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GENERAL STUDIES (TEST CODE : 1500)

Name of Candidate	ASHUTOSH KUMAR		
Medium Eng./Hindi	ENGLISH	Registration Number	657129
Center	LUCKNOW	Date	16/11/2021

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
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Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

Ashu

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

1. The extraction of groundwater in India has reached a level that is threatening the water security in the country. Analyse the guidelines issued by the Central Ground Water Authority in this regard. **(150 words) 10**

भारत में भौमजल का निष्कर्षण एक ऐसे स्तर पर पहुंच गया है, जो देश में जल सुरक्षा के समक्ष खतरा उत्पन्न कर रहा है। इस संबंध में केंद्रीय भूमि जल प्राधिकरण द्वारा जारी किए गए दिशा-निर्देशों का विश्लेषण कीजिए।

Groundwater is the water stored in underground aquifers in the earth.

According to recent assessment by Central Ground water authority, about 37% of assesment units are at a critical level. This highlights threatening levels of groundwater extraction.

Reasons:

1) Agriculture: It consumes about 90% of entire groundwater extracted. Most ground-water is used for cultivating water guzzling crops like rice, wheat, sugarcane.

2) industries: unregulated extraction by industries.

3) high groundwater demand in urban areas with high population density.

In this context, following new guidelines have been issued by Central Ground water authority:

1) all industries will require a NOC certificate to extract water.
2) companies will have to pay water abstraction and usage charges.
3) in critical units, only MSMEs will be allowed to extract water.

Issues with guidelines:

1) The largest consumer i.e. agriculture has been exempted from guidelines.
2) Household consumption and defense establishment have been exempted.
3) payment of water usage charges may promote un-restricted usage and consumption.

Way forward:

1) There is a need to reduce water consumption in agriculture by:-
   1.1) rationalizing electricity subsidy
   1.2) crop diversification to pulses, oilseeds, millets
   1.3) promoting usage of micro-irrigation.

A comprehensive participatory & decentralized approach can help in reviving the water levels.

2. Highlighting the distribution of coal in India, discuss the issues associated with coal mining. **(150 words) 10**

भारत में कोयले के वितरण को रेखांकित करते हुए, कोयला खनन से जुड़े मुद्दों की विवेचना कीजिए।

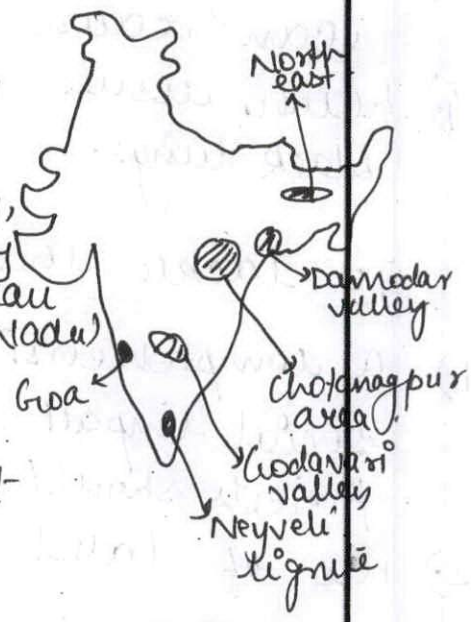
Coal is the major source of energy in India. Around 68% of electricity of India is produced via coal based thermal power plants.

Distribution of coal in India:

In India coal of two different ages occurs:

1) Gondwana Rocks : Damodar valley, Godavari valley Chotanagpur plateau Neyveli (TamilNadu) Goa.

2) Tertiary rocks → in North East India.



Issues associated with coal mining:

1) ecological issues:
   1.1) large scale cutting down of forest.
   1.2) adverse effect on local wildlife.
   1.3) huge consumption of freshwater is needed.
   1.4) it can occassionally contaminate ground water.

1.5) Collapse of abandoned coal mines can cause earthquake.

1.6) large scale air pollution due to dust and particulate matter.

Social issues:

1) displacement of tribals from their homeland.
2) loss of traditional means of livelihood leading to poverty among tribals.
3) mining accidents due to gas leaks can cause large scale deaths.
4) health issues faced by miners. eg: black lungs.

To tackle these issues:

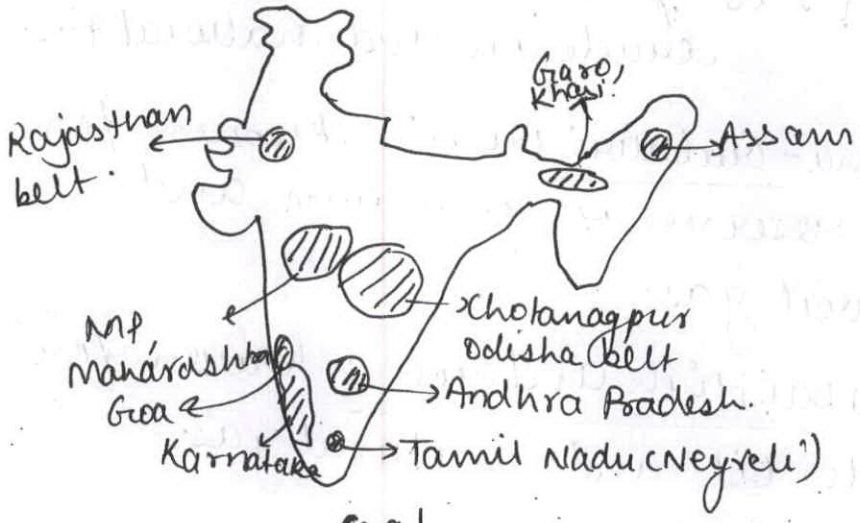
1) a comprehensive environmental & social impact assessment of mining projects should be done.
2) use of latest ~~te~~ coal mining technologies.
3) use techniques like coal gasification to reduce challenges associated with coal.

