

UPSC MAINS 2016

GS PAPER - 1

Time Allowed: 3 hr.

Max. Marks: 250

1. Early Buddhist Stupa-art, while depicting folk motifs and narratives successfully expounds Buddhist ideals, Elucidate.
2. Krishnadeva Raya, the King of Vijayanagar, was not only an accomplished scholar himself but was also a great patron of learning and literature. Discuss.
3. Explain how the Uprising of 1857 constitutes an important watershed in the evolution of British policies towards colonial India.
4. Discuss the role of women in the freedom struggle especially during the Gandhian phase.
5. Highlight the difference in the approach of Subhash Chandra Bose and Mahatma Gandhi in the struggle for freedom.
6. Has the formation of linguistic States strengthened the cause of Indian Unity?
7. The anti-colonial struggles in West Africa were led by the new elite of Western-educated Africans. Examine.
8. To what extent globalization has influenced the core of cultural diversity in India? Explain.
9. "An essential condition to eradicate poverty is to liberate the poor from the process of deprivation." Substantiate this statement with suitable examples.
10. Why are the tribals in India referred to as 'the Scheduled Tribes'? Indicate the major provisions enshrined in the Constitution of India for their upliftment.
11. With a brief background of quality of urban life in India, introduce the objectives and strategy of the 'Smart City Programmes'.
12. What is the basis of regionalism? Is it that unequal distribution of benefits of development on regional basis eventually promotes regionally? Substantiate your answer.
13. Discuss the concept of air mass and explain its role in macro-climatic changes.
14. "The Himalayas are highly prone to landslides." Discuss the causes and suggest suitable measures of mitigation.
15. The effective management of land and water resources will drastically reduce the human miseries. Explain.
16. South China Sea has assumed great geopolitical significance in the present context. Comment.
17. Major cities of India are becoming more vulnerable to flood conditions. Discuss.
18. Present an account of the Indus Water Treaty and examine its ecological, economic and political implications in the context of changing bilateral relations.

19. Enumerate the problems and prospects of inland water transport in India.
20. In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India?



GS SCORE

UPSC GS MAINS PAPER - 1

HINTS

1. *Early Buddhist Stupa-art, while depicting folk motifs and narratives successfully expounds Buddhist ideals, Elucidate.*

Hints:

- In Buddhism, the earliest stupas contained portions of the Buddha's ashes, and as a result, the stupa began to be associated with the body of the Buddha.
 - Buddha had asked pupils to place the relics "where four roads meet". This is probably to indicate the openness and universality of the Buddhist teaching, which invites all to come and try its path, and also to radiate loving-kindness to beings in all four directions.
 - Stupas contain intricate lotus designs which symbolises the potential for spiritual growth latent in all beings, and the complete non-attachment of the enlightened mind, which stands beyond all defilements
 - Stupa is an image of the creation of the universe (the archetype of regeneration), with the stupa axis founded on the waters and rising through the earth, atmosphere and heavens so as to unite them and form a communicating link between them.
 - The shape of the stupa represents the Buddha, crowned and sitting in meditation posture on a lion throne.
 - While stupas have changed in form over the years, their function remains essentially unchanged. Stupas remind the Buddhist practitioner of the Buddha and his teachings almost 2,500 years after his death.
 - The most elaborate stupa in Java contained Buddha images symbolizing Arûpajhâna, the sphere of formlessness. The main stupa itself is empty, symbolizing complete perfection of enlightenment.
 - Thus the art and architecture associated with Buddhism symbolized the Buddhist ideals.
2. *Krishnadeva Raya, the King of Vijayanagar, was not only an accomplished scholar himself but was also a great patron of learning and literature. Discuss.*

Hints:

- Historians consider Krishnadevaraya as the greatest ruler of the Vijayanagara kingdom. His greatest achievement is of the broad tolerance that existed during his rule in his empire.
- His reign marked a new era in Telugu literature when imitation of Sanskrit works gave way to independent works.
- His rule was an age of prolific literature in many languages ,although it is also known as a golden age of Telugu literature.
- He was a gifted scholar of Telugu and Sanskrit and wrote many works in these languages.

- Sanskrit plays "JambavatiKalyanam", "Ushaparinayam", Madalasacharitha, Rasamanjari, Satyavaduparinaya and a Telugu poem "Amuktamalyada" were written by him. This work beautifully subscribed the agony of separation suffered by Sri Andal for her lover Lord Vishnu.
 - He was fluent in many languages including his mother tongue "Tulu".
 - He extended his patronage to Telugu, Kannada and Tamil poets alike.
 - He patronised many famous poets like Haridasu, Nanditimmana, Kannada poet mallanaraya etc.
 - His court BhuvanaVijayamu was adorned by eight literary giants called as "Astadiggajas". The most celebrated of them were Allasanipeddana (father of Telugu poetry), Dhurjati, Tenali Ramakrishna.
 - His munificence for scholars earned for him the title "Andhra Bhoja".
3. *Explain how the Uprising of 1857 constitutes an important watershed in the evolution of British policies towards colonial India.*

