

# **GSSCORE**

**An Institute for Civil Services**

## **IAS TOPPER'S**

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**REKHA YADAV**

**RANK - 509**

### **GS MAINS**



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**SCIENCE - TECH. AND ENVIRONMENT**

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
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Name Rekha Yadav

Roll No. \_\_\_\_\_

Mobile No. \_\_\_\_\_

Date \_\_\_\_\_

Signature Rekha

1. Invigilator Signature \_\_\_\_\_

2. Invigilator Signature \_\_\_\_\_

# REMARKS

**Section - A**

Q1. What is an air-independent propulsion system? What are its advantages? (10 Marks)

Air independent propulsion system is the newest technology developed in the field of space research and development. It ~~is~~ is an efficient system to conduct a space probe with least cost. Hence, it is the need of the hour, As India is heading towards becoming a global power.

Advantages of Air independent propulsion system -

- ① Highly efficient & effective technology
- ② less cost of production
- ③ Increase efficiency of fuel system
- ④ Reduction in the cost of space travel
- ⑤ Can turn out to be global benchmark for future space probes.

Remarks

Conclusion. Thus greater focus should be made on such less budget Research technologies for greater sustainability & effectiveness of available resources

Remarks

Q2. What is cold fusion technology in nuclear power generation? What are its benefits and issues associated with this technology? (10 Marks)

Fusion - It is the process of addition of smaller / lighter nuclear particles to form a giant particle. Hence huge amount of energy is released in this process. This released energy is known as fusion energy.

Cold fusion technology :- It is a recent development in the field of Nuclear power generation. It involves the use of cold techniques along with fusion process thereby reducing the immense heat generated during the process so that this technology can be effectively used in various sectors for power generation and other energy requirements.

### Benefits

- ① Huge amount of energy can be generated.
- ② Hazardous risks can be minimised with the implementation of this technology.

Remarks

- ③ Can be used in various sector specific needs.

### Issues

- ① Cost high - less accessibility due to high cost burden.
- ② Huge technological skills - India lacks required technological skills in the workforce.
- ③ Lack of proper regulatory mechanism

### Way forward -

- ① Need of a dedicated & efficient regulatory mechanism.
- ② Skilling, reskilling & upskilling of the workforce
- ③ Proper fund allocation and required infrastructure should be given

Remarks

- Q3. To compete in a future teeming with new technologies and possibilities, banks cannot afford to wait to embark on their artificial intelligence journey. Comment. (10 Marks)

Artificial Intelligence - The technological development whereby machines acts as human and performs human activities is termed as Artificial intelligence. It is also known as ~~Artificial~~ machine Intelligence.

Artificial Intelligence finds an important role to play in the fields of - Agriculture, health, education, banking & finance, governance etc.

### Role of AI in Banking Sector

- ① Yes Bank deployed a Robot named IRA for the customer assistance in the banking services.
- ② First such Robot was inducted by city union Bank and the name of the robot was Laxmi. On the similar lines SBI Bank has also introduced an artificially intelligent efficient robot namely SIA, for the help of the customers and assisting

Remarks

them to the required counters.

### Positives of AI in Banking Sector

- ① Tracking of customers data
- ② Resolution of customers problems
- ③ De-burdening of banking systems
- ④ Organisation of customer specific data
- ⑤ Providing suitable solutions to the technological glitch.
- ⑥ Cyber security & digital fraud.

### Negatives of AI in Banking sector

- ① Unemployment will increase - as they will eat away the jobs.
- ② Too much dependence on machines
- ③ Human memory efficiency decrease.

Conclusion. In order to compete with the global structure, banks should equip themselves with required technologies but in a regulated manner so that prof proliferation of information does not take place.

Remarks

- Q4. Whenever global rankings of universities are announced, there is always a discussion about India's poor performance. Overall culture of research is largely missing in Indian institutions. What are the reasons behind it and what should be way-out? (10 Marks)

India spends only 0.8% of its GDP on research & development. There is an increasing demand from all spheres to increase this percentage to ~ 2% of GDP.

### Research and Indian institutions

- ① most of the research are conducted by govt. bodies / agencies.
  - ② lack of private participation in the research field.
  - ③ most of the funding is being provided by govt.
  - ④ universities just acts as teaching institutions
  - ⑤ lack of skilled manpower
  - ⑥ lack of research infrastructures
  - ⑦ untimely fund delivery system.
- Hence, all these factors highlights the point that the culture of research is missing in the Indian universities.

Remarks

Way out for this problem

- ① Increase in participation of private players
- ② more allocation of funds for research purpose
- ③ mission -driven Research
- ④ separate body for research monitoring & evaluation
- ⑤ Adoption of international Best practices
- ⑥ Creation of new legislation in this direction

Conclusion - The culture of research in the Indian universities can be enhanced through proper implementation of ~~pol~~ policies & programmes and for this allocation of funds should be ensured on timely basis.

Remarks

- Q5. Discuss the challenges in increasing adaptability of digital world and ways to enhance digital penetration in India. (10 Marks)

Digital Connectivity is spreading like a wildfire. It has become an essential requirement of the time. for this govt is making various programmes for reducing the digital divide.

### Challenges

- (1) Lack of internet connectivity in rural & remote areas
- (2) Cost of accessibility is high
- (3) Low level of adaptability to the technology.
- (4) digital divide - due to ~~more~~ poor resources
- (5) security threats - cyber frauds
- (6) lack of smartphones & smart gadgets.

### Ways to enhance digital divide

- (1) making technology adaptable to all
- (2) Increasing the internet connecting across the Indian landmass - reducing the digital divide

Remarks

- ③ Govt programmes - optical fibre network - Bharat net, Digital India, Make in India, Cashless India, e-wallet.
- ④ Establishment of Payment Banks - eg. Paytm Payment Banks.
- ⑤ Increasing financial inclusion - will also help in increasing internet penetration
- ⑥ Common Service Centres.