Given the developmental needs of India, coal mining should be developed along modern & scientific lines to ensure sustainability.

3. Give an account of the different mineral belts in India. **(150 words) 10**
भारत की विभिन्न खनिज पेटियों का विवरण दीजिए।

Minerals are naturally occuring elements or compounds found in nature. In India, there is abundance and diversity of mineral availability.

Different mineral belts of India:



1) Chotanagpur - odisha belt → coal, iron ore, bauxite, manganese, mica are important minerals.

2) MP, Maharashtra: major minerals include mica, limestone, coal.

3) Goa: major minerals are iron ore and coal.

4) Karnataka: iron ore is the major mineral.

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5.) Andhra Pradesh: Cuddapah rocks are repository of limestone, diamonds (Golconda)

6.) Rajasthan: It is famous for copper in Khetri mines.

7.) Garo, Khasi, Jaintia → famous for coal.

8.) Assam → is important source of crude oil and natural gas.

9.) Krishna-Godavari Basin: known for huge reserve of petroleum and natural gas.

10.) Mumbai High and Goa: known for crude oil and natural gas.

Mineral belts need strong governmental support, infrastructure creation, technology upgradation and value addition.

It can help in industrial development of India

4. Throw light on the contribution of agriculture to GHG emissions. Suggest measures that can be undertaken to address the challenges in reducing agriculture's carbon footprint in India. **(150 words) 10**

GHG उत्सर्जन में कृषि के योगदान पर प्रकाश डालिए। भारत में कृषि के कार्बन फुटप्रिंट को कम करने में विद्यमान चुनौतियों से निपटने के लिए किए जा सकने वाले उपायों का सुझाव दीजिए।

Agriculture is the mainstay of Indian economy. With the climate change, there is increased scrutiny of agriculture as a source of Greenhouse gas emissions.

GHG emissions from agriculture:

1) Methane: rice cultivation by flooding the fields is a major source of methane emissions.

2) use of fertilisers (primarily nitrogenous one like urea) lead to emission of harmful nitrous oxide.

3) stubble burning leads to release of carbon dioxide, Black carbon, particulate matter.

4) huge diesel generates used for ground-water extraction also add to GHG emissions.

Measures that can be taken:

1) to reduce rice based methane emission:
   1.1) promote direct seeding of rice which does not require field flooding.
   1.2) promote crop diversification.
2) encourage organic farmer and Zero budget natural farming to reduce ~~use~~ fertiliser usage.
3) promote bio-decomposition of stubble like Pusa biodecomposer technology used in Delhi.
4) Instead of burning stubble, use "Swedish Torrefaction" technique to convert it to bio-char.
5) solarize the diesel pumps via PM-Kusum scheme. This will reduce diesel generator related emission.

Holistic 10 steps can ensure the de-carbonization of entire agricultural value chain.

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5. Assess India's vulnerability and preparedness to deal with the sea level rise. **(150 words) 10**

समुद्र तल में वृद्धि के प्रति भारत की सुभेद्यता और इससे निपटने में इसकी तैयारियों का मूल्यांकन कीजिए।

According to latest IPCC assessment report earth has warmed upto 1.2°C above pre-industrial level. This has accelerating the melting of ice and leading to rise of sealevel

Vulnerability of India:

1) India has 7500 km long coastline which is susceptible to submergence.

2) Major cities like Mumbai, Vishakhapatnam, Chennai are coastal cities. Any rise in sea level can:
   2.1) damage the infrastructure
   2.2) affect economic activities
   2.3) lead to migration of people.

3) Some islands in Lakshadweep and Andaman and Nicobar can be submerged.

4) coastal agricultural fields in areas like Kerala can be submerged.

Hence it is necessary to ensure preparedness

India's preparedness

Strengths :

1) presence of advanced climate and sea monitoring & modelling technology to predict the impact.

2) presence of international coalitions for sea level rise - eg : CDRI

weakness :

1) lack of participatory planning

2) poor capacity to implement advanced construction techniques like sea retention wall.

3) weak institutional capacity

4) inadequate workforce to plan and implement adaptation schemes.

Going forward, India needs to work on its preparedness to deal with inevitable. It has been rightly said - "Time to talk is over, Time to act is now".

6. What are the challenges faced by the jute industry in India? Highlight the steps taken by the government to address these challenges.

