

# **G|SCORE**

**An Institute for Civil Services**

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## **IAS TOPPER'S**

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# **VIRENDER KUMAR DAS**

**AIR - 854  
(CSE 2022)**

## **GENERAL STUDIES**



**8448496262**



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# SCIENCE & TECHNOLOGY AND ENVIRONMENT

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
1.	9	
2.	2.5	
3.	2.5	
4.	3	
5.	2.5	
6.	4.5	
7.	4	
8.	4	
9.	4	
10.	3	
11.	4.5	
12.	5.5	
13.	4.6	
14.	15	
15.	4.5	
16.	—	
17.	5.5	
18.	5	
19.	5	
20.	15	

Invigilator Signature: \_\_\_\_\_

Invigilator Signature: \_\_\_\_\_

Name: Virender Kr. Das

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

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

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

# REMARKS

## Section - A

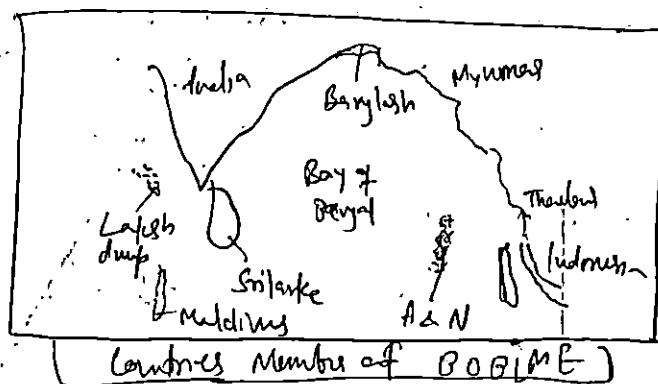
Q1. "Bay Of Bengal Large Marine Ecosystem Project (BOBLME) has tried to mitigate trans-boundary issues affecting marine ecosystem effectively." Critically Analyse.

~~Bay of Bengal Large marine ecosystem project~~ (10 Marks)  
Phase has started. After the partial success of its  
1st phase. The project is funded by Global Environment Facility.

what BOBLME Try to achieve.

- Sustainable fishing is interest of fish community
- protection to the marine life
- improvement of Mangroves
- Reducing pollution

By coordination & cooperation among member nations  
 Indian authorities providing training to neighbor countries in developing their capacity to measure pollution & increase forest laws.



Remarks

Now every country has this pollution assessment,  
 communities are training has been going on, because  
 they are first contact with sea.

~~Because this are certain problem in its function~~

~~Their are not Institute among nation like India & Bangladesh  
 over Sundarban island~~

~~points → Despite between India & Sri Lanka over Palk  
 Strait & between Myanmar & Thailand~~

~~Point high so, the project would have little impact~~

~~low communities are reluctant to use  
 modern technology means of high last~~

~~Dependence on sea of fishing communities  
 will government is growing~~

~~finding is not adequate  
 BOBME is a great focus, because fishing is  
 requirement for a local community if step  
 are not taken seriously disastrous consequence  
 can be. World Bank & other institution can  
 provide funding, Developed countries that  
 giving subsidies to fisheries <sup>may</sup> ~~can~~ also be  
 called to provide funding.~~

Remarks

- Q2. "Apart from affecting polar ice caps, Black Carbon has significantly contributed in receding Himalayas." Analyse. (10 Marks)

As recent report from IITMOP, Himal Kush glaces & may be reduced to one-third by 2030, if steps are not taken it <sup>may</sup> would be vanished by 2100. The most impact is on timelays soups of Himal Kush.

(2)

~~Report~~ - Black Carbon is a pollutant mainly emitted by aeroplanes, rockets & other vehicles. It has the ability to absorb sunlight more intensely. Despite having a short life cycle (4-30 days) it can effect the polar cap & Himalaya upto a large extent.

Black Carbon after settled on mountain absorbs more sunlight & warms the environment, result in <sup>due to</sup> melting of glaces.

Report of IPCC & other institutions found abundance of Black Carbon in Himalayas. As commercial activity are growing, the quantity of Black carbon is also going to increase.

### Impact

→ Reducing albedo of mountain, thus more sunlight on earth & heat the temperature

Remarks

~~Consequently  
be affected  
decreased~~ Initially water in rivers is going to increase but in long term it is going to decrease

? Himalays play a major role in monsoon so if Himalays loss its environment it too may have disastrous impact.

### Solutions to remove

(a) → Green fuel in Aeroplane & Rocket for example bio-fuel in aeroplane & Hydrogen in rocket

of sustainable development, following industrial growth meets environment.

