

68

ENVIRONMENT, SCIENCE AND TECHNOLOGY

Time Allowed: 3 hrs.

Max. Marks: 250

| Q. | Marks | Instructions to Candidate |
|-----|-------|--|
| 1. | | <ul style="list-style-type: none">• There are 20 questions.• All questions are compulsory• The number of marks carried by a question is indicated against it.• Answer the questions in NOT MORE THAN 200 words each. Contents of the answer is more important than its length.• Answers must be written within the space provided. <p>Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.</p> |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |
| 15. | | |
| 16. | | |
| 17. | | |
| 18. | | |
| 19. | | |
| 20. | | |

1. Invigilator Signature _____

2. Invigilator Signature _____

Name Shashank Chaudhary

Roll No. —

Mobile No. —

Date 23-4-16

Signature SA

REMARKS

GS SCORE
GS MAINS TEST SERIES 2016

| | |
|--|--|
| | |
|--|--|

Q1. Sustainable use of the major and minor natural resources can provide fundamental life support, in the form of both consumptive and public, good services. What are the policy initiatives that are undertaken to tackle illegal and inappropriate mining in India? Explain how the Amendment to the Environment Impact Assessment can be helpful in preventing indiscriminate exploitation of natural resources? (12.5 Marks)

Sustainable use of natural resources is important
 so that the future generation will also be
 able to take benefit from them.

Steps to tackle illegal and inappropriate mining:

- Stringent actions against violators.
- Prudent allocations of coal blocks.
- Prevention of open cast mining.

The amendment to the Environment Impact Assessment will be helpful towards detailed

analysis of the future implication of the developmental project on the socio-economic life of the affected people.

Improved rehabilitation mechanism have been placed.

Also ~~is~~ a concerted effort by the various stakeholders and departments

Initiatives and laws made by govt. required (Properly mention them.)

have been mandated in the Amendment
to the Environmental Impact Assessment.

Therefore only after detailed scrutiny a
exploitation process of natural resources can
be undertaken. This will ~~reduce~~ prevent

indiscriminate exploitation and promote

$2\frac{1}{2}$ balance between ~~natural~~ and human needs.
nature

Properly discuss the
amendments and
their benefits

Remarks

Mention the revised guidelines (provisions) and then discuss its pros and cons

Q2. The Controller General of Patents, Designs and Trademarks (CGPDT) has recently issued an order excluding software patents in its revised guidelines for Computer Related Inventions (CRIs). How will this new order impact the development of software and what will be its possible on innovation in India? (12.5 Marks)

Ans

Softwares are the string of codes designed to run in a specific manner and to accomplish a specific task on a hardware platform. e.g. Microsoft Office, Window XP etc.

Impact of the order on development of software:
Positives

- Level playing field for the start-up companies vis-a-vis software giants like Google, Microsoft.
- Evergreening will be prevented.
- Now software can be patented only with considerable innovation in the hardware, this will promote new technologies.

Negatives

- Big companies may not be incentivised to invest in the Research and development.

Remarks

Purely service-based companies will be ^{at} disadvantageous stage.

Impact on India!

The sector of IT and software is booming in India, new startups are registered everyday. However, the software companies in India are still far far behind the developed world. Such an order will ensure that the monopoly of Big Western software companies will be prevented in terms of software. ~~That~~

Therefore, it will help in the promotion and indigenization of the software technology and far reaching innovation.

Ans lacking clarity

Remarks

Q3. The alternative clean energy sources like biofuels can not only cut off the emission of harmful gases but surly can cut carbon dioxide emissions by up to 68% compared to petroleum fuels. What are the potential advantages of using microalgae derived biofuels? Demarcate the challenges associated with use of such fuels in India. Suggest some strategies to uplift their use taking into account the recent developments. (12.5 Marks)

Ans

Alternative energy refers to the source of energy other than the traditional sources like coal, wood, petroleum etc. There are plethora of alternative clean energies like bio-fuel, hybrid fuels, solar energy etc.