(150 words) 10

भारत में जूट उद्योग को किन चुनौतियों का सामना करना पड़ रहा है? इन चुनौतियों से निपटने के लिए सरकार द्वारा उठाए गए कदमों को रेखांकित कीजिए।

Jute is a bio-degrable natural fibre that is used for variety of purpose like making ropes, gunny bags for packagnig etc.

Challenges faced by jute industry:

1.) small size of jute making firms
2.) use of obsolete machinery and technology.
3.) inadequate connect to high value markets like USA, European union.
4.) challenge and competition from Bangladesh.
5.) competition from synthetic fibres.
6.) inadequate branding and marketing.

Steps taken by government:

1.) A National Jute policy has been

put in place a comprehensive roadmap.

2.) Board to promote jute has been set up.

3.) MSP is announced for jute to incentivize jute cultivation.

4.) mandatory jute packaging for certain percentage of sugar in sugar mills.

5.) mandatory jute packaging for FCI grain godowns.

6.) Branding and promoting jute in international markets.

These steps will ensure that jute production stays at healthy level.

With rising consciousness of bio-degradable fibres, jute can well become the "golden fibre".

7. Give an account of factors that determine the location of Iron and Steel Industry in India. **(150 words) 10**
भारत में लौह-इस्पात उद्योग की अवस्थिति का निर्धारण करने वाले कारकों का विवरण दीजिए।

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8. Discuss the causes and consequences of Harmful Algal Blooms (HAB).
(150 words) 10

हानिकारक शैवाल प्रस्फुटन (HAB) के कारणों और परिणामों की विवेचना कीजिए।

Harmful algal bloom refers to proliferation of algae in water bodies and oceans due to anthropogenic causes. It is harmful because it causes harmful airborne disease.

Causes:

1) excessive addition of nutrients in water body due to:
   1.1) inflow of sewage waters
   1.2) agricultural runoff containing pesticides and fertilisers.
   1.3) discharge of industrial effluents.
2) release of warm water in water bodies which causes thermal pollution.

Consequences:

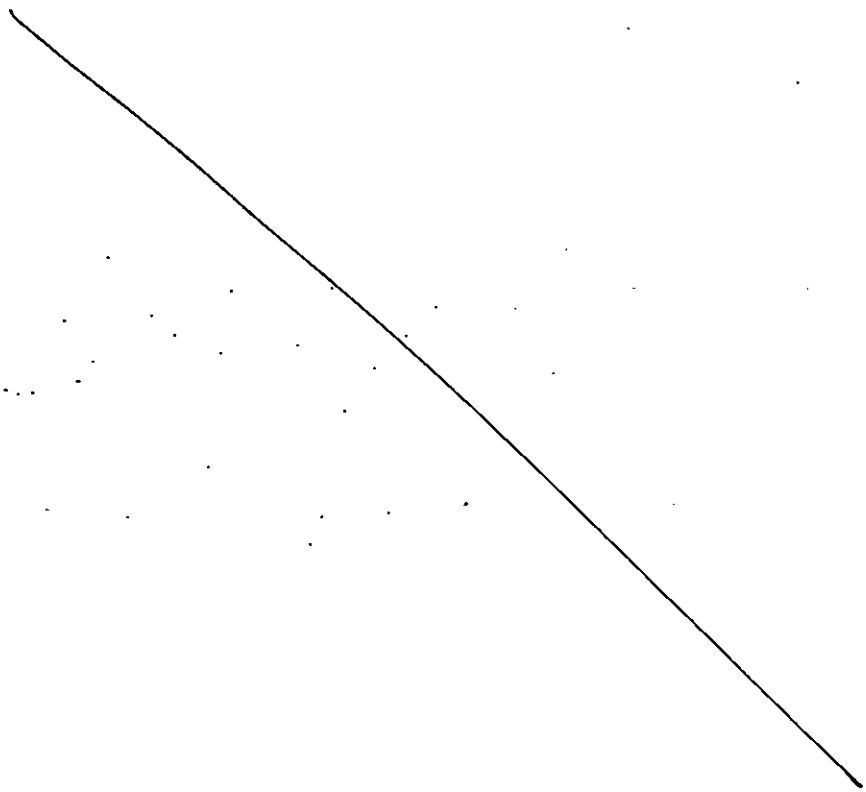
1) large scale coverage of waterbody with algae.
2) slowdown or stopage of oxygen generation process in water body.

3) ~~mass~~ death of fishes and other aquatic life.

4.) depletion of oxygen in water body.

5.) emission of foul odour which contains harmful gases which affects human health.

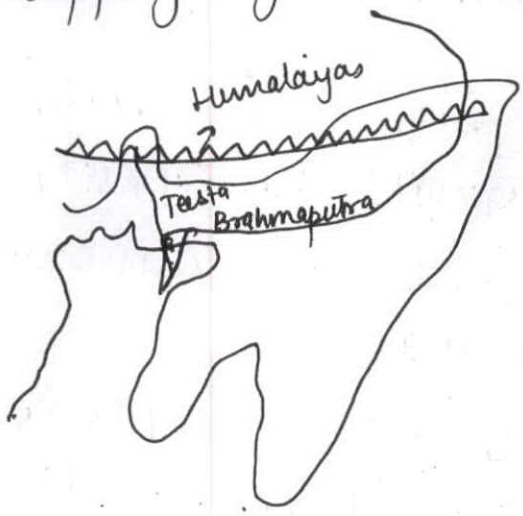
6.) contamination of drinking water supply.