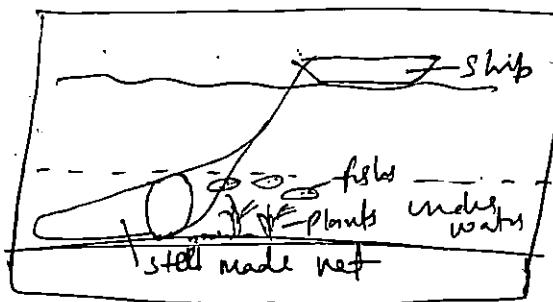
Himalaya impact many nations & 10 of biggest cities of Asia, so coordinated approach is needed, BRICS & SCO can be helpful the Himalayas. India ~~can't~~ go for International collaboration.

Refer to books

Remarks

- Q3. India has banned bottom trawling in few areas while Sri Lanka has banned it completely. Critically analyse the impact of bottom trawling and deep sea mining on aquatic ecosystem. (10 Marks)

India has banned bottom trawling. Bottom trawling produced disastrous impact on marine life both fishes & ~~plants~~. An open mouthed net with narrow end is used under water to catch fish, it kill any plant & fish (not need to catch), which come in its way.



2.5

The net only kill plant but also erode the soil & beneath surface.

Deep sea mining is the search & extraction of mineral from the ~~so~~ earth below sea, this required huge infrastructure, under water connected to the ship. India recently gave nod to deep sea mining in Indian ocean.

Impact of aquatic system

Remarks

Plant & other plant community get disturbed & uprooted, hence such plant growths are for fish & other animal to reproduce, thus affecting them may make fishes unfit.

affected unwanted life for example Dugong & in Indian coastal area, it is a protected species by wildlife protection act.

bottom sea farming & deep sea mining noise & pollution by ship & disturbed the habitat in life, change this daily life cycle & reproductivity.  
the importance of flooded land & so that plantations on the land under sea level become very difficult.

Many fishermen need to balance the growth & ecosystem both are essential, without sustainable fishing many of Indian fishers will be leave with no source of income in long run, finning bottom sea farming is good step but implantation of local & providing time to aquatic life to reproduce is necessary.

Remarks

- Q4. "Anthropogenic activities have been constantly threatening biodiversity of India's hotspots. Analyze the impact of human interference on flora and fauna of these biodiversity rich regions. Suggest some of the conservation strategy with existing framework citing Gadgil and Kasturirangan reports on Western Ghats. (10 Marks)

India is one of the major dinner countries, & has connected with three biodiversity hot spot, western ghats & eastern himalaya are part of India. 3

Houses, urban growing demand & growth needs lead to exploitation of its rich biodiversity. Human interference like mining, over fishing, cutting forest for agriculture, & dam on rivers increase the vulnerability of wildlife.

In these days India has made too many commitments one by one, Gadgil & Kasturirangan are among them they recommend

→ declare western ghats a protected area  
what are the → create eco-sensitive zone  
activities → breakdown the mining activity  
prohibited → halt the constructions activity or prohibited these zones a minimum area.

However due to major lobbying & non political will by southern states, these recommendations

Remarks

are not implemented

### Need for conservation of western ghats

→ Provide water to the ~~to the~~ growing urban area in south as 21 cities by 2020 left nutrient water

This is  
not  
asked → the culture of tribes

in → absorb pollution & heat & provide climate required for plantation of crops

→ Sanjay national park in ~~the~~ western ghats have highest number of tigers. In case of elephant South India with western ghats have majority population.

### Step for conservation

- emphasis must be given on recycling & reuse so that requirement of primary product come down, then mining & other activities can be induced to limited area
- Create natural reservoirs of water, then the need of large dam ~~is reduced~~
- Implementing法令 related to wildlife act & environment act
- use IPR & traditional knowledge to create monetary value so that ~~existing~~ class of biodiversity can be helped.

Remarks

Conclusion?

- Q5. National policy on Biofuels primarily tries to address supply-side issues that has discouraged the production of biofuels within the country. In this regard, highlight the salient features of the policy and also mention the benefits of the policy.

(10 Marks)

National Policy on Biofuel 2018 was launched by Ministry of Petroleum to promote ethanol blending & reduce import of oil from some foreign countries.

2.5

Salient Policy tries to stimulate supply side issues by promote ethanol & waste management, providing more staff for production.

### Salient features

→ Directing the Biofuel into basic 1u & advanced 2u & 3u.

