NEXT IAS

CSE MAINS

PREVIOUS YEARS SOLVED PAPERS

2018-2022

GENERAL STUDIES

- ✓ Detailed model solutions of last 5 years CSE Mains.
- ✓ Topicwise Trend analysis of last 5 years.
- ✓ Pictographic presentation with maps & graphs.
- ✓ Value addition boxes wherever relevant.

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CSE MAINS PREVIOUS YEARS SOLVED PAPERS: GENERAL STUDIES

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Director's Message

History is full of lessons, and the History of UPSC Civil Services lies in its previous year's questions. I often tell students that the first and most important step to conquer an examination like UPSC is to understand it thoroughly. The best way to understand the exam is through the syllabus and analysis of the previous year's questions. This book is an effort to make sure that you learn the most out of the history of the Civil Services Examination.

The book contains solved previous year questions of the UPSC Civil Services (Mains) Examination from 2018 to 2022. The questions have been segregated paper-wise as well as year-wise to make them more accessible for the students. The rationale behind including questions from 2018 is a major shift in the pattern and difficulty level of the Mains examination post-2018. A compilation from 2018 ensures that the questions are in-line with the latest trends of the exam.

There are three distinctive features that make this book stand apart from the existing options. First, we have included a trend analysis of the subject-wise marks distribution over the past 5 years. Second, the answers have been made as informative as possible while still being concise. Third, answers are enriched with necessary value additions, examples, maps, diagrams, etc where needed.

The NEXT IAS team has put sincere efforts into preparing this valuable resource for the students. I hope this book will stand up to the expectations of aspirants and my desire to serve the student community by providing the best study material will get accomplished.

B. Singh (Ex. IES)
CMD, NEXT IAS & MADE EASY Group

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CSE 2018-2022 TOPIC WISE WEIGHTAGE

SYLLABUS KEYWORD		YEAR WISE WEIGHTAGE (MARKS)				
GENERAL STUDIES PAPER-I						
CIVIL SERVICE EXAM YEARS		**2022**	**2021**	**2020**	**2019**	**2018**
INDIAN AND WORLD HISTORY						
1	Indian culture will cover the salient aspects of Art Forms, Literature and Architecture from ancient to modern times.	40	10	50	10	35
2	Modern Indian history from about the middle of the eighteenth century until the present- significant events, personalities, issues, The Freedom Struggle - its various stages and important contributors / contributions from different parts of the country.	35	40	25	50	10
3	Post-independence consolidation and reorganization within the country.		10			15
4	History of the world will include events from the 18th century such as industrial revolution, world wars, redrawal of national boundaries, colonization, decolonization, political philosophies like communism, capitalism, socialism etc.- their forms and effect on the society.		15		15	15
SOCIETY						
5	Salient features of Indian Society, Diversity of India. Role of women and women's organization, population and associated issues, poverty and developmental issues, urbanization, their problems and their remedies. Effects of globalization on Indian society. Social empowerment, communalism, regionalism & secularism.	75	75	75	75	75
GEOGRAPHY						
6	Salient features of world's physical geography. Distribution of key natural resources across the world (including South Asia and the Indian subcontinent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India). Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location- changes in critical geographical features (including water bodies and ice-caps) and in flora and fauna and the effects of such changes.	100	100	100	100	100

GENERAL STUDIES PAPER-II						
	CIVIL SERVICE EXAM YEARS	2022	2021	2020	2019	2018
	POLITY					
1	Constitution, Polity: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure. Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein. Separation of powers between various organs dispute redressal mechanisms and institutions. Comparison of the Indian constitutional scheme with that of other countries Parliament and State Legislatures - structure, functioning, conduct of business, powers & privileges and issues arising out of these. Structure, organization and functioning of the Executive and the Judiciary Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity. Salient features of the Representation of People's Act. Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies. Statutory, regulatory and various quasi-judicial bodies	105	125	125	125	125
	SOCIAL JUSTICE					
2	Government policies and interventions for development in various sectors and issues arising out of their design and implementation. Development processes and the development industry- the role of NGOs, SHGs, various groups and associations, donors, charities, institutional and other stakeholders Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes; mechanisms, laws, institutions and Bodies constituted for the protection and betterment of these vulnerable sections. Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources. Issues relating to poverty and hunger.	70	40	55	35	40
	GOVERNANCE					
3	Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures. Role of civil services in a democracy.	25	35	20	50	35

	INTERNATIONAL RELATIONS					
4	India and its neighborhood- relations. Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests Effect of policies and politics of developed and developing countries on India's interests, Indian Diaspora. Important International institutions, agencies and fora- their structure, mandate.	50	50	50	50	50

GENERAL STUDIES PAPER-III

	CIVIL SERVICE EXAM YEARS	2022	2021	2020	2019	2018
	ECONOMY					
1	Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment. Inclusive growth and issues arising from it. Government Budgeting. Land reforms in India. Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth. Infrastructure: Energy, Ports, Roads, Airports, Railways etc. Investment models.	70	50	50	65	55
	AGRICULTURE					
2	Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing. Food processing and related industries in India- scope and significance, location, upstream and downstream requirements, supply chain management.	40	50	50	35	50
	BIODIVERSITY AND ENVIRONMENT					
3	Conservation, environmental pollution and degradation, environmental impact assessment	40	35	35	25	50
	DISASTER MANAGEMENT					
4	Disaster and disaster management.	10	15	15	25	15
	SCIENCE AND TECHNOLOGY					
5	Technology: Science and Technology- developments and their applications and effects in everyday life . Achievements of Indians in science & technology; indigenization of technology and developing new technology. Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.	40	50	50	50	25

SECURITY MANAGEMENT						
6	Linkages between development and spread of extremism. Role of external state and non-state actors in creating challenges to internal security. Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention Security challenges and their management in border areas; linkages of organized crime with terrorism. Various Security forces and agencies and their mandate	50	50	50	50	50

GENERAL STUDIES PAPER-IV

	CIVIL SERVICE EXAM YEARS	2022	2021	2020	2019	2018
1	Ethics and Human Interface: Essence, determinants and consequences of Ethics in human actions; dimensions of ethics; ethics in private and public relationships. Human Values – lessons from the lives and teachings of great leaders, reformers and administrators; role of family, society and educational institutions in inculcating values.	30	10	40		10
2	Attitude: content, structure, function; its influence and relation with thought and behaviour; moral and political attitudes; social influence and persuasion. Aptitude and foundational values for Civil Service , integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker sections. Emotional intelligence- concepts, and their utilities and application in administration and governance.	20	30	40	10	30
3	Contributions of moral thinkers and philosophers from India and world. Public/Civil service values and Ethics in Public administration: Status and problems; ethical concerns and dilemmas in government and private institutions; laws, rules, regulations and conscience as sources of ethical guidance; accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding; corporate governance.	10	50	20	40	20
4	Quote Based Questions	30	30	30	30	40
5	Concept of public service; Philosophical basis of governance and probity; Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen's Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.	40	10		50	30
6	Case Studies	120	120	120	120	120

CSE MAINS

2022

GENERAL STUDIES

PAPER-I to IV

2022

GENERAL STUDIES

PAPER-I

1. How will you explain that medieval Indian temple sculptures represent the social life of those days? (Answer in 150 words) 10 Marks

Medieval Indian temple sculptures are a depository of information about the social life of those days which not only shows religious beliefs prevalent at that time but also provide a glimpse into the daily lives of the people, their customs, and traditions. Khajuraho, Ellora, Lepakshi, Konark, Elephanta, Vithala, Jagannath Puri, etc. are among the prominent temples of that time.

SCULPTURES REPRESENTING THE SOCIAL LIFE OF THOSE DAYS

1. **Religious influence:** The sculptures of Gods and Goddesses related to Hinduism showcase the **religious inclination of people**. The people in Southern India worshiped Vishnu and Shiva which was incorporated in the regional architecture. Eg: ***Sculptures at Brihadeshwara Temple in Thanjavur (Tamil Nadu)*** depicting Shiva and Parvati and a relief depicting Durga slaying a demon.
2. **Economic conditions:** The ornamentation on the sculptures of temples represented the **tradition of jewelry making** and wearing in the local areas. It also represented prosperity in the vicinity. Eg: ***In the Lakshmana temples at Khajuraho*** and the ***Parasnath temple in Rajasthan***, the figures are decorated with a lot of jewelry.
3. **Patronage by Kings and rulers:** Sculptures of kings or local rulers were made which reflected the **State's patronage of the art** or respect for the ruler amongst the commoners.
4. **Philosophical influence:** The sculptures in temples at Khajuraho depict the **philosophical thoughts of society** related to Dharma, Artha, Kama, and Moksha.
5. **Artistic upgradation:** Ninth and tenth centuries witnessed a lot of bronze sculptures. The great **bronze image still worshiped in the Brihadeshwara temple** at Thanjavur is a good example. It showed that **society was moving towards better art forms**.
6. **Daily life and lifestyle:** In many of the temples, sculptures related to **routine activities were carved out**. The lavish lifestyle and animals used in contemporary society were shown through sculptures Eg: ***Hoyasaleshwara temples depicting the daily life of people*** alternately standing and sitting on its walls.
7. **Tantrism:** In local temples, sculptures of **deities who were worshiped for tantric gains** were made. Eg: ***in the Chausath Yogini temple, and e***rotic sculptures in the Khajuraho temple.
8. **Influence of art of other regions:** The art and culture of a place are **influenced by its neighbors.** Eg: ***Kashmir sculpture had some Gandhara influence*** as far as the rendering of the body and the drapery are concerned. This type can be seen in sculptures from Avantipura.

In almost all time periods, the influence of local cultures is visible in temple architecture, sculptures, and paintings. These societies, wars, rulers, and economic conditions shaped the artistic and cultural history of India.

2. Why did the armies of the British East India Company – mostly comprising Indian soldiers – win consistently against the more numerous and better equipped armies of the Indian rulers? Give reasons. (Answer in 150 words) 10 Marks

During the 18th-19th century, the East India Company controlled its own army, comprising nearly 200,000 soldiers, mostly Indian. The company used its armed force to subdue Indian states and principalities and

won many battles where in most of the cases the number of EIC troops was less and that of regional ruler's troops was more.

