

## GEOGRAPHY, DISASTER MANAGEMENT, SCIENCE AND ENVIRONMENT

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
1.		<ul style="list-style-type: none"><li>• There are 20 questions.</li><li>• All questions are compulsory</li><li>• The number of marks carried by a question is indicated against it.</li><li>• Answer the questions in <b>NOT MORE THAN 200</b> words each. Contents of the answer is more important than its length.</li><li>• Answers must be written within the space provided.</li><li>• Any page or portion of the page left blank in the Question-Answer Booklet must be clearly struck off.</li></ul>
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1. Invigilator Signature



2. Invigilator Signature



Name JYOTI SHARMA

Roll No. 444589

Mobile No. 

Date 22/9/2019

Signature Jyotisharma

# REMARKS

**GS SCORE**  
GS MAINS TEST SERIES 2017

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Q1. What do you understand by biological disaster? While listing the workplace and occupations prone to biological hazards, discuss the preventive and control measures that are required to be taken at these places. (12.5 Marks)

Ans. Biological disaster means disaster caused by micro organisms, living organisms or other biological agents to extent causing harm to human life and property and adverse impact on other living organisms also. For instance pest attack by any <sup>hazardous</sup> organism leading to failure of crops and causing human diseases. eg. Swine Flu

Workplace and occupations are prone to biological disasters because of lack of awareness and lack of preparedness about the same.

wrote in detail (especially asked)

Preventive and Control Measures

- Awareness about personal hygiene.
- Awareness about work place and living spaces hygiene
- Regular fog fumigation to stop breeding of harmful organisms
- Having Medical kit ready

1/2 + 2 1/2

Remarks

- Listing ~~near~~ nearby hospitals and pharmacists in case of emergency

- Listing people's name for their blood group and checking availability of blood in ~~near~~ hospital

✓ - So these are certain preventive and control measures for the biological disasters.

Remarks

Q2. Water resource augmentation, conservation, efficient utilization will be very important determiner of India's future development. What is the status of water resource in India and discuss needs for its conservation and efficient utilization. (12.5 Marks)

Ans ② India has 17.7% of world's population but only has access to 4% of world's fresh water resources. This itself shows that India is a water deficit country and there is need to conserve and efficiently utilise the available resources.

per capita availability → 1500 (app) c.m

In terms of water usage; the division of water is as:

- Agriculture - ~ 60%
- household - ~ 10-15%
- Industry - ~ 10-15%
- Miscellaneous - ~ 10-15%

So in India, agriculture uses the most water resources and to conserve water resources we have to put forward efficient irrigation and agricultural practices. In this use of micro irrigation can be great help.

For industrial and household use, practices of water audit, water conservation

4

Remarks

- what write this word

through recycling has to be encouraged.

Population and urbanisation both would grow in times to come and there would be greater demand for water as it forms the life blood line of any activity. Hence to do so, there is urgent need that water resources are conserved, preserved and augmented.

Remarks

Q3. Renewable energy is emerging as anchor of Indian economic development. What is the spatial distribution of renewable energy resources in India? What efforts have been made to augment these resources? (12.5 Marks)

In times of global warming and climate change, the focus to expand the renewable energy resources have gained a new momentum. For instance formation of international solar alliance.

India also started its expansion of its renewable energy sources. Types of Renewable energy sources and their distribution.

- Wind energy : Rajasthan, Gujarat, Tamil Nadu
- Solar energy : Rajasthan, Gujarat
- ~~Nuclear energy~~
- Geothermal energy : Gujarat, Tamil Nadu, Andhra Pradesh
- Small, medium hydroelectricity : Uttarakhand, Himachal Pradesh, J&K, N-E states.

show map

U2

India with several missions on renewable energy have started expanding the sources. such as National Solar Mission which focuses to expand solar

- NDA  
- L&M  
- Mega Project

Remarks

energy capacity to manifold by 2022.  
Similarly we have various missions  
under head of National Renewable Energy  
Sources.

India has voluntarily committed  
to expand its capacity in non fossil  
energy sources at international forum  
in Paris climate deal and hence it is  
skipping to do it, also.