→ Provide funding of ₹ 5000 crore for 2G ethanol plant through measures like viability gap funding.

→ Established 12 Biomass based & 10 demonstration plants for ethanol blending plant.

→ Direct use of Sugarcane & Coagac leaf in ethanol production.

→ Promote waste grain to ethanol production

→ Targeted blending of Ethanol by 10%.

Remarks

## Benefit of the Policy

- Waftage of food grains norms in India,  
 Government has stored 65 mn tonn of grain  
 as against requirement of (40-45 mn tonn) of  
 for economic security, now it can be used  
 for better purpose rather than selling it  
 at loss in open market
- Sugar cane farmers now can directly sell  
 this product for ethanol production, &  
can be solved the issue of non-payment of money
- Technology development in India.
- Employment generation
- Reductions in pollution & increase life of  
 vehicle after ethanol blending
- Give foreign exchange to India  
 Conclude by greatest the  
 says it will create the  
 goal of PM as well i.e.  
 doubling the business  
 balance

Remarks

- Q6. What do you understand by 5G technology? What are the advantages/applications and challenges to adapt to 5G in India? (10 Marks)

5G technology is the latest addition in Telecom industry. It work on long term evolution (LTE) principle.

4.5

### Advantage of 5G

→ Increased bandwidth as of now 4G has maximum bandwidth of 20-30 Mbps, 5G will have bandwidth of 30-300 Gbps so this is fastest flow of data.

good point

→ Introduce IoT & IIoT

→ Reduce latency in network

→ Increase speed of data as well as provide more connectivity, many more connections with a single node ~~as~~ when compared to 5G.

5G:

→ More boom to Big data analysis

→ It has potential to add \$1 trillion to India's

very good point

GDP, it will create employment, innovation

start up, research.

→ Provide safety to India Cyber space

→ Induce digital divide, a more powerful network on least unconnected part of country.

Remarks

### Challenges to adopt 5G

- ~~Initial cost for company~~ ~~framing~~ ~~finances~~, as ~~now~~ ~~is~~ ~~going~~ ~~on~~ maximum profit ~~from~~ spectrum sale.
- ~~Initial cost to use, as new device need to installed in home & charges of 5G may be high~~
- ~~Technology is the major challenge as US goods pressure from America on India to include Chinese technology, as there are suspicions that Chinese equipment may steal data from network & user~~
- ~~Indigenization of Technology is difficult in less time~~
- ~~Private banks - as new startup & more cases would mean more data generated which stored outside India, so India will lose if raw material~~

India should strive for indigenous equipment in large size, Date privacy & openness are also need to place in law book

Remarks

- Q7. It is expected that there will be more than 24 billion IoT devices on Earth by 2020. What do you understand by 'Internet of Things' (IoT)? Who are the major stakeholders in it? How will it benefit different industries? Examine. (10 Marks)

~~The distinct of thing is the inter connecting simple things between various physical devices having electric sources or connection with a single well controller. For example, fan, T.V., washing machine, light, freeze, mixer, food delivery connections all will be connected with Internet & one can use with a single controller.~~

### Major stakeholders in IoT

(4)

- Service providers - who may be large MNC & Indian companies. Even after IoT there may be concern that, these MNC have power to control human daily life.
- Government - as IoT is not a public body the role of government related to law making
- Startups - Silicon Valley must \$ 2.3 trillion in IoT, AI & Big data analysis. In India too many App service are introduced in last 4 or 5 years.

Remarks

→ uses, whose data will be used by many  
against the theme they founded

It will have different benefit for different  
Industries for example

→ Automobiles - They use computers to measure  
load factor, engine performance before  
finishing the product. After IoT it  
became easy to do it with less man  
labour

→ Pharma - Research became easy, computers  
can collect data from all over the world  
certain second, unknown ~~letter~~ can be  
identified more easily. New editing.  
to may get a boost.