9. Discuss the challenges that lie in harnessing the potential of hydroelectricity in North-East India. **(150 words) 10**

पूर्वोत्तर भारत में जलविद्युत की संभावना का दोहन करने में आने वाली चुनौतियों की विवेचना कीजिए।

North east India has a rugged topography consisting of mountains and fast flowing rivers. This makes it ideal for tapping hydro electric power.



Challenges in tapping :

1) ecological
   1.1) dams will lead to submergence of large scale pristine forest and biodiversity will be lost.

2) geographical : region is seismically active and dams can be prone to disasters.

3) social: dam can cause large scale displacement of tribal people and loss of their livlihood like shifting cultivation.

4) administrative: delays in granting approval

5) connectivity: due to mountainous terrain, road connectivity is poor & it is difficult to transport construction material.

6.) ecological: dam can affect downstream aquatic biodiversity

7.) security: threat of insurgency in the region.

Thus going forward a comprehensive approach is needed for dam construction. It involves:

1) proper environmental impact assessment
2) stakeholder consultation via participatory approach
3) proper grid infrastructure to evacuate electricity.

10. Identify the factors affecting location of cement industry in India. Also, suggest measures to control the carbon footprint of the cement industry.
(150 words) 10

भारत में सीमेंट उद्योग की अवस्थिति को प्रभावित करने वाले कारकों की पहचान कीजिए। साथ ही, सीमेंट उद्योग के कार्बन फुटप्रिंट को नियंत्रित करने के उपायों का भी सुझाव दीजिए।

Cement industry is one of the key backbone and core industry in India. various factor affect the location of cement industry.

1.) availability of limestone. eg.: many cement factories are located in Madhya Pradesh & Andhra Pradesh due to limestone.

2.) availability of gypsum. eg.: some cement factories in Rajasthan are dependent on local gypsum supply.

3.) Many cement factories located near coastal areas. because raw material can easily be imported.

4.) Many cement factories are located close to market centres. eg: cement factories near important metropolitan cities.

To control the carbon footprint of

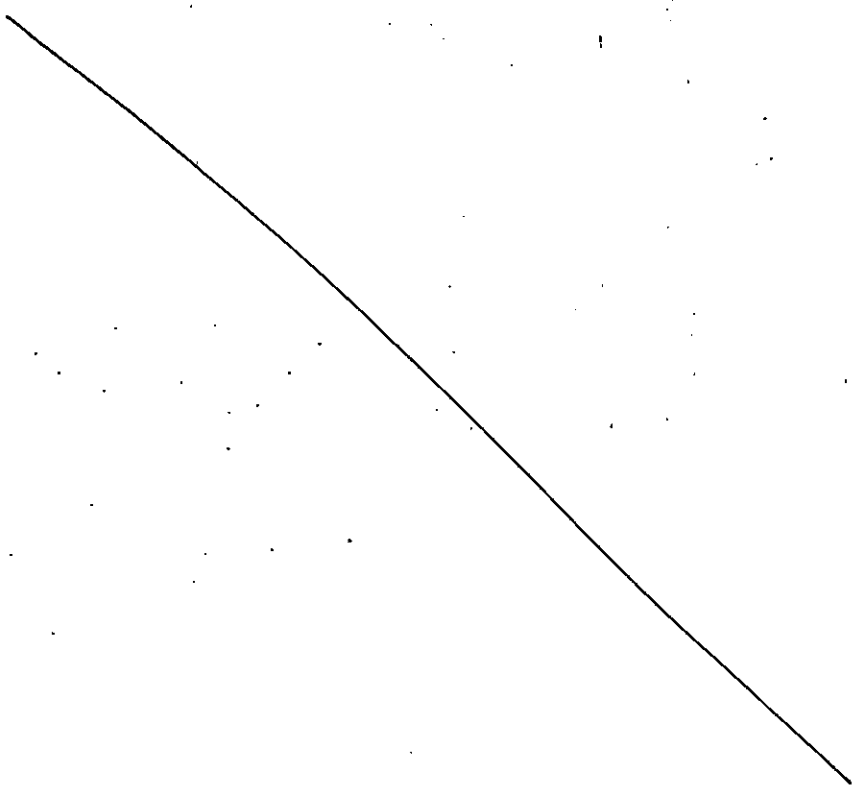
Cement industry :

1.) encourage the use of cleaner fuels like natural gas.

2.) increase the proportion of flyash mixed in cement.

3.) improve limestone mining technologies.

4.) use ~~so~~ clean fuels in transporting cement.