Advantages of microalgae derived biofuels:

- (i) Post Paris-summit it is a global effort to move to cleaner fuels and biofuels are desirable candidate for it
- (ii) Reduced emissions of disease causing gases and carbon dioxide, which will check the global warming.
- (iii) New employment opportunities
- (iv) Improvement in conditions of the workers of coal factories etc.
- (v) Reduced conflicts in middle east that arises due to dominance of oil reserves in that area.

Remarks

Challenges include:

- Supply - Demand bottlenecks, meeting energy requirement of ^{1.2} billion people using biofuels is difficult.
- New technology required in vehicles.
- Slow process.
- Phasing out traditional resources will lead to ~~un~~ ~~em~~ unemployment.
- Biofuels will be expensive in the initial stages.

Strategies to improve their use:

- Proper National policy to introduce biofuels in a gradual manner.
- Investing ⁱⁿ R/D to make them more feasible
- Promotion of decentralization in manufacturing of biofuels
- International cooperation to achieve best results.

Therefore, biofuels holds good potential for use in the future.

Remarks

Ans. not to the point
Precisely discuss advantages, challenges and strategies specifically in context of algae biofuel.

Q4. Countries like India which depend majorly on coal for their electricity production face a surmounting international pressure and an environmental concern. Discuss how the coal fed power plants can be uplifted using newer technologies? Examine how the revised standards for coal-based thermal power plants will help in minimising pollution?

Ans

Coal is the source of meeting majority (12.5 Marks) energy requirement in India. It has uses in power generation, domestic uses, ~~to~~ heavy manufacturing industries etc.

~~Enter~~ Newer technologies can be ~~can~~ used to reduce coal usage :-

- Use of biofuels
- Use of solar energy, wind energy etc.
- ~~Use of~~ Use of geothermal energy

~~By Introduction of these technologies~~

- Photovoltaic cells to ~~to~~ convert solar energy into electrical energy.
- Smart Grids to share the extra power leading to efficient use.

Revised standards can help in minimising pollution :-

- Washing of coal before use will ensure reduce CO₂ emissions

Not required

Remarks

Discuss specifically in context of clean coal energies (Ref. hints)

- Limiting the maximum use of coal in the plants will further lead to check on the emission hence reducing pollution.

$1\frac{1}{2}$

Remarks

Objective and features

- Q5. (a) Explain how National Electric Mobility Mission Plan can be a remedy to surmounting problems of urban air pollution?
- (b) What are the causes Urban Heat Islands? What are their impacts and what could be the mitigation strategy? (12.5 Marks)

Ans (a) National Electricity Mobility Mission Plan is initiated to promote the use of electrically powered motor vehicles.

This will reduce the emission from the domestic vehicles and hence ~~considerably~~ ^{air} reducing the urban pollution.

Proper and complete ans. required

(b) Urban Heat Islands are the high temperature urban dwellings whose temperature is increased due the entrapment of the incident solar energy.

Cause:

- (i) Use of concrete which absorbs heat. (Lower albedo)
- (ii) Removal of green cover which has ~~low~~ high albedo.
- (iii) Roads made up of Tar which is heat absorbant.

Remarks

(iv) Reduced sources of surface water in cities like ponds, lakes etc.

Impacts

- (i) Heat waves
- (ii) Increased temperatures that can be detrimental health.
- (iii) Deadly to the poor who can't afford goods like AC's, coolers etc.

Mitigation:

(i) Improve green cover as envisaged under National Forest policy (33% forest)

(ii) Terrace gardens.

(iii) Water sources in cities.

(iv) Better healthcare ~~cond~~ facilities for heat stroke etc.

Try to briefly explain your points.

Remarks

Q6. The environment regulations in India were just to cater the domestic needs and challenges, but with changing climate and increasing global challenges they may look the thing of last decade. Critically analyze the suitability of the present environment regulations in the country. Explain how these regulations can be strengthened to bring an international parity? (12.5 Marks)

Ans

Environment regulations in India are made in such a manner that along with protecting the environment, they also have space for developmental activities. This compromise make the regulations out of pace with the international mandate.