→ Petroleum oil & gas mining became easy  
IoT will help in searching fast &  
information. Under ground, satellite data  
became more efficient

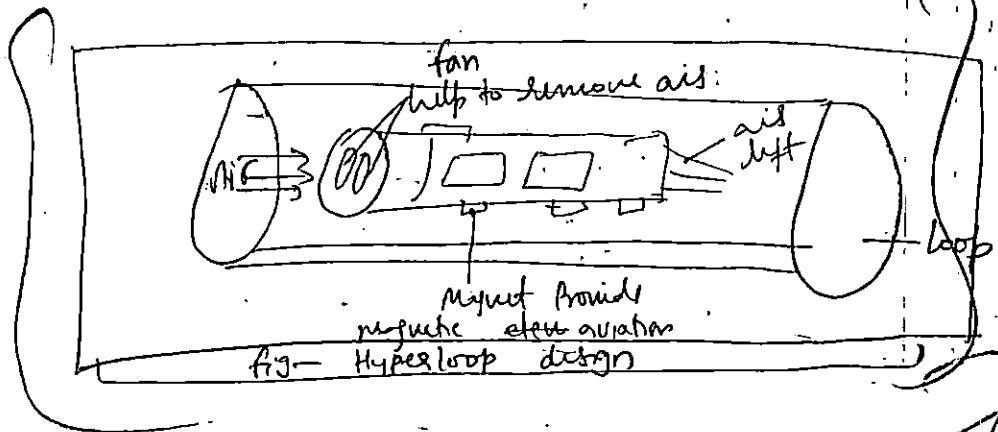
→ Teaching - use of Technology already  
expanded now ~~new~~ delivery will be  
improved

Remarks

- Q8. US-based Hyper-loop Transportation Technologies (HTT) is in talks with five Indian states to build a high-speed travel network. Highlight the technology behind hyperloop and discuss its significance for India. (10 Marks)

Hyper loop is upcoming technology in form of technology conceptualized by Elon Musk in 2012, Government of Andhra take first step to connect Vijaywada & Amravati.

### Technology behind hyperloop



Hyper loop move in a loop cylindrical air mechanism, it work on magnetic levitation, magnets of the same sign repulsive each other required so the vehicle will be elevated, than it just need up & for removing air from the way (to reduce resistance) this will be fan in front to absorb air & remove it from

Remarks

sister or back.

### Significance for India

- ~~designated route between Mumbai & Pune will be cover in 25 min, which is cheaper than now takes 2.5 hours.~~
- ~~improved service delivery & migration pattern, as people now can work from far off~~
- Technology development, as still it is not any where in the world
- Produce more skilled labor force to India
- Developed economy & ~~not~~ led confident with the Hall

### Misery

- Indigenous & technology
- fare will be high
- delay in project

### A way forward

Indigenous capability should be developed & industry should remain focus while promoting new ~~Technology~~.

Remarks

- Q9. Owing to growing dependence on space resources, it is important for India to protect its critical space assets and infrastructure from possible threats. In this context, examine the need for a Space Security Policy in India. (10 Marks)

Militarization & weaponization of Space has been happening taken place, America has developed 6th force & Russia has introduced Strategic Space Force.

This can be your  
points

### Space Assets

→ India has many satellite which provide inestimable service to India for example Remote Sensing, Communication, Meteorology, Surveying & ~~GPS~~ & many others.

→ Also here communicate its space operations hence it also become a economic resource

4

### Threat to Space

→ Anti satellite & jamming of satellite will be used in case of war.

→ Satellite can be used as source of missiles, bomb & a direct attack from space is possible.

### Need for Security Policy

Remarks

→ India build an army for people

it GPS of a nation (NAVE in India)

Main focus → become distinct during war, the whole army become blind

discuss militartization Global satellites will send data subscription & and weaponizing) for dense, satellite will be target so policy off us in need of India.

→ Communist interest & India dependent on countries satellite for monitoring monsoon & tsumans is of great importance

discuss → Communications is of utmost importance in India's case of conflict then we need to safe our comms satelite.

space → immigrant problem failed by India can be solved by satellite like Gaganyaan, RISAT but need protection

→ Use of Internet for radicalization can be stop handled by Skynet assist.

India need to maintain shall feels by holding talks with other nations, in armable one nation can't think it will be safe if there is technology Glare technology dependency

Remarks

- Q10. Graphene was touted as "the next big thing". Many believe it could spell the end for silicon and change the future of computers and other devices forever. In this context, list out its potential applications. Discuss the challenges that are arising in the commercial use of Graphene. (10 Marks)

Graphene is the allotrop of carbon which has excellent technology like, super conductivity, light weight, super strength even more than steel.

It has a lot of potential in technology development for example:

→ Semiconductor - without resistance, we produce a world with zero wastage of electricity.

→ Super Strength → provides durability to product

~~With~~ to zero resistance to help in understanding ~~and~~ physical phenomenon like neutron, electron etc. ~~and~~ it will produce product which will stand millions of cycles of temperature, then思考 ~~and~~ so it can be built easily ~~and~~ 0.5 mm per glass

→ Device with zero latency change the working of communications technology.

But there are many challenges in its production & usage.