Hints:

- One of the important events of Indian history is the 'Revolt of 1857' or 'India's first war of Independence' or 'The Sepoy Mutiny'. It was the first rebellion against the East India Company which took the massive form. It showed resentment towards British policies thus it acted as the watershed in the evolution of British policies towards colonial India.
- Britishers felt that the efforts to westernize the Indian society were one of the reasons which caused the mutiny, after the revolt they tried to integrate Indian higher castes and rulers into the government and abolished any attempts of westernisation. Similarly the government distanced itself further from the Christian missionaries.
- The revolt depicted the Hindu-Muslim unity thus Britishers started to appease one community over the other giving rise to the divide and rule policy.
- It led to the dissolution of the East India Company in 1858 with the passage of Government of India Act and was thereafter directly governed by the crown.
- A new post named Secretary of State was created to govern India and formulate Indian policy. The Governor General from now on called as viceroy implemented the policies.
- Doctrine of lapse policy was one of the main causes of the revolt was ended.
- Administrative changes were made in the executive, legislative and judicial arenas with greater participation of Indians. This change was visible in the Indian Council Act 1861, the Indian High Court Act 1861 and the Indian Civil Services Act 1861.
- After the rebellion British reorganized the army and brought changes in the financial system and administration as well. These troops were replaced by new units recruited from castes hitherto under-utilized by the British and from the so-called "Martial Races", such as the Sikhs and the Gorkhas, which were not part of mainstream Indian culture.
- The British increased the ratio of British to Indian soldiers within India. From 1861 Indian artillery was replaced by British units.

4. *Discuss the role of women in the freedom struggle especially during the Gandhian phase.*

Hints:

- Woman's participation in India's freedom struggle began as early as in 1817. Bhima Bai Holkar fought bravely against the British colonel Malcolm and defeated him in guerilla warfare.
- The role of Rani of Ramgarh, Rani Lakshmi Bai, Tapasvini Maharani in the War of Independence (the Great Revolt) of 1857 was commendable.
- While women were involved in the political arena since the foundation of Indian national congress days (Annie Besant started Home Rule League) and especially during the Swadeshi movement but it was Gandhiji who initiated for mass participation of women in freedom struggle.

- In 1920, Sarojini Naidu joined the non-cooperation movement. Many women participated in this movement by performing their domestic and social roles. Sarla Devi, Muthulaxmi Reddy, Susheela Nair, Rajkumari Amrit Kaur, Sucheta Kripalani and Aruna Asaf Ali, Vijay Laxmi Pandit are some the women who participated in the Non - violent Noncooperation movement. They participated in political protests, picketed shops selling foreign goods and organized Prabhat Pheri (singing patriotic songs).
 - Women's participation in the national movement helped in breaking several of the old barriers of tradition and custom. Women's organization side by side raised their voices for removal of social and legal disabilities.
 - Role of few women have been discussed below:
 - a) Arun Asaf Ali was a radical nationalist played an outstanding role in the historic Quit India Movement launched by Mahatma Gandhi on August 9, 1942, and was a prominent leader of the underground movement.
 - b) Vijay Lakshmi Pandit represented India in many of the Conferences abroad. She attended numerous public lectures and challenged the British dominated delegate's rights to represent India therein. She was a great fighter and took parts in many of the freedom movement.
 - c) Women like Kalpana Dutt, Preeti Lathawaddedar have been actively involved in revolutionary activities as well like the Hindustan republic socialist association, Chittagong uprising, etc.
5. *Highlight the difference in the approach of Subhash Chandra Bose and Mahatma Gandhi in the struggle for freedom.*

Hints:

- Although Subhash Chandra was a follower of Gandhi during the initial days, the later part of the 1930s witnessed a growing radicalization of his thoughts and Bose became increasingly frustrated with the lack of momentum in the independence movement. This caused increasing differences in their approaches.
- Differences are as follows:
 - a) **Basic Ideology:**
 - o Bose was a nationalist who believed in the tradition of Tilak and Aurobindo (Extremists). Gandhi, on the contrary, was a nationalist who belonged to the tradition of his mentor Gokhale (Moderates) and Tagore.
 - o Bose's strong revolutionary urge for the emancipation of his motherland made him critical of many of Gandhiji's techniques.
 - b) **Strategy to achieve independence:**
 - o Netaji's demand for complete freedom of India from the British in contrast to Gandhi's want for independence in phases through dominion status.
 - o Bose has also been unambiguous that he would seek political emancipation through the most efficacious means which could involve armed conflict or even a total war.
 - c) **Future of India post independence:**
 - o Gandhi was hostile to industrialization, while Bose saw it as the only route to making India strong and self-sufficient.
 - o Gandhi advocated a back to the roots vision comprising of spinning, khadi and local self-sufficiency at village level while Bose held steadfast to a futuristic vision of large scale industrialization and a politics devoid of irrationality and religiosity.
 - o Bose was influenced by the success of the five-year plans in the Soviet Union and he advocated for a socialist nation with an industrialized economy.

