, Sundargarh, Mayurbhanj,
    - ✓ **Chhattisgarh: Bailadila mine**
    - ✓ **Jharkhand:** Singhbhum
    - ✓ **Karnataka:** Kemmangundi in Bababudan hills of Chikmagalur
- Coal is a fossil fuel that is formed from the remains of plants that lived and died millions of years ago. The main types of coal are:
  - Anthracite - It has a high carbon content, low moisture content, and high energy density.
  - Bituminous - It has a moderate to high carbon content

- Lignite -Lignite is the lowest rank of coal and is often referred to as "brown coal." It has a high moisture content and a lower carbon content.
- **Important mines of coal in India are**
  - Jharkhand - Bokaro, Jharia, Deltenganj, Dhanbad
  - Odisha - Talchar, Rampur-Himgir
  - **Chhattisgarh - Korba, Gevra**
  - West Bengal - Raniganj, Bardhaman, Birbhum, Bankura
  - Madhya Pradesh - Singrauli, Muhipani, Satpura, Pench Kanhan, Jhingurda
  - Telangana - Singareni coalfield
- India has 501.83 million tonnes of gold ore reserves as of April 1, 2015, according to National Mineral Inventory data. Out of these, 17.22 million tonnes were placed under the reserves category and the rest under the remaining resources category.
  - Gold mines
    - ✓ **Karnataka - Kolar Gold Field, Hutt Gold Field**
    - ✓ Jharkhand - Sona nadi in Singhbhum district
    - ✓ Andhra Pradesh - Ramagiri in Anantapur district, Jonnagiri
- **Hence option (a) is the correct answer.**

**Q 34.D**

- **Recent context:** United States had recently begun sending Israel additional military assistance including interceptors to replenish the Iron Dome defence system.
- **The Iron Dome system is a ground-to-air short-range air defence system deployed in several parts of the Israel to counter rocket attacks, mortars, artillery shells, and Unmanned Aerial Vehicles (UAVs) at short range.** The air defence system has a range of approximately 70 km. **Hence statement 1 is not correct.**
- **The system was developed by Isreal's state-owned Rafael Advanced Defence Systems with the backing of the United States** in order to counter rockets fired by the terror group Hezbollah from Lebanon during the 2006 war and by Palestine's Hamas. **Hence statement 2 is not correct.**
- Considered one of the most advanced defence systems in the world, the Iron Dome uses a radar in order to identify and destroy air-based threats before they can cause any damage. In 2017, Israel also developed a naval version of the Iron Dome system in order to protect ships and other sea-based assets.
- The Iron Dome has three main systems that work together to provide a shield over the area where it is deployed, handling multiple threats. It has a detection and tracking radar to spot any incoming threats, a battle management and weapon control system (BMC), and a missile firing unit. The BMC basically liaises between the radar and the interceptor missile.

**Q 35.A**

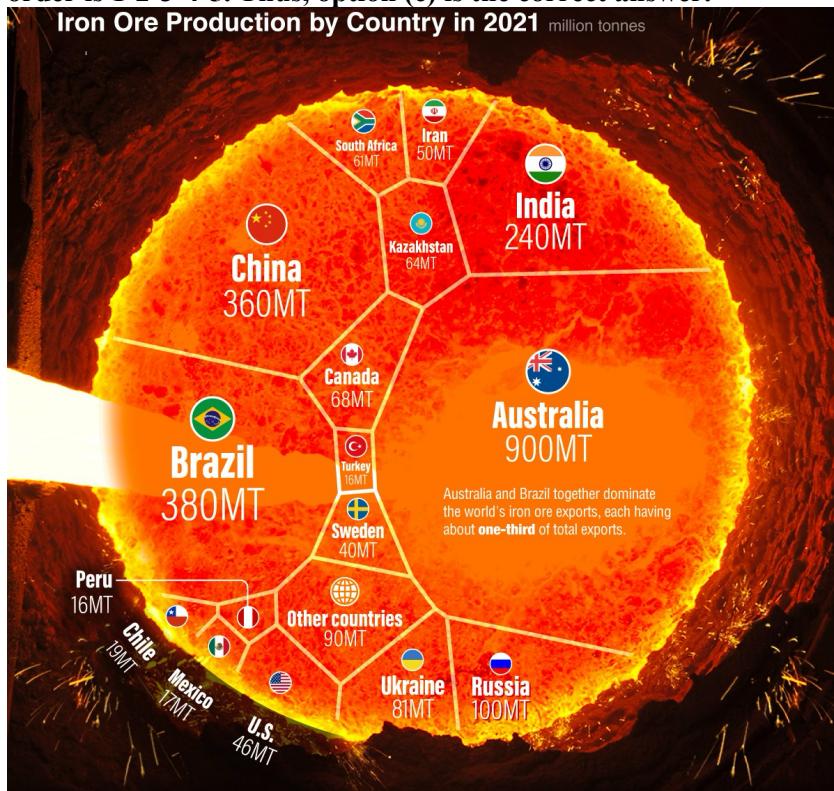
- In Asia, rail network is the most dense in the thickly populated areas of Japan, China and India.
- Other countries have relatively few rail routes. West Asia is the least developed in rail facilities because of vast deserts and sparsely populated regions. **Hence option (a) is the correct answer.**

**Q 36.C**

- **Australia tops the list of iron ore production by country. It is the leading producer of iron ore in the world.** The nation produces about 37.6% of total world production. It doubles its closest rival, Brazil. Australia also has nearly 48 billion tons of crude iron ore reserves, the largest globally. Iron ore is the country's largest export, and its major markets are China, Japan, South Korea, Taiwan, and Vietnam.
- **Brazil is the second-largest producer of iron ore.** Brazil produces 16.7% of total world production. China, the United States, India, and Malaysia are the main markets for iron ore from Brazil. Iron ore in Brazil is abundant in the state of Para, which produces nearly 190 tons every year, followed closely by the state of Minas Gerais. Vale, a Rio de Janeiro-based mining company, is the main iron miner in Brazil.
- **Despite being a major importer of iron ore, China is also the third-highest iron ore producer.** That's because it consumes more tons of iron ore than any country. China supplements its domestic iron ore with imports from other countries to sustain its demand in the steel industry and other related fields. It has nearly 20 billion tons of crude oil reserves. Areas in China rich in iron ore include Hebei, Inner Mongolia, Liaoning, and Shanxi.
- **India is Asia's second-largest producer of iron ore and the fourth-largest producer worldwide.** It accounts for 9.6% of the total iron ore produced around the globe. India exports its resources to Japan and South Korea despite using iron ore in its steel industries. Its two major customers in these countries are

Japanese Steel Mills and Posco. National Mineral Development Corporation, Vedanta, and Hindustan Zinc are India's major iron ore miners.

- Russia is the fifth largest iron ore-producing country in the world. It is the leading producer of iron in Europe.** The nation is expected to increase its iron ore production given its extensive iron ore reserves, which hold an estimated 25 billion metric tons. Russia is among the leading exporters of iron, with its main markets being China, Ukraine, Germany, Slovakia, and Turkey. Hence, the correct descending order is 1-2-3-4-5. Thus, option (c) is the correct answer.



#### Q 37.A

- Production of Important Crops in three Largest Producing States (in million tonnes)**

Rice	West Bengal	16.76
	Uttar Pradesh	15.27
	Punjab	12.89
Wheat	Uttar Pradesh	33.95
	Madhya Pradesh	22.42
	Punjab	14.82
Maize	Karnataka	5.22
	Madhya Pradesh	4.57
	Maharashtra	3.53
Total Nutri / Coarse Cereals	Karnataka	7.30
	Rajasthan	7.07
	Maharashtra	5.84
Tur	Maharashtra	1.37
	Karnataka	1.14
	Uttar Pradesh	0.35
Gram	Maharashtra	3.28
	Madhya Pradesh	3.03
	Rajasthan	2.65
Total Pulses	Madhya Pradesh	6.03
	Maharashtra	5.19
	Rajasthan	4.02
Total Foodgrains	Uttar Pradesh	56.11
	Madhya Pradesh	39.05
	Punjab	28.21

Groundnut	Gujarat	4.49
	Rajasthan	1.70
	Tamilnadu	0.95
Rapeseed & Mustard	Rajasthan	5.48
	Madhya Pradesh	1.69
	Haryana	1.37
Soyabean	Maharashtra	5.47
	Madhya Pradesh	5.39
	Rajasthan	0.93
Sunflower	Karnataka	0.14
	Telangana	0.02
	Odisha	0.02
Total Oilseeds	Rajasthan	8.39
	Madhya Pradesh	7.92
	Gujarat	6.90
Sugarcane	Uttar Pradesh	177.43
	Maharashtra	110.54
	Karnataka	61.15
Cotton@	Gujarat	7.48
	Maharashtra	7.12
	Telangana	6.07
Jute & Mesta <sup>s</sup>	West Bengal	8.36
	Assam	0.91
	Bihar	0.82

- Hence option (a) is the correct answer.

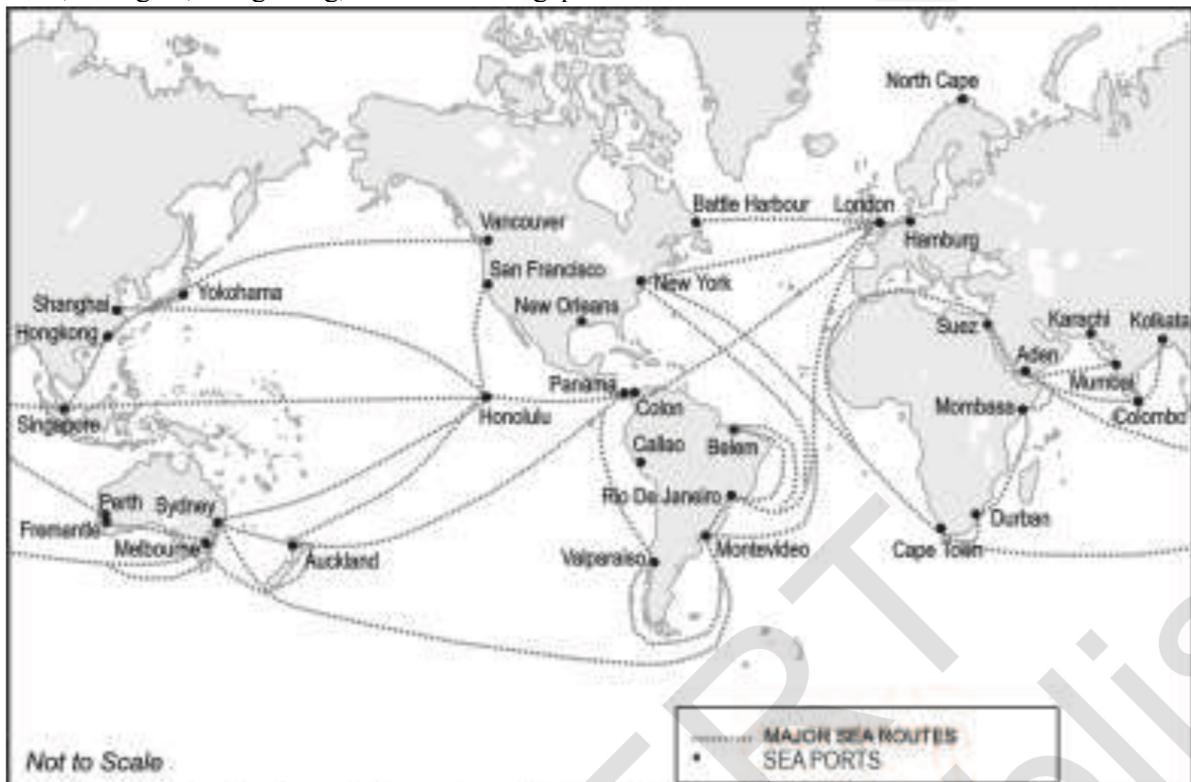
#### Q 38.C

- According to the United Nations, Africa is home to about 30 percent of the world's mineral reserves, 12 percent of the world's oil and 8 percent of the world's natural gas reserves. Lithium and cobalt are some of the key metals used to produce batteries. In 2019, about 63 percent of the world's cobalt production came from the Democratic Republic of the Congo. Hence, statement 1 is correct.
- According to the World Mining Congress, the world extracted some 17.9 billion tonnes of minerals in 2019. Asia was the largest producer, accounting for 59 percent of the world's total production valued at \$1.8 trillion. North America was second with 16 percent, followed by Europe at 7 percent. Hence, statement 2 is correct.

#### Q 39.D

- The oceans offer a smooth highway traversable in all directions with no maintenance costs. Its transformation into a routeway by sea-going vessels is an important development in human adaptation to the physical environment. Compared to land and air, ocean transport is a cheaper means of haulage (carrying of load) of bulky material over long distances from one continent to another.
- The Northern Atlantic Sea Route:**
  - This links the North-eastern U.S.A. and Northwestern Europe, the two industrially developed regions of the world. The foreign trade over this route is greater than that of the rest of the world combined. One-fourth of the world's foreign trade moves on this route. It is, therefore, the busiest in the world and is otherwise, called the Big Trunk Route. Both coasts have highly advanced ports and harbour facilities. Hence option (d) is the correct answer.
- The Mediterranean–Indian Ocean Sea Route:**
  - Port Said, Aden, Mumbai, Colombo and Singapore are some of the important ports on this route.
  - The construction of the Suez Canal has greatly reduced the distance and time as compared to the earlier route through the Cape of Good Hope. This trade route connects the highly industrialized Western European region with West Africa, South Africa, Southeast Asia and the commercial agriculture and livestock economies of Australia and New Zealand.
- The Cape of Good Hope Sea Route:**
  - This sea route is another important one across the Atlantic Ocean which connects West European and West African countries with Brazil, Argentina and Uruguay in South America.