Remarks

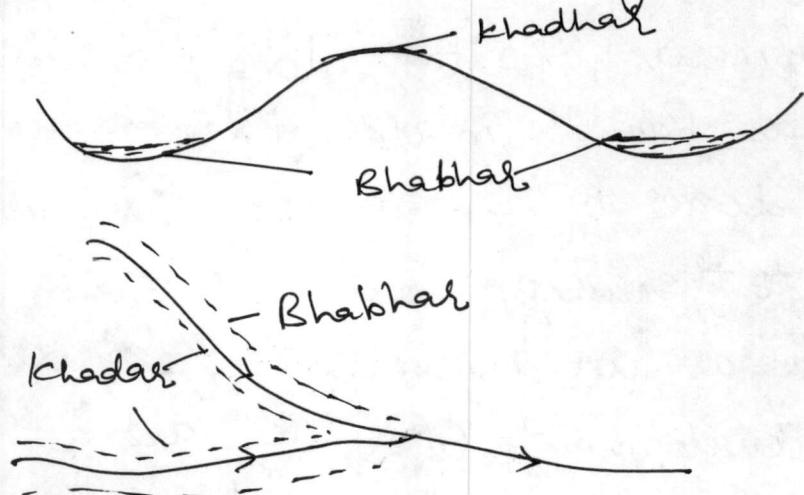
- Q6.** DRDO has signed a technology transfer agreement with Jindal Stainless (Hisar) Limited for manufacturing High Nitrogen Steel (HNS). In this context, elaborate on High Nitrogen Steel (HNS), its significance and applications. (10 Marks)

*Remarks*

*Remarks*

- Q7. Floodplains' 'conserve and use principal' can be a game changer in sustainable management of flood plains and in ensuring the demands of water in nearby cities. Discuss. (10 Marks)

Flood plains - are the landforms created by the river & associated channels during their mature phase/stage.



Flood plains are important fertile grounds for the agricultural production & productivity. Hence they need proper conservation & preservation.

The sustainable management of flood plains can be ensured through -

- ① Proper desedimentation of river beds
- ② Clearing the course of the river streams
- ③ No pollution along the river course

Remarks

All these will ensure greater production & productivity in the region as well as maintain the health of the river ecosystem.

The development of cities along the river course has been an old phenomenon. It was done to ensure regular supply of water to the city dwellers. Thus water acts as an important resource for the development of cities along the river course.

If floodplains are conserved & preserved it will create the demand for the conservation of water resource as well thus in this may it can ensure demand of water in the nearby cities.

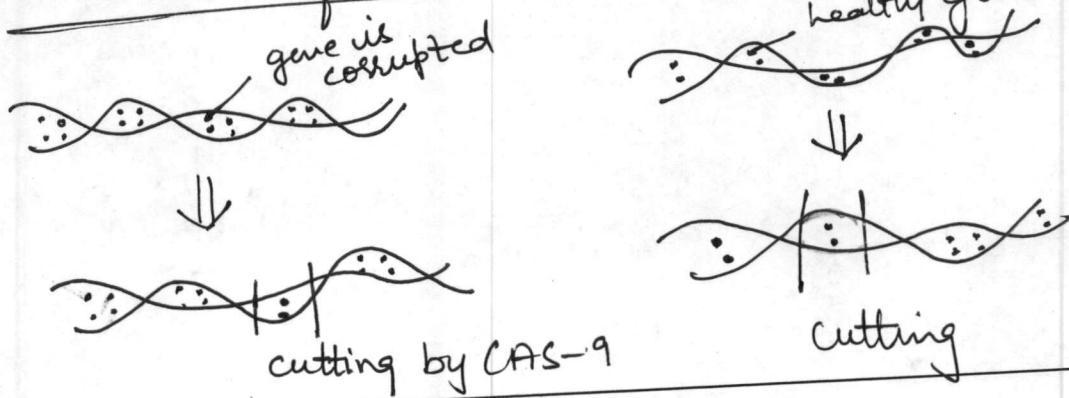
Remarks

Q8. What is DNA Repair Mechanism? Explain how this mechanism works and what its significance for Human? (10 Marks)

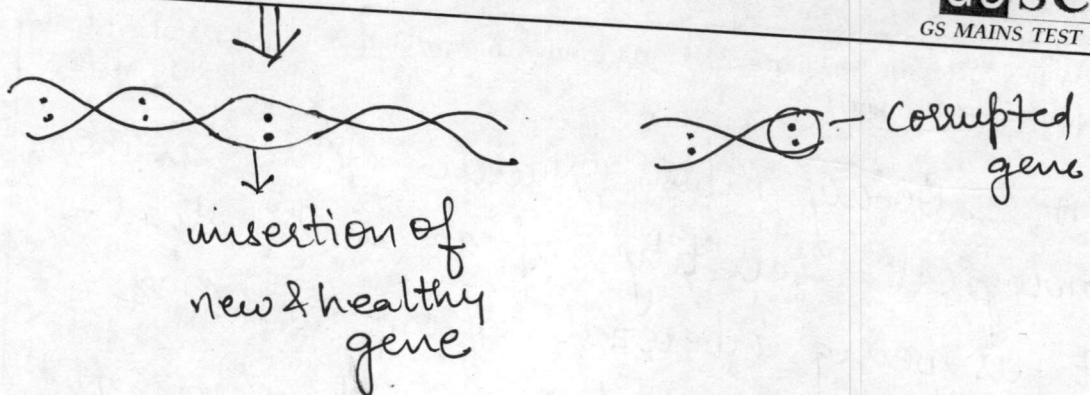
DNA - De-oxy Ribose Nucleic Acid is the biological identity of an individual. It is being inherited from mother & father to the offspring. It carries the genetic information of the individual.