- o Bose wanted to develop free India as a modern, industrialized nation with focus on advances in science, livelihood, and education for the masses.

d) Idea about freedom:

- o Bose believed that freedom is never given; it is taken, while Gandhi on the other hand sought to attain his Swaraj through loyalty to the empire and a change of heart on their part.

e) Non cooperation movement:

- o Gandhi wanted a mass non-violent movement. Putting pressure on British raj by non-violent means such as fasting. However when Chauri Chaura incident occurred Gandhi ended the non cooperation movement abruptly but Bose thought that was the right time for mass movement against British.

f) Second World War:

- o Bose wanted to strike down the enemy when it was vulnerable. During the second world war Bose wanted to take action against British which was opposed by Gandhi as he thought it was not ethically right

g) Military:

- o Bose wanted a organized military campaign and he dint mind being included in a lot of international politics. Bose's Azad Hind force joined axis powers in WW2 against British.

6. *Has the formation of linguistic States strengthened the cause of Indian Unity?*

Hints:

- Language is closely related to culture and therefore to the customs of people. Besides, the massive spread of education and growth of mass literacy can only occur through the medium of the mother tongue. Democracy can become real to the common people only when politics and administration are conducted through the language they can understand.
- Thus States Reorganization Commission recommended a division of India based on dominance and geographical concentration of ethno-linguistic communities.
- **Accepting linguistic diversity helped each state to officially patronize its language.** It gave the assurance of respecting different culture and language.
- **By accepting diversity India had indirectly strengthened the federal fabric of the nation.** Regional representation ensured that all genuine grievances are channelized through democratic means and addressed.
- Government's focus on Jnanapith awards, Classical language status to languages further encouraged scholar to do research in respective language and make Indians aware of the governments support.
- But on the flip side, it has also **promoted local identity**. It has created distinctiveness among people. The **regional differences have come in the way of national integration**. Extreme sense of regionalism has resulted in parochialism and ethno centricism; instances like Inter-state water disputes, boundary disputes have also increased.
- Hence steps should be taken to place language as a source of unity of the country by recognizing linguistic diversity and initiating tolerance for each culture.

7. *The anti-colonial struggles in West Africa were led by the new elite of Western-educated Africans. Examine.*

Hints:

- Independence movements in Africa often were led by individuals who had attended Western schools (either in Africa or abroad).
- These Western educated Africans spoke the language of the colonizers and knew the types of political activities and organizations which the colonizers understood; therefore, they were in a better position to communicate with the colonizers in their efforts to gain the independence which

their fellow Africans without European education appreciated, desired and often sacrificed their lives for.

- Some of them were: Kwame Nkrumah (Gold Coast, now Ghana), Léopold Sédar Senghor (Senegal), Nnamdi Azikiwe (Nigeria), and Félix Houphouët-Boigny (Côte d'Ivoire).
 - They with the help of their counterparts in other continents, protested against the colonial order by publicizing the corruption and injustice perpetrated by the colonial master.
 - However the independence achieved by these colonies has not been very fruitful because:
 - a) Since independence, West Africa has suffered from the same problems as much of the African continent, particularly dictatorships, political corruption and military coups.
 - b) The region of West Africa has seen a number of civil wars in its recent past including the Nigerian Civil War (1967–1970), two civil wars in Liberia in 1989 and 1999, a decade of fighting in Sierra Leone from 1991–2002, the Guinea-Bissau Civil War.
 - c) The socio economic development in the African countries did not improve much even after independence and they still remain as the poorest countries in the world.
8. *To what extent globalization has influenced the core of cultural diversity in India? Explain.*

Hints:

- Globalization in its basic economic sense refers to the adoption of open and unfettered trading markets (through lowering of trade barriers, removal of capital controls, and liberalization of foreign exchange restrictions). There is also a significant movement of people from one country to another for trade and work.
 - The **impact of globalization on local culture** and the changing role of the nation-state can be examined by observing the particularities of the social and cultural patterns and their local, national and transnational manifestations in India. These social and cultural realities have a plural character in terms of language, geography, ethnicity, religion and culture. Thus globalisation impacts the culture of the region. Some of them are:
 - a) Family disruption and social and domestic violence are increasing.
 - b) Concepts of national identity, and of family, job and tradition are changing rapidly and significantly.
 - c) There is concern that competitiveness introduced by globalization is leading to more individualistic societies.
 - d) Loss of tolerance for differences in religion and culture.
 - e) The nation state is losing influence relative to global economic pressures, and in some countries there is a failure or hesitation to develop social policies. All of these changes increase the likelihood that vulnerable people will be exploited, and threats to the human rights of less able people will increase.
 - However globalization has made the local culture more assertive in demanding their identity. They have, in fact, consolidated their strength. Apart from such empowering impact, the local communities and cultures are also inspired by the new telecommunication media to re-assert their cultural identity and reinforce their residence. It helps them maintain their identity by accessing themselves to cultural meanings and values rather selectively through an adaptive mechanism.
 - Thus globalization with its intending consequences has revolutionised the societal dynamics and introduced functional/dysfunctional dimensions.
9. *"An essential condition to eradicate poverty is to liberate the poor from the process of deprivation." Substantiate this statement with suitable examples.*

Hints:

- Poverty is pronounced deprivation in wellbeing. High poverty levels are synonymous with poor quality of life, deprivation, malnutrition, illiteracy and low human resource development.