MANY REASONS ARE RESPONSIBLE FOR IT

1. **Discipline:** The armies of EIC were **better disciplined and well maintained** by the British commandants whereas there was a lack of discipline and occurrence of repetitive conflicts amongst the local armies. Due to hierarchy, caste, rigidities, and societal divisions, unity was missed in them.
2. **Recruitment criteria:** EIC used to hire troops in an **objective manner based on merit.** They used to **hire both British and Indian soldiers** (sepoys) and hired regular regiments of the British Army, and funded its own navy, the Bombay Marine. In the armies of princely states, preferences were given to the people of a particular caste, heredity, or personal relations with the rulers.
3. **Training:** Troops were **well trained by higher officials and British authorities** similar to the training given to the English troops back in England who fought in European wars. It made them maintain a high standard in the forces.
4. **Remunerations:** Regular salaries were given to the soldiers and **they were paid a little extra if they were stationed outside** their presidency. Also, **extra payment was made after victories** in battle as well as a small slice of the taxes the company imposed on merchants who supplied the army.
   - In princely states, payments were less and sometimes because of economic hardships in the states, **payments were not made** to the troops thus demotivating soldiers to fight for the territory.
5. **Loyalty:** EIC forces used to have **British, Sikhs, and Gurkhas from Nepal who were loyal to the company** and fought wars to serve their master. In the princely states, loyalty was missing due to weak leadership or discriminatory attitude based on the castes, region, or religion within the armies.
6. **Type of weaponry:** The troops of Indian rulers were armed but their weaponry was outdated while **EIC armies used modern guns and ammunition** which were more destructive than the weapons of Indian rulers. Eg: Flintlock rifles, the EIC introduced its own pattern musket in 1764.
7. **Good Leaders:** The ECI armies were **led by some of the best military minds** of the time like Clive, Hastings, Cornwallis, etc. While the Indian side also had good leaders like Haider, Tipu, etc they **lacked a good string of secondary leaders** like ECI armies.

The lack of unity among the soldiers of the armies of Indian states and the lack of any incentive to the troops worked as a challenge to their efficient working which led to the winning of various battles by the East India Company.

3. Why was there a sudden spurt in famines in colonial India since the mid-eighteenth century? Give reasons. (Answer in 150 words) 10 Marks

With the arrival of the 18th century, India witnessed famines like that of the Great Bengal famine of 1770, the Chalisa famine of 1783–1784, Doji Bara famine of 1791–1792 which cost India millions of lives and resources. Natural calamities like famines used to occur previously also but since the mid-18th century, their implications multiplied majorly because of mismanagement and the state's apathy.

REASONS FOR THE SUDDEN SPURT IN FAMINES IN 18TH-CENTURY COLONIAL INDIA

1. **Change in cropping pattern:** Farmers were **forced to grow commercial crops** like indigo and cotton instead of food crops for years which distressed Indian agriculture.
2. **Failure of monsoon:** Crop **failure due to the El-Nino** event lasting from 1789–1795 and prolonged droughts caused high hunger and poverty leading to numerous deaths.
3. **Economic exploitation by the British:** The **drain of Indian wealth by the British** made India scrapped off of her resources which would have been helpful during times of famines. Eg: The East India Company increased tax collection to address the shortage of trained administrators during the late 1770s.

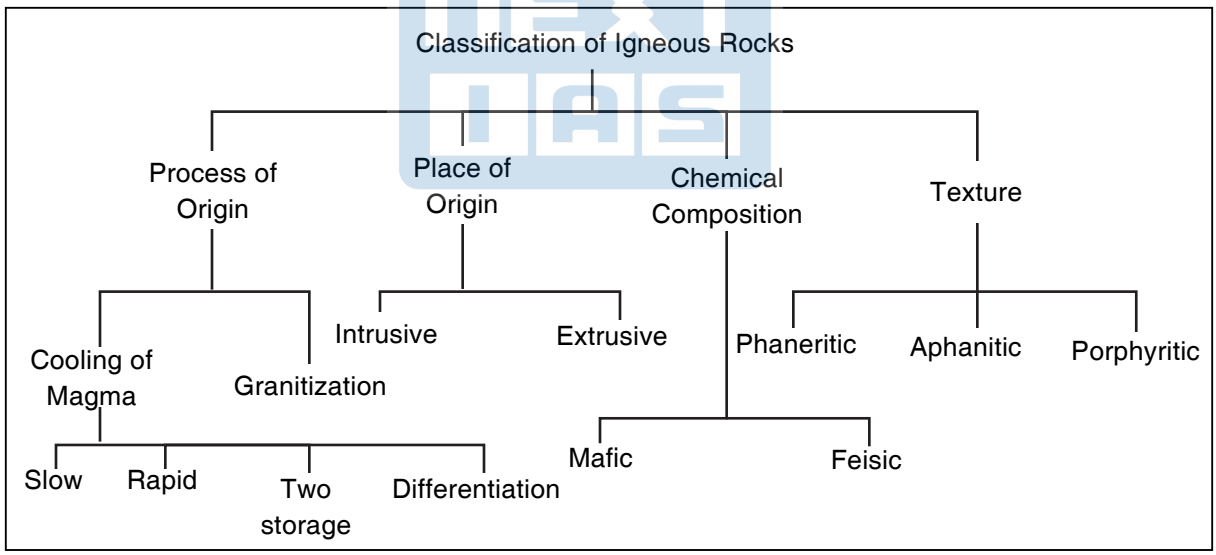
4. **State's inaction:** The government was **apathetic towards the miserable conditions of the population** and didn't try to take any significant action to address the effects of famines. Mismanagement by the British had a multiplier effect on famine.
   - **Eg:** The East India Company purchased a large portion of rice for its army which led to a shortage of rice by the end of 1769 rice prices had risen two-fold, and in 1770 they rose a further three-fold.
5. **Poverty:** The condition in the majority of Indian princely states and British occupancies was that of poverty. Already **poor, people were not able to buy even essential medicines and food** for themselves.
6. **Outbreak of diseases: Epidemics** acted as catalysts in the occurrence of famines and deteriorated the situation manifold. Eg: ***The smallpox epidemic during the Bengal famine.***
7. **Inadequate health facilities:** The health facilities were **not adequate to treat the persons** infected with epidemics of diseases, which accelerated the spread of famines.

India kept on facing many famines till the late years of British rule but the British attitude towards the miseries did not change over the years. They even conducted the Delhi Durbar during the famine of the late 19th century, showing the administrative apathy of the British Raj.

4. Describe the characteristics and types of primary rocks. (Answer in 150 words) 10 Marks.

Primary rocks are rocks whose particles or grains are formed for the first time by the cooling and solidification of the molten magma. These are also called Igneous rocks. These are the first ones to appear in the earth's crust during rock formation and initiate the rock cycle, that is why they are called primary rocks.

TYPES OF PRIMARY ROCKS



1. **Based on Origin:** Based on the type of origin primary rocks can be of two types: One formed through the **Solidification of magma** and the other through **Granitization**.
2. **Based on place of origin:** When these are formed inside of the earth, they are called **intrusive**, or **plutonic** igneous rocks. Eg: Granite.
   - **When this molten lava comes to the earth's surface, it rapidly cools down and becomes solid. Rocks formed in such a way on the crust are called extrusive igneous rocks. Eg:** Basalt.
3. **Based on Chemical composition:** Based on chemical composition they are categorized into **Mafic and Felsic** rocks,
4. **Based on Texture:** They are divided into **Phaneritic**, **Aphanitic,** and **Porphyritic** based on their texture.

CHARACTERISTICS OF THE PRIMARY ROCKS

1. **No fossils:** They are of **volcanic origin and no life exists** in the magma region so these are devoid of any fossils.
2. **Texture:** Their structure is hard and depending on the location of their formation they can be of **fine or coarse texture.**
   - In **intrusive rocks,** they have a coarse texture with large mineral grains, indicating that they spent thousands or millions of years cooling down inside the earth, a time course that allowed large mineral crystals to grow.
   - **They can also have a vesicular, or "holey" texture. This happens when the ejected magma still has gasses inside of it so when it cools, the gas bubbles are trapped and end up giving the rock a bubbly texture. *Eg: pumice rocks***
3. **Size:** The exposed intrusive rocks are found in a **variety of sizes,** from small vein-like injections to massive dome-shaped batholiths, which extend for more than 100 square km and make up the cores of the great mountain ranges. Eg: ***The Deccan plateau is made up of basalt rocks.***
4. **Silicates and ferromagnesian minerals** are their most important components.
5. **They may have layers of lava. *Eg: sills and dykes.***

These rocks further go through the processes of erosion, denudation, and sedimentation and change into sedimentary and metamorphic rocks. Thus, these rocks provide the base for many other rocky structures on the Earth.

5. Discuss the meaning of color-coded weather warnings for cyclone prone areas given by the India Meteorological Department. (Answer in 150 words) 10 Marks.

The color-coded weather warnings for cyclone-prone areas are given by India Meteorological Department(IMD) to the states to provide information to the authorities and people to stay prepared for the upcoming cyclone as per the severity of the cyclone.

COLOUR-CODED WEATHER WARNINGS FOR CYCLONE PRONE AREAS

The Meteorological Department has four color-coded warnings that flash depending on how intense or violent a weather system is at a given point in time. The four colors are green, yellow, orange, and red.

COLOUR	STAGE OF WARNING
Green	No warning
Yellow	Be updated
Orange/Amber	Be prepared
Red	Take action

1. **Green:** Green signal means **no warning** as such. No advisory is issued in such cases..
2. **Yellow:** The yellow color code asks the guards to "**be updated**" to handle the bad weather that can last for days, with a warning of affecting daily activities.
3. **Orange/Amber:** The alert for color code orange indicates to "**be prepared**". It can be a warning of extreme damage to communication disruptions that can lead to power cuts, and road, and railway blockages. The orange alert is also a sign of evacuation and keeping the basic necessities ready for families.
4. **Red:** The red color is the highest level of warning that notifies the authorities to "**take action**". This is a case in which there is a threat to life with the worst weather conditions. In this case, all the measures are taken to handle the situation along with the help of disaster management response teams.

India is the 7th most vulnerable country in the world to various disasters(Global Risk Report), the Early Warning System forms an important part of its disaster management strategy. With prompt information sharing and timely action taking, the disastrous effects of cyclones can be minimized and lives can be saved.