DNA Repair mechanism - It is the technology through which diseased or corrupted gene is being removed and in place of that new & healthy gene is being inserted. It can be done through CRISPR CAS-9 where CRISPR is the technology & CAS-9 is the enzyme responsible for DNA cutting

### Mechanism of DNA Repair Mechanism



Remarks



### Significance

- ① It can help in curing of several genetic diseases
- ② It can help in increase in rate of human survival.
- ③ It can be used in creating Designer babies.
- ④ This technique can be useful in curing Cancer disease.

Remarks

- Q9. Deep Sea Trawling has emerged a significant threat to marine ecosystem including destroying coral reefs and pristine marine habitats. Elaborate. (10 Marks)

Deep sea Trawling is one of efficient way of catching fishes through the use of motor powered trawlers. It maximises the fish production but along with that it causes harm to the marine ecosystem.

### Threats of Deep Sea Trawling

- ① Destruction of coral reefs
- ② Degradation of marine ecosystem & ecology
- ③ Destruction of eggs of fishes and other marine animals.
- ④ Marine vegetation is uprooted
- ⑤ Disbalancing the marine stability & sustainability by eroding the components of the marine habitat.

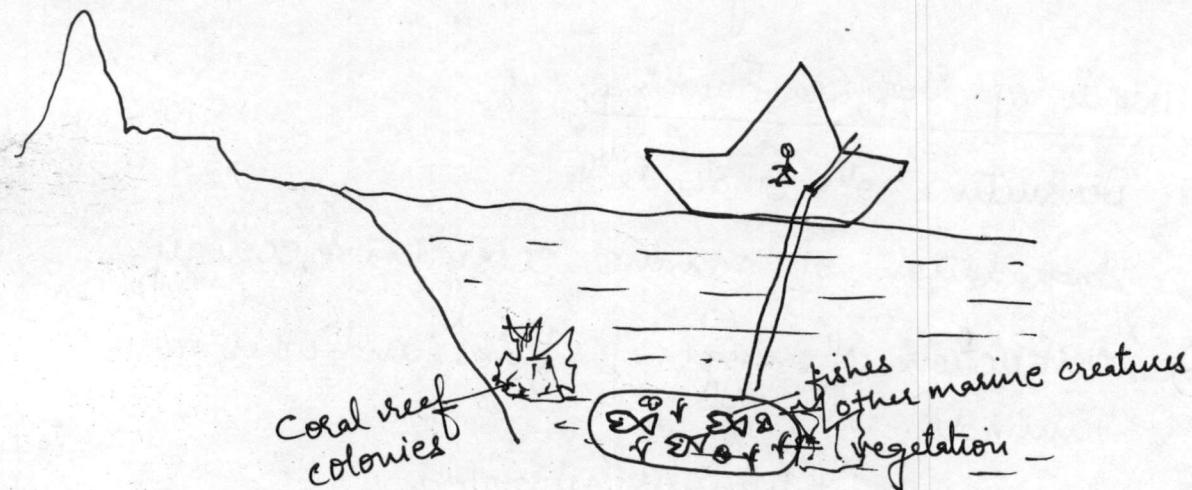
### Impacts on Coral Reefs

Deep sea Trawlers are in use because of the bulk production of fisheries but in this direction, harms are being caused to the wings of the marine ecosystem i.e. Coral Reefs. Coral Reefs held a significant play in marine

Remarks

Ecology as it sustains a large number of marine organisms and it also provides food & shelter to the marine creatures.

The destruction of coral reefs has severe impacts on the overall functioning and sustainability of the earth.

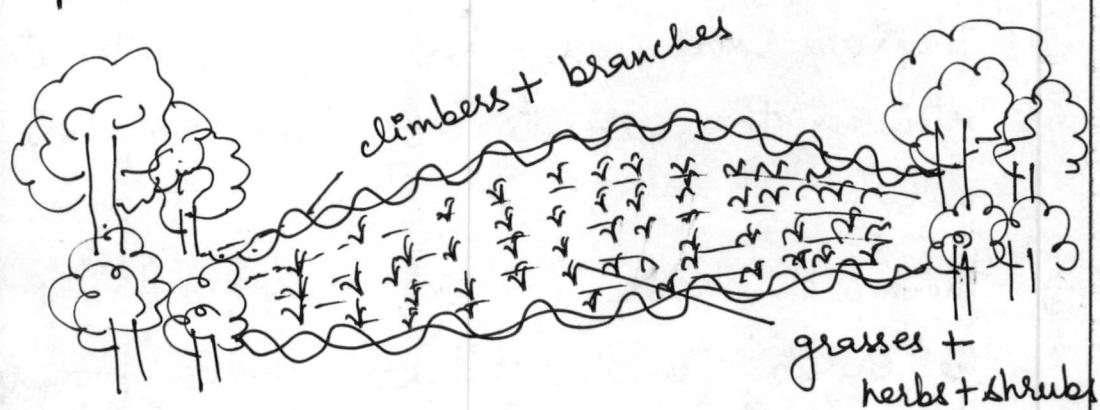


Way forward:- Since for the economic growth & development a large production of fisheries is essential but it should not be at the cost of degrading the environment. Thus sustainable utilisation should be done in order to protect and save the "mother Earth".

Remarks

Q10. What are eco bridges? Discuss the need and significance of eco bridges in biodiversity management. (10 Marks)

Eco Bridges :- These are the natural bridges formed by the vegetation growing in the particular landscape



Thus eco bridges acts as natural pathways to connect one natural landscape to another.

### Need of Eco Bridges

- ① Because of development, animals life is getting worsened due to rail & road across the forests
- ② Lack of availability of food & predator in one landscape.
- ③ Reduced space for animals wandering due to certain developmental projects.
- ④ For increasing the population of forest animals to maintain balance & stability.

Remarks

## Significance of Eco bridges:-

- ① They resemble natural landscape hence animals use them without any harm to their survival & life.
- ② They are required for greater interaction between the species of two natural forest.
- ③ They are must for the sustainability of the earth as the natural forest footprint is degrading & decreasing.
- ④ Eco bridges can act as a channel for the interrelationships, interlinkages & interdependence between various forest components to ensure resistance, resilience and ~~and~~ adaptability.