Remarks



Q4. What do you understand by energy security? How India should develop its energy mix to assure sustainable energy access to its people? Also discuss the steps taken by government in this direction. (12.5 Marks)

Ans (4) Energy security is vital for the any country's developmental goal to be successful. It is main driver of industrial, agricultural or economic growth. Hence energy security is inevitable to gain.

Energy security mean that a country is self reliant on its energy dependence without any external help or interference. India has started moving forward to secure its energy requirements. To do so it has diversify its energy resources and also started building capacities for the sustainable energy resources.

Also India has constructed reserve reservoirs of oil and natural gas; in case of sudden supply shortage of energy from international resources.

India has also come up with new policy for hydro carbon exploration to augment its domestic energy resources.

Refer  
list

4

Remarks

- Ans require sufficient

~~How~~ India is making various bilateral and multilateral treaties for the nuclear energy resources; to ~~diversify~~ have nuclear energy reactors and materials.

So these are various steps India has taken to secure its energy sources.

Remarks

Q5. India is the largest user of groundwater resources, which is unsustainable with visible signs emerging. Elaborate. How should India manage its groundwater resources with sustainable use? answ

(12.5 Marks)

Ans (5) India has largest share in use of ground water resources for agricultural and industrial use. It has become unsustainable

due to:

- groundwater tables are going down to minimum levels especially in northern belts of India

- Due to unplanned urbanisation and concentration; there is <sup>very less</sup> recharge to groundwater aquifers leading to aggravation of problem.

- then due to subsidy in agriculture electricity; there is lack of awareness about groundwater depletion among farmers which again is ~~causing~~ <sup>concern</sup>.

- then due to over utilisation of groundwater resources; salinization of soil is happening especially in Punjab area.

Hence due to above reasons; ground water use is becoming unsustainable

(5)

undr

Remarks

- To ~~maintain~~ make it sustainable ; India should :
- encourage farmers to go for water efficient irrigation techniques such as micro irrigation
  - cutting down on subsidy for electricity so that un mindful use of groundwater is not there
  - stringent penalties for industries for causing groundwater depletion
  - encouraging watershed development programmes ; to recharge aquifers
- Water is common essential resource without which life would be very difficult. Given that lack of freshwater resources in India ; groundwater conservation, preservation is the need of the hour.

Remarks

Q6. (Ports are not just the facilitator of trade, but could be inclusive centers of economic development.) In this light discuss the significance of Sagarmala project and its objectives. (12.5 Marks)

Q6 Sagarmala project objects to connect all Indian ports with multimodal transport of railways and roadways. It also intends to create new ports ~~and~~ having world class facilities.

Port is not merely an infrastructure development activity but it has various socio-economic benefit associated with it. It develops the whole area around it. For example; a port is developed, so there is increased mobility of people and goods; it fosters domestic production, increase employment and bring prosperity. That is why it is deemed to be engine of development.

Understanding the significance of Port led development; government of India has come up with Sagarmala project with objectives of:

- connecting all Indian ports
- building new ports and expanding capacity

Remarks

- add specific points - Coastal Eco Zone  
Community dev.

lab  
10/10

9

of new ports.

- Connecting cities with ports with network of rails and roadways.

Significance of this project lies in the fact that; India is at cusp of transition and with huge population growth; to ~~see~~ convert that demography into dividend; it is mandatory that it is supported by necessary infrastructure projects; and Sagarmala is one of them.

Remarks

Q7. Sustainability of India's forest cover lies in adoption of social forestry, examine. Also discuss what factors are hampering the growth of social forestry in India? (12.5 Marks)

Ans) India's national forest policy envision to have 33% of forest cover. However India has only 23% of total forest cover; in this situation to cover deficit ~~with~~ social forestry is a good idea.

Social forestry mean growing trees by community over waste / fallow land for overall development ~~with community involvement~~. India has around 4-5% of fallow land and 4-5% of wasteland; so social forestry has great potential. Also through social forestry; there is greater awareness and participation by people ~~which~~ about usefulness and need for protecting trees and forest.

However, social forestry has not been able to reap its potential due to following reasons:

- lack of awareness among people
- lack of resources with people such as plant saplings and manures
- lack of water resources

6

inadequate  
key words

Remarks

- little incentive for people to take care plants once sowing of them.
- ~~due to climate change~~; plants get
- destruction of plants by wild animals, insects.