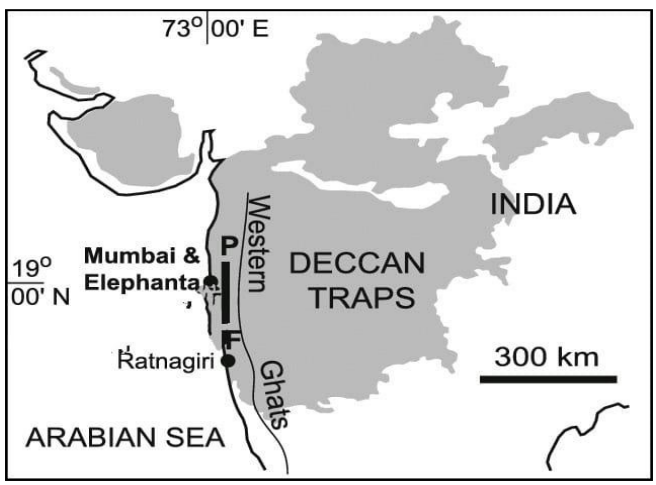
VALUE ADDITION

OTHER WARNINGS ISSUED IN THE ADVENT OF CYCLONE

1. During disturbed weather over the Bay of Bengal and Arabian Sea, the ports likely to be affected are warned by concerned Area Cyclone Warning Centres (ACWCs) by advising the port authorities through port warnings to hoist appropriate Storm Warning Signals.
2. The Department issues "Fleet Forecast " for the Indian Navy, Coastal Bulletins for Indian coastal areas covering up to 75 km from the coastline, and Sea Area Bulletins for the sea areas beyond 75 km.
3. special warnings are issued for fishermen four times a day in normal weather and every three hours in accordance with the four-stage warning in case of disturbed weather.
4. IMD also issues a 4 stage warning to state officials with regard to any cyclonic activity in the north Indian Ocean. These 4 stages are:
   - "PRE CYCLONE WATCH" issued 72 hours in advance contains an early warning about the development of a cyclonic disturbance in the north Indian Ocean.
   - "CYCLONE ALERT" is issued at least 48 hrs. in advance of the expected commencement of adverse weather over the coastal areas. It contains information on the location and intensity of the storm, the likely direction of its movement, intensification, and coastal districts likely to experience adverse weather.
   - "CYCLONE WARNING" issued at least 24 hours in advance of the expected commencement of adverse weather over the coastal areas. The landfall point is forecast at this stage.
   - "POST LANDFALL OUTLOOK" is issued at least 12 hours in advance of the expected time of landfall. It gives the likely direction of movement of the cyclone after its landfall and adverse weather likely to be experienced in the interior areas.

6. Discuss the natural resource potentials of the 'Deccan trap'. (Answer in 150 words) 10 Marks

The Deccan Traps is the area of the peninsular plateau characterized by a larger flood basalt province. The volcanic eruptions that occurred in these areas played a role in the Cretaceous-Paleogene extinction event. It consists of congealed lava flows covering an area of 400,000 square kilometers, with a thickness estimated at above 3000m. It covers the states of Maharashtra, Goa, and Gujarat and to some extent in Madhya Pradesh and southern Rajasthan.



NATURAL RESOURCE POTENTIAL OF DECCAN TRAP

1. **Oil Deposits:** Deccan Trap is stated to have massive oil deposits, estimated at **around 30 billion tonnes**, exploration of which can make India a leading country in oil production. It can increase the export potential of India.
2. **Building material:** The rocks of the Deccan Traps are **hard, dense, and durable**, hence, they are extensively used as road metals and building material. The monumental site "Gateway of India" which is located in Mumbai is built by using these rocks.
3. **Fertile soil:** Black soil, also known as regur, **formed due to the weathering of the traps**, is highly suitable for the cultivation of cotton. It makes the area highly fertile for cotton production.
4. **Iron ore:** Some of the **districts of Maharashtra and Goa** are replete with the presence of iron ore mines.
5. **Bauxite deposits:** The weathering of the Deccan Traps formed many workable deposits of high-grade bauxite, which is an ore of Aluminium ore. These deposits occur in **Jabalpur, Katni, Mandla, Belgaum, Kolhapur, and Gujarat**. India can become a leading producer of Aluminium in the world with the extraction of more Bauxite ore.
6. **Precious stones:** Many semi-precious stones such as **agate, chalcedony, amethyst,** etc. are found in the rocks of the Deccan trap.
7. **Waterways:** This area has many river basins like those of Bhima, Godavari, Krishna, etc. which makes the area important for **the development of inland waterways.**
8. **Biodiversity hotspot:** These areas including the Western Ghats have rich biodiversity having a variety of flora and fauna. This has led to the development of tourist hotspots in the area like **Mahabaleshwar, Pachmarhi, etc.**

India is home to numerous geomorphological structures which make her rich with resources having the potential to make India a leading country in the world by catalyzing its economic development.

7. Examine the potential of wind energy in India and explain the reasons for their limited spatial spread. (Answer in 150 words) 10 Marks.

India stands 4th globally in Wind Power capacity. The estimated potential of wind energy in India is 302 GW(IWEA). However, the actual installed capacity is much lower, at around 41 GW as of 2022.

POTENTIAL OF WIND ENERGY IN INDIA

1. **Long coastline:** India is blessed with a coastline of about 7600 km and has good prospects of **harnessing offshore wind energy.**
2. **Commercially exploitable potential:** The commercially exploitable potential of wind energy in India is estimated to be more than 200 gigawatts (GW). But as of 2022, **the total installed capacity of wind power was 41 GW,** i.e., about 20% of the commercially exploitable potential.
3. **States potential:** The wind energy potential of India is huge in eight states which include **Andhra Pradesh, Gujarat, Karnataka, and Madhya Pradesh.** More onshore and offshore wind turbines with technological advancements can be installed here to utilize the full potential of wind energy in India.
4. **Wind-solar hybrid projects:** Wind-solar hybrid projects with a capacity of **4,250 megawatts (MW**) have been awarded, of which 201 MW have been commissioned as of February 2022.
5. **Low import dependence:** Our import dependence is quite low as compared to solar energy equipment. So the **domestic industries have a high potential to be a manufacturing hub** for wind energy equipment.

VARIOUS REASONS ARE LIMITING ITS SPATIAL SPREAD

1. **Different wind speeds:** Unavailability of optimum wind velocity to generate energy. The **best wind resources are found in the western and southern coastal regions**, while the northern and eastern regions have lower wind speeds.
2. **Priority to Solar Energy:** From March 2014 to May 2022, the **installed capacity of wind power has increased** by 93% as compared to a 2064% increase in solar power.
3. **Obsolete technology:** The usage of **old parts and obsolete technology** in the wind turbines in the majority of the projects gives very little output, thus the field becoming unattractive for other regions to follow.
4. **Infrastructural bottlenecks:** The **lack of infrastructure** such as transmission lines, to connect wind farms to the grid makes it difficult to transport the electricity generated by wind farms.
5. **Shift in tariff system:** Shift in tariff system from feed-in-tariff (guaranteed above-market price for producers) to **tariff determination by competitive bidding** disincentives private players to invest in wind energy.
6. **Faulty bidding system:** Under the current bidding mechanism, **projects are awarded to large independent power producers**/developers. These developers resort to aggressive bidding, decreasing prices to unsustainable levels, and eventually back out of the project.

The huge untapped potential of the wind energy sector in India can be utilized by replacing old and less efficient turbines with advanced turbines and giving incentives to the developers to establish more wind turbines especially offshore. Government initiatives like the "National offshore wind energy policy", 2015 are needed for the development and spread of Wind Energy in India.

8. Explore and evaluate the impact of 'Work From Home' on family relationships.

(Answer in 150 words) 10 Marks.

With the contemporary gig economy, the concept of Work From Home (WFH) has taken center stage, especially during COVID-19 times in various industries, making significant impacts not just on the work culture and employee-employer relations but also on family relationships.

IMPACT ON FAMILY RELATIONSHIPS

1. POSITIVE IMPACTS

1. **Spending more time with family members improved family relationships. Eg:** Spending time with children.
2. Problem of commuting from far away places is addressed which has **enhanced safety and security concerns related to traveling**.
3. **Opportunities** from well-established companies for working from home have increased the income prospects of families.
4. Online skilling and academic courses are provided which has **increased the employability** of individuals thus enhancing the confidence of the individual and hence cordial relations in the family.
5. **Care work of the old aged and children** is handled properly with work from home which strengthens the family bond.
6. The **household chores are shared** between spouses thus relieving women from the dual burden of office and household work.

2. NEGATIVE IMPACTS

1. **Second shift:** It has put a **double burden on the females** as they are doing housework and office work both in the same stretch of hours. It has caused situations of stress for females.

2. **Too close/Breach of privacy:** Families are living in closed spaces now with **less escape out from stressful relations**. It has a negative impact on husband-wife relations and also between parents and children.
3. **Masculine environment:** It is supposed to make male members cooperate in the household work but most of the time **males don't help females with housework** which increases the burden on females and creates friction in the relations.
4. **Shadow pandemic:** Due to stressful work conditions and no work-life balance, **cases of domestic violence are increasing**, where women are often at receiving ends. According to official data, the National Commission for Women (NCW) registered an increase of at least 2.5 times in domestic violence complaints during the nationwide lockdown.
5. **Continuous work:** While the working hours of the office are limited, WFH created a situation of **working throughout the day** because of unscheduled video calls and Zoom meets, etc. creating more stress and reducing the quality time spent with family despite being at home.

Family relationships have a critical impact on well-being and mental health. Strong family relationships provide crucial social support that could mitigate psychological problems including anxiety and loneliness. Working from home has benefitted a large population during stressful Covid times, but only with emotional conditioning and an understanding of its ill effects can it be converted into a highly positive opportunity.

9. How is the growth of Tier 2 cities related to the rise of a new middle class with an emphasis on the culture of consumption? (Answer in 150 words) 10 Marks.

According to the government, cities with a population in the range of 50,000 to 100,000 are classified as tier 2 cities. In India, examples of tier-2 cities are Ayodhya, Kurnool, Indore, etc. These are also the cities that can become tier 1 cities in the near future. The underlying reason for the growth of these cities is often attributed to the culture of consumerism adopted by the rising and aspiring middle class.