- Economic growth is not the solution for eradicating poverty. **Economic growth** provides greater command over goods and services however, this does not necessarily imply higher wellbeing for everyone; the benefits of economic growth are never shared equally. Income allows an individual to purchase commodities with which he or she generates various functioning. But all individuals cannot convert commodities into functioning to the same degree.
- Thus, poverty should be viewed as the deprivation of basic capabilities rather than merely as low level of income. Poverty encompasses not only material deprivation (measured by income or consumption) but also many other forms of deprivations in different aspects of life such as unemployment, ill health, lack of education, vulnerability, powerlessness, social exclusion and so on. Poverty is present when basic capability failure arises.
- Therefore, Anti-poverty strategy should comprise of a wide range of programmes aimed to strengthen and to generate more employment, create productive assets, impart technical and entrepreneurial skills and raise the income level of the poor.
- Government should focus on improvement of **Human infrastructure** by means of the provision of basic education and basic health care. Further, public investment in physical infrastructure should be supplemented with it to improve the access to the resources to form the vicious cycle of development.

10. *Why are the tribals in India referred to as 'the Scheduled Tribes'? Indicate the major provisions enshrined in the Constitution of India for their upliftment.*

Hints:

- **Schedule Tribes** are community of people who lived in tribal areas (**mainly forest**). They make up to 7-8% of Indian population. They have traditionally been marginalized and not in the mainstream of the society. They are also known as **Adivasis**.
- The criterion followed for specification of a community, as scheduled tribes are indications of primitive traits, distinctive culture, geographical isolation, shyness of contact with the community at large, and backwardness. This criterion is not spelt out in the Constitution but has become well established.
- Constitutional Provisions / Safeguards for Scheduled Tribes; can be divided into two **Protective Provisions and Developmental and upliftment provisions**.
- **The constitutional provisions are:**
 - a) **Article 15(4): Promotion of Social, Economic and Educational interests:**
This article empowers "the state to make any special provision for the advancement of socially and educationally backward classes of citizens or for the Scheduled Castes and Scheduled Tribes".
 - b) **Article 19(5): Safeguard of Tribal Interests:**
While the rights of free movement and residence throughout the territory of India and of acquisition and disposition of property are guaranteed to every citizen, special restrictions may be imposed by "the state for the protection of the interests of any Scheduled Tribe".
 - c) **Cultural and Educational Rights:**
A cultural or linguistic minority has right to conserve its language or culture. "The state shall not impose upon it any culture other than the community's own culture.
 - d) **Articles 330, 332 and 334:**
Seats shall be reserved for Scheduled Castes and Scheduled Tribes in legislative bodies. There are provisions for reservations of seats in the parliament as well as legislative Assembly of every state (Article 330,332).Such reservations were cease to be effective after a period of 10 years from the commencement of the constitution (Article 334) but after every ten years it's being extended through constitutional amendments.

e) **Article 338:**

It says that there shall be a special officer for the Scheduled Castes and Scheduled Tribes to be appointed by the President. National Commission for Scheduled Tribes has been established under 338A.

- The Government of India has also enacted progressive legislation, programmes and schemes for the development and empowerment of the SCs and STs. *The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA); The Provision of the Panchayats (Extension to the Scheduled Areas) Act, 1996; Minor Forest Produce Act 2005; and the Tribal Sub-Plan Strategy.*
- The Government of India has also enacted special schemes to enable access to opportunities including scholarships for education, financial support and skill building for setting up enterprises, reservations in jobs, and special courts to address instances of atrocities and violence.

11. *With a brief background of quality of urban life in India, introduce the objectives and strategy of the 'Smart City Programmes'.*

Hints:

- Urbanization has been an instrument of economic, social and political progress, but due to haphazard urbanization in the recent time, the situation relating to civic amenities such as water supply, electricity, public toilets, garbage disposal, etc. has worsened in particular.
- According to the 2011 Census, amenities available with the households has been listed as follows: 87% of households are using tap, tube well, hand pump and covered well as the main source of drinking water while 43.5 percent use tap water. Only 47% of households have source of water within the premises while 36% of households have to fetch water from a source located within 500 m in rural areas/100 m in urban areas and 17% still fetch drinking water from a source located more than 500 m away in rural areas or 100 m in urban area.
- This has increased due to rural-urban migration; financial crunch which affects the provision of civic amenities both in qualitative and quantitative manner; lack of autonomy of ULBs in generating revenues; inadequate user charges for civic amenities to cover the expenses for its provision and politics of populism.
- Against this backdrop it can be said that the concept of smart cities would be able to handle this crisis of civic amenities.
- Smart city mission is an urban renewal and retrofitting programme by Government of India with a mission to develop 100 cities to all over the country. **INR 48,000 Crore** to be spent over the next five year to build 100 smart cities. Each selected city is to be receiving assistance of **100 Crore per year for five year**. Important cities located in hilly area, major and minor tourist spots are to be transformed into smart cities. Each city will receive special purpose vehicle to implement the scheme.
- Smart City Mission envisages the bottom up approach i.e. planning and implementation both at local level. The conceptualization of Smart City, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents.
- However for the development of smart cities formation of smart villages is also important to reduce rural-urban migration and burden on urban resources.

12. *What is the basis of regionalism? Is it that unequal distribution of benefits of development on regional basis eventually promotes regionally? Substantiate your answer.*

Hints:

- Roots of regionalism in India are manifold, ranging from diversity of languages, cultures, ethnic groups, communities, religions and so on, and encouraged by the regional concentration of those identity markers, and fuelled by a sense of regional deprivation. But for many centuries, India remained the land of many lands, regions, cultures and traditions even with this sense of diversity.
- However the unequal development of states, discrimination by state administration and concentration of development activities, administrative power and political power to a particular region have been

the main reason for demand of new states and emergence for secessionist movement in North-East India.

- There are certain regions in the country where industries and factories have been concentrated, educational and health facilities are sufficiently provided, communication net work has been developed, rapid agricultural development has been made possible. But there are also certain areas where the worth of independence is yet to be realized in terms of socio-economic development.
- Further the economy's failure to create enough employment opportunities for the educated youths created an acute scarcity of jobs, and led to intense competition for the available jobs.
- This disparity has caused the feeling of relative deprivation among the inhabitants of economically neglected regions.
- Thus, the need of the hour is to develop a realistic perception of regionalism at the conceptual level focusing on righteousness and judicious outlook maintaining unity in diversity
- With the promotion of cooperative federalism, establishment of NITI AAYOG, interstate council the negative connotation of regionalism can be further diluted and more inclusive and faster growth can be achieved.

13. Discuss the concept of air mass and explain its role in macro-climatic changes.

Hints:

- An air mass is a large body of air whose physical properties, especially temperature, moisture content and lapse rate are more or less uniform horizontally for hundreds of kilometres.
- The nature and degree of homogeneity of an airmass are determined by properties of the source area and the direction of its movement and changes introduced in the airmass during its journey away from the sources area and age of the air mass.
- The interaction of air-mass of different regions plays an important role in determining the temperature and precipitation of temperate regions in following ways:
 - a) Laurential type of climate: Continental polar air-mass moves in southerly and south-easterly direction picks up moisture from great-lakes region of north American produces lake-effect snow and heavy snowfall in Appalachians.
 - b) China type of climate: Maritime tropical pacific air-mass when enters the mainland china produces cyclones in the region of Yellow sea and Japan sea.
 - c) Maritime tropical Atlantic air mass control the weather conditions of vast areas of USA near the Gulf of Mexico region producing thunderstorms, cyclones etc. Ex Hurricanes in USA.
 - d) The interaction of polar continental cold air-mass and temperature air mass produces extreme cold conditions in winter causing heavy snowfall in temperate latitudes.
 - e) According to Halley, the **monsoon** in Indian subcontinent is nothing but movement of maritime airmass (high moisture content) into Indian landmass.
 - f) Convergence of African hot airmass and European cold airmass over Mediterranean produces **temperate cyclones** ,which is a major determinant of weather condition of temperate latitude.(also causes western disturbance over Pakistan and India, good for winter wheat)
- Hence Air masses play an important role in microclimatic changes, especially in temperate latitudes.

14. "The Himalayas are highly prone to landslides." Discuss the causes and suggest suitable measures of mitigation.

Hints:

- A landslide is a downward and outward movement of slope materials like rocks, soil and so on under the influence of gravity. It is a natural process that removes materials from the hill slopes and coastline.