Remarks

for example,

~~Bring~~ Graphene is a 2-D product, then  
~~clarify~~ commercial usage will not be possible  
~~if~~ 3D product ~~was~~ built

~~Elaborate~~ Production in large scale ~~is~~ still not  
~~possible~~

→ It structure is very complex, so it  
~~need~~ time to used it.

~~work  
proper  
Conclusion~~

Remarks

## Section - B

- Q11. Environment Pollution Prevention and Control Authority (EPCA) recently recommended to the Supreme Court that Delhi's buses switch to H-CNG within the next two or three years. In this regard, what do you understand by Bio-CNG and HCNG? What are the advantages of Using H-CNG Vehicles? Also highlight the challenges. (15 Marks)

Pollution problem of India is growing at a faster rate, as per WHO report in top 20 most polluted cities 15 come from India. Mostly of them come from Northern India. Environment performance ranking India 78 out of 180.

There are solutions coming on one of them is H-CNG. EPCA recommended use of H-CNG in public vehicle to reduce pollution in Delhi. Similarly there is thrust to do so in India.

Bio-CNG - It is the gas produced by decomposting of organic waste. This gas gives 90% methane.

H-CNG - It is produced by mining hydrogen & LNH in appropriate manner.

Remarks

## Benefit of H- $\text{C}_6\text{H}_6$

- Reduces gas pollution from CNG vehicle as hydrogen burns easily.
- longer life of Vehicle as there are less combustion substances.
- More efficiency to vehicle & utilisation of fuel is more efficiently.
- Hydrogen is easily available, so the cost will not be increased much, as its import cost will be increased by just  $\approx 1$ .
- Reduces CNG consumption thus foreign exchange as India is the 4th largest importer of CNG.
- Indigenous indigenisation of technology & more innovative solutions will emerge with this financial boost. R&D.
- Reduces cost of fuel for Oxy.
- low energy density fuel with dedicated class of additives.  
Challenges in using H-C<sub>6</sub>H<sub>6</sub>
- ...

Remarks

write benefit  
and challenges  
separately

- There are apprehensions that runny 20%.
- hydrogen will reduce the energy potential of fuel by 14% you have not discussed it
- Production of fuel in a short time will be a challenge. (why)
- Public confidence will be required to implement this technology, after all it is benefit of customers who has to use.
- It will require more R&D in this field & India has a minimum of it in R&D. 4.5
- India requires a mixture of fuel working together: Diesel, Bio-CNG, ethanol blended Petrol,
- India must invest in Upcoming technology & move to Indigenous technology
- Battery technology like Thionyl battery can be utilised
- India need to give its energy sector a great push to establish its fuel security

Q12. Over-exploitation and loss of habitat is leading to the extinction of various plants, animals and microbial species. How is the Indian government attempting to tackle the issue? (15 Marks)

his statement looks like over exploitation of forest vs. the need for economic development. A developing country required mineral fuel, wood for its development, India too required. Hence forest exploitation without a blind eye can make more than a need of now.

### Loss of biodiversity

→ Due to the overuse of forest forest fire become prominent in south, east central part of India, nearly 50% of How India affects forest fire every year.

→ Global warming affects forest fire every year. Development of land dam lead to submergence population of birds & animals. It kill lot of animal, destroyed plants & other species.

→ India too is loosing its culture, culture are already lost.

→ Many fish community are on decline.

Remarks

## India government take many step

- wildlife protection Act 1972, India was one of the first countries to adopt this type of legislation, Many species of India are safeguarded by this act. like tiger numbers has increased due to safety provided. Wildlife sanctuaries, national park provide safety to animal as well as biodiversity environment.
- forest Act 1986 - This act provided lot of powers to both government & Indian citizens to safeguard forest. Any citizen can reach court for safeguard forest help. A lio. It has given the power to stop any industry which破坏 environment safety.
- forest policy 1980's - It introduce Joint forest Management, to safeguard forest, National Board established (NBF)
- forest Right Act 2006 provided power to local community to save forest.

Remarks

- India signed Stockholm Convention against persistent organic pollutants, ban on incineration of hazardous waste.
- India signed Convention on Methyl Chloroform to ban Ozone.
- India is mentioned & proud safety to them by signing of Treaty agreement to reduce Green house gas & promoting green inventory legibility and sustainability in India. focus now on zero based organic basis.
- India joined International Solar Alliance & worked hard for its establishment now 49 countries are members to produce green energy & reduce use of fossil fuel energy products.
- Wind energy, first plant are set up in 1980's then nuclear energy too gave boost by India.
- Namami Ganga, Project Shiva Tapovan, Sone Hindaya, are some other laws taken by India.