Way forward:- There is a need for building of a large number of eco-bridges because they can improve the balance between the degrading forest ecosystem.

**Section - B**

- Q11. Briefly elaborate on concepts Virtual Reality (VR), Augmented Reality (AR) and Artificial Intelligence (AI), along with their role in improving social parameters like health and education. (15 Marks)

Virtual Reality - It creates a type of virtual world before us without getting in physical touch with that. for eg. Gaming

Virtual Reality engages our mind towards the virtually created world and helps us learn new prospects related to the artificial created ecosystem. It has nothing to do with reality.

Augmented Reality :- It links the reality of the world with technology. i.e. It ~~creates~~ is not reality but it augments the reality. It can be used in various fields. eg - health, education, medicine, governance, business.

It helps ~~in~~ medical students learn the complex body organs in the augmented world without risking the patient's life.

Artificial Intelligence - It is also known as Machine intelligence.

Remarks

Artificial intelligence empowers the machine to behave as a human. Thus, it acts as a humanisation of machine.

It helps us in many ways - It interpret data for us. It tracks our performance. It measures the development of an individual's intelligence etc.

### Role of VR, AR and AI in Health Sector

- ① Smart Health
- ② Enhanced medical treatments and cure of disease.
- ③ 3-D printing of human organs.
- ④ Analysis of health sector performance across the country.
- ⑤ Incorporation of these technologies will provide greater assistance to medical practitioners to treat their patients in a effective & efficient way.

### Concerns

- ① Too much dependence on these technologies can drain away natural human capacity & capabilities.

*Remarks*

- ② Loss of jobs.
- ③ Cost inefficient - Rich poor divide

### Role of VR, AR and AI in Education Sector

#### ① Positives

- ↳ Help in tracking student and teacher's performance.
- ↳ Better understanding of concepts, theories and models.
- ↳ No need of physical infrastructure
- ↳ Anywhere, anytime availability of education and knowledge.
- ↳ Help in making education a outcome based learning.

#### ② Negatives

- ↳ Technologies cannot be compared with a teacher's crucial engagement with the students
- ↳ Technologies cannot understand child psychology
- ↳ Social development of child may get hampered.
- ↳ Loss of jobs of teachers.

Conclusion:- Technologies are required for growth and advancement of a nation but they cannot substitute the role of human, hence technologies should work in coherence with the human gene pool.

Remarks

Q12. Although, there are several international efforts like Bonn Convention and CITES for conservation of migratory birds, yet they are facing severe threat from human and climate related changes. Discuss. Highlight some initiatives taken by civil and NGO organization to save migratory birds. (15 Marks)

In 1972, a convention was held in Stockholm to talk about the sustainability of the Earth and its resources. Thereafter various conventions held around the world for the protection, prevention & conservation of Earth and its limited Natural Resources. Some of these conventions were -

Bonn Convention

CITES

Ramsar Convention

Minamata convention

Stockholm Convention etc.

All these Conventions, more or less talk about the conservation & preservation of pristine ecosystem and ecological balance of the earth.

### Bonn Convention

It is also known as Convention on migratory species. It works for the various migration related issues of the species (animal & plants) so that Ecological balance should not be disturbed.

Remarks

It assigned certain criteria for the species migration related issues -

- ① Invasive species should not be migrated
- ② It defines the migratory routes of the birds & animals due to various climatic factors.
- ③ It takes into consideration the origin place and final place of migration and related laws for their regulations.

India is signatory to the Bonn Convention

#### CITES

↳ Convention for International Trade in Endangered Species or CITES talks about the trade in ~~endanger~~ endangered species both plants and animals across the globe.

It divides countries into various groupings known as annex 1, annex 2 etc.

Those in annex 1 have to follow the rules bindingly whereas some relaxation is being given to those in annex 2.

Thus, it regulates the international trading in both fauna & flora to maintain the stability & balance of the various ecosystems.

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Remarks

Threats

- ① Habitat degradation degradation & destruction
  - ② lack of availability of food
  - ③ frequent cyclonic and flood activities
  - ④ Rising incidents of droughts & anticyclones
  - ⑤ Global warming
  - ⑥ Changing patterns of rainfall & temperature
- All these are posing threat to their survival and sustainability.

Initiatives taken by Civil Societies & NGOs

- ① Campaignings to ban the trade and poaching of animal species.
- ② Campaign against the use of forest land for development purpose which is causing loss of habitat for the faunal species.
- ③ Initiatives taken for the afforestation and reforestation for the degraded forest land
- ④ Providing better liveability condition & health assistance to plant & animal species for their proper growth & development.
- ⑤ Campaigns for public awareness about the role of plants & animals in survival and sustainability of earth.