- Gravity and accumulation of soft soil, debris and rocks on a steep slope are the primary reason for a landslide, There are various other factors that could increase the risk. For instance, erosion by rivers, weakening of rocks and soils by heavy rains, earthquakes, volcanic eruption, stockpiling of rocks and ores and deforestation could increase a region's susceptibility to landslides.
- Himalayas are more prone to landslides because the earth's structure consists of an outer silicate solid crust (about 30km from the surface), a viscous mantle (2,900 km thick) and the core (3,500 km diameter). The uppermost part of the mantle and crust is broken into seven major tectonic plates- African, Australian, Eurasian, North American, South American, and Pacific. These plates can move over the low viscous region below them. The Himalayas are created by the collision of the Indian landmass with the Eurasian plate. The landscape in the Himalaya and the north east is highly susceptible to landslides. The slopes of the mountains have immature and rugged topography, high seismicity and high rainfall, all contributing to the region's high vulnerability to landslides.
- Measures to control landslides are:
 - a) Hazard mapping: locate areas prone to slope failure. Identifying areas prone to landslides and avoidance of areas for building settlements
 - b) Land use: preservation of vegetal cover. Denuded path slopes provoke landslides and must be reforested with suitable tree species. Terrace farming, construction of bunds, etc
 - c) Slope stabilisation: Afforestation, retaining walls, use of jute geotextiles, plastic geogrids to increase slope stability.
 - d) Control human activities: prevent people from deforestation, urbanization, mining or infrastructural projects.*
 - e) The presence of water within a rocky hillside is one of the major factors leading to instability. Knowledge of the water pressure and of the runoff mode is important to stability analysis, and to planning measures to improve hillside stability. Care must be taken to avoid blockage of natural drainage while constructing roads, buildings and canals.
 - f) On community lands, fuel or fodder trees should be grown to increase forest cover to reduce landslide hazard in India.
 - g) Grazing should be restricted and better grass must be grown on the surface previously grazed to increase the hold on soil by plant roots
 - h) Reinforcement measures generally consist of the introduction of metal elements which increase the shear strength of the rock and to reduce the stress release created when the rock is cut.

15. *The effective management of land and water resources will drastically reduce the human miseries. Explain.*

Hints:

- Human settlements, unsustainable agriculture, commerce, industry and tourism development have historically been competing for the limited land and water resources.
- As human needs and population grow, the pressure on land and water continue to increase and this competing demand has led to skewed resource distribution resulting in poverty, hunger, lack of equitable distribution of water, land and other social resources.
- Lack of institutional capacity to properly negotiate rights to exploit socio-economic activities continues to exert pressure on these critical resources.
- Various ways through which effective land and water resources management can reduce human misery are:

A. Land management:

- Land capability classification to determine the different uses of land.
- Land not capable for cultivation can be used for construction activities, infrastructure projects, settlements, industry, etc.

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- The area set aside for forest cover needs to be utilised for afforestation, sacred groves etc.
- Land suitable for agriculture should be used to grow crops based on agro-climatic conditions to ensure effective land use and ensure optimum productivity of the produce to help reduce hunger and famine conditions and ensure food security.
- Some of the effective land use practises are agro-forestry, social forestry, plantation of trees along national highways etc.
- Land record management with proper legislation for land lease and land tenancy, mutation orders and limited accessibility etc so that land is effectively utilised in the land market.
- Geospatial technologies facilitate the mapping of land parcels, valuation of land, and the integration of data sets from multiple departments to realize a strategic land suitability assessment.
- Data integration from multiple sources, displaying the results on a map integrated with satellite images will help in effective decision making.

B. Water management practices that help in effective water usage to reduce human misery:

- water conservation harvesting using some of the traditional water harvesting techniques like Zing in Ladakh, Kere in Karnataka, Tankas, etc help in water storage that would help in water use in lean seasons, utilize water for multiple purposes like drinking water, agriculture, use for cattle, small hydropower generation etc. this water helps in fighting droughts
- water use efficiency using micro-irrigation practices like sprinkler and drip irrigation can reduce indiscriminate water use and increase the efficiency of irrigation for agricultural crops
- As per national water policy the water use must be prioritized - drinking water, water use for agriculture, household activities, women needs and industries etc can help in reducing human misery and ensure equitable distribution of water resources.
- The land and water management techniques should aim at: Economic efficiency in water use; Equity and Environmental and ecological sustainability.

16. South China Sea has assumed great geopolitical significance in the present context. Comment.

Hints:

- The South China Sea is a marginal sea that is part of the Pacific Ocean, encompassing an area from the Karimata and Malacca Straits to the Strait of Taiwan of around 3,500,000 square kilometres.
- The South China Sea is ringed by Brunei, China, Indonesia, Malaysia, the Philippines, Taiwan, and Vietnam, and dotted with hundreds of small islands, shoals and reefs, many of them occupied by the disputants.
- Geopolitical significance of South China Sea is due to the competing demands and interests of various littoral states and other world countries in the region.
- **Economic reasons:**
 - a) The SCS is a busy international waterway, being one of the main arteries of the global economy and trade. More than \$5 trillion of world trade ships pass through the SCS every year.
 - b) The SCS is also resource rich, with numerous offshore oil and gas blocks.
 - c) Fishing presents another potential source of conflict. The South China Sea is the largest source of fish, an important foodstock, in each of the claimant countries. The fishing industries of each of the disputants include large numbers of vessels which travel increasingly farther from their home coasts due to overfishing in coastal waters, bringing them into disputed waters. This has led to frequent incidents of harassment of vessels, confiscation of catches and equipment, and sometimes imprisonment of fishermen.
- **Political reason:**
 - a) The fundamental issue in the South China Sea is one of territorial sovereignty, that is, which state has sovereignty over the islands and their adjacent waters. Presently six countries are having

territorial claims in the South China Sea waters for trade, transport, hydrocarbons, freedom of navigation etc.