GROWTH OF TIER 2 CITIES AND MIDDLE CLASS WITH EMPHASIS ON CONSUMPTION

1. **Increasing salaries:** With the development and increased job opportunities in tier 2 cities, the **salaries of individuals are increasing**, creating an increased demand for goods and services of not just essential goods but goods generally considered as a luxury. The **attitude has shifted from reusing items to buying new products** creating demand.
2. **Expansion of markets:** Markets are now shifting from providing goods and services which are **considered necessities** to providing goods and services which are **addressing pleasure and mental peace**. Eg: Zumba classeand s, yoga centers.
3. **Mall culture:** In small cities also, malls are blooming up **delivering various products** under one roof. There are cinema halls and cafes/restaurants also set up in the malls which ultimately leads to people buying complementary goods.
4. **E-marketplaces:** The **comfort of shopping while sitting at home** is enjoyed by the individuals while surfing online marketplaces like Amazon, Meesho, etc. This has made these cities important markets for big companies, which in turn is helping the growth of these cities.
5. **Change in eating habits:** With the availability of **processed food and fast food items** and changed job pattern, people are spending much on dining outside and canned food.
6. **Digital literacy increasing:** The digital literacy and social media impacts are spreading in tier 2 cities also at a fast pace which has **made people more aware** and they have started making better choices related to clothes, vehicles , etc.. This has created a demand for expensive products also in the tier 2 cities.

However, the rise of the middle class and its emphasis on consumption is not the only factor that is fuelling the growth of tier 2 cities. **There are other related factors also:**

1. **Push Factors:** The industries are expanding in these cities from the metro cities due to:
   - Lack of space in metros
   - High rent in tier 1 cities
   - Pollution, traffic jams, etc.
2. **Pull factors:**
   - Conducive environment for new businesses
   - Job opportunities for rural youth
   - Availability of land, cheap labor, etc.

With increasing urbanization in tier 2 cities, problems associated with urbanization like slums, ghettos, infrastructural constraints due to rapid expansion of population, and inequality in access to amenities and housing, also increase. Lessons learned so far with respect to dealing with these problems in tier 1 cities must be put to use to ensure that rapidly growing tier 2 cities of India do not face these issues.

10. Given the diversities among the tribal communities in India, in which specific contexts should they be considered as a single category? (Answer in 150 words) 10 Marks.

As per the Census 2011, the tribal population constitutes about 8.9% of the total population. The tribal population is spread throughout the country with areas of concentration in central and North-Eastern India and hilly areas of Southern India and both major Island regions. The tribal population in India is very diverse with rich traditions, cultures, and unique lifestyles thus making it very difficult for Anthropologists and policymakers to classify them on any basis of any single category.

DIVERSITIES AMONG THE TRIBAL COMMUNITIES IN INDIA

1. **State-specific:** Diversity in tribes that occupy various States/UTs is i**nfluenced by local geographical and political situations** in the state.
2. **Liking for customs/traditions:** Local Customs and traditions vary significantly across India. **Traditions of one tribe may be disliked by the other.**
3. **Economic Stratification:** An influential class of Tribes has emerged owing to **affirmative actions by the State.** Eg: Meena Tribe. But some are still living in premodern/nomadic lives. Eg: Sentinelese in Andaman.
4. **Religiosity:** There is **no uniformity in religious beliefs**. Some tribes revere Hindu Gods, some Jesus Christ, some Prophet Muhammad.
5. **Racial diversity:** Tribes of Ladakh(Dard Aryans), North East(Mizos), Central India(Mundas), and South India(Irula) belong to **different racial groups.**

CONTEXTS IN WHICH TRIBES SHOULD BE CONSIDERED AS A SINGLE CATEGORY

1. **Backwardness:** They should be **considered as a single category** when addressing issues related to their overall socio-economic and political development because regardless of their diversity tribes in India are still relatively backward in these aspects.
2. **Attachment to their customs:** Irrespective of their different customs one thread that runs across various tribes is **their love for their unique cultures.**
3. **Isolated community:** Almost all of the tribes are **detached from mainstream Indian societ**y with respect to language, education levels, job opportunities, and social status. They believe in simplicity and avoid entering the complexities of the mainstream populations.
4. **Endogamy:** Tribes continue **marriages among their own communities** in order to ensure the passage of their lifestyles and cultures without any hindrance.
5. **Health and Wellness:** Tribes across the country practice their **traditional medicine system** based on locally available herbs.
6. **Forest and Agriculture dependent livelihood:** Tribes still have **faith in the primitive style of agriculture** which utilizes nature-based solutions. Eg. Income from selling Tendu Leaves and Bamboo drip irrigation system of Meghalaya hills.

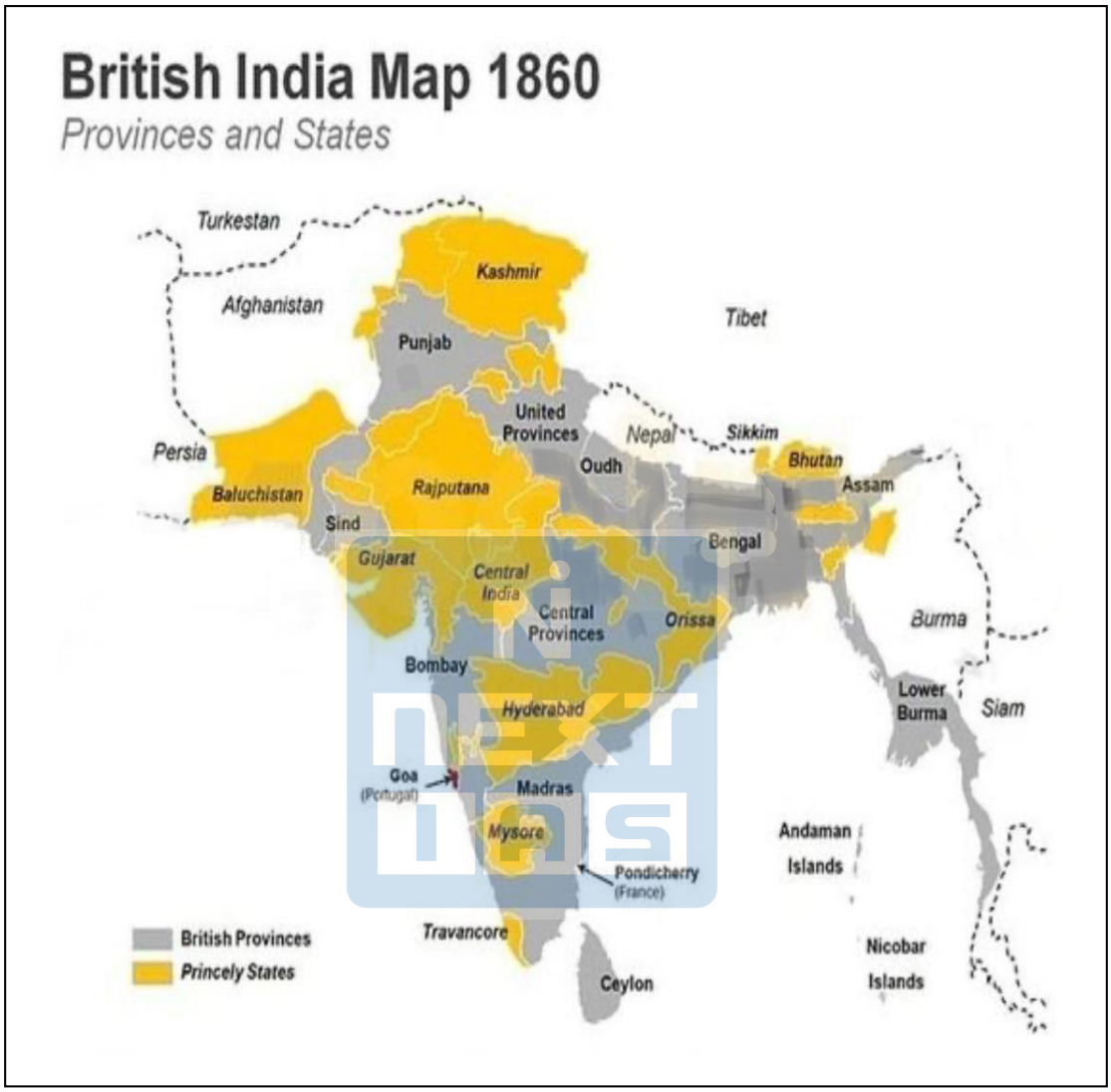
With a rich diversity in tribal traditions in India, the diversity in tribal cultures should be seen as the key to making India a 'knowledge superpower' as highlighted by President Droupadi Murmu. Efforts like the establishment of more Ekalavya Model schools, giving more autonomy under Schedule 5 and 6, revamping self-governance institutions in these areas under PESA, focus on health and nutrition mainly among females and girls, must be taken so that gradually they should be made to come out of the tag of "most backward and marginalized community of India."

11. The political and administrative reorganization of states and territories has been a continuous ongoing process since the mid-nineteenth century. Discuss with examples. (Answer in 250 words) 15 Marks.

The current organization of the Indian Union is partly a byproduct of the historical process of the unification of former Indian States, and partially a result of the conditions surrounding the expansion of British power in India. The map of the territories that the British seized and directly ruled was also not created via any kind of logical or scientific design, but rather by the military, political, or administrative needs or conveniences of the time.

REORGANIZATION OF STATES AND TERRITORIES: A ONGOING PROCESS

Phase-I: 1850 to 1947



1. **India's political map was reorganized following British occupation.** Boundaries were adjusted after local monarchs and rulers were vanquished (Battle of Plassey and Buxar).
2. The company rapidly **gained control over vast portions of India,** known as "presidencies". Examples include Calcutta Presidency, Madras, and Bombay.
3. The **Act of 1854,** which established the administration of British India through the usage of provinces and districts, and the Act of 1861, which created the Provincial Councils to oversee the provinces, were put into effect by the British government.
4. Due to these initiatives, **India's states were politically reorganized** and new provinces were established, including Bengal and Bombay.
5. During the **rebellion of 1857,** the British government sped up the continuing process of political and administrative reorganization.
6. The northwestern districts of the Punjab Province were combined to form the **North-West Frontier Province** in 1901.
7. Bengal was divided in 1905 based on language and religion pursuant toits policy of '**divide and rule**'.