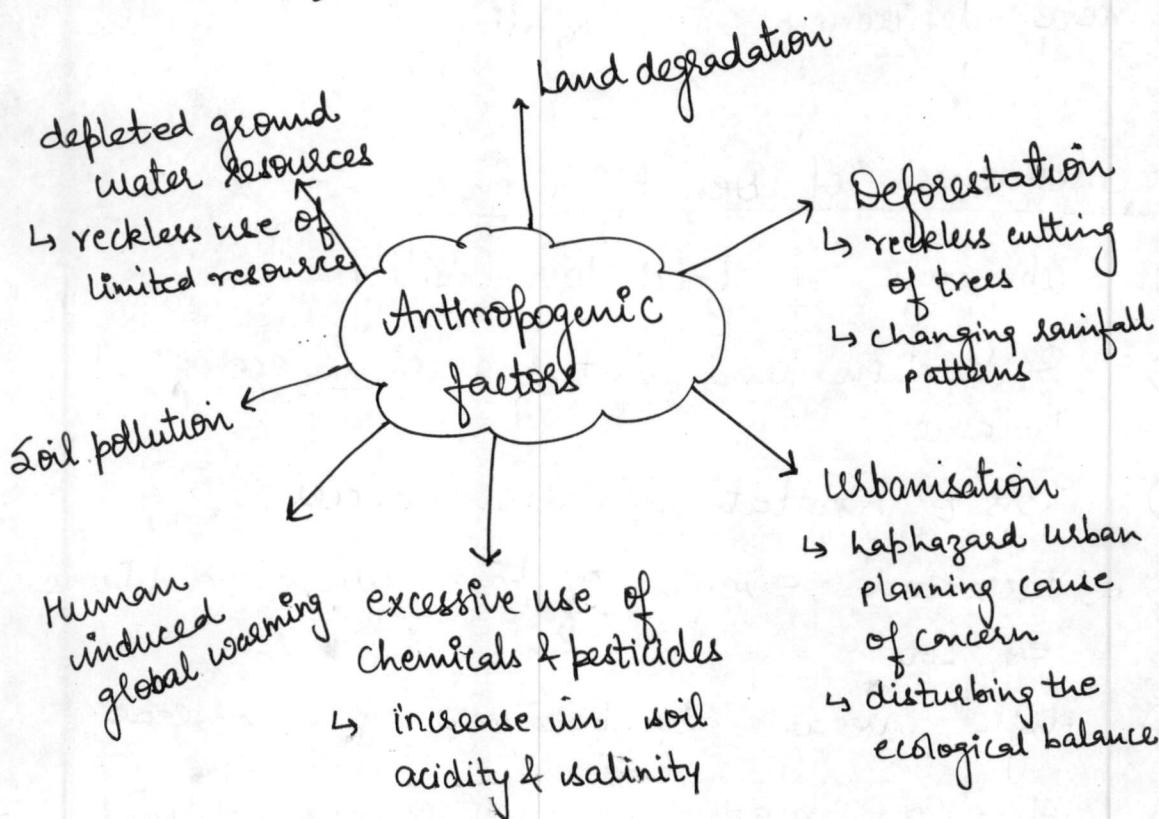
Remarks

Q13. Drought is a broader concept than just deficiency of rainfall. Discuss how drought is more of a man-made disaster than a mere deficiency of rainfall. Elaborate on the ③ consequences of desertification that drought prone regions face. Also, bring out the ③ preventive steps to be taken in light of targets to curb desertification as mentioned under the SDGs. (15 Marks)

Drought- The state of Earth ecosystem where the components of earth like soil, water and air and minerals does not produce any outcome, is described as a condition of drought.

Drought can occur due to various reasons -

- ① Anthropogenic factors
- ② Natural factors.



Remarks

### Natural factors

- ① Decreasing rainfall availability.
- ② rising ~~&~~ average Earth Temperature
- ③ Frequent occurrence of El-Nino events
- ④ Rising & frequent heat wave conditions.
- ⑤

Thus we can say that Droughts has now become a more of anthropogenic activity rather than mere deficiency of rainfall.

### Consequences of Desertification

- ① Shortage of food availability.
- ② Destruction and disturbance in ecological balance.
- ③ Loss of habitat of various species
- ④ Increased events of heat wave conditions  
eg Loo.
- ⑤ High average temperature of landscape
- ⑥ Effect on monsoonal pattern i.e. delayed and less frequent

Remarks

- ⑦ Productivity of the land decreases
- ⑧ Land a limited resource becomes wasteland & barren land.
- ⑨ It will lead to further spread of desert.

Preventive steps as mentioned under SDGs

SDG 7, SDG 10 & SDG 14 & SDG 15 are related to the environment & related climate change phenomenon -

- SDG 7 - Climate change
- SDG 10 - Smart cities
- SDG 14 - Life below water
- SDG 15 - Life above land

Thus, the targets under the SDGs are focused towards preservation ~~and~~, conservation & successful restoration of natural landscape for better production & productivity in order to maintain ecological stability & resilience. Following targets are realised in this regard -

- ① Afforestation + Reforestation
- ② Water harvesting techniques should be used.
- ③ Climate sustainable cropping patterns should be used.
- ④ Building of green corridors around the cities
- ⑤ Use of mixed farming techniques i.e Agriculture+livestock
- ⑥ Use of water efficient variety of crops.

Remarks

- Q14. Convention on Biological Diversity (CBD) 1992, included bio-prospecting as one of its objectives, putting forth an international treaty that aims to ensure fair and equitable sharing of benefits arising from the use of biological resources. In this context, explain bio-prospecting? What are the main benefits and challenges associated with it?

(15 Marks)

In 1992, Convention of Biological Diversity (CBD) came into existence under the aces of Rio Earth Summit, 1992. It talks about the conservation, protection, preservation of Biological diversity of a natural landscape. In this regard, major impetus was laid on Bio prospecting.

Bio prospecting refers to the management of biological diversity through coordinated & collaborated efforts from the various countries across the globe.

It focuses on the fair & equitable sharing of benefits arising from the use of biological resources, in this direction various protocols have been signed / tabled under the aces of CBD - such as -

Nagoya Protocol - It talks about the ABS mechanism i.e. Access and Benefit Sharing mechanism which ensures equality of access and the distribution of profits amongst the participatory countries.

Remarks

Convention on living modified organism - It refers to the trade & transportation of living modified organism (LMO's) across countries boundaries for enhanced production & productivity and the revenue generated through this should also be shared between the parties involved.

Hence, we saw that Convention on Biological diversity aims to ensure fair & equitable sharing of benefits.

### Bio prospecting:

Bio prospecting refers to the enhanced outcomes obtained from a modified species, so that it can be used for the greater good, of the social ecosystem.

### Benefits

- ① Diversifying a species may bear more fruits.
- ② Maintenance of Biological diversity for large benefits of the earth.
- ③ Increased participation among the countries for shared benefits.