- The traffic is far less on this route because of the limited development and population in South America and Africa. Only southeastern Brazil and Plata estuary and parts of South Africa have large-scale industries.
  - There is also little traffic on the route between Rio de Janeiro and Cape Town because both South America and Africa have similar products and resources.
  - Trade across the vast North Pacific Ocean moves by several routes which converge at Honolulu. The direct route on the Great Circle links Vancouver and Yokohama and reduces the travelling distance (2,480 km) by half.
- The North Pacific Sea Route:**
- This sea route links the ports on the west-coast of North America with those of Asia. These are Vancouver, Seattle, Portland, San Francisco and Los Angeles on the American side and Yokohama, Kobe, Shanghai, Hong Kong, Manila and Singapore on the Asian side



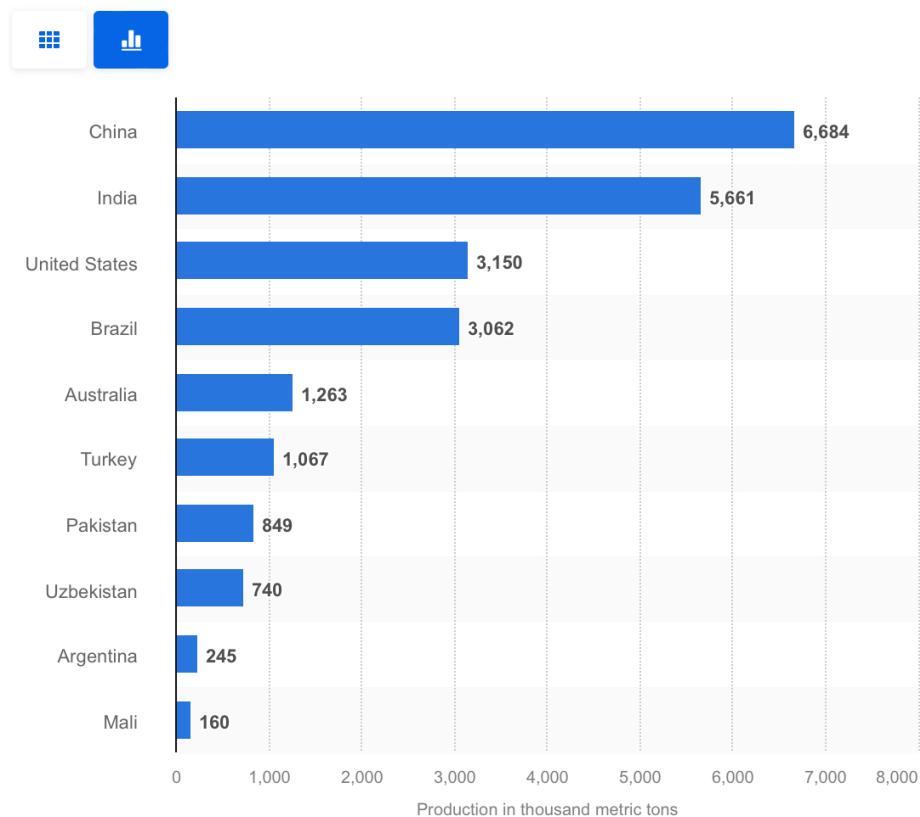
**Fig. 8.9: Major Sea Routes and Sea Ports**

**Q 40.C**

- India, China, Pakistan and United States are major producers of cotton worldwide. United States exports most of its cotton produce as it has less developed textile industry. Asian countries dominate the cotton production as well as they are also one of the biggest consumers of cotton. China, India, Pakistan, and Bangladesh are the largest cotton consumers worldwide, accounting for one of the highest global consumption. In recent years both countries Vietnam and Uzbekistan have also emerged as a major consumer of cotton.
- As with production, China and India are the top two users of raw cotton. However, China is by far the world's leader in processing raw cotton fiber into textiles and apparel. India's cotton consumption is second globally, accounting for about 20 percent of the total, while Pakistan contributes another 9 percent. **Hence statement 2 is correct.**

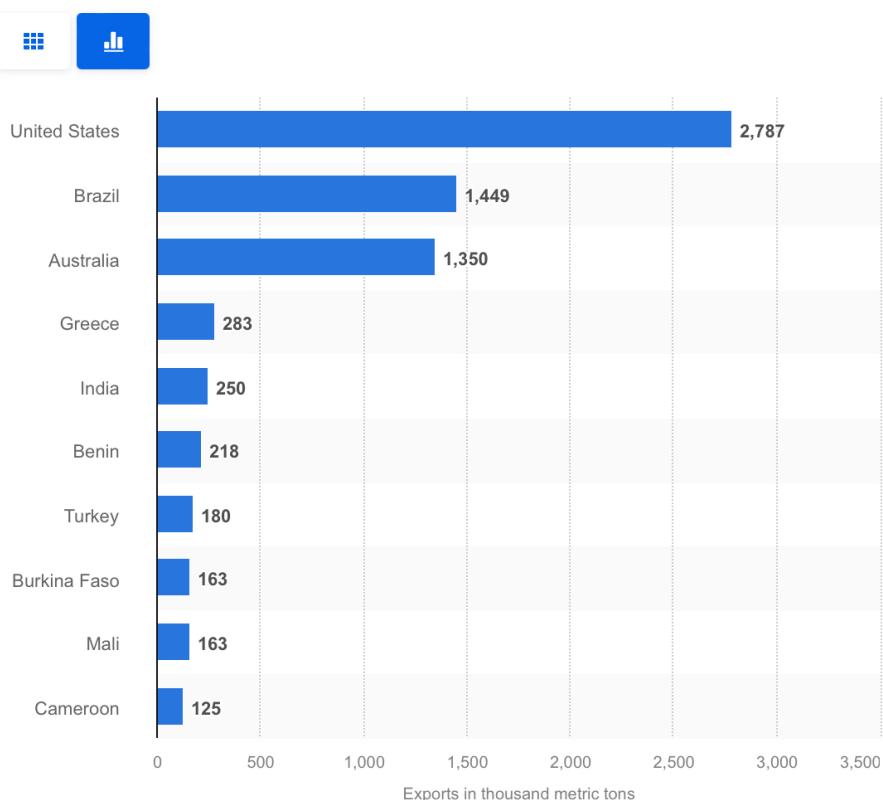
## Leading cotton producing countries worldwide in 2022/2023

(in 1,000 metric tons)



- Hence statement 3 is correct.

## Leading cotton exporting countries in 2022/2023 (in 1,000 metric tons)\*



- Hence statement 1 is correct.

#### **Q 41.A**

- International Coffee Organization (ICO), in collaboration with the Coffee Board of India, Ministry of Commerce and Industry, Karnataka Government, and the Coffee Industry hosted the 5th World Coffee Conference (WCC) - 2023 recently. The event will be inaugurated by Minister of Commerce and Industry, Piyush Goyal and is expected to draw participants from over 80 countries, including 2,400 delegates, 117 speakers, 208 exhibitors, 10,000 visitors, and over 300 B2B meetings. The conference aims to create pathways to benefiting coffee farmers who play a pivotal role in the coffee production chain. The central theme of the event will be 'Sustainability Through Circular Economy and Regenerative Agriculture'. It is also dedicated to promoting the coffee trade and fostering good relations among coffee-producing and consuming nations.
- In India, coffee is traditionally grown in the Western Ghats spread over Karnataka, Kerala, and Tamil Nadu. Coffee cultivation is also expanding rapidly in the nontraditional areas of Andhra Pradesh and Odisha as well as in the North East states. **Karnataka is the largest producer of coffee with 70% of India's total production. Kerala and Tamil Nadu are the second and third largest producers respectively. Nearly half of Tamil Nadu's coffee is produced in the Nilgiri District where Arabica is grown. Hence, statement 2 is not correct.**
- **The two main varieties of coffee viz., Arabica and Robusta are grown in India. Arabica is mild coffee, but the beans being more aromatic, it has a higher market value compared to Robusta beans.** The cool and equable temperature, ranging between 15 degrees C to 25 degrees C, is suitable for Arabica while for Robusta, a hot and humid climate with temperatures ranging from 20 degrees C to 30 degrees C is suitable. **Hence, statement 1 is correct.**
- **The naxal-hit Bastar region in Chhattisgarh is set to become a hub of coffee production as coffee cultivation has increased in the region. The first harvesting was done in 2020-21. Chattisgarh coffee has got a good rating from the Coffee Board of India. After that, it was cultivated on 100 acres in 2021-22. Farmers are reaping the benefits of coffee production in the region.**

#### **Q 42.C**

- Aquaculture is the process of rearing, breeding, and harvesting of aquatic species, both animals and plants, in controlled aquatic environments like oceans, lakes, rivers, ponds, and streams.
- Aquaculture is categorized according to hydrobiological features, the motive of farming, and special operational techniques. Various types of cultural practices are carried out in each of these divisions.
- **Mariculture is aquaculture that involves the use of seawater. It can either be done next to an ocean, with a sectioned-off part of the ocean, or in ponds separate from the ocean but containing seawater all the same.** The organisms bred here range from mollusks to seafood options like prawns, shellfish, and even seaweed. Growing plants like seaweed are also part of mariculture. These sea plant and animal species find many uses in manufacturing industries, such as in cosmetics and jewelry, where collagen from seaweed is used to make facial creams. Pearls are picked from mollusks and made into fashion items. **Hence, statement 1 is correct.**
- **Fish farming is the most common type of aquaculture. It involves the selective breeding of fish, either in freshwater or seawater, with the purpose of producing a food source for consumption. Fish farming is highly exploited as it allows for the production of a cheap source of protein.** Hence, statement 2 is correct.
- **Algaculture is a type of aquaculture involving the cultivation of algae. Algae are microbial organisms that share animal and plant characteristics.** They are sometimes motile like other microbes, but they also contain chloroplasts that make them green and allow them to photosynthesize just like green plants. However, they have to be grown and harvested in large numbers for economic feasibility. Algae are finding many applications in today's markets. **Hence, statement 3 is correct.**
- Inland Pond culture usually involves inland artificial ponds of about 20 acres in size and about 6-8ft deep. It is common to see aeration systems connected to the pond to introduce air into the ponds. This enhances the supply of oxygen and also reduces ice formation in the winter season.
- Open-net pen and Cage systems are often found offshore and in freshwater lakes. Mesh cages of between 6 and 60 cubic feet (pens) are installed in the water with the fish inside them. With a high concentration of fish in the pens, waste, chemicals, parasites, and diseases are often exchanged in the immediate water environments.

**Q 43.C**

- Rice: Area, Production, and Yield in 2021-22

State (1)	Area (2)	% to All - India (3)	2021-22#		
			Production (4)	% to All - India (5)	Yield (6)
					All - India (4)
West Bengal	5.60	12.06	16.76	12.87	2996
Uttar Pradesh	5.70	12.29	15.27	11.72	2679
Punjab	2.97	6.40	12.89	9.89	4340
Telengana	3.65	7.88	12.30	9.44	3366
Odisha	3.94	8.50	9.14	7.01	2318
Tamilnadu	2.21	4.76	8.07	6.19	3658
Chhattisgarh	3.76	8.10	7.90	6.06	2101
Andhra Pradesh	2.25	4.84	7.79	5.98	3470
Bihar	3.10	6.67	7.06	5.42	2282
Assam	2.36	5.08	5.27	4.04	2236
Others	10.86	23.41	27.84	21.37	2565
<b>All India</b>	<b>46.38</b>	<b>100.00</b>	<b>130.29</b>	<b>100.00</b>	<b>2809</b>

- Rice crop needs a hot and humid climate. It is best suited to regions that have high humidity, prolonged sunshine, and an assured supply of water. The average temperature required throughout the life period of the crop ranges from 21 to 37°C.
- Hence option (c) is the correct answer.

**Q 44.B**

- Recent Context: ISRO is set to launch its first-ever test flight, TV-D1, for the Gaganyaan mission, marking a pivotal moment in India's pursuit of human spaceflight.
  - Test Vehicle Abort Mission-1 (TV-D1) will evaluate the crew module's readiness for the Gaganyaan mission.
  - It is a single-stage liquid rocket developed specifically for this abort mission.
  - The payloads consist of the Crew Module (CM) and Crew Escape Systems (CES) with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters.
  - This flight will simulate the abort condition during the ascent trajectory corresponding to a Mach number of 1.2 encountered in the Gaganyaan mission.
- Hence option (b) is the correct answer.

**Q 45.B**

- Recent Context: NASA's OSIRIS-REx mission successfully collected a sample from asteroid Bennu and is now on an extended mission to study Apophis. The mission was significant for understanding the early solar system, potential asteroid impacts, and the Yarkovsky effect on asteroids.
  - The Yarkovsky effect is a phenomenon in space where the way an asteroid absorbs and re-emits solar radiation can alter its trajectory over time. This effect can lead to small but significant changes in an asteroid's path, potentially influencing its orbit and posing collision risks with Earth. Hence option (b) is the correct answer.
- About OSIRIS-REx Mission:
  - The OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer) spacecraft was launched in 2016 for the journey to Bennu.
  - It is the United States' first asteroid sample return mission, aiming to collect and carry a pristine, unaltered sample from an asteroid back to Earth for scientific study.
  - The mission is essentially a seven-year-long voyage and will conclude when at least 60 grams of samples are delivered back to Earth (in 2023).

#### **Q 46.D**

- **Copper** is a versatile and important metal with a wide range of applications due to its excellent electrical conductivity, malleability, and corrosion resistance.
  - Copper reserves of India are Jhunjhunu (Khetri-Singhana) in Rajasthan, Singhbhum in Jharkhand, and Balaghat (Malanjkhand copper mines) in Madhya Pradesh.
  - The production of copper concentrate at 114.42 thousand tonnes in 2021-22 increased by about 5.25% as compared to the previous year. **Madhya Pradesh followed Rajasthan are the two leading producers. Hence pair 2 is not correctly matched.**
- **Lead** is a heavy, bluish-gray metal. It is a dense, soft, and malleable metal. It has a relatively low melting point, which makes it easy to work with.
  - During the year 2021-22, the production of lead concentrate at 368 thousand tonnes decreased by 2.36% and that of zinc concentrate at 1594 thousand tonnes showed an increase of 5.29% over the previous year.
  - **Rajasthan accounted for the entire production of lead concentrate and zinc concentrate during the year 2021-22. Hence pair 1 is not correctly matched.**
- Limestone is a sedimentary rock primarily composed of calcium carbonate ( $\text{CaCO}_3$ ) in the form of the mineral calcite. It is one of the most common and versatile types of rock found on Earth.
  - The production of limestone was at 393 million tonnes in the year 2021-22 increased by 12.50%, as compared to that in the previous year. Limestone is widely produced in India.
  - **As much as, 91.28% of the total output in the year 2018-19 was contributed by nine principal States; viz, Rajasthan (22.32%), Andhra Pradesh (12.80%), Madhya Pradesh (12.77%), Chhattisgarh (10.66%), Karnataka (10.03%), Telangana (7.26%), Gujarat (5.99%), Tamil Nadu (5.43%), and, Maharashtra (4.01%). Hence pair 3 is not correctly matched.**

#### **Q 47.D**

- **Port of Hamburg**, the largest seaport in Germany, lies between the North Sea and the Baltic Sea.
- **The Port of Rotterdam** in the Netherlands is the largest seaport in Europe, and the world's largest seaport outside of East Asia, located in and near the city of Rotterdam.
- **The Port of Shanghai** is the busiest port in the world in terms of cargo tonnage and comprises a deep-sea port and a river port at the mouth of the Yangtze River.
- **The Port of Tokyo** is one of the largest Japanese seaports and one of the largest seaports in the Pacific Ocean basin.