- b) Given the ambiguities of international law over the Spratly and Paracel islands, countries in the region have occupied various islets, reefs, rocks and outcrops over the decades
- c) China's increased presence in the region by deployment of deep-sea rigs and drilling in the disputed area also raises many political issues.
 - Growth of naval power in the region as joint military exercises has also increased.
 - Hence the geopolitical significance of the South China Sea has increased in the present era.

17. *Major cities of India are becoming more vulnerable to flood conditions. Discuss.*

Hints:

- Urban flooding has become a common phenomenon in recent times with every city sees flooding during the monsoon or during heavy rainfall times. There is a complete disconnect between geological and hydrogeological cycle and urban planning.
- The problem of floods in urban areas became so acute that in 2010, the National Disaster Management Authority (NDMA) recognised urban floods as different from riverine floods. It said urban floods "happen in a relatively short period of time and can inundate an area with several feet of water".
- Some of the reasons for urban flooding include:
 - a) Destruction of wetlands: Lakes and wetlands are an important part of urban ecosystem. They perform significant environmental, social and economic functions, ranging from being a source of drinking water, recharging groundwater to acting as sponges, supporting biodiversity and providing livelihoods. Destruction of wetlands leads to decreased absorbing capacity leading to floods. Ex Hyderabad has lost 3,245 ha of its wetlands. The vast network of lakes in the city had allowed the excess water from one lake to follow into another and eventually into the Musi River. With the destruction of this network any amount of heavy rains leads to flooding of the city as seen in 2016.
 - b) Concretization: Management of Urban Flooding report, published by the National Disaster Management Authority (NDMA) in 2010, says that concretisation is a major problem in many cities and towns. Concrete jungles obstruct and encroach upon the natural flow of water bodies and create pockets that trap water, which increases the flood intensity.
 - c) Destruction of river basin area of rivers flowing in the cities: Natural streams and watercourses, formed over thousands of years due to the forces of flowing water in the respective watersheds, have been altered/reduced because of urbanization. There have been large scale encroachments on the natural drains and the river flood plains. Consequently, the capacity of natural drains has decreased, resulting in flooding during heavy rains. Ex three rivers in the Chennai city are highly encroached upon and that has reduced the amount of water runoff into the Bay of Bengal. Kashmir floods of 2014 is the result of unplanned urbanization and encroachment of Jhelum flood plains decreasing its carrying capacity
 - d) Migration: Explosive increase in the urban population without corresponding expansion of civic facilities such as adequate infrastructure for the disposal of waste. The sewerage generated by the people gets mixed with the water and clogs the natural channels and storm water drains leading to flooding when it receives excessive water. Guwahati's Deeporbeel lake is used by the municipal corporation to dump solid waste since 2006.
 - e) Construction of dams on the river beds: Increased water that is released from these dams floods the low lying areas as in Kashmir the deluge was the result of the dam at Srinagar, its floodgates were opened without warning and the water carried all the debris from the dam site to the city.
 - f) Unmindful sand mining from the catchment areas and river beds also reduce the river absorbing capacity of excess water leading to floods during heavy rains. Vembanad Lake on the outskirts of Kochi has water level halved its initial level after the mining activity.

- Steps needed are:
 - a) Urban planners should undertake a detailed mapping of waterbodies, natural drainage and flood-prone areas in cities using remote sensing. And then integrate the drainage system of the city including rivers, rivulets, ponds, lakes and other natural drainage systems.
 - b) Policymakers to relook the development plans approved by city authorities and find out whether they violate the hydrological cycle of the city.
- This calls for stronger laws to protect urban lakes and the setting up of a single authority for the management and restoration of water bodies.

18. *Present an account of the Indus Water Treaty and examine its ecological, economic and political implications in the context of changing bilateral relations.*

Hints:

- The Indus Waters Treaty is a water-distribution treaty of Indus river system between India and Pakistan. The treaty was signed in Karachi on September 19, 1960 by Prime Minister of India Jawaharlal Nehru and President of Pakistan Ayub Khan. According to this agreement, control over the three “eastern” rivers – the Beas, the Ravi and the Sutlej – was given to India, while control over the three “western” rivers – the Indus, the Chenab and the Jhelum – to Pakistan.
- The treaty allowed India to use Pakistan’s rivers for irrigation, transport and power generation, while laying down precise regulations for Indian building projects along the way. The treaty is considered to be one of the most successful water-sharing endeavors in the world today.
- The changing bilateral equation between India and Pakistan over issues like border dispute, Siachen, Kashmir and terrorist attack such as Uri, has significant implication on Indus water treaty (recently Indian government’s consideration of optimizing Indus water use).
- The implications will be:

A. Ecological:

- i. Competitive and ecologically unsustainable constructions of big hydel power dam, can disturb the fragile ever ecosystem. (According to world bank both country have to maintain a threshold level of water flow for natural cleansing).
- ii. Bilateral rivalry can be a significant hurdle in putting joint effort for conservation of the river ecosystem and associated flora and fauna.