B. Phase II: 1947- 2022

1. **The Indian Constitution originally divided the states of the Indian Union into four categories based on their political and administrative systems: Part A, Part B, Part C, and Part D States.**
2. In 1874, during the time of British Control, some regions were established as **"scheduled districts" of regions**. They were referred to as provinces of chief commissioners. Finally, they were classified as Part "C" States and Part "D" Territories.
3. The **States Reorganisation Commission (SRC)**, headed by Fazal Ali, was established in 1953 to make recommendations regarding the redrawing of state boundaries in the backdrop demand for linguistic states.
4. The **States Reorganisation Act and the Seventh Amendment to the Constitution Act of 1956**, established the two categories of units—States and Union Territories. Consequently, states were created on the basis of a language like Andhra Pradesh (1953), Maharashtra, and Gujarat in 1960.
5. Goa, Daman, Diu, Dadra Nagar Haveli, and Puducherry were among the areas acquired from the **Portuguese** and included in the Union Territories in 1961 (Goa was given statehood later in 1987).
6. **Regional divisions and political regions** from inside the existing States of Madhya Pradesh, Bihar, and Uttar Pradesh, respectively, allowed for the establishment of Chhattisgarh, Jharkhand, and Uttarakhand.

7. In 2014, **Andhra Pradesh Reorganisation Act 2014** was passed that carved Telangana State out of Andhra Pradesh.
8. The **State of Jammu and Kashmir was reorganized in 2019** for administrative and security reasons by making Jammu and Kashmir a Union Territory with a legislative assembly and by separating Ladhak from J & K and making it an independent Union Territory.

From the middle of the nineteenth century until 1947, India's states and territories have undergone constant political and administrative reform. Many variables, including British control, the independence movement, post-independence policies and reforms, continued calls for additional states and administrative changes, constitutional provisions, and Supreme Court rulings, have had an impact on this process.

12. Discuss the main contributions of the Gupta period and Chola period to Indian heritage and culture . (Answer in 250 words) 15 Marks.

Gupta Period, also called "The Golden Period in Indian history", was attributed to the Gupta dynasty established by Chandragupta I in the 3rd Century AD in North India. The Chola empire, a Tamil thalassocratic empire, was established in South India by Vijayalaya in the 9th century. Both Gupta and Chola periods have contributed to Indian heritage and culture in various ways.

CONTRIBUTION OF GUPTA PERIOD (300-600 AD)

1. **The Nagara style of temple architecture:** It emerged during the **Gupta dynasty,** distinguished by a **curved spire and a mandapa (hall)**. The **temple at Deogarh** near Jhansi and the **sculptures in the temple near Allahabad** remain important specimens of Gupta art.
2. **Sculptures:** Sculptures of **stone and metal,** rose to new heights throughout this period. During this period a new school of sculpture emerged in and around Sarnath which was characterized by the use of metal and cream color sandstone. Ex: ***Sarnath Buddha, a sculpture of the Buddha teaching the Dharma***, was made during this time.
3. **Mural Paintings:** Art, particularly murals, thrived throughout this period as well. Eg: ***Ajanta Caves feature murals*** representing the Buddha's life and jataka stories.
4. **Coinage:** The **Gupta coinage** was also noteworthy. Samudragupta issued eight different kinds of gold coins.
5. **Metallurgy:** It advanced dramatically during the Gupta era. **The Delhi Iron Pillar from the Gupta period is still rust-free.**
6. **Literature:** The **Mahabharata and the Ramayana, two of the greatest epics in Indian literature,** were written during the Gupta period. The Sanskrit language rose to prominence. Many works in classical Sanskrit were written in the form of epics, lyrics, drama, and prose. The Gupta period produced the best Sanskrit literature. Eg: ***Kalidasa's Abhijnana Shakuntalam.***
7. **Scientific progress:** During the Gupta period, s**cientific treatises in subjects like mathematics, astronomy, and medicine were also developed.** During this period, the Sushruta Samhita, a book on medicine and surgery, was composed and the establishment of the decimal system and the idea of zero was also propounded.

CONTRIBUTION OF CHOLA PERIOD (900-1300 AD)

1. **Temple architecture:** The Chola period was known for its magnificent temple architecture of **Dravidian style** which was distinguished by the **use of granite and the gopuram (**tower). Eg: ***The Brihadeshwara Temple in Thanjavur.***
2. **Bronze sculptures:** Sculpture development in bronze made from **lost wax techniques** were initiated. Eg: ***Bronze Nataraja of the Chola period***, which indicates the sound of creation, destruction, benediction, and path of salvation.

3. **Paintings:** A great example is the artwork found in the temples of the **Kailasanathar temple** in Kanchipuram.
4. **Tamil literature:** The Chola period saw the **development of Tamil literature**, with the composition of Tamil literature, a collection of poems and hymns. Kalladanar, Kambar, and Pugalandhi were some of the prominent Tamil poets of that time.
5. **Art:** The Cholas were also patrons of the arts and supported the development of **classical music and dance.** Nathamuni and Nambiandar made contributions to the growth of music.
6. **Trade relations:** The Cholas developed a **strong navy and increased trade** with the Middle East and Southeast Asian nations. The Cholas built the Tondi port and conducted business with nations like China, Indonesia, and Malaysia.
7. **System of local governance:** The Chola period also had an elaborate system of **local government- the Kudavolai system**.

Both dynasties' significant contributions have shaped India's culture and heritage into a rich and prosperous one, with Gupta's cave still in good condition after 1500 years and Chola's Nataraja sculpture being worshipped at various temples throughout modern India.

13. Discuss the significance of the lion and bull figures in Indian mythology, art, and architecture.
(Answer in 250 words) 15 Marks.

Human-animal relationships can be traced back to paintings from the Upper Paleolithic period, approximately 12,000 years ago. "Lion" and "Bull" are two important animals that have played important roles in human history and carry huge significance culturally in India. From the Stone Age to Modern India, traces of their presence have been discovered in various aspects, especially in mythology, art, and architecture.

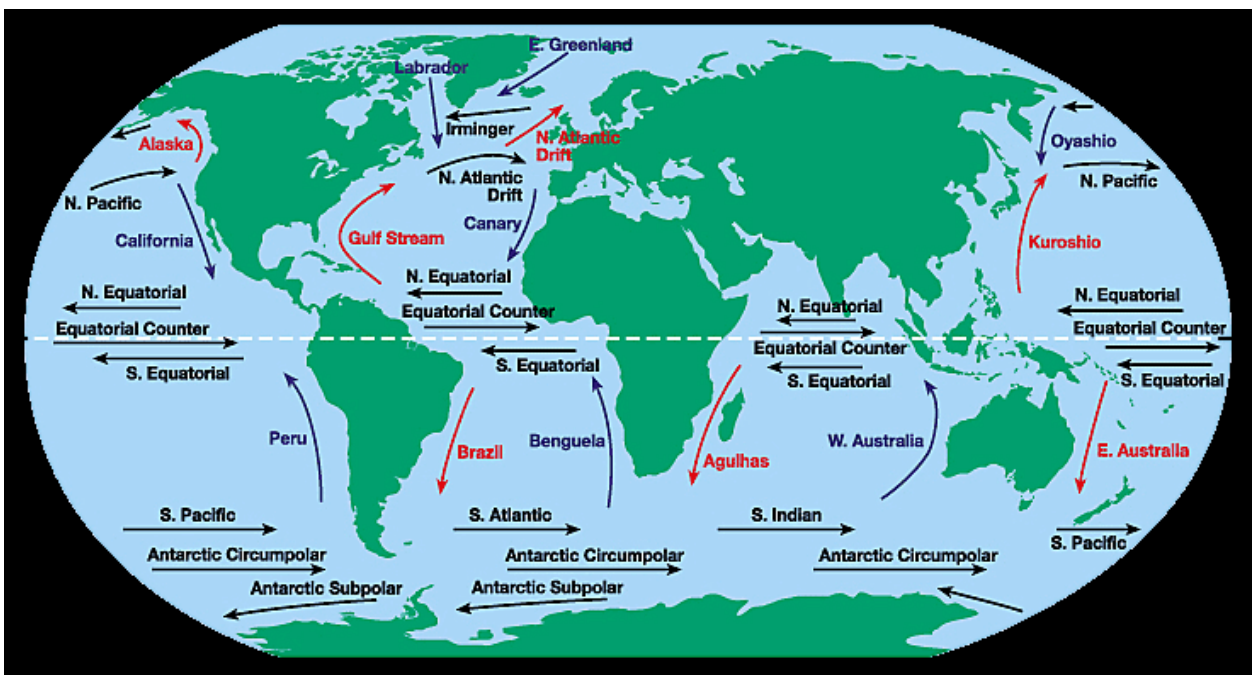
Significance of Bull in Indian Mythology	Significance of Bull in Indian Art and Architecture
The bull was widely used as a **fertility and strength symbol** in India as early as the Indus Valley Civilization (around 2000 BC), as well as in ancient Egypt, Greece, and the Near East. The bull is also a **symbol of Adinatha**, the First Jain Tirthankara. Bull is associated with the **Janma (Birth) in Buddhism.** Nandi, or Nandikeshwara which means "giving delight" or "giving joy," is the Hindu god Shiva's sacred bull.	Bhimbetka prehistoric rock shelters feature a painted bull. Prehistoric men capturing and attempting to tame bulls have been depicted in **rock art discoveries in Tamil Nadu**. Several **steatite seals and sealings** with bull figures have been discovered in the Indus Valley. The bull was depicted on **silver punch-marked coins,** copper cast coins of Kushana emperors, and Skandagupta's coins. Bull appears in many **Indian historical emblems**, including Rashtrakuta and Pallavas. Bull is also one of the prominent capitals of Mauryan Pillars. **Rampurva Bull.**

Significance of Lion in Indian Mythology	Significance of Lion in Art and Architecture
The lion is **Goddess Durga's vahana.** The animal also represents her power. **One of God Vishnu's Avatar** Narasimha is a blend of human and lion. Lions appear in Buddhist symbolism as well. **Lions represent the Bodhisattvas** in Buddhism. **Yali is a Hindu mythological** creature with a lion's head and body. **The Mauryan Pillar**: The lions represent "the power of a universal emperor (Chakravarti) who dedicated all his resources to the victory of dharma."	Lions have been widely used in sculpture to c**onvey majesty and awe**, particularly in public buildings. The n**ational anthem of India** is an adaptation of Ashoka's Sarnath Lion Capital. Throughout Indian history, it has been used in painting. **Western Chalukyas** used lions on their coins. Lions have been discovered as the **crowning animal of Mauryan pillars** in a variety of locations. Such as the Lion **Capital of Bakhira**, Lauriya Nandangarh, Rampurva and Sarnath. In addition, the **Allahabad pillar** was topped by a lion.