Remarks

Challenges

- ① May prove detrimental to certain ecosystems.
- ② May not bear the expected results
- ③ Regulatory mechanism are not well formulated
- ④ Lack of global governing body

Way Ahead :-

- ① Proper mechanisms <sup>should</sup> ~~need to~~ be adopted for better results.
- ② Ensure efficient regulatory framework
- ③ Proper investment should be made in this direction.
- ④ Infrastructure should be strengthened.

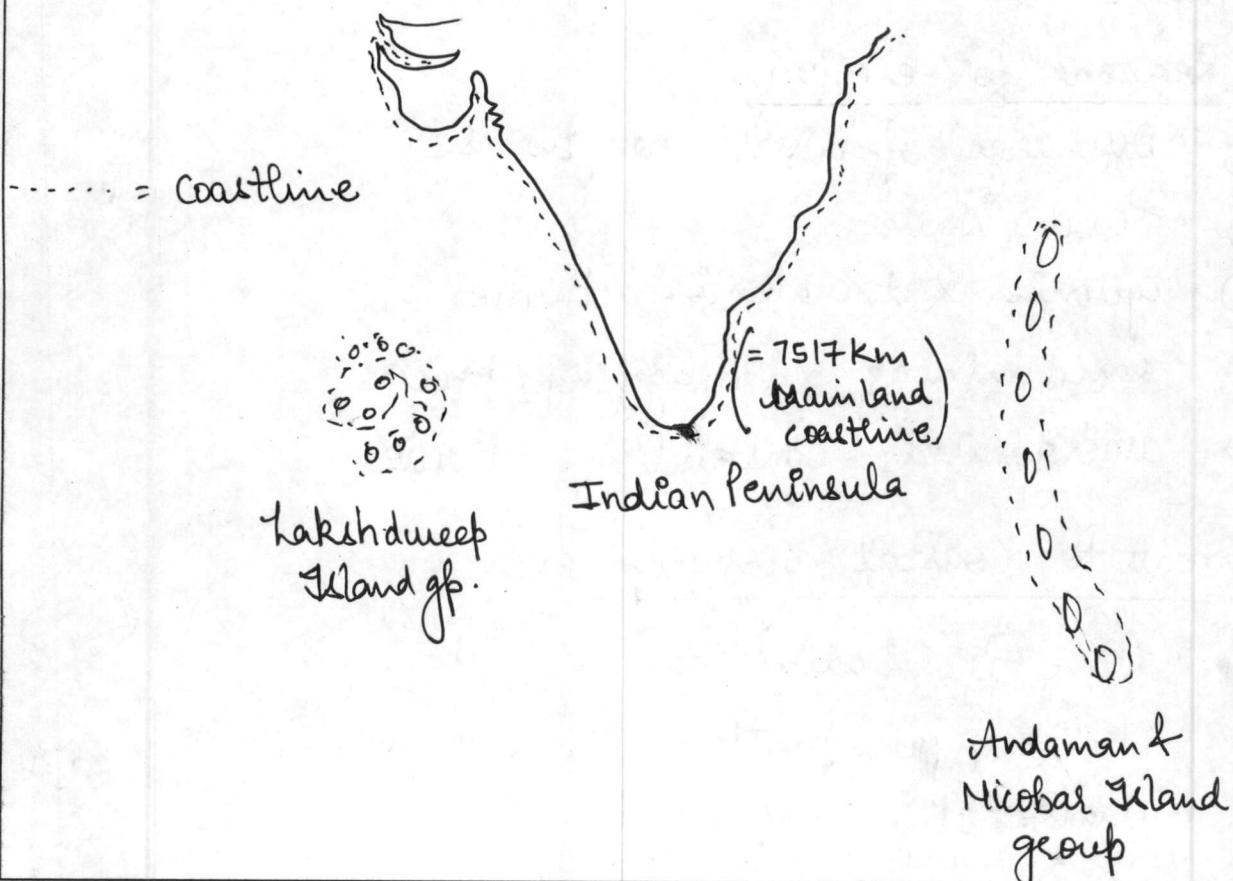
Remarks

- Q15. According to MOEF&CC, 40% of the Indian 8,414-km long coastline is subjected to coastal erosion which is posing a significant threat toward sustainability of coastal ecosystem. In this context discuss the major reason of coastal erosion. Also suggest measures to deal with coastal erosion. (15 Marks)

India is having one of the longest coastline of the global landmass. It forms a part of the Indian peninsula. This coastline has various significance as - Ports, beaches, Lagoons, various research stations etc.

Thus, the coastline is one of the natural resource of the Indian landmass.

### Coastline of India



Remarks

Threats toReasons for Coastal Erosion

The Western Coastal region of India is the submerged coastal zone. It is the narrow zone. less number of rivers drain into Arabian Sea. Estuaries are formed in this region. Thus it is subjected to less erosional processes.

The Eastern Coastal region is the emergent coast. It is quite wider than the western side. A large number of rivers drain into this. Deltas & mangroves are the landscapes found along this coast.

Reasons for erosion

- ① Discharge of rivers into the sea
- ② Tidal Waves
- ③ Cyclonic & tsunami activities
- ④ Sand mining & dredging process
- ⑤ unorganised construction activities.