Hence due to above reasons; social forestry even though having huge potential could not become a movement. To foster

this Government has come up with various incentives such as:

- distribution of free plant saplings and manures.
- incentivising local bodies through competition
- through awareness campaigns such as Nukkad Natak for potential benefits.

Hence through this social forestry can help India to achieve desired 33% of forest cover.

Remarks



Q8. Discuss the problems of agro-based industries in India. Do you think agro-based industry could be a better option to absorb shift of labour force from agriculture, What steps has government taken to promote agro-based industries in India? (12.5 Marks)

Q8 India has huge dependence on agriculture in terms of employment. Nearly 50% population still employed in agriculture which is again less remunerative. Hence in this scenario agro based industry provides a good option to shift labour from agriculture to agro based industry especially disguised employment and women labour because agro based industry demands less skilled / low skilled human power and mainly based near to the agricultural produce.

However agro based industry has various problems such as:

- ~~the~~ lack of backward and forward linkages and hence disincentivises people to go for it
- lack of capital with people for processing and infrastructure
- lack of technology for processing

Remarks

- less agricultural productivity due to small and marginal farmers
- redundant APMC acts prohibiting contract farming with farmers
- faulty MSP which pushes ~~to~~ farming of only few crops.
- lack of financial institutions and infrastructural bottlenecks.

steps by Government to promote agro based industry

- Reforming APMC act through incentivizing and introducing e-NAM for better price discovery and to have greater money with farmers.
- Introducing Mega food park schemes
- Introducing SAMPADA scheme to promote export of ~~agro products~~
- introducing niche banking for financial inclusion
- ~~streamlining through tar net~~

Hence through these steps government is trying to develop agro based industry with a vision of doubling farmer's income.

Remarks

Q9: Indian efforts in conserving tiger population are appreciable. In this reference, discuss achievements and steps taken by government to protect this magnificent animal. Also highlight some challenges which remains and need to be addressed. (12.5 Marks)

Ans. India with its proactive steps and progressive programmes such as "PROJECT TIGER" has been able to conserve tigers and to augment their populations.

To conserve tiger population India took following measures:

- Introducing Project tiger to conserve, preserve their habitat and population.
- enacting wildlife protection act 1972, and including tiger in 1st schedule which made tiger conservation on highest pedestal and poaching tiger as non bailable, cognizable offence.
- mapping of tiger populations through their foot prints regularly to check the progress of the initiatives
- Using Media platform to aware people about importance of tiger conservation
- Including new forests as Reserved

50 Tiger Res. Nat. Land Authority

5

Remarks

forests to minimise man-animal conflict and securing their habitat.

- Research on their genetic makeup ~~and~~ to ~~not~~ conserve their gene & materials.

Hence with following above steps India could successfully conserve tiger population. However various ~~of~~ conserve remains ~~at~~ such as:

- depleting their habitat due to infrastructure project. Recently due to Ken-Betwa link, ~~panna~~ tiger reserve was to be expected to submerged affecting tiger population.

- ~~Minimise~~ how to minimise Tiger-human conflicts

Hence ~~to~~ if these concerns are addressed then tiger population can be saved and augmented more vigorously.

Remarks

Q10. With fires raging across Central Indian forests and the Himalayan Pine forests, the frequency of such blazes has risen by a drastic 55 per cent in the past year. In this reference, discuss whether forest fire is always non-desirable? What are various reasons of forest fire and How to prevent Major Fires? (12.5 Marks)

Q10 Recently parliamentary committee on forest fires reported an increase of 55% in forest fire than past year. ~~This~~ This has awaken governments to take measures to prevent forest fires.

Reasons for Forest fires:

- Due to pine needle leaves which when dry causes forest fires
- Due to forest mafia which causes fires for vested interests
- Due to increase climate change; heat and hence forest fires
- Due to accidental fires by tourists and local population
- Jhum / shifting cultivation

Due to forest fires; there is loss of lives, loss of forest cover, loss of biodiversity. However it is not always that forest fires are undesirable. There

5

Remarks

Refer to Bilgini Case Study

certain benefits which forest fires provides such as:

- regeneration of new plants
- seedling of plants, flowering
- ecological succession
- soil regeneration

→ Measures to ~~take~~ prevent forest fires:

- uprooting pine trees with planting broad leaved trees
- incentivising local population to pick pine leaves to ~~pick~~ when dry.
- checking illegal forest mafia and taking stringent steps
- use of new Radar technology to detect early forest fires
- ~~to~~ awareness of local population to stop jhum cultivation or fires
- stop tourists from bon fires and taking matches to high altitudes.