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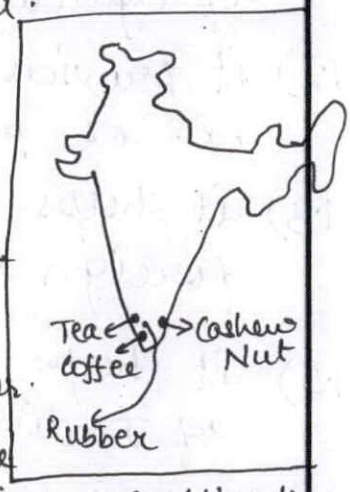
11. Highlight the reasons behind high concentration of plantations in South India. Also, give an account of the significance and challenges that the plantation sector of South India is confronted with. **(250 words) 15**

दक्षिण भारत में बाग़ानों के उच्च संकेन्द्रण के लिए उत्तरदायी कारणों पर प्रकाश डालिए। साथ ही, दक्षिण भारत के बाग़ान क्षेत्रक के महत्व और उनके समक्ष व्याप्त चुनौतियों का भी विवरण दीजिए।

Plantation is an highly commercial and specialized form of cultivation of cash crops in India. Most of plantations of crops like tea, coffee, rubber, banana are located in South India.



Reasons:

1) Climate:

1.1) Tropical climate with temperature more than 22°C favours cultivation of rubber.

1.2) Slopes of western ghats are relatively cooler and help in tea cultivation.

1.3) Rainfall of more than 100-120 cm helps in cultivation of crops.

1.4) Monsoon lasts for more than 4 months in South India.

2) Soil: Red soil and laterite soil can be made fertile by adding fertilisers.

3.) Labour: Abundant availability of workforce to work on plantations

4.) Connectivity: Proximity to port helps in exporting cash crops grown in plantation.

Significance of plantation

1.) Economy:

1.1) it is most remunerative sector of agricultural economy.

1.2) it provides employment to large no. of people

1.3) it helps in earning precious foreign exchange.

1.4) it helps in building brand-value of Indian products

1.5) It supports ancillary small and medium industries.

2.) Social:

2.1) large scale employment of women help in economic empowerment of rural and tribal women.

challenges :

1.) Plantation uses obsolete machinery and outdated processes.
2.) Inadequate quality control and standardization.
3.) Low connect with high value markets like USA, European Union.
4.) Poor connectivity via roads, ports.
5.) Frequent disturbance and damage by wildlife like elephants.
6.) Pest attacks.
7.) Climate change and consequent floods and landslides

way forward :

1.) holistic landscape planning to minimize impact of landslide, animal damage
2.) strengthen infrastructure, value addition, market connect.

12. Assess the efforts India has taken towards achieving the goals of the Strategic Plan for Biodiversity (2011-2020). **(250 words) 15**

जैव विविधता के लिए रणनीतिक योजना (2011-2020) के लक्ष्यों को प्राप्त करने की दिशा में भारत द्वारा किए गए प्रयासों का मूल्यांकन कीजिए।

Biodiversity refers to diversity found at genetic, species and ecosystem level. To arrest rapid decline in biodiversity, Aichi Biodiversity goal and strategic plan for Biodiversity has been approved by Convention for Biodiversity (CBD).

The strategic plan of biodiversity ends in 2020 and hence 2020 was declared "super year of Biodiversity)

Steps taken by India:

1) Forest Conservation:

1.1) Green India Mission to enhance forest cover by 5 million hectare and to increase quality of forest cover in another 5 million hectare.

2) Under Bonn Pledge, India has pledged 26 million hectare to restore forest by 2023.

2.) Economic.

2.1) Natural capital accounting via NCAVES project to include cost of natural capital in policy planning.

Wildlife specific

1.) Lichen → a new park for lichen set up at Munsiyari, Uttarakhand.

2.) Grasshopper survey in Kerala.

3.) Recovery programme for critically endangered species which includes sea cow (dugong dugong), Great Indian Bustard, Lion Tailed Macaque, Irrawaddy dolphin, Nilgiri Tahr.

4.) Project Tiger → Census for Tiger and regular evaluation of tiger reserve via MEE framework.

5.) use of digital/GPS technology, eg:- MStripes app for geo-tagging tiger presence.

6.) Project Elephant-s to improve population of wild elephants.

7.) Vulture Conservation and Breeding programme. eg: Centre at Pinjore, Haryana.

8.) Special drive to conserve population of Olive Ridley turtle (especially at Rushikulya beach, Odisha).

9.) for ex-situ biodiversity conservation,

9.1) botanical gardens and zoological parks have been set up for plants and animals respectively.

9.2) seed banks set up to preserve seeds

9.3) germplasm of endangered species conserved.

10.) Biodiversity exchange has been approved.

These steps are important steps by India towards Strategic Plan. India need to play active role in Kunming (China) COP for Post-2020 biodiversity plans.

13. What do you mean by industrial inertia? Bring out the factors that contribute to industrial inertia and also give a few examples from the Indian context. **(250 words) 15**

औद्योगिक जड़त्व से आप क्या समझते हैं? औद्योगिक जड़त्व में योगदान देने वाले कारकों को स्पष्ट कीजिए और साथ ही भारतीय संदर्भ से कुछ उदाहरण भी दीजिए।

Industrial inertia is a phenomena where a particular industry continues to operate in a particular region even after region's locational advantages have disappeared.