- Hence option (d) is the correct answer.

#### **Q 48.B**

- **Global Framework on Chemicals** – For a planet free of harm from chemicals and waste" was adopted at the Fifth International Conference on Chemicals Management (ICCM5) in Bonn, Germany. **Hence statement 3 is not correct.**
- The Global Framework on Chemicals sets concrete targets and guidelines across the lifecycle of chemicals. The framework is based on 28 targets, designed to improve the responsible management of

chemicals and waste. These targets also aim to establish stronger connections with other important global agendas, including climate change, biodiversity, human rights and health.

- Objectives of Global Framework on Chemicals
  - **Prevention of illegal trade and trafficking of chemicals and waste. Hence statement 2 is correct.**
  - **Phase out highly hazardous pesticides in agriculture by 2035. Hence statement 1 is correct.**
  - Setting up policies and regulations aimed at reducing chemical pollution by 2030 as well as promoting safer alternatives.
- It also calls for the transition to safer and more sustainable chemical alternatives, the responsible management of chemicals in various sectors – including industry, agriculture and healthcare – and the enhancement of transparency and access to information regarding chemicals and their associated risks.

#### **Q 49.B**

- **Recent Context:** As part of the Deep Ocean Mission, India will for the first time, embark on a journey to a depth of 6,000 meters in the ocean using an indigenously developed submersible.
  - It is one of 9 missions under the Prime Minister's Science, Technology, and Innovation Advisory Council (PMSTIAC). **Hence statement 1 is correct.**
  - **It has been launched by the Ministry of Earth Sciences. Hence statement 2 is not correct.**
  - **Project duration:** 5 years (since 2021)
  - **Funding:** 4,077 crore
  - **Aim:** To help India in achieving the target of over Rs. 100 billion “Blue Economy” through its ocean resources. **Hence statement 3 is correct.**
  - **Objectives of Deep Ocean Mission:**
    - ✓ To develop technologies for exploration and conservation for sustainable utilization of marine bio-resources.
    - ✓ To provide ocean climate change advisory services.
    - ✓ To develop renewable energy generation techniques and to explore the avenues of desalination of water.
- **About PMSTIAC:** The PM-STIAC is an overarching council that facilitates the Office of the Principal Scientific Adviser to the Government of India (O/o PSA) to assess the status in specific science and technology domains, comprehend challenges in hand, formulate specific interventions, develop a futuristic roadmap and advise the Prime Minister accordingly.
  - ✓ O/o PSA also oversees the implementation of such interventions by concerned S&T Departments, agencies and other government Ministries.
  - ✓ The PM-STIAC is assisted by the Project Management Team (PMT) at Invest India, together with the Office of the PSA.
  - ✓ The 9 missions are - Natural Language Translation, Quantum Frontier, Artificial Intelligence, National Biodiversity Mission, Electric Vehicles, Bioscience for Human Health, Waste to Wealth, Deep Ocean Exploration and AGNIi (Accelerating Growth for New India’s Innovations).

#### **Q 50.A**

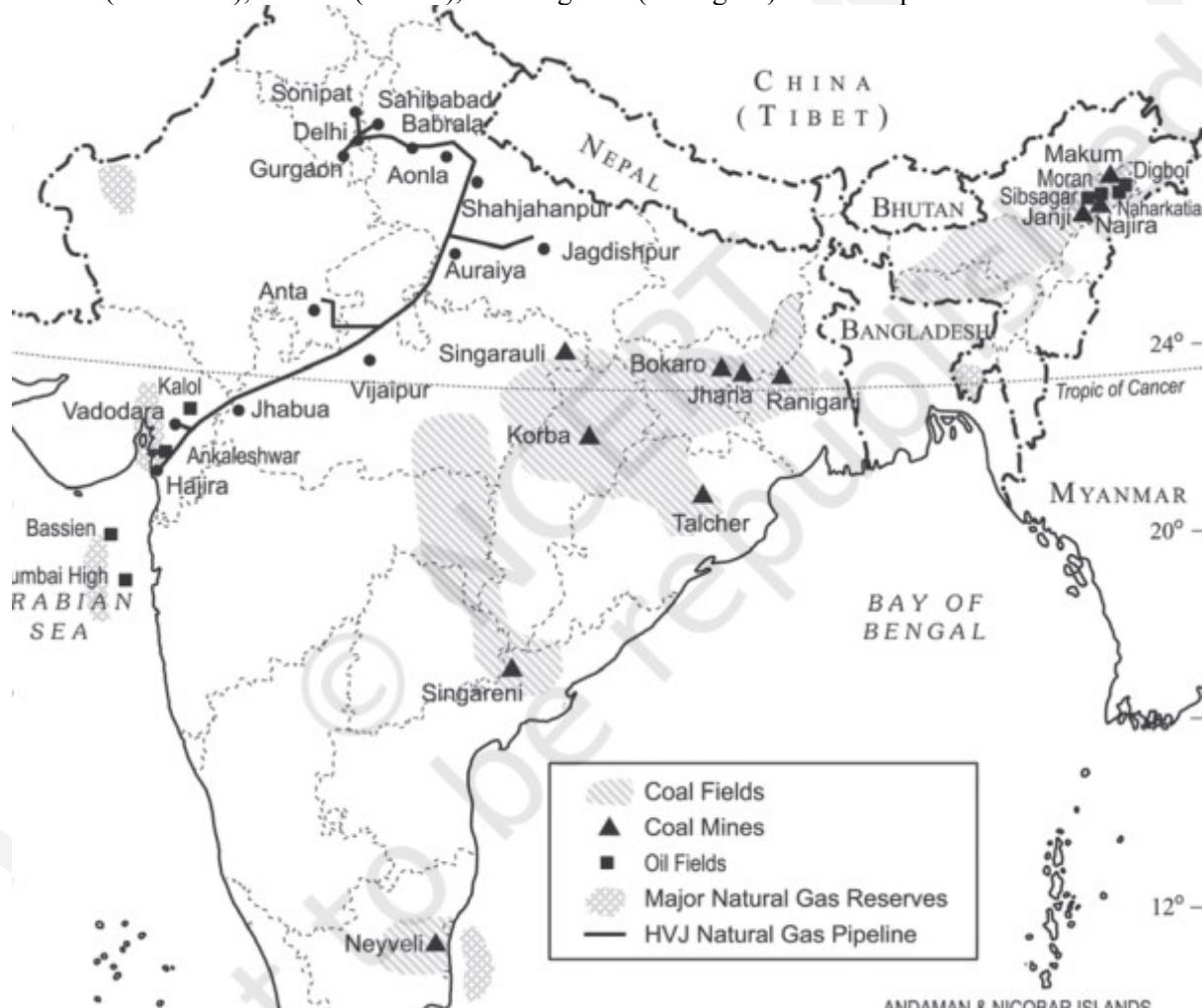
- India is home for Hinduism where close to 97 Crores Hindus reside. In India, out of total population of 121 crores 79.8% are Hindus.
- Muslims in India are about 17.22 Crores i.e. 14.2 % of the total population of India follows Islam. India is home to close to 11% of the total Muslims Population of World.
- In India, Christian Population is 2.78 Crores as per the latest figure of 2011 Census which is about 2.3% of total Indian Population.
- India has Sikh Population of 2.08 crores as per latest figures of 2011 census.
- Approximately 84 lakh Buddhists reside in India who makes up 0.7% of Indian Population.
- India is home to 45 lakhs Jainism follower. While Jains Population is just 0.4% of Indian Population.
- **Highest population of Muslims is in Uttar Pradesh at 38,483,967.**
  - It is followed by West Bengal and Bihar.
- **Highest population of Jains is in Maharashtra at 1,400,349.**
  - It is followed by Rajasthan and Gujarat
- **Highest population of Christians is in Kerala at 6,141,269.**
  - It is followed by Tamil Nadu and Meghalaya.
- **Hence option (a) is the correct answer.**

#### Q 51.B

- Recently, India's first tilapia parvovirus was reported in Tamil Nadu. The occurrence of tilapia parvovirus (TiPV) causing a huge mortality rate has been reported for the first time in India at ponds in Walajah in the Ranipet district of Tamil Nadu.
- Tilapia are mainly freshwater fish inhabiting shallow waters, rivers, and lakes and are also commonly found living in brackish water of India. Tilapia are also among the most consumed fish in the world and one of the most important fish in aquaculture after carp and salmon.
- Considered "a poor man's fish", Mozambique tilapia was introduced to Indian freshwater bodies in the 1950s and it is called Jilabi in Tamil. Capable of surviving in low-oxygen levels in water, the fish has turned invasive across the country.
- Dhib is an Arabian wolf. It is the smallest wolf in the world. It is iconic wildlife of the wildlife species of West Asia. It is classified as critically endangered in the IUCN Red List.
- Shushuk is a common name for the Ganges river dolphin.
- Starfish or sea stars are star-shaped echinoderms belonging to the class Asteroidea.

#### Q 52.D

- Bokaro (Jharkhand), Talcher (Odisha), and Singareni (Telangana) are the important coal mines of India.



- Hence option (d) is the correct answer.

#### Q 53.B

- Recent Context:** Kasaragod in Kerala recently became the first district in India to declare an official tree, flower, bird, and species. Kasaragod has chosen the **Cantor's Giant Softshell Turtle**, locally known as '**Bheemanama**', as the district species.
  - Cantor's Giant Softshell Turtle** is locally known as '**Bheemanama**' in Kerala. It occurs in a variety of habitats, including lakes, rivers, estuaries, seacoasts, and occasionally in coastal marine waters.
  - Cantor's giant softshell turtle is easily recognized by its broad head with eyes close to the tip of the snout giving it a frog-like appearance. This rare species is listed on the **Red List of Endangered Freshwater Turtles** and relies on estuaries for laying eggs, making its conservation particularly critical.Hence option (b) is the correct answer.

- The **Olive ridley turtles** are the smallest turtles found in the world, inhabiting warm waters of the Pacific, Atlantic and Indian oceans. They are known for the mass nesting event called **Arribada**. The species is recognized as **Vulnerable by the IUCN Red List**.
  - The **Olive ridley turtles** are the smallest turtles found in the world, inhabiting warm waters of the Pacific, Atlantic and Indian oceans. They are known for the mass nesting event called **Arribada**. The species is recognized as **Vulnerable** by the IUCN Red List. Odisha's Gahirmatha Marine Sanctuary is known as the world's largest nesting beach for Olive Ridley Turtles.
- **Leatherback turtles** are named for their shell, which is leather-like rather than hard, like other turtles. They are the largest sea turtle species and also one of the most migratory, crossing both the Atlantic and Pacific Oceans. Globally, leatherback status according to IUCN is listed as **Vulnerable and has been given the highest level of protection under Schedule I of the Indian Wildlife Protection Act, 1972**. In India, they are found in the Andaman and Nicobar Islands, mainly Little Andaman Island from the Andaman group and Little Nicobar Island & Great Nicobar Island from the Nicobar group.
- The **Red-crowned roofed turtle** is native to **India**, Bangladesh and Nepal. Historically, the species was widespread in the Ganga River, both in India and Bangladesh. It also occurs in the Brahmaputra basin. Currently in India, the **National Chambal River Gharial Sanctuary** is the only area with a substantial population of the species.

**Q 54.C**

- **Gentrification is a complex urban phenomenon characterized by the transformation of a neighborhood or community, typically in an urban area, through the influx of more affluent residents and investments in real estate and infrastructure.**
  - This process often leads to changes in the socioeconomic and demographic makeup of the neighborhood. Key features of gentrification include :
- **In-Migration of Affluent Residents:** Gentrification typically begins with the arrival of higher-income individuals or families, often young professionals or artists, who are attracted to the neighborhood's unique character, cultural amenities, or proximity to job centers.
- **Property Investment and Renovation:** As affluent newcomers move in, there is increased investment in real estate, including the renovation of older buildings and the construction of new developments. This can lead to rising property values.
- **Rising Rents and Housing Costs:** The increased demand for housing in gentrifying neighborhoods often results in rising rents and property prices. This can make it more difficult for long-time residents, particularly low-income families, to afford to stay in the neighborhood.
- **Changes in Local Businesses:** Gentrification can bring changes to the types of businesses in the area. Often, upscale restaurants, cafes, and boutique shops open to cater to the preferences of the new residents, while older, locally-owned establishments may struggle or close.
- **Demographic Shift:** Gentrification can lead to a shift in the demographic composition of the neighborhood. Lower-income and minority residents may be displaced as the neighborhood becomes more affluent and less diverse.
- **Cultural Transformation:** The influx of new residents and businesses can result in a transformation of the neighborhood's cultural identity. Gentrified areas may lose some of their traditional character and cultural authenticity.
- **Investment in Infrastructure:** Gentrification can lead to improved infrastructure, including better public transportation, parks, and public spaces, which can benefit both newcomers and long-time residents.
- **Community Tensions:** Gentrification often generates tensions and conflicts within the community. Long-time residents may feel marginalized or forced out, while newcomers may face resentment or accusations of cultural appropriation.
- **Hence option (c) is the correct answer.**

**Q 55.C**

- **Literacy rate, Youth total ( (% of people ages 15-24)-**

South Asia

Country	Most Recent Year	Most Recent Value
Afghanistan	2021	56
Bangladesh	2020	94
Bhutan	2022	98
India	2022	97
Maldives	2021	99
Nepal	2021	94
Pakistan	2019	73
Sri Lanka	2021	99