Threat to Coastal Ecosystem

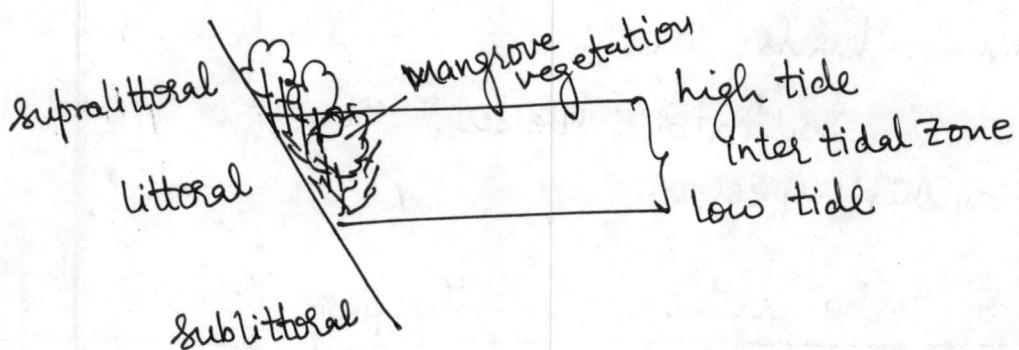
- ① Loss of biodiversity
- ② Habitat destruction & degradation
- ③ Marine life degradation

Remarks

- ④ Degradation of nesting sites of various turtle & fish species.
- ⑤ Frequent flood like situations
- ⑥ Degradation of agricultural productivity.

### Measures to deal with Coastal Erosion

- ① Proper fencing & bunding of coastal areas
- ② less interference in the coastal biology
- ③ less use of draggers in the coastal zone
- ④ Plantation of mangrove vegetation



- ⑤ Adoption of Coastal Zone Regulation Laws
- ⑥ Proper supervision & surveillance of coastal region.

Thus, by adopting the above measures we can protect our coastal zones from degradation.

Remarks

Q16. Rapid urbanization and other anthropogenic activities have become greater threat for the existence of birds. In this context, discuss various reasons for decline in the population of the birds. Also, suggest solution to protect this avifauna. (15 Marks)

Bird or Avian species forms an important part in the balance of the Earth. They are one of the component of global food web. Hence, there ~~covers~~ conservation is a the need of the hour.

### Role of Bird in ecological balance & stability

- ① Spreading of seeds - ~~red~~ increased plantation
- ② Maintain an important place in food energy kinetics
- ③ Earlier birds are used to send messages
- ④ Acts as Indicator species, keystone species, Flagship species.

### Impact of Urbanisation & Anthropogenic activities on existence of birds

- ① unplanned & haphazard urbanisation process is ~~degrades~~ degrading the habitat of the birds
- ② Deforestation - Increasing deforestation for economic growth & development is also

Remarks

poses a threat to habitat destruction of birds.

- ③ Pollution - impacting the birds in a serious way.
- ④ Increasing wiring lines - causing deaths of birds.
- ⑤ Kite flying - This is one of the important factors responsible for killing of birds.
- ⑥ Sky scrapers - The increasing height of buildings is also posing threat to the survival of birds.
- ⑦ Airports - Nowhere birds are safe. From land to air everywhere birds have to struggle for their survival.

Solutions All these factors are posing threat for the existence of birds along with they are responsible for the decline in the population of the birds.

#### Solutions to protect birds

- ① Planned & environment friendly city development

Remarks

- ② Increase forest cover, so that they can have a place to reside
- ③ Use of cotton thread for kite flying, this will save their lives.
- ④ Provide water & food to the birds
- ⑤ Application of proper waste disposal rules.

Way forward:- Thus if we want to live a better and progressive life, then all the components of the Earth's ecosystem should thrive properly, lest it will degrade the ecological balance of the earth.

Remarks

Q17. It is a well-established fact that no nation aspiring to great power status can expect to achieve it without being substantively self-reliant in defence production. In this context, discuss the need for indigenization of defence technology. (15 Marks)

India aspires to become a great power, in this regard proper impetus is being laid on defence capacity enhancement.

India has come out with New Defence Production policy. The salient features of this policy are -

- ① Increase in defence investment upto 1.7 lakh crore by 2035.
- ② Increase in defence exports worth Rs 35K crore.
- ③ Increased participation of private industries in defence production
- ④ Liberalisation of clearance window
- ⑤ Rationalisation in Tax policies.

Thus, India has taken a futuristic step to devolve funds to the greater production of defence equipments.

Another significant step taken by India in this regard is the revision of msme definition

Remarks

New MSME definitions are based on the total turnover of the industry irrespective of segregating it in goods & service industry.

Type of Industry	Annual turnover
Micro	$\leq 5 \text{ Cr}$
Small	$> 5 \text{ Cr} \text{ but } < 75 \text{ Cr}$
Medium	$> 75 \text{ Cr} \text{ but } < 250 \text{ Cr}$

Thus it now involve a large no. of defence production industries into the ambit of MSMED Act 2006. Hence it will ensure great production of defence equipments.

### Need of Indigenization of defence technology

- ① Exports are costlier
- ② Delays in defence exports may hamper our national security.
- ③ Increases debt ~~due~~ burden
- ④ Drain of demographic talent
- ⑤ Private industries are working efficiently in this direction, hence need to collaborate with them for increased production of defence equipment.

Remarks

- ⑥ Self-reliance
- ⊕ Global power

Thus, in order to realise all these aims we need a robust policy for the indigenization of defence technology and production through increased participation from all stakeholders.

Conclusion - Strong defence mechanism is necessary for any country to thrive independently in this linked global community. Hence specific policy should be formulated to reap this goal through building state of the art technologies for better utilisation of available resources.

Remarks

Q18. Throughout the history, dams have contributed significantly toward the economic and social developmental. However, riverine fisheries, fauna, fauna and ecosystem is near collapse due to them too. In this context, analyses the impact of dams on riverine fishing and their sustainability. (15 Marks)

Construction of dams is not a recent phenomenon. Rather it was being observed during the ancient period as well.

Dams are built with a view to contribute to the social & economical development of the nation. But there are certain drawbacks also associated with them as they are constructed against the free flow of the natural path of the rivers.

### Dams as drivers of economic & social development

- ① Provides water to water deficient areas
- ② Generation of electricity
- ③ Increase in the agricultural activity.
- ④ Acts as a bridge to across the rivers
- ⑤ It leads to development of a region.

### Negative impact of dams on the life of fauna & flora, riverine fisheries and ecosystem

- ① It leads to the destruction of natural habitat of the species.