Remarks

- Q13. The main factors contributing to urban air quality deterioration are growing industrialization and increasing vehicular pollution. Discuss the recent policy initiatives taken by the government in mitigating air pollution. (15 Marks)

The main factors contributing to air quality deterioration are industrialisation, urbanisation, increased vehicles density on road, fast food, garbage burning, Power generation etc.

The major area of concern are Industrial pollutants, air, autumn & Vehicular emission.

The effect of air pollution are on health. It is enormous, it declined 2-5 years of life expectancy in India as per WHO report.

Premature death to a great extent & major impact in efficiency & productivity of workers, elderly face problem in respiration.

National Clean Air Action Plan now has been established by India to tackle problem of air.

It has 3 areas mainly to work on include

① Industry

→ Planting of trees, especially in highway &

Remarks

& by action so that air dust will reduced

~~→ Transboundary pollution can be tackle at  
the international level with Madeline  
Bale Convention against transboundary pollution in South  
Asia~~

~~more  
formulations of  
Global response & A  
Global plan  
Sectoral development after path for e-vehicle  
Action plan  
battery manufacturing~~

### ② Knowledge development

- Studying the issue of health related aspect affected by pollution.
- More monitoring station.
- Monitoring station in both rural & urban area

### ③ Organisations

National air addressing Committee under MoEFCC  
State addressing Committee under chief secretary.

4. Pollution monitoring unit

### ④ Introduction of Happy index-a matrix

Remarks

introduced for harvesting of crop residue so that ~~less~~<sup>more</sup> stubble burning. Government also fined farmers burning stubble.

- bioethanol is given to exchequer, government introduced tax on bioethanol like TDS of ETS in e-vehicle for customer.
- Bio ethanol & 2G ethanol program get boost good under National Bioethanol Policy 2018.
- India Cooling action plan was made to reduce energy requirement for cooling by 25-30% by 2037-38.
- India set a target to achieve 33% of its land under forest.
- green highway program to plant trees along highway.
- fly ash guidelines introduced to make use of fly ash easily & mandatory in construction activity.
- Electricity code was concluded for sync with Japan.
- Mandatory labelling by BIS.

Remarks

Conclusion

Q14. The Environment (Protection) Act was enacted in 1986 with the objective of providing for the protection and improvement of the environment. To what extent, the act has been able to live up to its mandate? (15 Marks)

~~A brief biography about the status of~~

~~environment protection Act was introduced in 1986. It was one of the major legislations of that time in world. By this law India made stringent of legislations for safeguarding forest. It was in consonance with Indian constitutional values & international commitment India give to other countries. It also full fill India's socialist agenda by improving & reducing deteriorations of forest.~~

~~Major salient features of act~~

- It remove the 'Loans Standi' rule, & now every one can go to court for safeguarding forest. If a company break law
- Central government is all empowered to take property of industry if law is broken

Remarks

even with going to Civil court.

→ It will the jurisdiction of Civil court

→ It introduce punishment of 5 years & fine.

So it is a steel frame to protect environment.

### Achievement

→ Under this many folly has introduced you have environmental become integral part of any not about major liability

→ Swaraj & Anuswas program was not started under it to provide knowledge to people through various provisions

→ The sensitive zone was introduced to provide safety to animal & types to national park, wildlife sanctuary.

→ Afforestation made a legal uplift & Afforestation fund was introduced

→ Many companies are

→ Many companies were stopped when they break environment law.

Remarks

But the law has not perform, what it provided.

→ Many waters bodies in forest has been dry out, & many are in danger like Sabarmati lake, & Narmada lake.

→ Afforestation remain on tapes, fund was treated in 2012 & finding remain unutilized.

→ Gradually loss of rampant in timber, netto that & latter that.

→ Many species are now scattered & just surviving this sounds as difficult.

Solution → Not need to strengthen this law, but right implementation is too very important, India how environment needs fullfill is very important its economic value is. Increasing IPR policy needs to be integrated & environment need to be protected. With economic growth

Remarks

Q15. "Nearly 30% perennial springs in the Himalayan region have dried up causing water scarcity in the Himalayan region". Discuss the issue in light of Shimla water Crisis and suggest the need to implement structural and non-structural solution.

(15 Marks)

Niti Ayog in its report mention that

30% of Himalayan perennial spring are either dying or become seasonal.