- **India:**
  - ✓ About 97% of Indians between 15 and 24 years of age are literate, meaning they can "both read and write with understanding a short simple statement about their everyday life", according to United Nations Educational, Scientific and Cultural Organization (UNESCO) data.
  - ✓ India's literacy rate has increased by 37 percentage points, from 41% in 1981 to 71% in 2015, according to data from UNESCO and CIA World Factbook. This means 931 million Indians are literate, up from 293 million 35 years ago.
  - ✓ The general literacy rate according to NSSO, Family Health Survey, 2022 is 74
- **Sri Lanka:**
  - ✓ Sri Lanka has the highest youth literacy rate in all South Asia at 99 percent, based on World Bank data. With free access to primary education, the World Bank reports that the net enrollment rate is 99 percent and the primary completion rate is more than 95 percent.
  - ✓ Additionally, Sri Lanka has high gender parity in education, with an equal proportion of girls and boys enrolled in primary school and a slightly higher number of girls than boys enrolled in secondary school.
- **Bhutan:**
  - ✓ According to the Bhutan Living Standard Survey (BLSS) report for 2022, the National Status Bureau (NSB), it shows that the literacy rate of a particular section of the population is low.
  - ✓ The literacy rate for female youth is 97.2%, while male youth literacy is 98.3% (Combined 98%). Similarly, the adult literacy rate for females has shown a difference of 57.0% over the 73.4% adult literacy rate for males.
- **Bangladesh - Youth literacy rate (94%)**
  - ✓ In 2019, the youth literacy rate for Bangladesh was 94%. The youth literacy rate of Bangladesh increased from 44.7 % in 1991 to 94.9 % in 2019 growing at an average annual rate of 14.84%.
- The above table clearly shows that Srilanka and Bhutan have better Literacy rates considering the youth Population than India. **Hence Option (c) is the correct answer.**

**Q 56.C**

- Australia is home to the largest gold mine reserves in addition to being the second largest producer of gold, after China. While gold no longer serves as an object of exchange and as a confirmation value, gold remains an investment asset for governments and it could provide a safeguard against inflation or recession. **Hence statements 1 and 3 are correct.**
- Mexico's silver mines produced some 6,300 metric tons of silver in 2022, making Mexico the world's largest silver producer. China and Peru ranked second and third, respectively that year. **Hence statement 2 is correct.**

**Q 57.B**

- The Nile River flows through multiple countries in northeastern Africa. The Nile's primary tributary, the White Nile, and its longest tributary, the Blue Nile, merge near the Sudanese capital of Khartoum, and from there, the Nile River continues northward, eventually emptying into the Mediterranean Sea.
- In addition to Egypt, the Nile runs through or along the border of 10 other African countries, namely, Burundi, Tanzania, Rwanda, the Democratic Republic of the Congo, Kenya, **Uganda, Sudan, Ethiopia, and South Sudan.**
- Its three main tributaries are the White Nile, the Blue Nile, and the Atbara.
- **The Nile River does not pass through Algeria and Gabon.**
- **Hence option (b) is the correct answer.**

**Q 58.B**

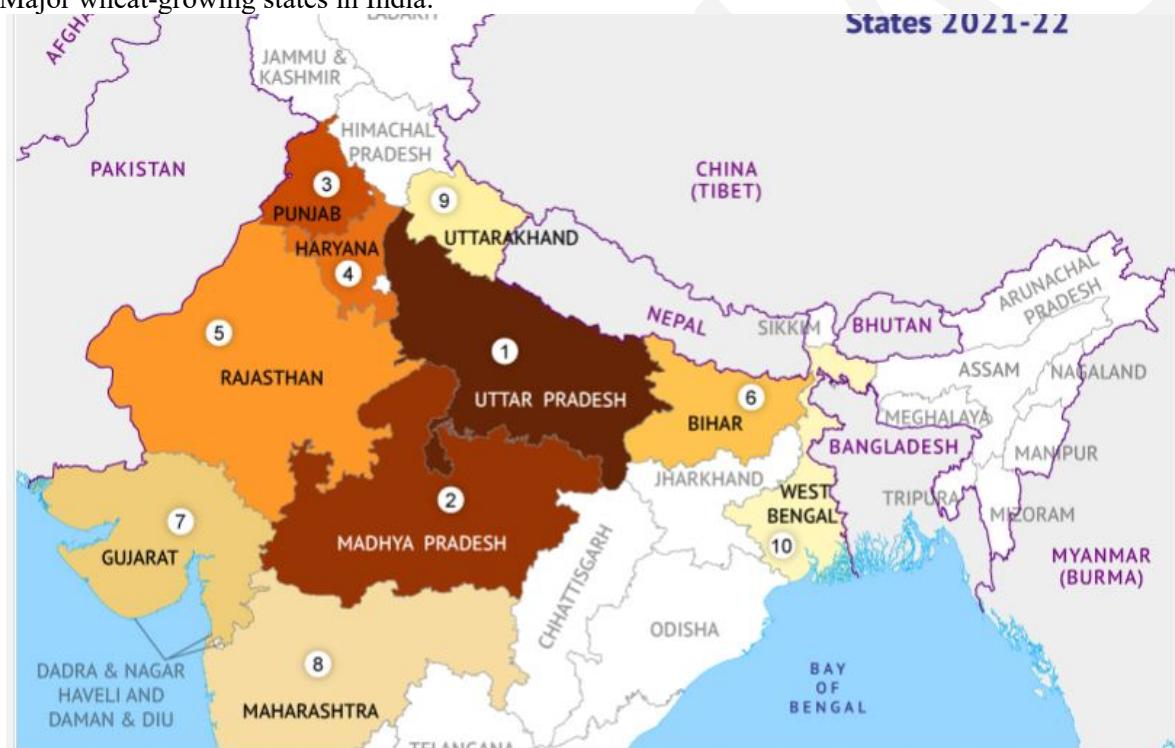
- The Black Sea is bordered by several countries in Eastern Europe and Western Asia. Here are the countries that have coastlines along the Black Sea:
  - Russia: The Black Sea's northern coast is shared with Russia, particularly in the region of Krasnodar Krai.
  - Ukraine: Ukraine has a significant coastline along the northern and western shores of the Black Sea, including the Crimean Peninsula.
  - Romania: Romania is located along the western coast of the Black Sea.
  - Bulgaria: Bulgaria's coastline is along the southeastern part of the Black Sea.
  - Turkey: Turkey has a substantial coastline along the southern and southwestern shores of the Black Sea.
  - Georgia: Georgia, in the South Caucasus region, borders the Black Sea along its eastern coast.
- **Moldova and Azerbaijan do not have a border with Black Sea.**
- The Black Sea is connected to the Mediterranean Sea via the Bosphorus Strait (Strait of Istanbul) and the Dardanelles Strait. These straits provide the only natural outlet for water from the Black Sea, allowing it to flow into the Mediterranean.



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

**Q 59.B**

- Wheat is the main cereal crop in India. The wheat crop has wide adaptability. It can be grown not only in the tropical and subtropical zones but also in the temperate zone and the cold tracts of the far north, beyond even the 60-degree north altitude. Wheat can tolerate severe cold and snow and resume growth with the setting of warm weather in spring. It can be cultivated from sea level to as high as 3300 meters.
- The best wheat is produced in areas favored with cool, moist weather during the major portion of the growing period followed by dry, warm weather to enable the grain to ripen properly. The optimum temperature range for ideal germination of wheat seed is 20-25 C though the seeds can germinate in the temperature range of 3.5 to 35 degrees C. Rains just after sowing hamper germination and encourage seedling blight. Areas with a warm and damp climate are not suited for wheat growing.
- During the heading and flowering stages, excessively high or low temperatures and drought are harmful to wheat. Cloudy weather, with high humidity and low temperatures, is conducive to rust attack. The wheat plant requires about 14-15 c optimum average temperature at the time of ripening.
- **Wheat is grown in a variety of soils in India. Soils with a clay loam or loam texture, good structure and moderate water-holding capacity are ideal for wheat cultivation. Hence, option (b) is the correct answer.**
- Major wheat-growing states in India:



**Q 60.C**

- **Recent Context:** In the wake of Israel-Palestine tension, the leopard species Nimr found in the region are in danger.
- **Nimr is an Arabian leopard (*Panthera pardus nimr*). It is the world's smallest leopard. Hence statement 1 is correct.**
- The Negev deserts, which dominate southern Israel till the Gulf of Aqaba, and the Judaean desert which is shared by Israel and the Palestinian West Bank — were once home to this animal. **The Arabian leopard is extinct in its entire northern range, including all historic distribution ranges on the Sinai Peninsula, the Negev, and the Judaean Desert.** They are now restricted to Oman, Yemen, and the southern part of Saudi Arabia. **They are found across the whole of the Arabian Peninsula. Hence statement 2 is correct.**
- As per the International Union for Conservation of Nature Red List of Threatened Species, they are critically endangered. **Hence statement 3 is correct.**

**Q 61.C**

- **The United States possesses the largest railway network in the world**, in terms of total operating length. China and India trail behind as the second and third largest railway networks respectively. The US rail network, with an operating route length over 250,000km, is the biggest in the world. Freight lines constitute about 80% of the country's total rail network, while the total passenger network spans about 35,000km. The US freight rail network consists of 538 railroads (seven Class I railroads, 21 regional railroads, and 510 local railroads) operated by private organisations. **Hence statement 3 is correct.**
- **In Russia, railways account for about 90 per cent of the country's total transport with a very dense network west of the Urals.** Moscow is the most important rail head with major lines radiating to different parts of the country's vast geographical area. Underground railways and commuter trains are also important in Moscow. **Hence statement 1 is correct.**
- **In South America, the rail network is the most dense in two regions, namely, the Pampas of Argentina and the coffee-growing region of Brazil which together account for 40 per cent of South America's total route length.** Only Chile, among the remaining countries, has a considerable route length linking coastal centres with the mining sites in the interior. Peru, Bolivia, Ecuador, Colombia and Venezuela have short single-track rail lines from ports to the interior with no inter-connecting links. **Hence statement 2 is correct.**

**Q 62.D**

- **The total number of operational holdings in the country has increased from 138.35 million in 2010-11 to 146.45 million in 2015-16 showing an increase of 5.86%.** The highest percentage share in 2015-16 was observed in the marginal category (68.5%) followed by the small (17.6%), semi-medium (9.6%), medium (3.8%), and large categories (0.6%). **Hence, the statement 1 is correct.**
- The total operated area in the country has decreased from 159.59 million ha. in 2010-11 to 157.82 million ha. in 2015-16 showing a decrease of 1.11%. The highest percentage share in 2015-16 was observed in the marginal category (24%) followed by semi-medium (23.8%), small (22.9%), medium (20.2%), and large category (9.1%).
- **The percentage share of female operational holders has increased from 12.79% in 2010-11 to 13.96% in 2015-16 with the corresponding figures of 10.36% and 11.72% in operated areas.** In 2015-16, participation of female operational holders was highest under the marginal category (72%) followed by small (17%) and semi-medium (8.1%). The share of female operational holders belonging to SC and ST social groups was estimated at 11.4% and 7.9% respectively. **Hence, the statement 4 is correct.**
- **The average size of operational holdings has declined to 1.08 ha. in 2015-16 as compared to 1.15 in 2010-11.** Hence, statement 2 is correct.
- **The percentage share of all food crops in the gross cropped area has gone down marginally from 76.3% in 2010-11 to 75.1% in 2015-16 while the percentage share of all non-food crops has increased marginally from 23.7% to 24.9% during the same period.** Hence, the statement 3 is not correct.

**Q 63.B**

- **Recently, the Berlin Process summit was held in Tirana the capital of Albania.**
- **The Berlin process was set up in 2014** as a platform for high-level cooperation between **high official representatives of the Western Balkan Six (WB6)**, consisting of Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia, and their peers in Berlin Process host countries. The Process also involves the EU institutions, international financial institutions and the region's civil society, the Regional Youth Cooperation Office RYCO and businesses. **Hence option (b) is the correct answer.**
- **The Berlin Process was initiated to utilize the potential of increased regional cooperation** in the Western Balkans. The idea was to foster specific projects in order to increase connectivity in the region, as well as good neighborly relations and interpersonal relationships, while subsequently supporting the **EU integration**.