This primarily happens due to historical connect with place.

Factors responsible:

1) A particular industry has :-
   - 1.1) well established running enterprise
   - 1.2) well trained pool of employees already at workplace.
   - 1.3) well established supply chain of raw material and market.
   - 1.4) proper regulatory approvals to remain in place.

Hence industry continues to operate in a particular region as result of industrial inertia.

It avoids to ~~go into~~ relocate itself because:—

1) Relocation will require immense capital and investment.
2) Regulatory approvals may not be in place
3) It will be difficult to find and train new workers.
4) A market may not be easily available.

Examples of industrial inertia in India:

1) A large no. of firms have continued in west Bengal as it was key economic centre during British rule.
2) Cloth making ~~or~~ industry in Ahemadabad, Mumbai as they were

started there due to colonial rule.

3.) Leather making industry in Kanpur and Agra.

To overcome industrial inertia following measures are need ~~to~~ by government:

1.) simplifying rules to enhance ease of business across entire country.

2.) large drive to strengthen connectivity via roads and highways.

3.) Skill mapping and skill augmentation of workers.

4.) enhancing credit access.

This will ensure that companies easily overcome industrial inertia and relocate to new places.

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14. What are rare earth elements? Highlighting their industrial applications, give an account of their distribution across the world. **(250 words) 15**
दुर्लभ मृदा तत्व क्या हैं? उनके औद्योगिक अनुप्रयोगों को रेखांकित करते हुए, विश्व भर में उनके वितरण का विवरण दीजिए।

Rare earth elements are elements called as lanthanides and actinides in periodic table. Some examples are: Yttrium, Lanthanum, Actium, Niobium etc.

Applications:

1) electronics: These elements find large scale usage in semiconductor and electronics.
2) To build powerful electromagnets
3) To create better catalysts in chemical industry.
4) they are also used in catalytic converters of automobile to reduce harmful gases from vehicular emission.
5) They are used to make high strength

and heat resistant spacecraft parts.

6) They are also used in petroleum industry.

Distribution across world:-

Rare elements are called rare because of their diffused concentration. However they are found all across world

1) China - is the world's largest producer of rare earth mentals.

2) South east asia → Indonesia, Malaysia (Kinta valley).

3) Australia

4) Chile in South America

5) India:

5.1) Chavara in Kerala.

5.2) Manvalkurichi in Tamil Nadu

5.3) Chatrapur in Odisha.

Indian PSUs are involved in mining of rare earth metals which are also used in nuclear industry.

15. Given the nature of air pollution crisis in India, certain context-specific solutions are required to tackle it comprehensively. Discuss. **(250 words) 15**

भारत में वायु प्रदूषण संकट की प्रकृति को देखते हुए, इससे व्यापक रूप से निपटने के लिए कुछ संदर्भ-विशिष्ट समाधानों की आवश्यकता है। चर्चा कीजिए।

According to IqAir report 2021, 9 out of 10 most polluted cities in terms of air pollution are in India.

Nature of air pollution crisis:

1) ~~high~~ agriculture sector: it contributes to methane emissions from paddy farming, nitrogen oxides from fertilisers & particulate & CO_2 via stubble burning.

2) Vehicles: vehicular emission results in CO_2, SO_x and NO_x emissions.

3) Industries: are major source of carbon dioxides, oxides of sulphur & nitrogen.

4) construction sector: emits large scale dust particles.

5) Thermal power plants: emit huge

quantities of Carbon, Sulphur oxides and large amount of soot/flyash.

6) Cooking: women in rural areas use traditional fuels like cowdung, wood.

Context specific solutions:

1) Agriculture:
1.1) adopt direct seeding method of rice cultivation to reduce methane emission.
1.2) adopt Pusa-decomposer technology of Delhi to tackle stubble burning. Bio-decomposers reduce need of stubble burning.

2) vehicles:
2.1) promote electric vehicles.
2.2) improve fuels → usage of BS VI fuel, CNG, green hydrogen.

3) industries and thermal power plant:
3.1) for SO_x: use flue-gas desulphurization
3.2) for NO_x: use Selective Catalytic Reduction (SCR) technique.

4.) construction sector:

4.1) frame guidelines to regulate technologies used.

4.2) promote covered construction sector.

5.) Electricity generation

5.1) replace thermal power plants with solar, wind and green hydrogen based fuels.

5.2) for current plants → adopt coal gasification technology.

6.) Cooking:

6.1) promote usage of LPG and ~~electron~~ electricity induction stoves.

7.) institutional

7.1) capacity building of newly formed Commission for Air Quality in NCR, CPCB.

These measure can significantly cut down air pollution levels in India.