Animals play a significant role in Hindu, Jain, and Buddhist mythology. As a result, the worth of animals and birds transcends their natural existence and is reflected in architecture and the arts. From their origins in ancient India to their significance as the country's national symbol, the lion and bull have witnessed various stages of development and change in India.

14. What are the forces that influence ocean currents? Describe their role in the fishing industry of the world. (Answer in 250 words) 15 Marks.

Ocean currents are the continuous, predictable, directional movement of seawater driven by gravity, wind (Coriolis Effect), and water density. This abiotic system is responsible for the transfer of heat, variations in biodiversity, and Earth's climate system.



FORCES INFLUENCING OCEAN CURRENTS

Ocean currents are influenced by two types of forces i.e. Primary Force, which initiates the movement of water while the secondary force influences the flow of current.

A. PRIMARY FORCES

1. **Planetary or prevailing winds:** Due to friction between the wind and the water, **water that is on the surface moves in the direction of prevailing wind**s. For instance, under the influence of the North East and South West trade winds, equatorial currents move westward.
2. **Coriolis Force:** In the Northern Hemisphere, the Coriolis effect causes **surface currents to shift to the right and move in the clockwise direction,** and in the Southern Hemisphere, to the left and counterclockwise. Circular patterns(Gyres) are created by this phenomenon in the currents.
3. **Gravity:** When the wind blows over ocean water, the water piles up in the direction of the wind. Gravity, therefore, **pulls the water down the 'hill' against the pressure gradient**.
4. **Temperature:** Solar **heating causes water to expand,** which is more in the equatorial regions Therefore, the water around the equator is roughly 8 cm higher than in middle latitudes. It causes a slight slope in the water and it flows down the slopes.
5. **Density:** The **greater the density differences** between different layers in the water column, **the greater the mixing and circulation.** Density differences in ocean water contribute to a global-scale circulation system, also called the global conveyor belt.
6. **Salinity:** Less salinized water travels in a surface current towards more salinized water, while **denser water sinks and moves as a subsurface current**. Eg: The Gibraltar Strait current that travels from the Atlantic Ocean to the Mediterranean Sea is a result of the salinity difference.

B. SECONDARY FORCES

1. **Physiography:** The direction of ocean currents changes as a result of **interactions with physiographic features.** Eg: The South Equatorial Current gets bifurcated due to South Amerlandmass. Some of it travels north and the remaining travels as a Brazil current.
2. **Underwater earthquakes:** They can **trigger ocean currents, moving masses of water inland**. Earthquakes can also trigger downslope movements of water-saturated sediments, resulting in strong turbidity currents.

ROLE OF OCEAN CURRENTS IN THE FISHING INDUSTRY

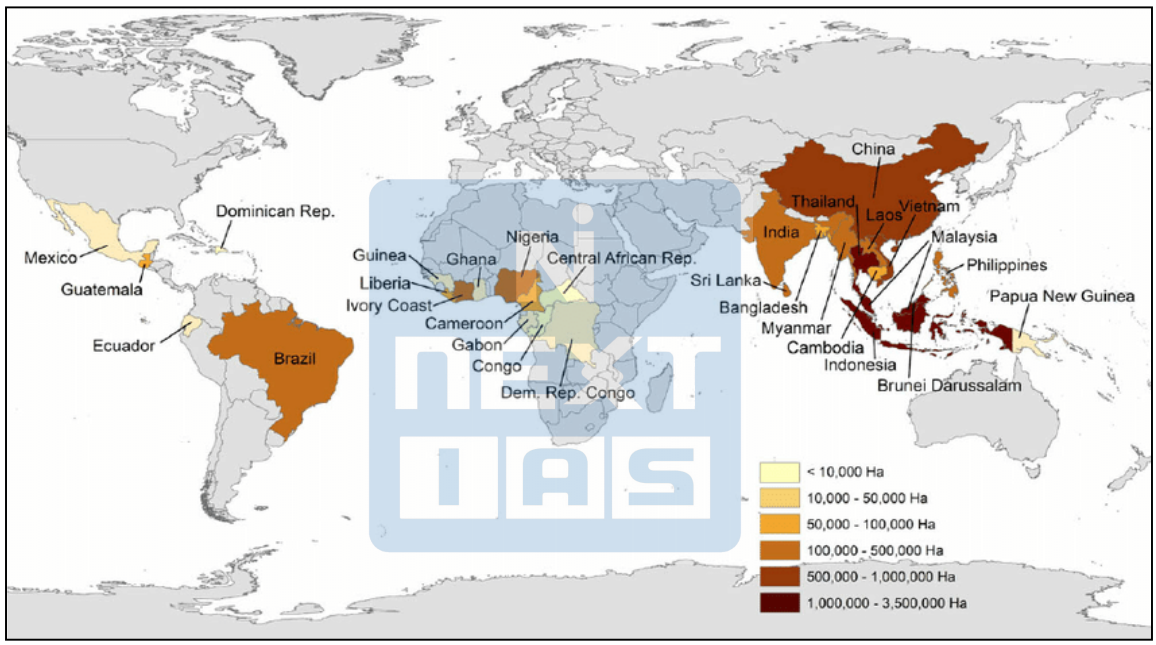
1. **Sustains sea life:** Ocean currents **carry nutrients and food** to organisms that live permanently attached in one place, and carry reproductive cells and ocean life to new places. Eg: Upwelling along the coast of Chile brings nutrients from the depth of the sea.
2. **Dispersal of life forms:** Ocean currents are also important as they **disperse many life forms.** For instance, the lifecycle of the European Eel is highly sustained and influenced by ocean currents.
3. **Plankton Movement:** Cold ocean currents moving from the polar and subpolar areas bring in a **large amount of plankton,** which is critical to the survival of numerous essential sea creature species in marine ecosystems.
4. **Formation of Fishing Zones:** The world's greatest fishing grounds are located where **cold and warm currents converge.** Eg: Newfoundland.
5. **Ecological Balance:** Ocean currents maintain ecological balance by **moving water to places with less oceanic current** and a low fish population in order to keep oxygen levels and fish populations in the deficit area stable. Examples include the Sargasso Sea and the Dead Zone.
6. **Vital for ports in the polar regions:** Warm ocean currents are responsible for **keeping the ports in polar regions operational by keeping them ice-free.** Ex: The North Atlantic Drift, keeps most of the European ports ice-free and operational, aiding the fishing industry in countries like Norway.

Ocean currents are complex and dynamic systems critical to the worldwide fishing industry, influencing the distribution and abundance of marine life and having economic consequences for fishermen and the seafood sector. Knowing and predicting ocean current movements may help to enhance the sustainability and resilience of the fishing industry, as well as promote marine ecosystem protection.

15. Describing the distribution of rubber producing countries, indicate the major environmental issues faced by them. (Answer in 250 words) 15 Marks.

Rubber is an important industrial raw material. It is an equatorial crop, but under special conditions, it is also grown in tropical and sub-tropical areas and requires a moist and humid climate with rainfall of more than 200 cm and temperature above 25°C.

DISTRIBUTION OF RUBBER-PRODUCING COUNTRIES



1. **Rubber is a tropical crop** that requires a warm and humid climate with abundant rainfall, high humidity levels, and moderate sunlight for optimal growth and latex production. The ideal temperature range is 20°C to 35°C, with stable temperatures preferred.
2. **Asia produces 90 percent of world rubber** with the industry mainly concentrated in Southeast Asia, where Thailand, Indonesia, Vietnam, India, China, and Malaysia are the largest rubber-producing countries due to their favorable climatic conditions.
3. **Thailand is the largest (35 percent of the world's natural rubber) and Indonesia is the second largest producer of rubber** in the world, followed by Vietnam. In Thailand, rubber production is concentrated in the southern part while in Indonesia production is mainly located in Sumatra, Java, and Kalimantan.
4. **India, China, and Malaysia** are also significant rubber-producing countries, each accounting for around 6-7% of global production. In India, rubber production is mainly concentrated in the southern part of the country,(75% of rubber is produced in Kerala).
5. While in **China, production is focused in the Hainan province.** Malaysia's rubber industry is located mainly in the states of Kelantan, Johor, and Terengganu.
6. The **majority of synthetic rubber is produced in the United States, Japan, Russia, and Western European nations.** In 2020, China was the world's top producer of synthetic rubber (22%).
7. Other nations that produce rubber include **Ivory Coast, Brazil, Mexico, Gabon, Guiana, Ecuador, and Sri Lanka**, among others.