**Q 64.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 the Sahara and Asiatic deserts, sheep, goats and camel are reared. In the mountainous

areas of Tibet and the Andes, yak and llamas and in the Arctic and subArctic areas, reindeer are the most important animals. **Hence, statements 1 and 2 are correct.**

- 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. **Hence, statement 3 is not correct.**

#### **Q 65.B**

- The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India.
  - The Ministry of Health and Family Welfare (MOHFW), Government of India, designated the International Institute for Population Sciences(IIPS) Mumbai, as the nodal agency, responsible for providing coordination and technical guidance for the survey.
- The National Family Health Survey 2019-21 (NFHS-5), the fifth in the NFHS series, provides information on population, health, and nutrition for India and each state/union territory (UT).
- As per NFHS-5 over half the population (52%) is below 30.**

##### **Infant and Child Mortality Rates (per 1,000 live births)**

25. Neonatal mortality rate (NNMR)	18.0	27.5	24.9	29.5
26. Infant mortality rate (IMR)	26.6	38.4	35.2	40.7
27. Under-five mortality rate (U5MR)	31.5	45.7	41.9	49.7

- As per NFHS-5 infant mortality rate is 35.2.**

<b>Population and Household Profile</b>	<b>Urban</b>	<b>Rural</b>	<b>Total</b>	<b>Total</b>
1. Female population age 6 years and above who ever attended school (%)	82.5	66.8	71.8	68.8
2. Population below age 15 years (%)	23.1	28.1	26.5	28.6
3. Sex ratio of the total population (females per 1,000 males)	985	1,037	1,020	991
4. Sex ratio at birth for children born in the last five years (females per 1,000 males)	924	931	929	919
5. Children under age 5 years whose birth was registered with the civil authority (%)	93.3	87.5	89.1	79.7
6. Deaths in the last 3 years registered with the civil authority (%)	83.2	65.8	70.8	na
7. Population living in households with electricity (%)	99.1	95.7	96.8	88.0
8. Population living in households with an improved drinking-water source <sup>1</sup> (%)	98.7	94.6	95.9	94.4
9. Population living in households that use an improved sanitation facility <sup>2</sup> (%)	81.5	64.9	70.2	48.5
10. Households using clean fuel for cooking <sup>3</sup> (%)	89.7	43.2	58.6	43.8
11. Households using iodized salt (%)	96.9	93.0	94.3	93.1
12. Households with any usual member covered under a health insurance/financing scheme (%)	38.1	42.4	41.0	28.7
13. Children age 5 years who attended pre-primary school during the school year 2019-20 (%)	18.1	12.0	13.6	na

- As per NFHS-5 sex ratio of the population is 1020.**
- Hence option (b) is the correct answer.**

#### **Q 66.D**

- Recent Context:** Green Credit Program (GCP) notified in October 2023 is an innovative market-based mechanism designed to incentivize voluntary environmental actions across diverse sectors, by various stakeholders like individuals, communities, private sector industries, and companies. **Hence statement 1 is correct.**
- Green credits generated through such actions can be traded on a domestic market platform. According to rules, environment-friendly actions include tree plantation, water management, sustainable agriculture, waste management, air pollution reduction, mangrove conservation and restoration, ecomark label development, and sustainable building and infrastructure.
- The rules also specify that green credits generated or procured by industries, companies and other entities to fulfil any legal obligation cannot be traded.** "The Green Credit programme is independent of the carbon credit programme under the Carbon Credit Trading Scheme, 2023, established under the Energy Conservation Act, 2001. **Hence statement 2 is correct.**
- The GCP's governance framework is supported by an inter-ministerial Steering Committee and The Indian Council of Forestry Research and Education (ICFRE) serves as the GCP Administrator, responsible for program implementation, management, monitoring, and operation. **Hence statement 3 is correct.**

#### **Q 67.C**

- Asia is the largest of the world's continents, covering approximately 30 percent of the Earth's land area. It is also the world's most populous continent, with roughly 60 percent of the total population.
- Asia can be divided into five major physical regions: mountain systems; plateaus; plains, steppes, and deserts; freshwater environments; and saltwater environments.
- The Tien Shan mountain system stretches for about 2,400 kilometers (1,500 miles), straddling the border between Kyrgyzstan and China.** Hence, statement 1 is correct.

- The name Tien Shan means “Celestial Mountains” in Chinese. The two highest peaks in the Tien Shan are Victory Peak, which stands at 7,439 meters (24,406 feet), and Khan Tängiri Peak, which stands at 6,995 meters (22,949 feet). Tien Shan also has more than 10,100 square kilometers (3,900 square miles) of glaciers. The largest glacier is Engil'chek Glacier, which is about 60 kilometers (37 miles) long.
- Asia is home to many plateaus, areas of relatively level high ground. The Iranian plateau covers more than 3.6 million square kilometers (1.4 million square miles), encompassing most of Iran, Afghanistan, and Pakistan. The plateau is not uniformly flat but contains some high mountains and low river basins. The highest mountain peak is Damavand, at 5,610 meters (18,410 feet). The plateau also has two large deserts, the Dasht-e Kavir and Dasht-e Lut.
- **The Rub' al Khali desert**, considered the world's largest sand sea, covers an area larger than France across Saudi Arabia, Oman, the United Arab Emirates, and Yemen. It holds roughly half as much sand as Africa's Sahara desert, even though it is 15 times smaller in size. **The desert is known as the Empty Quarter because it is virtually inhospitable to humans except for Bedouin tribes that live on its edges. Hence, statement 2 is correct.**
- **Lake Baikal, located in southern Russia, is the deepest lake in the world, reaching a depth of 1,620 meters (5,315 feet). Hence, statement 3 is correct.**
  - The lake contains 20 percent of the world's unfrozen freshwater, making it the largest reservoir on Earth. It is also the world's oldest lake, at 25 million years old.
- The Sea of Okhotsk covers 1.5 million square kilometers (611,000 square miles) between the Russian mainland and the Kamchatka Peninsula. The sea is largely frozen between October and March. Large ice floes make winter navigation almost impossible.
- **Hence option (c) is the correct answer.**

**Q 68.B**

- The Department of Animal Husbandry & Dairying under the Ministry of Fisheries, Animal Husbandry & Dairying attributes critical importance to livestock and to the collection and availability of up-to-date and accurate data related to livestock, as they are a vital component of the rural economy. For proper planning and formulation of any program meant to bring further improvement in this sector and its effective implementation and monitoring, valid data are required at every decision-making stage.
- The Livestock Census is the main source of such data in the country. The livestock census has been conducted across the country periodically since 1919. The census usually covers all domesticated animals and head counts of these animals are taken. So far, 19 Livestock Censuses were conducted in participation with State Governments and UT Administrations.
- **The Livestock Sector is an important subsector of agriculture in the Indian economy. It grew at a CAGR of 7.93 percent during 2014-15 to 2020-21 (at constant prices). The contribution of livestock in total agriculture and allied sector GVA (at constant prices) has increased from 24.32 percent (2014-15) to 30.13 percent (2020-21). The livestock sector contributed 4.90 percent of total GVA in 2020-21. Hence, statement 1 is correct.**
- India has vast resources of livestock and poultry, which play a vital role in improving the socio-economic conditions of rural masses. There are about 303.76 million bovines (cattle, buffalo, Mithun and yak), 74.26 million sheep, 148.88 million goats, 9.06 million pigs and about 851.81 million poultry as per the 20th Livestock Census in the country.
- **According to the 20th Livestock Census, the total Livestock population is 535.78 million in the country showing an increase of 4.6% over the Livestock Census 2012. Hence, statement 3 is not correct.**
- **Among states, Uttar Pradesh has the highest livestock population followed by Rajasthan, Madhya Pradesh and West Bengal. Hence, statement 2 is correct.**

**Q 69.C**

- The Government of India, in the exercise of the powers conferred by Clause (e) of Section 3 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) declared the below-listed minerals to be Minor Minerals.

1. Agate	16. Fuschite Quartzite
2. Ball clay	17. Gypsum
3. <b>Barytes</b>	18. Jasper
4. Calcareous sand	19. Kaolin
5. Calcite	20. Laterite
6. Chalk	21. Limekankar
7. China Clay	22. <b>Mica</b>
8. Clay (others)	23. Ochre
9. Corundum	24. Pyrophyllite
10. Diaspore	25. Quartz
11. Dolomite	26. Quartzite
12. Dunite or pyroxenite	27. Sand (others)
13. Felsite	28. Shale
14. Felspar	29. Silica sand
15. Fire clay	30. Slate
	31. Steatite or talc or soapstone

• **Hence statement 2 is correct.**

• The value of production of minor minerals was estimated at Rs 79110 crore in the year 2020-21. **Telangana with share of 21.79% in the value of minor minerals produced in the country occupied the top position.** Rajasthan was at second place and had a share of 19.08% in the value of minor minerals. Next in the order was Andhra Pradesh with a share of 15.32%,

• **Hence statement 1 is correct.**

**Q 70.A**

- **A social bond (or social impact bond) is a type of financial instrument issued by governments, international organisations, or corporations to raise funds for projects and initiatives that have a positive social impact on society.** These bonds are designed to finance projects that address various social issues, such as healthcare, education, affordable housing, poverty alleviation, and environmental sustainability. **Hence statement 1 is correct.**
- **The National Bank for Agriculture and Rural Development (NABARD) has listed the country's first social impact bond to the tune of Rs 1,000 crore. This is the first externally certified AAA-rated INR social bond in the country.** Hence statement 2 is not correct.
- The Pimpri Chinchwad Municipal Corporation (PCMC) in Maharashtra's Pune, and United Nations Development Programme (UNDP) in 2020 co-created India's inaugural Social Impact Bond (SIB).

**Q 71.C**

- Ajinomoto is a brand name for monosodium glutamate (MSG), **a common food additive used to enhance the flavour of foods.** MSG is primarily used to enhance the umami or savoury taste of foods. It can make dishes taste more flavourful and appealing, which is why it's commonly used in many cuisines. Ajinomoto is widely used in processed foods, restaurant cuisine, and fast-food items. **Hence statement 1 is correct.**
- **Ajinomoto is rich in sodium, a component of salt.** Overconsumption of sodium can lead to high blood pressure and cardiovascular problems, making it a concern for individuals with hypertension or those at risk of heart disease. **Hence statement 2 is correct.**
- **Ajinomoto itself offers no nutritional value.** It is merely an artificial flavour enhancer and should not be relied upon as a source of nutrition. Overreliance on such additives can detract from the consumption of more nutritious whole foods.

**Q 72.D**

- **Recent context:** The Delhi High Court has passed a “dynamic injunction” in favour of the ICC Men’s Cricket World Cup 2023 broadcaster, Star India Private Limited, before the World Cup’s commencement.
- **What is a Dynamic Injunction?**
  - An injunction is an official order given by a law court, usually to stop someone from doing something.

- A dynamic injunction is passed to protect copyrighted works even before they are publicly released, distributed, or created. Hence, option (d) is the correct answer.
- It ensures that no irreparable loss is caused to its authors and owner, owing to the imminent possibility of such works being uploaded on rogue websites or their newer versions immediately after their creation or release, given the challenges posed by online piracy.
- Star India filed the pleas on the basis of exclusive rights they had acquired from ICC, they enjoyed broadcast reproduction rights which are contemplated under **Section 37 of the 1957 Copyright Act**.

**Q 73.A**

- Chile, the world's leading **copper** producer by far, produced an estimated 5.2 million metric tons of **copper in 2022**. Tied for second place was Peru and Democratic Republic of the Congo, with an estimated copper mine production of 2.2 million metric tons that same year. The world's third-largest copper producer from mines is China. **Hence pair 1 is correctly matched.**
- In 2022, **China's zinc** mines produced approximately 4.2 million metric tons of zinc. Accordingly, China is the world's largest producer of the base metal zinc. Peru and Australia were the second and third-largest zinc mining countries in the world in 2022, respectively. **Hence pair 2 is not correctly matched.**
- **South Africa** is the world's largest producer of **manganese** by a long shot. In 2022, its manganese output was on par with the previous year. The country also holds the largest reserves of manganese at 640 million metric tons (MT). **Hence pair 3 is not correctly matched.**
- **China** is the world's largest **silicon** producer, with a production volume estimated at six million metric tons in 2022. The second largest producer of this metalloid in the world was Russia, which produced 640,000 metric tons in the same year. The total global production of silicon in 2022 was an estimated 8.8 million metric tons. **Hence pair 4 is not correctly matched.**

**Q 74.C**

- **Saffron (Crocus sativus L.)** is a perennial herb that belongs to the Iris family Iridaceae and is the most expensive spice in the world known for its aroma and colour and is used for flavouring and colouring and in medicinal, and pharmaceutical industries. **Hence statement 3 is correct.**
  - Due to its very high crocin content and rich aroma, the Kashmir saffron is famous worldwide and commands a premium price over the saffron available from Spain or Iran.
  - The red tip of the saffron strand is the costliest, because of its colour intensity, flavour and fragrance. Post-harvest, saffron is sun-dried, separated and graded by hand to ensure quality
- Saffron is produced on well-drained karewa soils of Kashmir and Kishtwar where ideal climatic conditions are available for good growth and flower production. It grows at an elevation of 1500-2000 metres.
- Iran, India, Spain and Greece are the major saffron-producing countries with Iran occupying the maximum area and contributing about 88% of the world's saffron production.
  - **Though, India occupies the 2nd largest area but produces approximately 7 percent of the total world production. Hence statement 1 is correct.**
- In September 2019, Kashmir's saffron got a GI tag, which became a game-changer in maintaining its quality. **Hence statement 2 is correct.**
- Saffron in J&K is primarily cultivated in four districts (Pulwama, Budgam, Srinagar, Kishtwar) with 86% saffron farming system in the heritage site of Pampore over 3200 hectares.

**Q 75.A**

- **Demographic Transition Theory:**
  - The Demographic Transition Theory is a well-established framework used in demography and population studies to understand the historical and future trends in population growth. **It describes the transformation of a society's population from a state of high birth and death rates to a state of low birth and death rates. Hence option (a) is the correct answer.**
- **This transition typically occurs in several stages:**
  - **Stage 1 - High Stationary:** In this stage, both birth and death rates are high. As a result, the population remains relatively stable with minimal growth. This stage is common in pre-industrial societies, where the high birth rates compensate for high mortality rates.
  - **Stage 2 - Early Expanding:** This stage is characterized by a decline in death rates due to improvements in healthcare, sanitation, and nutrition, while birth rates remain high. As a result, the population experiences rapid growth.

- **Stage 3 - Late Expanding:** In this stage, birth rates start to decline due to changing societal and economic factors, while death rates continue to decrease. Population growth remains positive but begins to slow down.
- **Stage 4 - Low Stationary:** In the final stage, both birth and death rates are low. The population reaches a state of stability with little to no growth. This stage is typically seen in industrialized and post-industrial societies.
- The Demographic Transition Theory is essential for understanding how population characteristics change as societies undergo economic and social development. It also helps policymakers anticipate demographic shifts, plan for healthcare and education services, and address potential challenges associated with an aging population or a high youth dependency ratio.