B. Economic:

- i. India and Pakistan have used the waters for irrigation purposes like agriculture in Jammu and Kashmir, paddy in Pakistan, tourism, electricity generation based on run of the river hydro-power generation, flood storage capacity ex. Baglihar project, Kishenganga project. Hence any misuse, overuse and unscientific use against the spirit of IWT can seriously affect local economies and runs the risk of aggravating conflict.

C. Political:

- i. As India enjoys respect and support for its adherence to global institutional arrangements (recent New Moore island with Bangladesh, Barkar river sharing, etc), any unilateral action may turn global community against India.
 - ii. Again countries like China will use this (any breach of IWT) as a pretext to divert water from the international rivers like the Brahmaputra and Mekong, leading to regional political instability.
- IWT acts as a confidence building measure (CBM) between India and Pakistan. It plays a big role in India Pakistan cooperation and peace
 - Therefore Ecological sustainability and economic demands of the local people should be the core priority, while using water of Indus. Rather than turning it into a point of conflict; it must be transformed into a conduit of cooperation by strengthening the IWT.

19. Enumerate the problems and prospects of inland water transport in India.

Hints:

- India has about 14,500 km of navigable waterways which comprise rivers, canals, backwaters, creeks, etc. The systematic development of waterways will create progressive economic opportunities in the country.
- However, the potential of water transport is underutilized in India. The share of inland water transport is only 3.5% compared to 40% in western countries.
- Inland waterways are the most fuel efficient, cost saving and environmental friendly mode of transport. It will reduce the burden on road and rail transport which are comparatively less efficient. The cargo conveyance too is cheaper will little energy requirements.
- But the inland water transport in India faces following issues:
 - a) Competing demands on the stressed water levels with existing users, between centre and state, human use and ecological need of the river particularly farmers who need water for irrigation, drinking water and use for industries , fisheries-based livelihoods, pilgrimage, or rights for local navigation remain unresolved.
 - b) Accidental spillage of hazardous fuels could directly affect the health of millions of people in India that still depend on rivers for drinking, domestic uses, commerce, and livelihoods, and present life-threatening risks to aquatic species.
 - c) Environmental and ecological concerns: Dynamic flow, flooding, changing river courses seen in most of the rivers are essential to maintain the river productivity and ecology of the rivers. The high sedimentation deposition and erosion patterns make navigation risky.
 - d) The need for huge private investments in maintaining the dredging work. Ex Farrakha barrage is a case in point.
 - e) Diversion of river water for irrigation canals has reduced the flow of water and declined the navigation capacity of the rivers.
 - f) The presence of waterfalls, cataracts and sharp bends hinders the development of waterways.
 - g) Silting of river bed reduces the depth of water and creates problem for navigation.
 - h) Insufficient depth throughout the stretch of navigable waters.
 - i) Non availability of low draft high technology vessels.
 - j) Non availability of navigational aids resulted in restricted sailing over a long period.
 - k) Most of the large rivers of the country enter the sea through shallow sand choked delta channels. Thus navigation is hampered unless dredging is done.
- In other to increase the significance of inland waterways and to improve their efficiency, the government has identified important waterways and designated them as national waterways of India.
- The Government is also developing National Waterway-1 (NW-1) under the **Jal Marg Vikas Project**, with assistance from the World Bank. NW-1 refers to 1620 km Haldia-Allahabad stretch of River Ganga.

20. In what way micro-watershed development projects help in water conservation in drought-prone and semi-arid regions of India?

Hints:

- The watershed is a natural hydrological entity that covers a specific aerial expanse of land surface from which the rainfall runoff flows to a defined drain, channel, stream or river at any particular point.

- Water collected from all the sources is stored in lakes, ponds, subsurface soil, soil moisture and geological formation and building of check-dams, tankas, etc help in storage of water for lean seasons.
- Micro-watershed is a strategy towards achieving inclusive growth with the objective of giving impetus to treatment of degraded watersheds, augmentation of drinking water, agricultural growth and spreading the benefits of growth to all sections of population.
- Micro-watershed strategy includes:
 - a) Development of waste lands in non-forest areas, checking of land degradation, agro-forestry and social forestry helps in conservation of soil moisture, recharge of ground water.
 - b) Watershed development for improving water use efficiency for agriculture and also provides water in regular intervals that will help improve productivity ex Bamboo drip irrigation of Meghalaya.
- The outcomes are prevention of soil erosion, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area.
- Thus concept of watershed development improve community resilience for semi-arid and drought prone area which may lead to development of alternate livelihood activities, allied agricultural activities, cottage industry.

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