The importance of spring ~~will be lessened~~ from data as 67% of agriculture in himalaya is dependent on spring & it is the major source of water for so many people in himalaya.

There is a need of revival of spring otherwise it will be disastrous for himalayan people, recent Shimla crisis shows that tracks, similarly lake of natural resources springing so environment ~~the~~ <sup>also</sup> ~~people~~ ~~will~~ be saved

steps need to be taken

Structural changes - obstructions of rivers need

Remarks

to Rationale: Dams are constructed for hydro power project were dug in many area. So flow of water need to be maintained.

~~relative~~ → Disadvantage need to be removed from this area, as due to urbanization to Himalayan region population, the disadvantage & water utilisation plan govt. movement need to tackle the problem by providing sustainable housing & water supply.

→ Reduce river pollution such as Coliform by making toilet accessible available.

~~be specific~~ → Enact laws & regulation or guidelines for industry & for use in application. ~~research & mapping~~

~~what are non structured changes~~ Awareness among user, as they are the most effective. Acquiring some good habit can solve the problem upto some extent.

like pollution by taking santation,  
good water use, discharge & water from  
home.

- introduce lawn water harvesting  
sand soil, water tank using storage  
in ground storey.
- some changes in land using practices,
- reduce pollution.

Govt should take more step since  
perennial storey are not just providing  
water they also provide by but hood  
like fishing, agriculture etc

Who can be encouraged, Environmentalist,  
biologist can be send to studying the  
problem & suggesting possible action, total  
should be included.

4/5

dry  
grd part  
of Question  
you  
need  
to  
explain  
structural  
&  
non structural  
pollution  
separately

Remarks

Q16. What do you understand by geo-engineering? Examine why North Eastern Monsoon brings less rainfall far below its actual potential and also critically discuss how geo-engineering can solve the problem. (15 Marks)

**Remarks**

*Remarks*

*Remarks*

- Q17. Unregulated growth of urban areas without necessary infra-structural services and proper collection, transportation, treatment and disposal of solid wastes has resulted in increased pollution and health hazard from these wastes. Assess Swachh Bharat mission's efficacy on the matter. (15 Marks)

India 35% population now residing in urban area, India has generated huge infrastructure, but there are disparities of infrastructure services, transportation, waste management.

Waste management is the integral part of urban life. It requires due to <sup>mention the attributes of well planned urbanization of products</sup>

→ with changing living pattern more waste is generated.

→ Landfill: not only used land but also lands at infertile. Similarly, leaking of harmful chemicals make ground water contaminated.

→ a great chaos among people as seen Delhi-NCR where people are not allowing

Remarks

to keep waste in this neighborhood.

Swarach Bharat Abhiyaan launched in 2016  
to make India clean with zero  
open defecations, zero waste & with  
solid waste management.

### what SBA achievement

→ Collection of waste become organized,  
people become conscious about their  
role.

~~discuss how many districts~~  
~~explain with data~~  
 Defecation is now ended almost in  
 many area.

~~Toilet - Coverage has achieved~~

But solid waste management is not given  
 that much priority because of

→ ~~high cost~~

→ low value when wet waste as this is  
 more wet waste

→ Majority of waste to treatment plant are

Remarks

not working

In India there are 5 major island energy plant, & 65 MW electricity supplied.

New rules have been made under SDA for Solid waste management & also in Solid waste management rule 2016. for example if

→ municipality should make info to where solid waste

→ Collector of Waste is liable for its whereabouts are demanded & policy related to them

But SDA not able to solve the problem of

analysis still there is large quantity of normal due to be given to scavenger

Municipality has no enough money

Govt has not been allotted to authorities.

So India need a comprehensive approach to solve the problems. Green bond & multiple bond can be used for funding.

Remarks

Q18. What is e-waste? A United Nations-affiliated group estimates that e-waste is growing faster than almost any other waste type. Examine how India can effectively manage its e-waste. Also briefly discuss the fresh rules that India recently brought in to govern the handling of electronic waste. (15 Marks)

According to ASOHAM report India generated 2mn tonne of e-waste yearly with only 4% of it recycled properly. Mah (19%) became the largest producer.

e-waste is growing faster than other waste & changing life style there are various reasons in India e-waste recycling more

to me in the large informal sector

some of the practiced going market & product

Best practice in No linkage between informal & formal Sector

adopted control of implementation of law

Other

like Tasmania manage e-waste effectively India need

Japan to take some strong step & some soft decisions

a different eg

linkage between informal & formal sector for e-waste did not formed.