Mention the various laws and regulations

- There is no stringent penal provisions in case of transgressing the environmental laws.
- Tribals in the northeast are allowed to practice Jhum cultivation.
- Land acquisition is relatively easy and lopsided efforts towards compensatory afforestation.
- Bad agriculture practices are common in India, leading to environmental degradation.

Remarks

Precisely discuss the lacunas of existing laws and regulations

Steps to bring them in International parity :-

- Implement and continuous efforts to achieve the Nationally Determined Contributions.

- International cooperation to make the rules more adequate.

- Awareness and promotion of importance of conservation in the country.

- Stringent penal provisions for the offenders.

- Comprehensive Environmental Policy to cover all aspects of conservation.

Avoid superficial ans.

Q7. Supercomputing can help India not only in proving its technological capacities but also in planning for growth. Explain uses of supercomputing in context of above statement. What are the recent initiatives of Government of India in the field of supercomputing?
(12.5 Marks)

Ans

Supercomputing is the process of doing massive amounts of ~~active~~ calculations using supercomputers in very less time.

Importance of supercomputing in planning and technological aspects:

- Better analysis of weather / climate changes to predict the upcoming disaster.
- Use in analysing Big Data that will be generated out of various governmental departments, surveys etc to make better strategies for targeting.
- Planning in medical field to analyse the data of diseases to prevent recurrence of the disease.

Discuss its implications in various avenues of govt.

Remarks

Recent steps in the field of super computing:

- India ~~to~~ currently has only 9 ~~to~~ super computers as compared to 190 in USA and 110 in China. The government is planning to increase the number.
- India supercomputer PARAM made its place in the top 100 supercomputers in the world.
- Promotion of the youth towards computer sciences and equipping the higher institutions with latest computer technologies.

Thus, Supercomputing can support the various developmental plans of the government and lift millions of out of poverty.

Remarks

Q8. What do understand by Green tax and Compensatory Afforestation? Critically analyze that whether the Compensatory Afforestation Fund Bill 2015, will create a benchmark futuristic regulation or in its present form would squander away staggering amounts on meaningless efforts. (12.5 Marks)

Green Tax: The tax levied on the ~~for~~ usage of the energy resources ^{and technology} which causes pollution. e.g. green tax on heavy vehicles.

Compensatory Afforestation

The ~~assess~~ "practice of providing ~~the~~ financial resources ~~and for~~ ~~cost~~ - for afforestation and/or direct afforestation by a company

which is responsible for the divergence of a forest land due to some person gain. e.g. setting up a factory etc.

The Compensatory Afforestation Fund Bill 2015, is a step towards deploying the money lying ~~not~~ unused in the Compensatory Afforestation Fund. The Bill mandates transfer of the money to the respective

Remarks

states so that it can be used for meaningful afforestation.

However, ~~as~~ the bill does not increase

the compensatory amount which is highly inadequate, to the damage done. compared

Precisely mention the objectives of CAF bill and related flaws

Required approach

- Q9. (a) Internet of Things and big data technologies can transform the ways and means of e-Governance in India. Comment
- (b) Briefly discuss the importance of Project loon and White-fi in expanding the reach of Digital India. (12.5 Marks)

Ans (a) Internet of Things

Interconnection of physical things to send and receive data in order to achieve improved services.

Big Data - The organisation of large amount of data ^{that is} generated everyday ^{by} through the people:

Considering the 1.25 billion ^{large} population of India, big data ^{and Internet of things} can help analysing the data generated through e-governance and continuous improvement in the service delivery

e.g. Better targeting can be achieved in schemes like MGNREGS, PDS etc.

~~Reduction~~

Properly explain it

Precisely elaborate

Remarks

(b) Project loon

Proposed by Google where large balloon will be deployed in the stratosphere which will provide internet services on land without any physical connectivity.

White-fi

Proposed by Microsoft, this technology uses the unused T.V. spectrum to use as a data delivery channel for Internet.