**Q 76.A**

- A robust road network is integral for the economy of a country and for the movement of its people. A good road network can help link markets and deliver substantial economic benefits to the people.
- **The United States has the biggest road network in the world.** It has a road network of 68,03,479 km, out of which 63 percent is paved and 37 percent is unpaved.
- India has the second largest road network in the world at 63,72,613 km. Out of this, 70 percent of the roads are paved and 30 percent of the roads are unpaved.
- **Hence option (a) is the correct answer.**

**Q 77.D**

- The diverse agro-ecological conditions in the country are favorable for growing nine annual oilseed crops, which include seven edible oilseeds (groundnut, rapeseed & mustard, soybean, sunflower, sesame, safflower, and niger) and two non-edible oilseeds (castor and linseed) and several perennial oil-bearing tree crops. In addition, oilseeds of tree and forest origin, which grow mostly in tribal inhabited areas contribute significantly as a minor source of oil, including coconut and oil palm. Among the non-conventional oils, rice bran oil and cottonseed oil are also important, along with small quantities from tobacco seed and corn.
- India accounts for about 15-20 percent of global oilseeds area, 6-7 percent of vegetable oils production, and 9-10 percent of the total edible oils consumption. In terms of acreage, production, and economic value, oilseeds are second only to food grains.
- **The area and production of oilseeds is concentrated in the Central and Southern parts of India, mainly in the states of Madhya Pradesh (27.89%), Rajasthan (21.49%), Maharashtra (14.84%), Gujarat, Andhra Pradesh and Karnataka. Hence, statement 1 is not correct.**
- **Among different oilseeds, groundnut, rapeseed-mustard, and soybean accounted for about 80 percent of the area and 87 percent of the production of oilseeds in the country during 2018- 19.**
- Currently, the share of oilseeds is 14% of the total area under major crops. The major soybean-growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, and Telangana. Madhya Pradesh and Maharashtra together produce more than 80% of the total area under soybeans in the country. Maharashtra tops with the largest area under Soybean followed by Madhya Pradesh. **Hence, statement 2 is not correct.**

**Q 78.D**

• **Gross Area Under Major Crops: The unit is a million hectares.**

<b>Foodgrains<sup>a</sup></b>	120.8	125.0	124.3	123.2	129.2	127.5	124.8	127.0	129.8	130.5
Kharif	67.7	69.1	68.8	69.2	73.2	72.0	72.3	70.9	72.4	73.0
Rabi	53.1	56.0	55.5	54.0	56.0	55.5	52.4	56.1	57.4	57.5
<b>Cereals<sup>b</sup></b>	97.5	99.8	100.7	98.3	99.8	97.7	95.6	99.0	101.0	99.5
Kharif	57.7	58.7	58.8	57.9	58.8	58.1	57.5	57.3	59.0	58.8
Rabi	39.8	41.1	42.0	40.4	40.9	39.6	38.1	41.7	42.0	40.7
<b>Nutri / Coarse Cereals<sup>c</sup></b>	24.8	25.2	25.2	24.4	25.0	24.3	22.1	24.0	24.1	22.7
Kharif	18.8	19.3	18.9	18.2	19.0	18.7	17.5	18.3	18.7	17.7
Rabi	5.9	5.9	6.2	6.2	6.0	5.6	4.6	5.7	5.5	5.0
<b>Pulses<sup>d</sup></b>	23.3	25.2	23.6	24.9	29.4	29.8	29.2	28.0	28.8	31.0
Kharif	10.0	10.3	10.0	11.3	14.4	13.9	14.8	13.5	13.4	14.2
Rabi	13.3	14.9	13.6	13.6	15.1	15.9	14.3	14.5	15.4	16.8
<b>Rice</b>	42.8	44.1	44.1	43.5	44.0	43.8	44.2	43.7	45.8	46.4
Kharif	38.9	39.4	39.8	39.7	39.8	39.4	40.0	39.0	40.4	41.1
Rabi	3.8	4.7	4.3	3.8	4.1	4.4	4.2	4.6	5.4	5.3
<b>Wheat</b>	30.0	30.5	31.5	30.4	30.8	29.7	29.3	31.4	31.1	30.5
<b>Jowar</b>	6.2	5.8	6.2	6.1	5.6	5.0	4.1	4.8	4.4	3.8
Kharif	2.4	2.3	2.3	2.1	2.1	2.1	1.8	1.8	1.6	1.5
Rabi	3.8	3.5	3.9	3.9	3.6	3.0	2.3	3.1	2.7	2.3
<b>Bajra</b>	7.3	7.8	7.3	7.1	7.5	7.5	7.1	7.5	7.7	6.7
Maize	8.7	9.1	9.2	8.8	9.6	9.4	9.0	9.6	9.9	10.0
Tur	3.9	3.9	3.9	4.0	5.3	4.4	4.6	4.5	4.7	5.0
Gram	8.5	9.9	8.3	8.4	9.6	10.6	9.6	9.7	10.0	10.9
<b>Oilseeds<sup>e</sup></b>	26.5	28.1	25.6	26.1	26.2	24.5	24.8	27.1	28.8	29.2
Kharif	18.3	19.7	18.2	18.9	18.7	17.2	17.7	19.3	20.9	19.8
Rabi	8.2	8.4	7.4	7.2	7.5	7.3	7.1	7.9	7.9	9.3
<b>Groundnut</b>	4.7	5.5	4.8	4.6	5.3	4.9	4.7	4.8	6.0	5.7
Kharif	3.9	4.6	4.0	3.8	4.6	4.1	4.1	4.2	5.2	4.9
Rabi	0.8	0.9	0.8	0.8	0.8	0.8	0.6	0.7	0.8	0.9
<b>Rapeseed and Mustard</b>	6.4	6.6	5.8	5.7	6.1	6.0	6.1	6.9	6.7	8.1
<b>Sugarcane</b>	5.0	5.0	5.1	4.9	4.4	4.7	5.1	4.6	4.9	5.1
<b>Cotton</b>	12.0	12.0	12.8	12.3	10.8	12.6	12.6	13.5	13.3	11.9
<b>Jute and Mesta</b>	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Jute	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6
Mesta	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0

- Gross Production of Major Crops

(Million Tonnes)

Group/Commodity	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>Foodgrains<sup>a</sup></b>	257.1	265.0	252.0	251.6	275.1	285.0	285.2	297.5	310.7	315.7
Kharif	128.1	128.7	128.1	125.1	138.3	140.5	141.5	143.8	150.6	156.0
Rabi	129.1	136.4	124.0	126.5	136.8	144.6	143.7	153.7	160.2	159.7
<b>Cereals<sup>b</sup></b>	238.8	245.8	234.8	235.2	252.0	259.6	263.1	274.5	285.3	288.0
Kharif	122.2	122.7	122.3	119.6	128.7	131.2	133.4	135.9	142.0	147.7
Rabi	116.6	123.1	112.5	115.7	123.2	128.4	129.7	138.6	143.3	140.4
<b>Nutri / Coarse Cereals<sup>c</sup></b>	40.0	43.3	42.9	38.5	43.8	47.0	43.1	47.7	51.3	50.9
Kharif	29.8	31.2	30.9	28.2	32.4	34.0	31.4	33.6	36.7	35.9
Rabi	10.3	12.1	11.9	10.4	11.3	12.9	11.7	14.1	14.6	15.0
<b>Pulses<sup>d</sup></b>	18.3	19.3	17.2	16.4	23.1	25.4	22.1	23.0	25.5	27.7
Kharif	5.9	6.0	5.7	5.5	9.6	9.3	8.1	7.9	8.6	8.4
Rabi	12.4	13.3	11.4	10.8	13.6	16.1	14.0	15.1	16.8	19.3
<b>Rice</b>	105.2	106.6	105.5	104.4	109.7	112.8	116.5	118.9	124.4	130.3
Kharif	92.4	91.5	91.4	91.4	96.3	97.1	102.0	102.3	105.2	111.8
Rabi	12.9	15.1	14.1	13.0	13.4	15.6	14.4	16.6	19.2	18.5
<b>Wheat</b>	93.5	95.8	86.5	92.3	98.5	99.9	103.6	107.9	109.6	106.8
<b>Jowar</b>	5.3	5.5	5.5	4.2	4.6	4.8	3.5	4.8	4.8	4.2
Kharif	2.8	2.4	2.3	1.8	2.0	2.3	1.7	1.7	2.0	1.6
Rabi	2.4	3.1	3.2	2.4	2.6	2.5	1.7	3.1	2.8	2.6
<b>Bajra</b>	8.7	9.3	9.2	8.1	9.7	9.2	8.7	10.4	10.9	9.6
<b>Maize</b>	22.3	24.3	24.2	22.6	25.9	28.8	27.7	28.8	31.6	33.6
<b>Tur</b>	3.0	3.2	2.8	2.6	4.9	4.3	3.3	3.9	4.3	4.3
<b>Gram</b>	8.8	9.5	7.3	7.1	9.4	11.4	9.9	11.1	11.9	13.8
<b>Oilseeds<sup>e</sup></b>	30.9	32.7	27.5	25.3	31.3	31.5	31.5	33.2	35.9	37.7
Kharif	20.8	22.6	19.2	16.8	21.5	21.0	20.7	22.2	23.7	23.9
Rabi	10.2	10.1	8.3	8.6	9.8	10.5	10.8	11.0	12.2	13.8
<b>Groundnut</b>	4.7	9.7	7.4	6.7	7.5	9.3	6.7	10.0	10.2	10.1
Kharif	3.2	8.1	5.9	5.4	6.0	7.6	5.4	8.4	8.5	8.4
Rabi	1.5	1.7	1.5	1.4	1.4	1.7	1.3	1.6	1.7	1.7
<b>Rapeseed and Mustard</b>	8.0	7.9	6.3	6.8	7.9	8.4	9.3	9.1	10.2	11.7
<b>Sugarcane</b>	341.2	352.1	362.3	348.4	306.1	379.9	405.4	370.5	405.4	431.8
<b>Cotton<sup>f</sup></b>	34.2	35.9	34.8	30.0	32.6	32.8	28.0	36.1	35.2	31.2
<b>Jute and Mesta<sup>g</sup></b>	10.9	11.7	11.1	10.5	11.0	10.0	9.8	9.9	9.4	10.3
Jute	10.3	11.1	10.6	9.9	10.4	9.6	9.5	9.4	9.0	9.9
Mesta	0.6	0.6	0.5	0.6	0.5	0.4	0.3	0.4	0.4	0.4

- Hence option (d) is the correct answer.

#### Q 79.D

- Commercial grain cultivation is practiced in the interior parts of semi-arid lands of the mid-latitudes. Wheat is the principal crop, though other crops like corn, barley, oats and rye are also grown.
- The size of the farm is very large, therefore entire operations of cultivation from ploughing to harvesting are mechanized. There is a low yield per acre but a high yield per person. **This type of agriculture is best developed in Eurasian steppes, the Canadian and American Prairies, the Pampas of Argentina, the Velds of South Africa, the Australian Downs and the Canterbury Plains of New Zealand. Hence, option (d) is the correct answer.**
- Some of the features are:
  - Dependence on Market and Export
  - Huge expenses
  - Good means of transport and communication

#### Q 80.C

- A market garden is a relatively small-scale production of fruits, vegetables and flowers as cash crops, frequently sold directly to consumers and restaurants. Commercial gardening or horticulture is growing flowers and non-edible plants on a large scale **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. Hence, statement 1 is correct.**

- The regions where farmers specialize in vegetables only, 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. **The major truck farming areas are in California, Texas, Florida, along the Atlantic Coastal Plain, and in the Great Lakes area. Among the most important truck crops are tomatoes, lettuce, melons, beets, broccoli, radish, onions, cabbage and strawberries. This type of farming requires comparatively high capitalization as well as a large amount of labor. Hence, statement 2 is correct.**
- Intensive animal farming or industrial livestock production is known as factory farming. It is a type of intensive agriculture, especially an approach to animal husbandry designed to maximize production while minimizing cost. **A modern development in the industrial regions of Western Europe and North America is factory farming. Livestock, particularly poultry and cattle rearing are fed on manufactured feedstuff and carefully supervised against diseases. Hence, statement 3 is correct.**

#### **Q 81.B**

- **Recent Context:** Union Home Minister and Minister of Cooperation addressed the 89th General Council meeting of the National Cooperative Development Corporation (NCDC) in New Delhi.
  - He said NCDC is playing a crucial role in fulfilling Prime Minister Shri Narendra Modi's vision of 'Sahakar se Samridhi'.
  - NCDC is set to achieve 10 times growth in disbursement of financial assistance in the current financial year from Rs. 5,300 crore in 2013-14.
- The National Cooperative Development Corporation (NCDC) is an important national organization involved in the agricultural and cooperative sector in India. **National Co-operative Development Corporation Act, 1962 provides for the establishment of the National Cooperative Development Corporation.** The National Cooperative Development Corporation (NCDC) was established by an Act of Parliament in 1963. **Hence statement 1 is not correct.**
- **NCDC is a statutory Corporation under the Ministry of Cooperation.** The major objective of the Corporation is to promote, strengthen and develop the farmers' cooperatives for increasing production and productivity and instituting post-harvest facilities. **Hence statement 3 is correct.**
- NCDC will now be able to finance projects in the rural industrial cooperative sectors and for certain notified services in rural areas like water conservation, irrigation and micro irrigation, agri-insurance, agro-credit, rural sanitation, animal health, etc.
- **Loans and grants are advanced to State Governments for financing primary and secondary level cooperative societies and direct to the national level and other societies having objects extending beyond one State.** The Corporation can also go in for direct funding of projects under its various schemes of assistance on fulfilment of stipulated conditions. **Hence statement 2 is correct.**

#### **Q 82.B**

- The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India.
- The Total Fertility Rate (TFR) is a standard demographic indicator used internationally to estimate the average number of children that a woman would have over her childbearing years.
- **As per the fifth round of the National Family Health Survey NFHS conducted by MoHFW during the year 2019-21, the Total Fertility Rate (TFR) has declined to 2.0 children per woman** from 2.2 children per woman as per the fourth round of NFHS conducted during the year 2015-16, resulting in the achievement of the replacement level of fertility, which is 2.1 children per woman.