Remarks

- Most of the waste is recycled by the non formal sector without any technology in hazardous condition, government can try to make this workers skilled & provide them basic so that they can improve industry.
- Indule sunset clause under various banks explain
- Extended producer responsibility should be + intensified strongly.
- New innovation, R&D can be promoted to collect the resources.
- NITI Aayog recommendations on resources after efficiency to be implemented: for eg. setting up a national board & a state board for implementing rules.
- Municipalities should take actions so fund must be provided to them, so they can take money from waste.

Remarks

India recently amendment e-waste rules & make more stringent

~~good reference~~ intended producer responsibility entered as industry responsibility act. 3 obligations

+ Add revised P&C Act → to store & recycle & solve also its problem & impact.

- ① Information → they should provide information about the products they made
- ② Economic → The cost should be bear by them.

Now sellers ~~can~~ also be make recycling sources for customers they sell product.

→ 2 years sunset clause has provided for industry.

~~optimistic~~ ~~conclusion~~ But more need to be taken, India must identify the ~~new~~ market, before it remain isolated & not follow the legislation, strict control over data can be made public so companies goes for good will.

Remarks

- Q19. With the view of Regulating the use of drones in India, Ministry of Civil Aviation recently announced guidelines on drones that will come into effect from 1 December 2018. In this regard, mention the key features of the "Drone Regulation 1.0". Also highlight the various non-military applications of drones. (15 Marks)

Drone became important part of modern society be in Agriculture, search, surveillance & it has many applications for new startup, & innovator.

Ministry of Civil Aviation introduced new guidelines for regulation of drone  
mention the registration of  
major features

- It divided drone in 5 part, from nano, mini to large
- there is registration required for all drone except nano
- license to used drone will be mandatory
- There are some area called no fly zone, where drone can't be used, but some area are left open without regulation.

Remarks

Drones has many applications in non military field for egs e.g.

→ Surveillance by drone during forest fire, flood, drought & other natural calamities.

Here Application  
to government

→ Drones have applications in entertainment industry for breaking new angles & structures.

→ for entertainment industry they provide adventure, virtual reality & augmented reality can be generated by using drones easily. Adventures of new world can be introduced as live games.

- ① Industrial
- ② Disaster search
- ③ Retreive scarce

→ open lock doors become easy with drone as more efficiently and time in functioning.

→ In mining, new field in inaccessible

Remarks

area can be searched more easily

- for environment protection used of drones is enormous, surveillance field, forest fire, animal in conflict,
- To save human life during calamities
- Home delivery of services for example deli delivery of food,
- E-commerce will get boost as seamless delivery become convenient, fast & easy
- Govt should work for Indigenization of technology, new startups & innovations should be promoted, & it will be given boost in true technology. India should think about earning foreign earnings from true technology & innovation.

Q20. What is Robotics? Highlight its applications in Automobile, Military applications, Health & Medicine, Agriculture, Space Exploration and Banking sector. Also mention the objectives of Robotics society of India. (15 Marks)

Robotics is the next field of Development in Human Society, with growth of Artificial technology & IoT. Robots become much more impactful & efficient in working. Robots are formed to reach where human can't reach, to work more efficiently.

It has Applicability in all field

- (1) Automobile → Automobile car, Robot as driver; Robots at traffic pole which every passes of rules.
- (2) Military → America is developing Robot army where Robot will take place of human, & this will be very difficult to kill Robot because they are more fast & efficient
- (3) Health & Medicine

Remarks

Robotics surgery are already taking place. Even ~~Robot~~<sup>who are</sup> ~~they~~ carry ~~in~~ human body are mounted. There are robot which goes into the body & do the surgery without external cut ~~area~~<sup>points</sup>

### Spare

To move to inhabitant territory will be possible if robots be ~~efficiency~~<sup>are</sup> specific increase upto that extent.

### Mining

Put hole mining in Meghalaya. Kill many people, but robots do not need oxygen, they can work in ~~in hospital~~<sup>in</sup> condition.

e.g.  
NASA use  
Robotic  
techno

### Objective of robotics society of India

- for human safety & convenience - they
- work should help India & its people to develop & reach their potential

Remarks

To ensure safety & wellness of human life.

To encourage R&D for human development  
in robotics.

~~general~~ Robotics has a field emerged but its command also has very problem like in case of war if robots will fight each other or not. Subjectivity does who will define the proportionality of war.

Robot can also kill innocent while working when commanded wrong & or due to improve its interpretation of command.

As a rising field it bring benefits & demerits too, India should engage with emerging field, fast she can't afford to remain abst different.

Remarks