Remarks

- ② It causes clogging of various species into the gates of them thus restricting their free movement
  - ③ Natural balance is disturbed as they are built against the flow of rivers.
  - ④ Increase in the course of river may lead to flood like situation. Recent example Idukki Dam Kerala
  - ⑤ Ecological of the area is degraded and also creates a restriction in the path of faunal species across the forest landscape
  - ⑥ Displacement of nearby community due to land acquired for Dam construction
  - ⑦ Dams also leads to ~~the~~ occurrence of reservoir induced seismicity.
  - ⑧ may lead to Algal bloom
- Thus, due to these effects there occurs the collapse of the riverine fisheries, fauna, flora & ecosystem.

### Measures

- ① Dams should be constructed in such a way there remains a free flow of ~~most~~ aquatic species so that they

Remarks

can thrive freely.

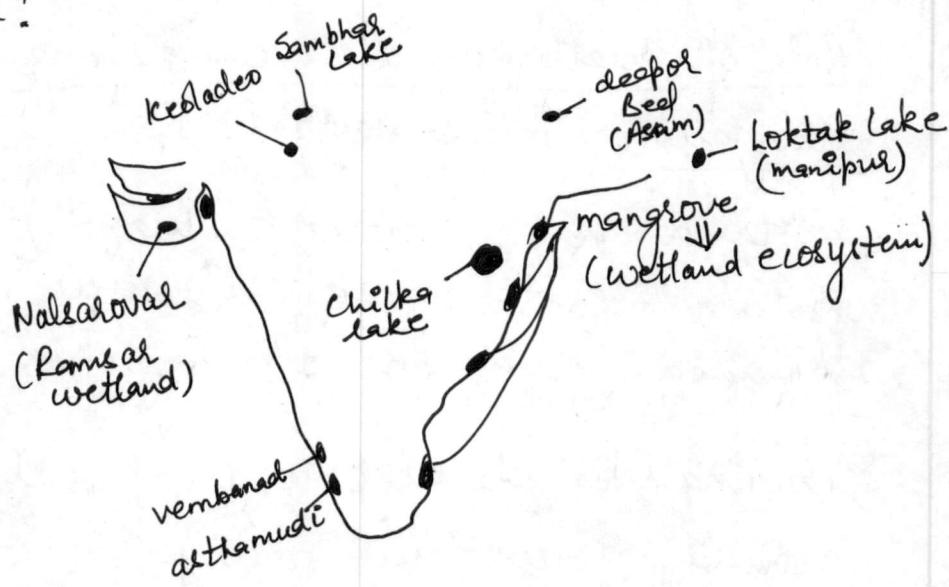
- ② Dams should be built with proper layout plans so that the risk associated with reservoir induced seismicity can be reduced.
- ③ It should not restrict the fisheries breeding and their free movement, in order to conserve the environment & ecosystem.

Remarks

- Q19.** This year, wetland day was celebrated with theme "Wetlands for a Sustainable Urban Future". In this context, discuss how wetland can contribute toward the sustainable urban future and development. (15 Marks)

Wetlands are areas with water logged soil for almost 7 days. These areas are good for development & thriving of certain agricultural crops and animal existence.

Feb 2 is celebrated as a Wetland Day every year with specific theme. This year the wetland day was observed with the theme of "Wetlands for a sustainable Urban Future".



wetland as an ecosystem supports large number of economic & environmental activity.

**Remarks**

## Contribution of wetlands towards sustainable urban future -

- ① Wetland can act as moderating medium for heat and temperature moderation. Urban areas are prone to vehicular & industrial pollution thus increasing the temperature. In this scenario wetlands may act as a moderating medium.
- ② Wetland as a tourist spot - The development of wetland ecosystem may bear economic fruit to urban area.
- ③ Role of wetland in channelling the navigation (inland navigation)
  - wetland may provide a way for inland navigation so that the resources can be exchanged from far off regions.
- ④ Planning & development of urban area around a wetland ecosystem demands cleaner and sustainable living there in order to construct such a urban living the ecological needs should be kept in mind.

Remarks

⑤ They (wetlands) are a fertile & ground for agri production & productivity like Paddy cultivation. Hence increasing food security.

Thus, wetlands play a diversifying role in the urban future and development.

Remarks

**Q20. Discuss the role of wildlife coalition in conservation, protection and management of wildlife and environment. (15 Marks)**

Wildlife species play a pivotal role in the maintenance of Earth's balance & stability. Wildlife conservation is the sum total of the efforts of the each stakeholders taking part in the ecosystem protection, preservation and conservation.

Wildlife Coalition - are the group of organisation (nationally & internationally), NGOs, civil societies and individuals, putting their efforts to conserve, protect & preserve the wildlife diversity & environment.

The efforts in the direction of wildlife conservation started with Wildlife Protection Act 1972. This act created a deterrence for the living society to stop poaching, hunting & illegal trading of wild animals as they are the essential components of an ecosystem and their degradation may harm the entire balance & stability.

Thus, under this came Water (Prevention & control of pollution) Act 1974, Forest Conservation

Remarks

Act 1980, Air (Prevention & Control of pollution)  
 Act 1981, Environment conservation act  
 1986, Biological diversity act 2002,  
 National Green Tribunal, 2010.

All these acts and bodies strive towards the conservation, protection and preservation of wildlife species along with their habitat safety.

#### Role played with wildlife coalition

- ① Banning on hunting, poaching, trading & illegal trafficking of animal parts etc.
- ② Increasing natural forest cover to secure their habitat
- ③ Lack of human interference in the natural habitat of the wildlife species
- ④ Proper surveillance and census should be conducted for the wildlife data.
- ⑤ Seeking global collaboration and international best practises for conservation of wildlife habitat & survival.

Remarks

Therefore, collective & collaborative efforts are required to conserve, protect & maintain & preserve the wildlife community.

Remarks