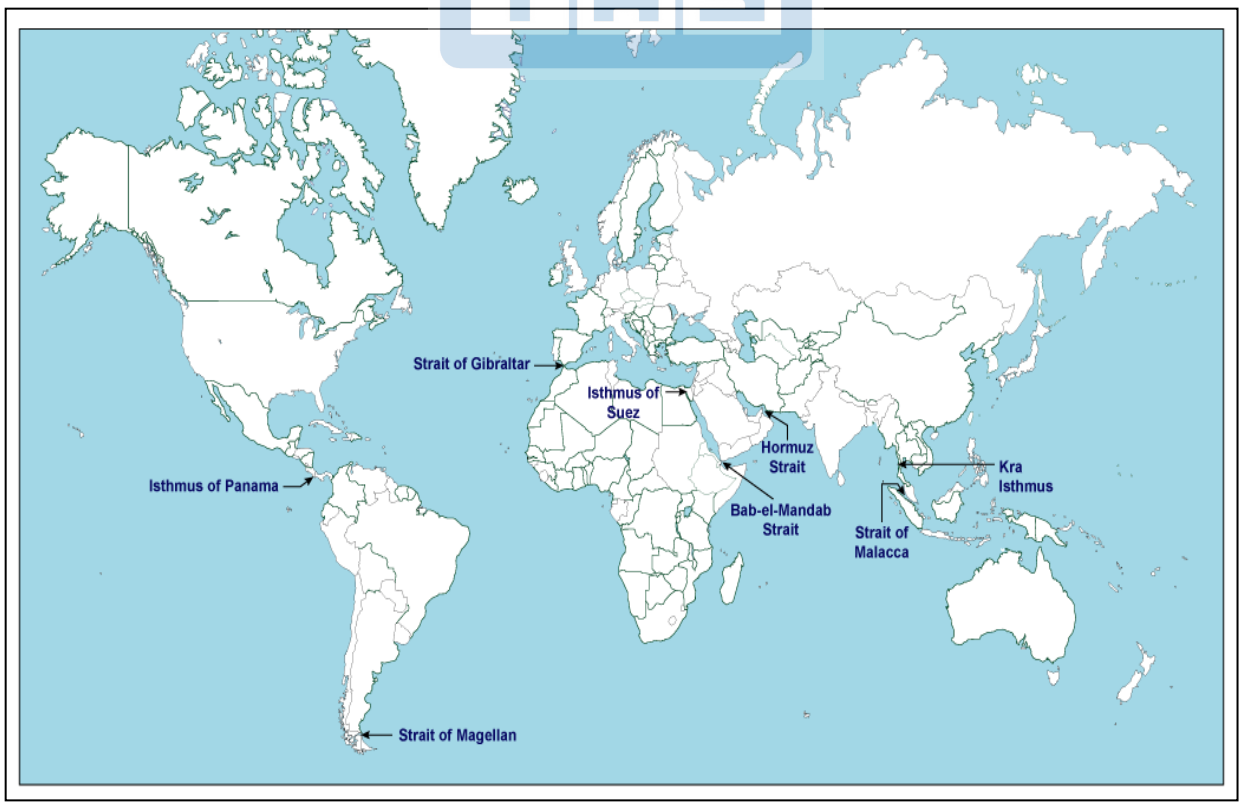
MAJOR ENVIRONMENTAL ISSUES FACED BY RUBBER-PRODUCING COUNTRIES

1. **Deforestation:** Rubber plantations often **replace natural forests,** leading to the loss of biodiversity and habitat for endangered species. Countries like Malaysia and Indonesia have lost a large part of their natural forest due to the cultivation of Rubber.
2. **Water Use:** Rubber production **requires significant amounts of water,** which can lead to water scarcity like in Thailand, and environmental degradation in areas where water is already limited. Water pollution from agrochemicals used in rubber plantations is also a concern.
3. **Chemical Use:** Use of **pesticides, fertilizers, and other chemicals,** which can pollute waterways and harm wildlife and human health. Chemical use is a problem in India, where the excessive use of pesticides and fertilizers in rubber plantations has led to water pollution and harm to wildlife.
4. **Soil Degradation:** Rubber trees are often grown in **monoculture,** which can lead to soil degradation, loss of soil fertility, and increased vulnerability to pests and diseases.
5. **Climate Change:** Per kg dry rubber generates eight kg of effluents and its natural degradation **releases a huge amount of carbon dioxide (CO2) and methane**. Practices like the open burning of rubber tree stumps after land clearing in Malaysia release GHGs.

Rubber cultivation covers approximately 14 million hectares worldwide and has been linked to negative environmental consequences. With the rising demand for rubber due to industrial expansion, sustainable cultivation methods are necessary to mitigate these consequences. To achieve this, a combination of local and global knowledge, as well as modern technology, must be used.

16. Mention the significance of straits and isthmus in international trade. (Answer in 250 words) 15 Marks.

Straits are narrow passages of water that connect two larger bodies of water, while isthmus are narrow strips of land connecting two larger land areas. These two geographical features play a significant role in international trade.



SIGNIFICANCE OF STRAITS

1. **Sites for ports:** They are natural sites for ports, trade routes, and **canals linking terrestrial and aquatic trade routes,** leading to international trade facilitation. For E.g. ***Singapore port on the Malacca Strait*** acts as a port of call for refueling long-distance ships carrying various goods.
2. **Ensures energy security:** Straits are often **important shipping lanes** that provide access to major ports and waterways, making them critical for international trade. Eg: The Strait of Hormuz connects the Persian Gulf to the Arabian Sea, and is used to transport oil to energy-scarce countries like India and China.
3. **Strategic location:** Straits have been historically significant as they can be **used to control access to important waterways and ports.** For example, the Strait of Gibraltar is a key strategic location for controlling access to the Mediterranean Sea.
4. **Boosts local economy:** Many straits are of immense significance to local communities as they **help to thrive in coastal areas.** For example, ***the Bosphorus Strait in Turkey*** is a key location for exchange of the goods and has been a significant location for trade and transportation for over 2,500 years.
5. **Make trade eco-friendly:** Straits make **shipping activities environment-friendly.** Eg: By making the Palk Strait deeper, Indian ships could circumvent Sri Lanka (a long route) while transporting goods from Vizag to Kochi, saving fuel.

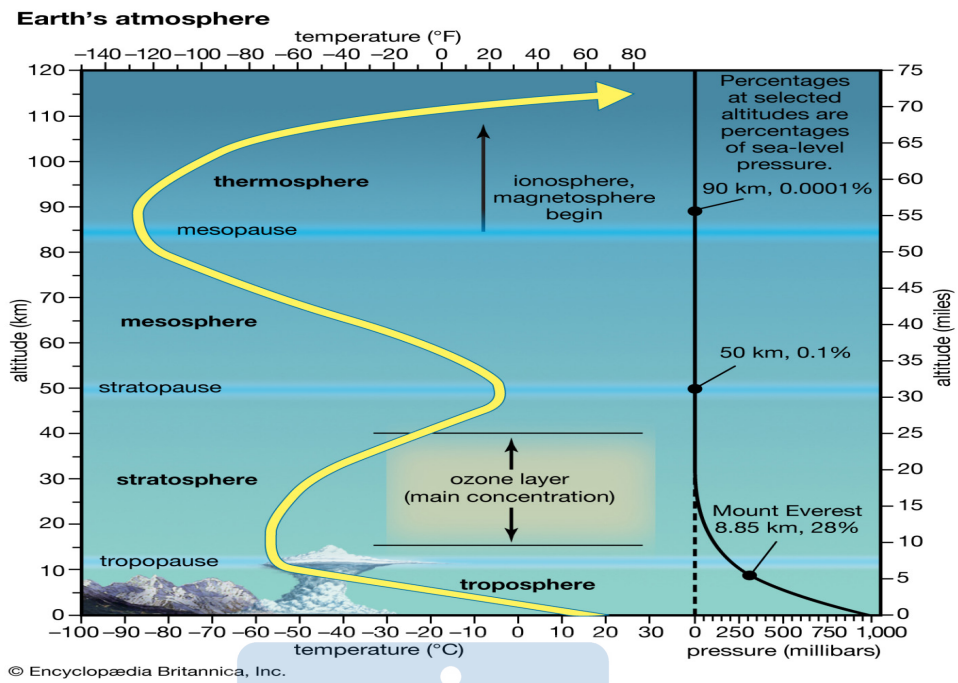
SIGNIFICANCE OF ISTHMUS

1. **Reduces distance: Isthmuses are often the site of major transportation routes**, including highways, railways, and canals. For example, ***the Panama Canal,*** which cuts across the Isthmus of Panama, is a crucial shipping route that connects the Atlantic and Pacific Oceans, saving thousands of miles of travel for ships.
2. **Trade:** Isthmuses are also important for international trade, as **they provide strategic locations for ports and shipping hubs.**
3. **Geoeconomics shaping geopolitics:** Isthmuses have often been contested territories throughout history, and controlling them has been an important strategic objective **for many nations**. For example, ***the Isthmus of Panama*** was once part of Colombia, but the United States supported Panama's independence in order to gain control of the land and build the Panama Canal.
4. **Seamless connectivity:** Provide well connectivity and **establish the connection between developed and developing nations.** For example***, the Isthmus of Suez in Egypt*** is a crucial trade route that connects developed Europe and developing Asia.
5. **Trade security:** Isthmus provides a **strategic place for defense establishmen**t that facilitates international trade by providing security from pirates.

Transporting goods by sea route is a great option for moving bulk items at a low cost. While it is the slowest mode, sea transport is environmentally responsible, fuel-efficient, and has the ability to carry massive amounts of goods. Hence, being in the proximity of sea routes of trade, straits, and isthmuses are strategically as well as economically of great importance.

17. Troposphere is a very significant atmospheric layer that determines weather processes. How?
(Answer in 250 words) 15 Marks

The troposphere is the lowest layer of the Earth's atmosphere, extending from the surface up to an altitude of about 7-20 km depending on location and season. It is the layer where weather processes occur and it is responsible for many of the weather patterns we experience on a day-to-day basis.



HOW THE TROPOSPHERE DETERMINES WEATHER PROCESSES

1. **Temperature and pressure:** There will be a **decrease in temperature and pressure** as altitude increases, a phenomenon called the **"lapse rate."** The warmer air at the Earth's surface rises, cools as it reaches higher altitudes, and then sinks back down. This vertical movement of air creates the pressure differences that drive the weather.
2. **Moisture content:** The **troposphere contains most of the water vapor in the atmosphere,** which is a key component in the formation of clouds and precipitation. As warm, moist air rises, it cools and the water vapor condenses into clouds, eventually leading to precipitation.
3. **Convection:** In the troposphere, the **movement of warm air rising and cool air sinking**, creates air currents that can lead to thunderstorms, hurricanes, and other weather phenomena.
4. **Atmospheric disturbances:** The troposphere is also the layer where **atmospheric disturbances occur,** including fronts, cyclones, and anticyclones. These disturbances are caused by temperature differences between air masses and can lead to changes in weather patterns.
5. **Solar radiation:** The troposphere is heated by solar radiation that is absorbed by the Earth's surface. This leads to **temperature differences between different regions**, which drives the movement of air masses and the formation of weather patterns.
6. **Global circulation patterns:** The troposphere is also part of the **global circulation patterns that occur in the atmosphere**, which are driven by differences in temperature and pressure between the equator and the poles. These circulation patterns can influence weather patterns on a global scale.
7. **Upper-level winds:** Although most weather processes occur in the lower part of the troposphere, upper-level winds can also have a significant impact on weather patterns. For example, **the jet stream, a narrow band of strong winds in the upper troposphere,** can affect the movement of air masses and the formation of storms.
8. **Human activities:** Human activities, such as land use changes, **deforestation, and the burning of fossil fuels, can also impact the troposphere** and contribute to changes in weather patterns. For example, deforestation can lead to changes in the amount of moisture in the air, which can affect cloud formation and precipitation.