Hence through these measures, forest fires can be controlled.

Remarks

Q11. What does the court verdict terming Ganga and Yamuna as living entity mean? What are the consequences of such directives? (12.5 Marks)

Ans (ii) Uttarakhand High Court declared Ganga and Yamuna as living entity. This judgement has implications in ~~consequences~~ <sup>consequences</sup> that:

- Both Ganga and Yamuna along with their tributaries have rights ~~as~~ <sup>of</sup> as of living beings. Such as right of being not polluted and in being indigified healthy state.
- Now any one can sue protectors of these living rivers when found he/she finds activities pertaining to infringing rights of these rivers.
- It imposes greater responsibilities to state government to conserve, preserve and protect the Ganga and Yamuna River System.
- Now state governments have to take pro active role in such protection unless they would be liable for dereliction of their duties.

Remarks

Rever. S.C. Jain ?

4

Hence this judgement ~~is~~ pushes river system conservation in a new era of Right based conservation of Rivers.

So living rivers means that these rivers have existence, rights and demands such as living organisms. And no external party can degrade them from their worth by polluting them and if someone does, who would be liable for stringent penalties.

Remarks



Q12. Elephant-human conflict is one of the most challenging issues in conservation of Heritage animal of India. What are various reasons of Elephant-human conflict? What need to be done in resolving these conflicts? (12.5 Marks)

Q12 Recently Elephant-human conflict came to forth again due to recent conflict in MP and Kerala.

Reasons for Elephant human conflicts

- declining forests and habitats for elephants due to which they are coming in contact with humans frequently
- increased activity of forest mafia for elephant's teeth for foreign markets
- inactive bureaucracy to in preventing humans going into core areas of forests
- rapid pace development of elephant's corridor by state governments
- infrastructure development projects going from elephant's corridor

Hence these are various reasons for increase in elephant-human conflict.

⇒ Measures to be taken for resolving these conflicts

Remarks

- Development of elephant's corridors by state governments at earliest with collaboration of each other.
- sensitizing local population living close to forests about elephants handling in case of conflict
- Bureaucratic proactiveness in checking human's presence in core forest areas
- checking forest illegal mafia through stringent measures.

Elephant is India's heritage animal and has cultural heritage associated with it. However, to protect them and also to properly address local population's grievances, above stated measures can be taken for benefit of both.

Remarks

Q13. The effects of urbanization and climate change are converging in dangerous ways. In this reference, discuss how cities are contributing to climate change and in turn how they are impacted by it? Discuss what should be done to make cities more suitable with special mention of concept of green buildings to reduce impact of climate change.

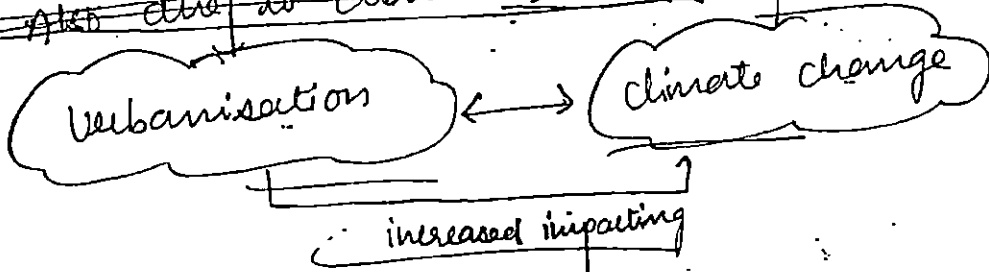
(12.5 Marks)

Q13) Climate change and urbanisation are interlinked whose impacts are converging in dangerous way on both of them.