16. India needs to move from being an assembler to a manufacturer of microchips. In this context, identify the associated challenges and opportunities. **(250 words) 15**

भारत को माइक्रोचिप्स के असेंबलर से विनिर्माता बनने की दिशा में आगे बढ़ने की आवश्यकता है। इस संदर्भ में, संबंधित चुनौतियों और अवसरों की पहचान कीजिए।

Micro-chips refer to small sized semi-conductor chips which are increasingly being used in day-to-day gadgets, appliances, devices, control systems.

Rise of 5G, Artificial Intelligence and Internet of Things has given significant fillip to micro-chip industry.

In this context, associated ~~tans~~ challenges for India are:

1) Historical: lack of any previous chip manufacturing base

2) Geographical: Inadequate mining and processing of silicon and rare earth metals used in industry

3.) Research: lack of adequate research and development in chip manufacturing.

4.) Administrative: Complex regulatory regime and outdated laws like IT Act, 2000.

5.) Imports: heavy reliance on import for chips and associated hardware.

6.) Strategic: Semi-conductor chips are strategic sectors and countries like USA, Taiwan are not willing to share technology.

Opportunities in sector:

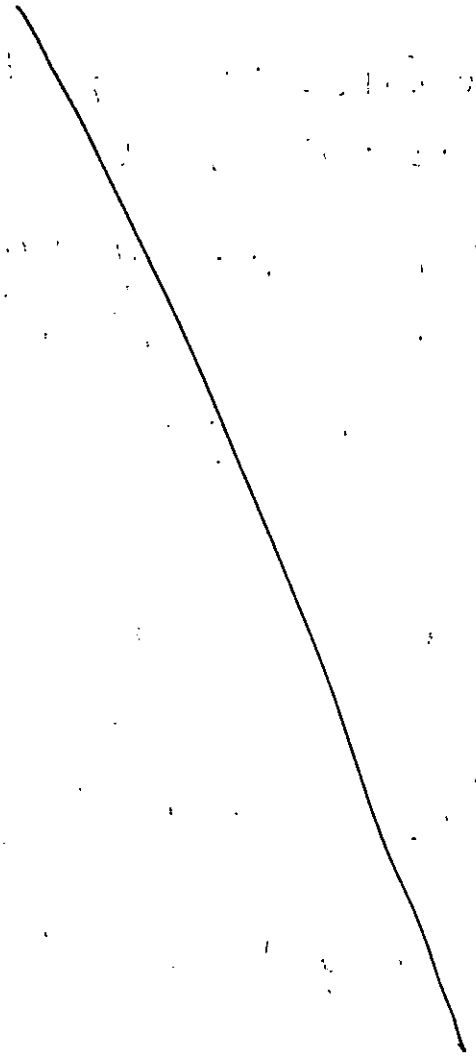
1.) Presence of large consumer base in India and huge market for the sector.

2.) large base of IT companies in India.

3.) Large push by government in form of Digital Communication Policy, 2018

and National Electronic manufacturing policy, 2019.

Ans)



17. Explain the concept of Ecosystem Restoration. What are the challenges and opportunities associated with this concept? **(250 words) 15**
पारिस्थितिक तंत्र पुनर्स्थापन की अवधारणा की व्याख्या कीजिए। इस अवधारणा से जुड़ी चुनौतियाँ और अवसर क्या हैं?

Ecosystem restoration refers to the process of restoring, revitalising the ecological process, services and productivity of an ecosystem.

UNCCD & FAO has recently declared 2021-30 as the UN Decade on Ecosystem Restoration.

Challenges:

1) Climate change is leading to increased instances of extreme events like flood, droughts which makes ecosystem restoration difficult.

2) Pollution: discharge of effluents in rivers, oil spills in ocean, garbage on land make process of

restoration difficult.

3) Deforestation: It leads to loss of natural vegetation and recovering it is difficult process.

4) Soil erosion: It leads to land degradation and intensifies desertification.

5) Acid rain: It destroys natural vegetation in large area.

6) Encroachment: on rivers, forest areas poses social & development challenge to ecological restoration.

Opportunities:

1) Globally:

1.1) FAO, UNCED are playing vital role in developing global consciousness on the issue.

1.2) Countries are partnering. eg: Pace setter fund for forest landscape restoration between

USA and India.

1.3) Commitments are being by nations under Bonn Pledge challenge to restore 300 million hectare forestland by 2030.

1.4) Special projects for coral reef restoration in Coral Triangle.

2) Nationally:

P.) Namami Gange to restore "Aviral Nirmal Dhara" of Ganga.

2.) Ecosystem Restoration in Himalayas via "Secure Himalaya" programme.

3) Local level: Agro-forestry model of Hoshangabad, water body restoration in Kupwara (J & K).

Clearly A lot of opportunities exist for global and national community to sustainably restore landscape.

18. Though there are various problems associated with single-use plastics, a number of challenges will need to be addressed before a blanket ban on their use can be imposed. Discuss. **(250 words) 15**

यद्यपि, एकल उपयोग वाली प्लास्टिक से विभिन्न समस्याएं जुड़ी हुई हैं, तथापि उनके उपयोग पर पूर्ण प्रतिबंध आरोपित करने से पूर्व अनेक चुनौतियों को दूर करने की आवश्यकता होगी। चर्चा कीजिए।

Single use plastic refers to plastic that can be used only once.