- Total Fertility Rate of various states**

States/UTs	NFHS-1 (1992-93)	NFHS-2 (1998-99)	NFHS-3 (2005-06)	NFHS-4 (2015-16)	NFHS-5 (2019-21)*
(1)	(2)	(3)	(4)	(5)	(6)
Andhra Pradesh	2.6	2.3	1.8	1.8	1.7
Arunachal Pradesh	4.3	2.5	3.0	2.1	1.8
Assam	3.5	2.3	2.4	2.2	1.9
Bihar	4.0	3.5	4.0	3.4	3.0
Delhi	3.0	2.4	2.1	1.8	1.6
Goa	1.9	1.8	1.8	1.7	1.3
Gujarat	3.0	2.7	2.4	2.0	1.9
Haryana	4.0	2.9	2.7	2.1	1.9
Himachal Pradesh	3.0	2.1	1.9	1.9	1.7
Jammu and Kashmir*	3.1	2.7	2.4	2.0	1.4
Karnataka	2.9	2.1	2.1	1.8	1.7
Kerala	2.0	2.0	1.9	1.6	1.8
Madhya Pradesh	3.9	3.3	3.1	2.3	2.0
Maharashtra	2.9	2.5	2.1	1.9	1.7
Manipur	2.8	3.0	2.8	2.6	2.2
Meghalaya	3.7	4.6	3.8	3.0	2.9
Mizoram	2.3	2.9	2.9	2.3	1.9
Nagaland	3.3	3.8	3.7	2.7	1.7
Odisha	2.9	2.5	2.4	2.1	1.8
Punjab	2.9	2.2	2.0	1.6	1.6
Rajasthan	3.6	3.8	3.2	2.4	2.0
Sikkim		2.8	2.0	1.2	1.1
Tamil Nadu	2.5	2.2	1.8	1.7	1.8
Tripura	2.7		2.2	1.7	1.7
Uttar Pradesh	4.8	4.0	3.8	2.7	2.4
West Bengal	2.9	2.3	2.3	1.8	1.6
Chhattisgarh			2.6	2.2	1.8
Jharkhand			3.3	2.6	2.3
Uttarakhand				2.1	1.9
Telangana				1.8	1.8
Andaman and Nicobar (UT)				1.4	1.3

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

**Q 83.D**

- There are 111 National Waterways (NWs) declared under the National Waterways Act, 2016.
- National Waterway-1 comprises of Ganga-Bhagirathi-Hooghly River System and passes through the states of Uttar Pradesh, Bihar, Jharkhand, West Bengal.**
- Other important waterways are
  - NW-2:** Brahmaputra River (Dhubri - Sadiya) - Assam
  - NW-3:** West Coast Canal (Kottapuram - Kollam), Champakara and Udyogmandal Canals - Kerala
  - National Waterway 4 :** Krishna River (Vijayawada – Muktyala) - Andhra Pradesh
  - National Waterway 5:** Dhamra-Paradio via Mangalagadi to Pankopal - Odisha, West Bengal
  - National Waterways 6** is a 71 km waterway between Lakhipur and Bhanga of the Barak River.
- Inland Waterways Authority of India (IWAI) is the statutory authority in charge of the waterways in India. It was constituted under IWAI Act-1985 by the Parliament of India. Its headquarters is located in Noida, Uttar Pradesh.

# National Waterways

TOTAL LENGTH:

**4,503 KM**

TOTAL STATES SERVED

**15**

Arabian Sea

**NW-3**

**WEST COAST CANAL**

KOLLAM TO KOTTAPURAM

**205 Km**

STATE SERVED: Kerala

**NW-1**

**GANGA**

HALDIA TO ALLAHABAD

**1,620 Km**

STATES SERVED:  
UP, Bihar, Jharkhand  
and West Bengal

**NW-2**

**BRAHMAPUTRA**

DHUBRI TO SADIYA

**891 Km**

STATES SERVED:  
Assam, West Bengal, Arunachal  
Pradesh, Meghalaya

**NW-6**

**BARAK**

LAKHIPUR TO BHANGA  
(IN PROCESS)

**121 Km**

STATES SERVED:  
Assam, Mizoram,  
Manipur, Tripura

**NW-4**

**GODAVARI, KRISHNA  
& CANALS**

KAKINADA TO  
PUDUCHERY

**1,078 Km**

STATES SERVED: AP, Tamil  
Nadu, UT of Puducherry

**NW-5**

**BRAHMANI, DELTA  
CANALS, ECC**

GOENKHALI TO TALCHER

**588 Km**

STATES SERVED: Odisha,  
West Bengal

- Hence option (d) is the correct answer.

## Q 84.C

Tribes are groups of people who share a common language, ancestry, culture, and distinct beliefs, customs, and traditions. These have been passed down through generations, and often have deep connections with the land and environment.

- Yang Shuo Cormorants -China**
  - Yangshuo county in Southwest China's Guangxi province has managed to preserve a dying art that dates back more than 1,300 years - fishing with cormorants. The fishermen use a loose collar around the throat of the cormorant, which they have trained to catch fish, while the noose prevents the bird from swallowing their catch and allows the fishermen to retrieve the fish when they return to the boats. **Hence pair 1 is correctly matched.**
- Masai, Kenya and Tanzania**
  - The Maasai tribe constitutes an indigenous ethnic ensemble in Africa, which includes semi-nomadic populations that have established settlements in both Kenya and northern Tanzania. Their unique customs, traditions, attire, and proximity to the abundant national game reserves of East Africa have elevated the Maasai to a prominent status among African ethnicities. Their international recognition is also hugely attributed to their close association with national parks and reserves in the region. **Hence pair 3 is correctly matched.**
- Maori, New Zealand, and French Polynesia**
  - The term Māori refers to the native inhabitants of New Zealand, as well as their language. As per the records, both the term and the people of this tribe are a fusion of diverse Polynesian cultures, who have been believed to have reached New Zealand over a millennium ago. Famed for their distinct traditional practice of intricate full-body and facial tattooing, the Māori people hold a distinctive position globally as indigenous individuals with complete legal rights. **Hence pair 2 is correctly matched.**

**Q 85.B**

- The present installed nuclear power capacity in the country is 6780 MW comprising of 22 operational nuclear power reactors.
- **Important Nuclear Power plants**
  - Kaiga - Karnataka
  - Kakrapar -Gujarat
  - Kudankulam -Tamil Nadu
  - Kalpakkam - Tamil Nadu
  - **Narora - Uttar Pradesh**
  - Rawatbhata - Rajasthan
  - Tarapur - Maharashtra



- Hence option (b) is the correct answer.

**Q 86.C**

- Sammakka Saralamma Jatara or Medaram Jatara is a tribal festival of honouring the goddesses celebrated in the state of Telangana, India. **It is the largest tribal religious congregation in the country, held every two years (biannually), in Telangana.** The Jatra begins at Medaram in Tadvai Mandal in Mulugu district. **Hence statements 1 and 2 are correct.**
- Medaram Jatara is the second-largest fair of India, after the Kumbh Mela, celebrated by the second-largest Tribal Community of Telangana- the Koya tribe for four days. As the largest tribal fair in Asia, Medaram

Jathara is conducted in honour of the Goddesses Sammakka and Saralamma. It is celebrated once in two years in the month of 'Magha' (February) on the full moon day.

- **Jampanna vagu (stream) is a tributary to River Godavari.** According to history, Jampanna is the tribal warrior and the son of Tribal Goddess Sammakka. The Jampanna vagu took his name as he died in a battle fighting against Kakatiyan Army in that stream. Tribals believe that taking a holy dip in the red water of Jampanna Vagu reminds them the sacrifice of their gods who save them and also induces courage into their souls. **Hence statement 3 is not correct.**

#### **Q 87.D**

- A number of the countries with the world's 10 largest Muslim or Christian populations also have large (and in some cases, larger) populations of other faith groups. In India, which has the second-largest Muslim population, Islam is a minority religion (making up 15% of the country's population) and Hinduism is the majority faith. **Hence statement 2 is not correct.**
- Nigeria, which has the sixth-largest Christian population in the world (87 million), also has the world's fifth-largest Muslim population (90 million). In addition, the lists illustrate the extent to which the population centers for these religions have moved away from their historical and traditional hubs. The countries with the five highest Muslim populations are all in South and Southeast Asia or in sub-Saharan Africa, rather than the Middle East; and the countries with the three highest Christian populations are in the Americas rather than in the Middle East or Europe.

## **Size and Projected Growth of Major Religious Groups**

	2010 POPULATION	% OF WORLD POPULATION IN 2010	PROJECTED 2050 POPULATION
Christians	2,168,330,000	31.4%	2,918,070,000
Muslims	1,599,700,000	23.2	2,761,480,000
Unaffiliated	1,131,150,000	16.4	1,230,340,000
Hindus	1,032,210,000	15.0	1,384,360,000
Buddhists	487,760,000	7.1	486,270,000
Folk Religions	404,690,000	5.9	449,140,000
Other Religions	58,150,000	0.8	61,450,000
Jews	13,860,000	0.2	16,090,000
<b>World total</b>	<b>6,895,850,000</b>	<b>100.0</b>	<b>9,307,190,000</b>

- In addition, the lists illustrate the extent to which the population centers for these religions have moved away from their historical and traditional hubs. The countries with the five highest Muslim populations are all in South and Southeast Asia or in sub-Saharan Africa, rather than the Middle East; and the countries with the three highest Christian populations are in the Americas rather than in the Middle East or Europe.
- Overall, there are about **2.3 billion Christians in the world and 1.8 billion Muslims**. That gap is expected to narrow by 2060, when the Pew Research Center projects there will be 3 billion Christians and nearly 3 billion Muslims. That's because Muslims, on average, are younger and have more children than Christians. **Hence statement 1 is not correct.**

#### **Q 88.A**

- The chemical industry is based on two types of raw materials: natural like minerals, coal, petroleum, salts, potash, sulphur, limestone, gypsum and vegetable products and by-products of other industries such as the paper and pulp industry, iron and steel industry and gas manufacturing industry.

- Major factor for the location of the chemical industry is the availability of raw materials, cheaper means of transport for bulky materials, water supply, sources for energy and demand of chemicals in other industries.
- In Canada, Montreal has a large petrochemical industry. The crude oil is brought from Portland and Maine through pipelines and by tankers from Venezuela. The other important petrochemical complex in Canada is located at Sarnia in Ontario province. Hence, pair 1 is not correctly matched.**
- Most of the petrochemical complexes in North America are located in the coastal regions. About 30 percent of the oil in the United States of America is refined along the Gulf of Mexico coast and another 15 percent is refined on the Pacific Coast.
- The petrochemical complexes in Europe are located near the markets where these products are in demand. The major complexes are located on the coasts of the Southern North Sea and the English Channel. The main centers are Antwerp, Rotterdam, Southampton and the cities located in the lower Seine Valley. The petrochemical complexes of Germany are located in the Ruhr region.
- The largest refinery in West Asia is located in Abadan (Iran). West Asia is a large producer of petroleum but there is little demand because the region is not industrially developed. Thus, most of the petrochemical complexes are located on the coasts in order to facilitate export. Saudi Arabia has a large petrochemical complex at Ras Tanura while Mina-el-Ahmadi is the largest petrochemical complex in Kuwait. Hence, pair 2 is not correctly matched but pair 3 is correctly matched.**

**Q 89.D**

- As per the 2011 census, 10.42 crore Indians are notified as 'Scheduled Tribes' (ST), which constitute 8.6% of country's total population.
- Top 10 states with tribal population**

#	State	No_HH	Population
-	India	21,511,528	104,545,716
1	<a href="#">Madhya Pradesh</a>	3,122,061	15,316,784
2	<a href="#">Orissa</a>	2,163,110	9,590,756
3	<a href="#">Maharashtra</a>	2,156,957	10,510,213
4	<a href="#">Rajasthan</a>	1,787,715	9,238,534
5	<a href="#">Chhattisgarh</a>	1,743,277	7,822,902
6	<a href="#">Gujarat</a>	1,699,510	8,917,174
7	<a href="#">Jharkhand</a>	1,699,215	8,645,042
8	<a href="#">Andhra Pradesh</a>	1,417,289	5,918,073
9	<a href="#">West Bengal</a>	1,160,069	5,296,953
10	<a href="#">Karnataka</a>	875,742	4,248,987

- Uttar Pradesh has a tribal population of 1,134,273.**
- Hence option (d) is the correct answer.**

**Q 90.C**

- As per the reports, the Centre is aiming to increase domestic palm oil production from the current level of 0.35 million tonnes (MT) to 1 MT by 2030 under the National Mission on Edible Oils-Oil Palm (NMOE-OP).**
- NMOE-OP is a new Centrally Sponsored Scheme. It is proposed to have an additional 6.5 lakh hectares for palm oil by 2025-26. It will involve raising the area under oil palm cultivation to 10 lakh hectares by 2025-26 and 16.7 lakh hectares by 2029-30.

- NMEO-OP focuses on Oil Palm area expansion, increasing Crude Palm Oil production, etc. **North-east and Andaman and Nicobar Islands focussed approach due to their favourable rainfall and temperature. Hence statement 3 is correct.**
- About Palm Oil
  - **Palm Oil is the source of the world's largest consumed edible oil primarily due to its high productivity, versatility and substantial price advantage. Hence statement 1 is correct.**
  - India buys palm oil mainly from Indonesia, Malaysia and Thailand. Palm oil imports account for around 59% of the country's total vegetable oil imports.
- Palm trees are grown mainly in tropical regions. Palm trees thrive in moist and hot climates. They require temperatures in the range of 21 °C to 32 °C and annual rainfall of 200 cm. **Hence statement 2 is not correct.**

#### **Q 91.B**

- Kuttanad known as the rice bowl of Kerala covers the Alappuzha, Pathanamthitta, and Kottayam Districts of Kerala, India. Kuttanad stretches for 75 km from Kollam in the south to Kochi in the north and is nestled between the foothills of the Western Ghats in the east and the comparatively elevated plains of coastal Alappuzha in the west. The entire region is a mosaic of backwaters, rivers, and numerous waterways and canals, extensive paddy fields enclosed by dykes and coconut groves.
- **Kuttanad Wetland Agriculture System is unique, as it is the only system in India that favors rice cultivation below sea level in the land created by draining delta swamps in brackish waters. As an approach to cope with the imminent climate impacts in coastal areas and evolve efficient methods, it aims to deal with soil availability and flood issues in agriculture.**
- The Kuttanad system is a complex mosaic of fragmented agricultural landscapes divided into three structures: wetlands used for paddy activities and fish catching, garden lands used for coconut, tubers, and food crops plantation, and water areas used for inland fishing and shells. Wetlands are created thanks to the construction of polders with bunds and dewatering. **Hence, option (b) is the correct answer.**

#### **Q 92.A**

- **Recent Context:** Recently, India's homegrown CAR-T cell therapy, a form of immunotherapy got market authorization.
- **About CAR-T cell therapy:**
  - The therapy represents a quantum leap in the sophistication of cancer treatment.
  - Unlike chemotherapy or immunotherapy, which requires mass-produced injectable or oral medication, CAR T-cell therapies use a patient's own cells.
  - They are modified in the laboratory to activate T-cells, a component of immune cells, to attack tumors. **Hence statement 1 is correct.**
  - These modified cells are then infused into the patient's bloodstream after conditioning them to multiply more effectively.
- **What is CAR-T Cell Therapy?**
  - **Revolutionary Approach:** CAR-T cell therapy involves modifying T-cells, a type of white blood cell, into potent cancer-fighting cells.
  - **Targeting Cancer:** These genetically enhanced cells are reintroduced into the patient's body, where they identify and eliminate cancer cells, particularly effective against blood cancers like leukemia and lymphomas.
  - **Game-Changer:** Unlike chemotherapy or immunotherapy, CAR-T therapy offers the potential for a cure and lifelong benefits, making it a transformative treatment option. **Hence statement 2 is not correct.**
  - As of today, CAR T-cell therapy has been approved for leukemias (cancers arising from the cells that produce white blood cells) and lymphomas (arising from the lymphatic system).