For instance; due to climate change, climate behaviour is becoming more erratic leading to extreme rainfall in some areas and ~~desert like~~ no rain in other areas. So in cities due to faulty urbanisation, due to climate change, rainfall. The result are

- frequent urban floods as seen in TN, Gujrat, Mumbai
- depletion of <sup>ground</sup> water resources due to ~~lack of~~ concretisation and overuse of resources.

~~Also due to climate change~~ impacting



4 1/2

Remarks

- Try to convey more in less words  
- Avoid repetition of point

Due to urbanisation; with less green spaces; due to urban heat island phenomena there is increase in climate change which in turn causes more global warming, heating which leads to causing of use of more ACs / Fridge which in turn causes more global warming and results are devastation in form of floods etc.

To reduce impact of climate change; the concept of green building is innovative measure which helps in construction of buildings in such a way to minimise their carbon ~~footprint~~ footprint and use of natural light, afforestation in building premises etc.

India has Green building code and recently Indira Gandhi International airport was declared to have zero carbon footprint due to its green code. Hence in mitigating the impacts of climate change green building is a good idea.

Remarks

Q14. Environmental governance introduced by international bodies aims at improving the quality of human living within the carrying capacity of supporting ecosystems. Elaborate with respect to role played by UN in sustainable development. (12.5 Marks)

Q14. Sustainable development means development of such kind without harming interests of future generations as ~~to~~ in other words development of economy having environmental imperatives in its fold.

However sustainable development was not a watch word till UN played significant role in making international community realize its importance.

1st step towards it was taken by UN in 1972 when United Nations Conference on Human Environment was convened. It is this conference which brought the paradigm shift in understanding of development and making the realization apparent that humans are part of nature not the competitors.

Then UN constituted Brundtland Commission which put forward various principles for sustainable development

Remarks

(5)

such as : intergenerational equity, public Trust doctrine, polluter's pay etc. which were adopted by international community at Rio conference.

- Then with various conventions such as
- Convention on climate change
  - Convention on biological diversity
  - Convention on desertification etc, UN

tried to deal with every aspect of environmental degradation and to minimise adverse impact of development.

With recently concluded Paris climate change; UN has successfully shown its important role in guiding human generations to develop in sustainable ~~and easy~~ way.

Remarks

Q15. The advances in science and technology lend themselves to greater possibilities for more efficient disaster management worldwide. Elaborate. (12.5 Marks)

Q15 Recently concluded Sendai framework then Asian ministerial conference on disaster risk reduction; claimed importance of science and technology in both prevention and mitigation of disasters.

Science and Technology holds great potential in minimising the impact of disaster.

In pre disaster time by having:

- Good innovative instruments for mapping various vulnerabilities for various hazards such as Tsunami, earthquake
- having disaster resilient material for construction
- better weather forecasting technique
- better communication techniques and having swift transportation technology

Impact of sound pre disaster science and Tech help can be seen from recent example where due to

Remarks

write stage wise Role  
Mitigation

precise weather forecast and movement of cyclone in Orissa; state government could be made alert before and result was; people were evacuated beforehand and hence very less <sup>loss</sup> ~~impact~~ <sup>human</sup> ~~life~~ and similar S/T can help in post disaster.

- in building quick temporary shelter
- having preserved food techniques
- having easy water filtering techniques
- New medicines for easy and effective care

So science and Technology has great potential to <sup>adverse</sup> minimise impact of disaster on human life and property.

Remarks



Q16) With rising vulnerability to cyber threats and electronic voting machines being proved to be vulnerable there is a demand for defaulting back to offline paper based systems but Blockchain technology is gaining importance that it would fight electoral fraud. Critically discuss. (12.5 Marks)

Ans 16) Blockchain technology is <sup>like</sup> electronic ledger where all transactions can be recorded and no further transaction can happen without previous transaction's identity noting. It is frequently being used by people for cryptocurrency transactions.

So this technology holds potentials for checking frauds in other areas also like banking, electoral machine, etc where each transaction can be recorded and verified.

That is reason RBI has formed high level committee to check feasibility of this technology in banking sector to check financial frauds and Money laundering.

However this technology has problems when it is death in internet system then that system becomes vulnerable. For example in cryptocurrency transaction

elaborate as I do

57

Remarks

through this technology, an exchange in Japan was hacked.