Overall, the troposphere is a complex and dynamic layer of the Earth's atmosphere that plays a critical role in determining weather processes. The interplay of temperature, pressure, moisture, and other factors in the troposphere creates weather patterns, and understanding these patterns is essential for predicting and preparing for weather events in the era of climate change.

18. Analyze the salience of 'sect' in Indian society vis-a-vis caste, region, and religion.
(Answer in 250 words) 15 Marks.

In Indian society, the concept of sect or panth refers to a group of people who share a common set of beliefs, practices, and rituals that distinguish them from other groups. Sectarian identity is often closely tied to factors such as caste, region, and religion, and can have a significant impact on social and political dynamics.

SALIENCE OF SECT IN INDIAN SOCIETY IN RELATION TO OTHER FACTORS

SECT AND CASTE

1. **Caste has traditionally been a primary marker of identity in Indian society. Sects often emerge within specific castes, with members sharing particular religious or cultural practices. Eg: *The Lingayat sect in Karnataka***, the ***Kabir Panthi sect*** is associated with the weaver community.
2. **The significance of a sect within a caste is often related to the role of religion and spirituality in the caste system. For example, some sects within the Dalit community have emerged as a response to the discrimination and marginalization faced by Dalits. Eg: Ravidassia panth emerged from the Sikh religion.**
3. **Sectarian identity** within caste can also be influenced by the historical and cultural context of a particular region. For example, ***the Tulu-speaking communities*** of coastal Karnataka have a long history of belonging to different sects, with each sect having its own distinct set of cultural practices and rituals.
4. The relationship between **sect and caste is complex** and sometimes contested. For example, some sects within a particular caste may be seen as more 'orthodox' or 'traditional' than others and may face criticism from members of their own caste who do not share their religious or cultural practices.

SECT AND REGION

1. Sectarian identity can also be tied to particular regions, with **different sects emerging in different parts** of the country. For example, the Baul sect is associated with the Bengali-speaking regions of West Bengal and Bangladesh.
2. The relationship between sect and region can be **influenced by the linguistic and cultural diversity** of different regions of India. For example, the Bhakti movement emerged in South India as a response to the Sanskritization of Hinduism and the need to create a more accessible and inclusive form of worship for the common people.
3. **Sectarian identity within a region can also be shaped by the influence of historical figures. Eg:** the ***Warkari sect*** is attributed to the saints of Maharashtra like Dnyandev and Tukaram.
4. The relationship between sect and region can also be influenced by **external factors, such as migration or globalization.** For example, the Sikh diaspora in North America has given rise to new sects that combine elements of Sikhism with other spiritual traditions.

SECT AND RELIGION

1. Sects can emerge within **different religious traditions,** with members sharing particular beliefs, practices, or rituals. For example, the Ahmadiyya sect emerged within the Muslim tradition.
2. The relationship between sect and religion can be i**nfluenced by the historical and cultural context** of a particular religious tradition. For example, the Sufi sects within Islam emerged as a response to the rigid legalism and formalism of orthodox Islam.

3. Sectarian identity within a religious tradition can also be s**haped by the influence of particular teachers or gurus.** For example, ***the Radha Soami sect within Sikhism*** emerged as a result of the teachings of the spiritual master Shiv Dayal Singh.
4. The relationship between sect and religion can also be influenced by **external factors, such as colonialism or modernity.** For example, ***the Arya Samaj sect within Hinduism*** emerged in response to the challenges posed by British colonialism and the need to create a more 'modern' and 'rational' form of Hinduism.
5. Sectarian identity within religions can sometimes be a **source of conflict**, as different sects may have different interpretations of religious texts or compete for influence within their communities.

India requires a delicate balancing act between preserving the richness and diversity of sectarian traditions, while at the same time promoting greater understanding and tolerance of sectarian differences, and addressing the challenges and issues that sectarian identities can create. By working together to promote greater understanding and appreciation of sectarian diversity, we can build a more harmonious and inclusive society for all.

19. Are tolerance, assimilation, and pluralism the key elements in the making of an Indian form of secularism? Justify your answer. (Answer in 250 words) 15 Marks.

Indian form of secularism is a positive secularism based on the 'principled distance model', unlike the Western 'strict wall of separation.' It is based on 'Sarva Dharma Sambhav'(equal respect to all religions) as well as 'Dharma nirapekshata'(religious neutrality), heralding the principles of tolerance, assimilation, and pluralism.

TOLERANCE: KEY ELEMENT OF INDIAN SECULARISM

1. **Indian secularism involves the acceptance and respect for the beliefs, practices, and values of others, even if they differ from one's own. Eg:** Greeting on the occasion of Diwali as well as Eid by Hindus and Muslims to each other.
2. Tolerance promotes **brotherhood and reverence** for all religions. In India, almost no native king forced his subjects to convert to another religion, with a few exceptions. The religious tolerance policies of Mughal King Akbar and Buddhist King Ashoka are particularly well-known.
3. The principle of **'Sarva Dharma Sambhava'** aims to provide equal respect to all religions and the coexistence of almost all religions of the world in India shows its tolerant nature.
4. Additionally, **Article 29 and Article 30** provide special cultural and educational rights to minorities, giving constitutional recognition to the value of tolerance.

ASSIMILATION: KEY ELEMENT OF INDIAN SECULARISM

1. Assimilation is the process whereby **individuals or groups of differing ethnic heritage** are absorbed into the dominant culture of a society. In India, assimilation has been a key element of secularism.
2. Most religious places in India, such as **Varanasi, Tirupati, and Ajmer Sharif of Haji Ali,** go beyond any single religious community, thus assimilating diverse religious groups of people.
3. The Supreme Court of India, in the **Shakti Vahini vs. Union of India** case, declared it illegal for anyone to attack couples marrying outside their caste or religion. This decision promotes assimilation by encouraging inter-religious and inter-caste marriages.

PLURALISM: KEY ELEMENT OF INDIAN SECULARISM

1. **Pluralism** is a logical corollary of religious secularism, as it respects all religions. India has a diverse religious landscape, with Sikhism, Jainism, Buddhism, Hinduism, Islam, and Christianity coexisting.
2. Some religions that are **disappearing from the world (Zoroastrianism)** are thriving in India, while some religious festivals are celebrated by all communities, cutting across religions. For example, while Hindus

celebrate Diwali and Holi both ritually and culturally, other religious communities celebrate these festivals culturally.

3. **Pluralism is not just followed in beliefs and practices but also in thinking. Eg:** The conception of ultimate reality or God differs from religion to religion as well as within religion.

Apart from tolerance, assimilation, and pluralism other elements involved in making of Indian form of secularism are the provision of community-based rights and rights to minorities, striving to establish not just inter-religious but also intra-religious equality while maintaining neutrality ability of the state to intervene in religious affairs when needed to ensure religious practices are not in contravention with principles of the constitution, i.e flexibility to have both positive and negative models of secularism as per need.

20. Elucidate the relationship between globalization and new technology in a world of scarce resources, with special reference to India. (Answer in 250 words) 15 Marks.

Globalization 4.0 is the most recent stage of globalization, incorporating cutting-edge new technologies like artificial intelligence, the Internet of Things, blockchain, and so on. Modern technologies reduce distances, open borders, create new markets and bring people from all over the world closer together.

POSITIVE RELATIONSHIP

1. **Emerging market economies:** The positive impact has been especially large for **emerging market economies,** which have made increasing use of the available foreign knowledge and technology to boost their innovation capacity and labor productivity growth. For instance, phenomenal growth in the GDP of India post-liberalization.
2. **Defense technology:** To address the security problem, India is **working with global partners** such as Israel (Barak Missile), the Philippines (Brahmos Missile), and Russia (AK-203), on sectors in which India lacks resources.
3. **Space technology:** Considering the **huge expenditure involved and the latest technology** needed in launching space missions, India is collaborating with nations such as Russia and France (Gaganyaan), and the United States (NISAR Satellites).
4. **Energy:** The International Solar Alliance (ISA) is I**ndia's global attempt to combat the shortage of fossil fuels** by securing solar energy with the help of nations with advanced technology in the field.
5. **Transport and communication: Collaboration with countries worldwide** such as Japan (bullet train), and the EU (5G) is on the top agenda of India.
6. **New Industries and Technology transfer:** Due to an aging population, **costly labor, and scarcity of skilled labor in developed countries,** many top companies are moving to developing countries to manufacture goods of cutting-edge technology and in the process also help in technology transfer. Ex: Apple manufacturing facility in Bengaluru, TATA, and Airbus aircraft manufacturing in India.

Apart from these use cases, India is also utilizing several technologies like digitalized mining technologies, technologies to address water scarcity, technologies like genomics, CRISPR, etc for wildlife conservation and GM crops, etc, all by signing IoU, FDIs, and technology transfer agreements.

NEGATIVE RELATION WITH RESPECT TO SCARCE RESOURCES

1. **Brain Drain:** Indian educated young choose **wealthy nations over India** for further growth. Eg: Attraction of Silicon Valley of USA among the IT graduates in India.
2. **Neo Colonization:** The **huge IT giant's neo-colonization in the name of data privacy**, free expression, and so forth, leading to the drain of wealth from developing to developed nations.

3. **Opportunity cost:** Diverting precious resources to **technology adoption** (Eg: Bullet train), therefore reducing spending on humanitarian development.
   - **Importation of cutting-edge technology reduces currency on the one hand and technological research on the other.** For example, there isn't a single successful Indian cellphone in the Indian market.
4. **Security dilemma:** The monopoly and scarcity of vital technology jeopardized Indians' security, as demonstrated by the Red Echo attack on Mumbai's power supply by Chinese equipment.

Globalization not only spreads knowledge but also in a world of scarce resources, the advanced technologies supplied by globalization help to utilize those resources in an efficient and effective manner. Moving forward, India needs to adopt An Atmanirbhar (self-reliant) approach with suitable and strategic global support to increase capabilities through learning competitive practices, collaborations, and pursuing business-driven R&D is also necessary.

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NEXT IAS