#### **Q 93.A**

- Coalbed Methane (CBM) is natural gas contained in coal.
- It consists primarily of methane, the gas we use for home heating, gas-fired electrical generation and industrial fuel.
- CBM commonly is referred to as an “unconventional” form of natural gas, (**Hence, statement I is correct**) because it is primarily stored through adsorption to the coal itself rather than in the pore space of the rock, like most “conventional” gas. (**Hence, statement II is correct and is the correct explanation of statement I.**) The gas is released in response to a drop in pressure in the coal.

- Coal Bed Methane (CBM), an unconventional source of natural gas is now considered as an alternative source for augmenting India's energy resource.
- India has the fifth largest proven coal reserves in the world and thus holds significant prospects for exploration and exploitation of CBM.
- In order to harness CBM potential in the country, the Government of India formulated a CBM policy in 1997 wherein CBM being Natural Gas is explored and exploited under the provisions of the Oil Fields (Regulation & Development) Act 1948 (ORD Act 1948) and Petroleum & Natural Gas Rules 1959 (P&NG Rules 1959) administered by Ministry of Petroleum & Natural Gas (MOP&NG).

**Q 94.B**

- Plantation agriculture was introduced by the Europeans in colonies situated in the tropics. Some of the important plantation crops are tea, coffee, cocoa, rubber, cotton, oil palm, sugarcane, bananas and pineapples.
- The characteristic features of this type of farming are large estates or plantations, large capital investment, managerial and technical support, scientific methods of cultivation, single crop specialization, cheap labor, and a good system of transportation that links the estates to the factories and markets for the export of the products.
- **The French established cocoa and coffee plantations in West Africa. The British set up large tea gardens in India and Sri Lanka, rubber plantations in Malaysia and sugarcane and banana plantations in the West Indies.** Hence, statement 1 is not correct but statement 2 is correct.
- **Spanish and Americans invested heavily in coconut and sugarcane plantations in the Philippines. The Dutch once had a monopoly over sugarcane plantations in Indonesia. Some coffee fazendas (large plantations) in Brazil are still managed by Europeans.** Hence, statement 3 is correct.

**Q 95.C**

- **Recent Context:** China has announced export restrictions on some gallium and germanium products, metals used in computer chips and other products, citing national security interests.
- Critical minerals can be defined as minerals that are essential to the economy, and their supply is generally limited. China is the largest producer of many of the world's critical minerals. For example, China produced a 98.18 percent share of the world's gallium, 90 percent of the world's magnesium, and 84.52 percent of tungsten in 2022. **Hence option (c) is the correct answer.**
- Critical Minerals for India:
  - Expert Committee under Ministry of Mines has identified a set of 30 critical minerals for India.
  - These are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.

**Q 96.D**

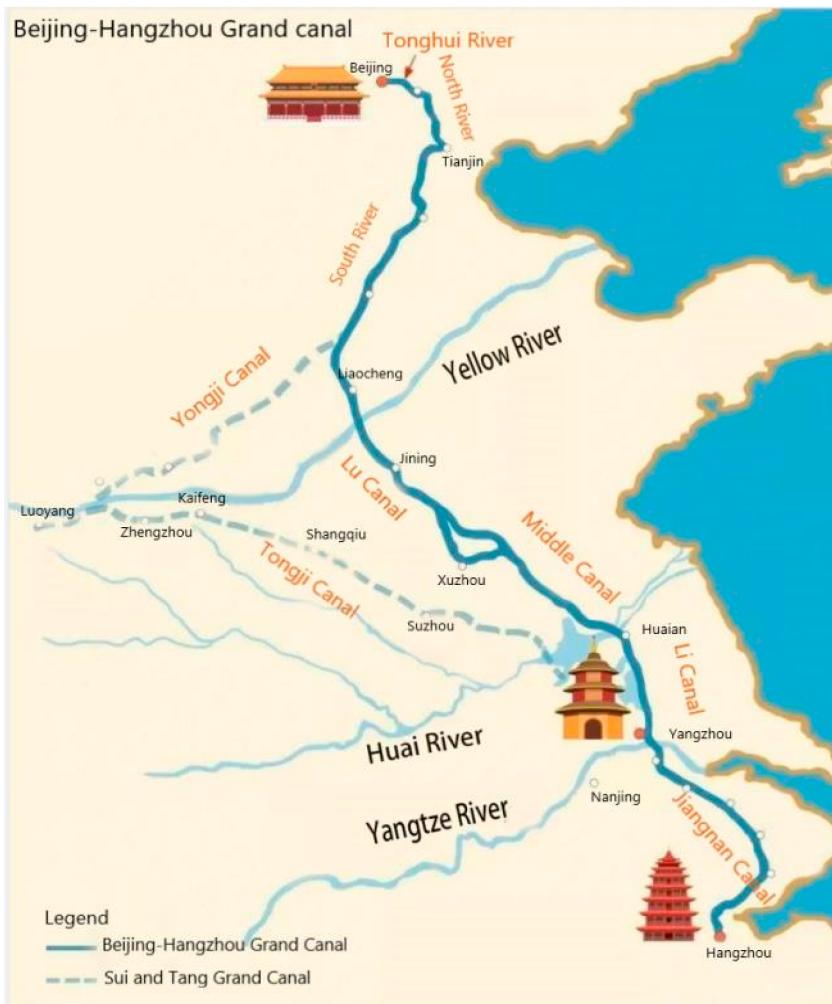
- **The fertility rate per woman in India is lower than the global average fertility rate:**
  - **The fertility rate measures the number of children an average woman is expected to have during her lifetime.**
  - **Today, the average Indian woman is expected to have 2.0 children in her lifetime, which is below the replacement rate. But the current global average fertility rate according to the UN is around 2.3 children per woman.** Hence statement 1 is not correct.
  - **Though India's Fertility rate is lower than the world's average it is still higher than China's (1.2) and the United States' (1.6).**
  - But considering India's fertility rate in 1992 (3.4) or 1950 (5.9), it has significantly decreased.
  - A fertility rate lower than the global average indicates that, on average, Indian women are having fewer children compared to the global norm. This information is crucial for policymakers, public health officials, and family planning programs to understand population growth and plan for the future.
  - A lower fertility rate can influence issues such as workforce dynamics, healthcare infrastructure, and educational requirements.
- **Life expectancy at birth for females in India is more than for males:**
  - **In India, as in most countries, life expectancy at birth for females(74 years) is generally higher than that for males(71). Hence statement 2 is not correct.**
  - The difference in life expectancy between males and females can be influenced by various factors, including biological, social, and economic factors. Understanding these differences is essential for

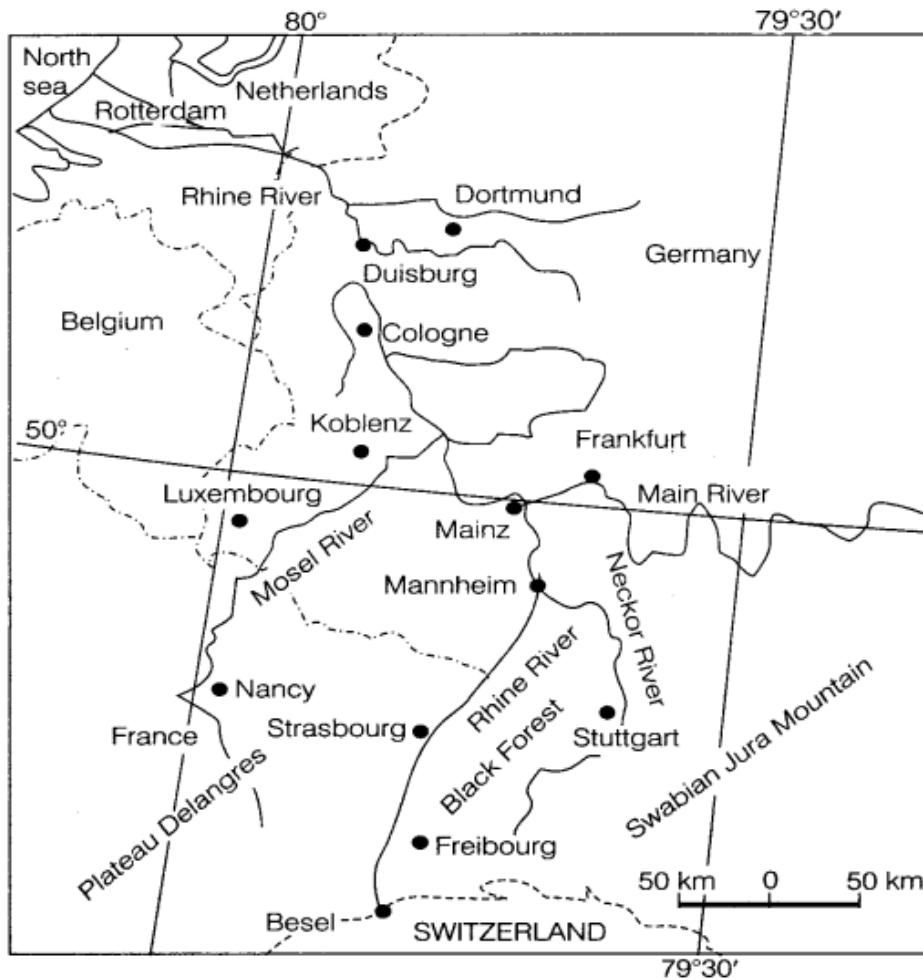
tailoring healthcare services and social policies to address the specific needs of both genders and promote gender equity.

**Q 97.D**

- **The Rhine Waterways:**
    - 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. Each year more than 20,000 ocean-going ships and 2,00,000 inland vessels exchange their cargoes. It connects the industrial areas of Switzerland, Germany, France, Belgium and the Netherlands with the North Atlantic Sea Route.
  - **The Mississippi Waterways:**
    - 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 option (d) is the correct answer.
  - **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 St. Lawrence River, along with the Great Lakes, forms a unique commercial waterway in the northern part of North America. It is the world's longest inland waterway.
    - 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. But here goods have to be trans-shipped to smaller vessels due to the presence of rapids. Canals have been constructed up to 3.5 m deep to avoid these.
  - **The Grand Canal of China:**
    - It is a series of waterways in eastern and northern China starting at Beijing and ending at the city of Hangzhou in Zhejiang province, linking the Yellow River with the Yangtze River. Stretching some 1,800 km, it is the world's longest man-made waterway, and constitutes one of the world's largest and most extensive civil engineering projects prior to the Industrial Revolution.
    - At its peak, it consisted of more than 2,000 km of artificial waterways, linking five of China's main river basins.
    - The canal was built to enable the transport of surplus grain from the agriculturally rich Yangtze and Huai river valleys to feed the capital cities and large standing armies in northern China.







**Q 98.A**

- According to 2011 Census, urban population grew to 377 million showing a growth rate of 2.76 percent per annum during 2001-2011 and the level of urbanisation at the country as a whole increased from 27.7 percent in 2001 to 31.1 percent.
- Top 10 cities population wise.**

#	City	State	Population
1	<a href="#">Mumbai</a>	<a href="#">Maharashtra</a>	12,442,373
2	<a href="#">Delhi</a>	<a href="#">Delhi</a>	11,034,555
3	<a href="#">Bangalore</a>	<a href="#">Karnataka</a>	8,443,675
4	<a href="#">Hyderabad</a>	<a href="#">Andhra Pradesh</a>	6,731,790
5	<a href="#">Ahmedabad</a>	<a href="#">Gujarat</a>	5,577,940
6	<a href="#">Chennai</a>	<a href="#">Tamil Nadu</a>	4,646,732
7	<a href="#">Kolkata</a>	<a href="#">West Bengal</a>	4,496,694
8	<a href="#">Surat</a>	<a href="#">Gujarat</a>	4,467,797
9	<a href="#">Pune</a>	<a href="#">Maharashtra</a>	3,124,458
10	<a href="#">Jaipur</a>	<a href="#">Rajasthan</a>	3,046,163

- Hence option (a) is the correct answer.

**Q 99.B**

- Central Plateau and Hills Region is a large region comprising 46 districts of Madhya Pradesh, Uttar Pradesh, and Rajasthan. It is subdivided into 14 sub-regions having varied topography of low hills, mounds, valleys, and ravines. Nearly one-third of the land is not available for cultivation. The climate is arid in the western part to sub-humid in the eastern part. Irrigation intensity and cropping intensity are low, and cropping is dominated by food crops.
- This region spreads over **Bundelkhand, Baghelkhand, Bhander Plateau, Malwa Plateau, and Vindhya hills**. The climate is semi-arid in the western part to sub-humid in the eastern part with temperatures in July month 26°C-40°C, in January month 7°C-24°C and average annual rainfall from 50 cm- 100 cm. Soils are mixed red, yellow, and black growing crops like millets, gram, barley, wheat, cotton, sunflower, etc. The region has a dearth of water resources. **Hence, option (b) is the correct answer.**

**Q 100.D**

- The Minsk Group was created by the Organisation for Security and Cooperation in Europe (OSCE) to facilitate talks between Armenia and Azerbaijan to find a peaceful solution to the Nagorno-Karabakh conflict. The Group was co-chaired by Russia, the United States and France. **Hence option (d) is the correct answer.**
- The Group came up with three peace proposals in the 1990s.
  - **The package deal (1997)**- It envisaged simultaneous removal of Armenian forces from occupied areas and the determination of Nagorno-Karabakh's status but was rejected.
  - **The step-by-step approach (1997)**- It suggested gradual steps starting with Armenian withdrawal, return of displaced refugees, and ending of hostilities followed by talks for a future resolution of the Nagorno-Karabakh issue which was rejected too.
  - **The common state proposal (1998)**- It would endow Nagorno-Karabakh with a separate passport, law enforcement and currency, but within Azerbaijan's internationally recognised borders.

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