Problems associated:

1.) It is non-biodegradable

2.) Plastic, when burned releases CO_2, SO_2, NO_x and other organic compounds.

3.) Plastic clogs the urban drainage system.

4.) Plastic if ingested by animals causes painful diseases & death.

5.) Plastics in landfills generates harmful odour & gases

6.) Plastic breakdown into micro-beads and affects the aquatic and marine life.

India has pledged to eliminate single use plastic by 2022. However there are several challenges in imposing blanket ban:

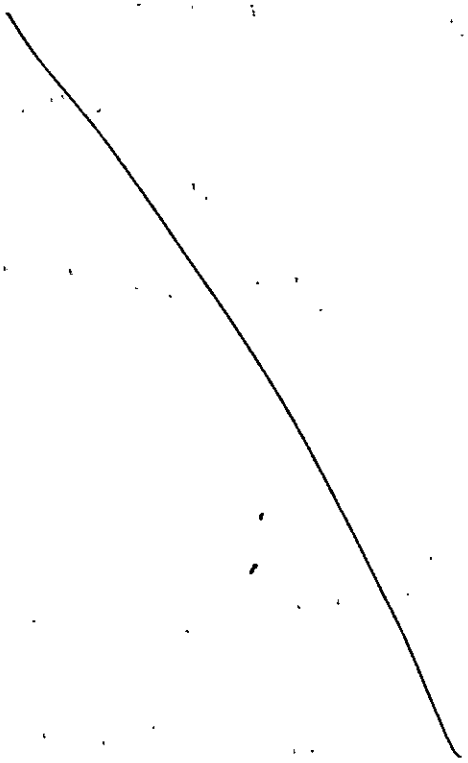
1.) it can lead to shut down of large no. of plastic manufacturing firms.
2.) it can cause job losses.
3.) it can affect associated MSMEs.
4.) it can disrupt upstream chemical industries & downstream vendors.
5.) substitute packaging material may not be easily available.

Therefore following steps are needed along with ban:

1.) promote research on alternatives and substitutes
2.) skilling up of workers in plastic firm so that they can seek alternative employment.

3.) Technological upgradation and transformation of plastic manufacturing companies to other companies.

4.) gradual transformation and phase-wise plastic usage reduction targets to give industry time to transition.



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19. Highlight the natural and anthropogenic factors contributing to climate change. Also, discuss the changes in climate witnessed in the Indian subcontinent since the middle of the 20th century. **(250 words) 15**

जलवायु परिवर्तन में योगदान देने वाले प्राकृतिक और मानवजनित कारकों को रेखांकित कीजिए। साथ ही, 20वीं सदी के मध्य से भारतीय उपमहाद्वीप में जलवायु में देखे गए परिवर्तनों की भी विवेचना कीजिए।

Climate change refers to gradual change in average weather conditions due to anthropogenic activities or other other natural factors.

Natural factors:

1.) milankovitch oscillation: gradual wobbling of earth's axis of rotation which is supposed to have caused climate change.

2.) solar flares and solar eruptions.

anthropogenic factors:

1) burning of fossil fuels like coal, wood, petroleum which releases vapours

2.) methane emissions from agriculture.

3.) large scale emissions of methane from livestock rearing.

4) deforestation.

Changes witnessed in Indian subcontinent:

1) rise in sea level.

2) glaciers: significant retreat of glaciers particularly in Hindukush region.

3) rivers: increasing runoff due to glacier melting.

4) ~~sea-like~~ rise in intensity and frequency of cyclonic rainfall, floods.

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20. Identify the causes behind the prevalence of various forms of human-wildlife conflicts in India. Also mention the steps taken by the government to prevent these, with emphasis on the "Landscape Approach to address Human-Elephant Conflicts". **(250 words) 15**

भारत में मानव-वन्यजीव संघर्षों के विभिन्न रूपों की व्यापकता के लिए उत्तरदायी कारणों की पहचान कीजिए। "मानव-हाथी संघर्षों को दूर करने के लिए भूदृश्य दृष्टिकोण" पर बल देते हुए, इन्हें रोकने के लिए सरकार द्वारा उठाए गए कदमों का भी उल्लेख कीजिए।

Recently various forms human-animal conflicts were reported. eg: monkey menace in urban areas, elephants destroying plantations, neelgai destroying crops, tiger preying on humans.

Causes behind human-wildlife conflicts.

1) deforestation & habitat destruction.
2) encroachment on forest margins.
3) rising prey related distress for animals.
4) fragmented forest corridors.
5) shortage of water in urban areas.

To tackle with this menace, recently landscape approach was proposed:

1.) analyze and map entire landscape
2.) involving tribal concerns in landscape planning.
3.) design landscape to include food & water concerned.
4.) prepare elephant corridor

Other steps taken by government:

1.) National wildlife action plan (2017-31) has been prepared.
2.) Indo-German collaboration to tackle human-elephant menace.
3.) Coordination between forest department and locals with help of 24x7 helpline no.