Hence it is ~~is~~ also not immune from cyber attack vulnerabilities. So electoral voting machines which do not function on internet and if this technology is used may not fully immune from attacks.

However this technology holds great potentials and if utilised and manipulated in right direction then may prove to be a boon against cyber attacks.

Remarks

Q17. What are gravitational waves? What does the discovery of it hold for the world? How is LIGO detecting and what is the contribution of India towards this project?

(17) <sup>Gravitational</sup> Gravitational waves are waves generated (12.5 Marks) by massive bodies due to their movement over space-time fabric.

Gravitational waves were first proposed by Einstein and recently these were detected by international community. It's discovery holds great significance as it would help in understanding the interaction of bodies specially of massive bodies in space and hence in turn understanding the space dynamics in more better way.

Since international community is making huge strides in space through various satellites and space programmes; understanding behaviour of gravitational waves of massive space bodies would further give impetus to space programmes.

India was also associated with detection of gravitational waves through

Remarks

= Ans all parts of qn.

Scientists and various machines. India has also come up for ~~forward~~ creation of LIGO observatory in India for detection of gravitational waves and would give impetus to India's R & D in this area and gaining respect at international level.

Remarks

Q18. Why is there is lack of communication between the scientific community and the public when it comes to acceptance of science projects like INO? Give your opinion. By writing a short note on India based neutrino observatory, mention its significance and why is it not gaining public support? (12.5 Marks)

Q18) In India; there is significant gap in communication between scientific community and ordinary people due to less engagement between the two because of which both sides do not understand the other side's perspective.

Ordinary people do not understand long term perspective of these scientific research and since there is lab to land disconnect; they do not want to give up their share of livelihood for progress of these projects.

On other side; due to lack of ~~eng~~ engagement ~~seto~~ by scientific community and lack of community based developmental project; scientific community feels helpless to gain confidence of local community.

That is reason; there is opposition by local community for big projects like NVD, Nuclear projects and even other

fear of  
people  
< earth  
radiation  
gran  
etc.

41/2

Remarks

space projects also.

Indian neutrino observatory is proposed to be made in Tamil Nadu to observe the neutrino particles from space and ~~then~~ to understanding their behaviour.

Neutrino is one of the fundamental particle; if understanding of the same can be researched properly then it would foster the particle physics and whole understanding of universe; its formation and functioning and hence it has great significance.

Remarks

Q19. To what extent is India a Knowledge based economy? What are the measures taken to make it so? What alternate suggestions are needed to make it a knowledge based economy? (12.5 Marks)

Ans (19) India is hub of world's IT sector. Indian company provide software solutions across the globe and have to quite an extent; India is a knowledge based economy having a huge share in India's GDP growth of state.

However we cannot fully say that India is knowledge based economy because India lags behind in other sectors such as:

- providing higher education or education sector. India fare very badly in education sector at international level.
- India's contribution in global research and development is quite low
- India has very low patent and research papers

So even though having good services sector especially in IT sector; India is not a full knowledge based economy

Remarks

- write Gov. schms. policies to

due to above reasons. To make it as a knowledge based economy India should take following measures;

- Reforming higher education; investing in making them world class universities
- developing scientific temper for R & D
- boosting private sector for the same with progressive policies and support

So with these measures; India can become a knowledge based economy.

Remarks



Q20. What is reusable launch vehicle? Why is it considered an important milestone for Indian space program? (12.5 Marks)

Ans 20) Reusable launch vehicle is launching vehicles for space programme which after launching its targets can come back into earth and hence is available for the reuse. India became 4th country in the world to have this technology.

It is considered as milestone in Indian space programme because it will cut down to heavily on space programme launch cost and would make them more efficient.

It would give impetus to the space market India is striving for. It would make Indian launches <sup>more</sup> competitive and cheap and India would gather international market for the same which will have both economic and strategic benefit for India.

Also it would enhance India's ~~emerge~~ <sup>emerge</sup> in international platform

52

underline keywords

Remarks

~~is not to only~~

Then it would encourage youngsters to come for space career as it would open new avenues for employment through ~~new~~ opening new space industry.

Hence having this technology would not only benefit India's space programme but would help overall in India's economic growth and development.

Remarks