~~Both the te~~

While Project loon can help in the inclusion of the poor into the world of internet, White-fi will ensure high speed data at a much cheaper rates so that even the poorest can avail and benefit from Digital

India initiative

Remarks

Q10. Municipal Solid waste management is one of the major problems faced today in India.

Elaborate upon the reasons that have created such mounting challenges in India. Explain how the conceptualization of waste to energy can bring a ground-breaking change in the scenario? Analyze how traditional practices of rural India can be a way out to the problems? (12.5 Marks)

Ans

Solid waste consists of the dry waste ~~also~~ which is generated in huge amounts especially in cities, these include electronic waste, plastic bags, metals etc.

Challenges:

- No comprehensive policy, haphazard management.
- Huge mountains of wastes in dumping grounds leading to socio-economic and health complication of the ~~to~~ slum dwellers and workers nearby.
- Fires in dumping grounds.
- No policy for ~~is~~ promotion for segregation of ~~to~~ solid and liquid waste
- No recycling ~~and~~ of e-waste.

Precisely explain the reasons and include more of them.

Remarks

Properly explain the phenomenon.

Waste to energy can bring a major change:

- Biodegradable waste can be used to produce bio gas which will solve energy problems and also provide manure for farming ~~hence~~ hence curbing pesticide pollution
- Problem of dumping grounds will be solved because due to increasing population not much land is left for this purpose

Tradition practices of digging the pit and bio-degradation in it will

be helpful in this respect. The cow dung can be used to meet the energy needs. Using earthworm for this process is also an alternative.

Ref

3 1/2

Remarks

Q11. The world has a greater need to gather and access personal information to provide Public Services and Security. Do you agree that digital encryption and mass surveillance can go hand in hand with right to privacy in India? Analyze— (12.5 Marks).

Ans

With increase in the number of cyber threats and terrorist attacks, the governments all over the world have resorted to the use of technology for mass surveillance and digital encryption.

Though right to privacy is not explicitly provided in the constitution but it derives its credibility from Article 21. There is no doubt that data encryption and pro-active measures are needed to combat the potential cyber threats. The initiatives like Smart-cities and digital India envisages to digitally connect the entire country. In such circumstances the concerns related to security increases manifold.

Remarks

However, in the name of national security, a government cannot violate the rights of the citizen. The recent reversal of National encryption policy by the government is the evidence that citizens are not ready to give up their rights.

Moreover, there have been studies which indicate digital surveillance of the population does not considerably reduce the threat. It is analysing such a huge data for one particular terrorist activity is similar to finding a nail in the hay.

Therefore, there needs to be a balance between surveillance and privacy. Rather than surveillance of citizens, citizens should be incentivised to act as the tool to report terrorist activities.

Remarks

Arguments are one dimensional
(Try to cover the benefits also. Discuss Right to Privacy related aspect in detail)

Precisely mention the features first and then discuss its usefulness.

Q12. What do you understand by National Air Quality Index? How it can be helpful in checking the levels of harmful urban and industrial air pollutants? What are major impediments in early roll out of BS-IV and BS-VI standards in India? (12.5 Marks)

Ans

National Air Quality Index determines the amount of various types of hazardous gases in the air which can be detrimental to health.

It can be very helpful in checking urban and industrial pollution as it will constantly measure the quality of air and displays a warning when the pollutants in the air are beyond acceptable limits. This in turn can help in taking the required steps to check the pollution.

Major impediments in early roll out of ~~BS-IV~~ ⁱⁿ BS-VI standards in India:-

- (1) ~~the~~ Automobile companies need more time to improve the quality of the engines to meet the requirement.

Remarks

(ii) fuel producers need better technologies
to reduce the amount of sulphur in
the fuel.

(iii) Vehicles will get expensive.

(iv) A nation with wide roll out is
difficult as many tier-II and tier III
cities are still on BS-III.

Therefore, a proper ~~concorda~~ consultation
between the government and, automobile
companies and fuel ~~co~~ companies
should be undertaken to effectively
and efficiently move to BS VI.

4

Q13. India is currently facing a major threat from communicable diseases. In the light of the above statement, comment on the vulnerabilities that India faces from Zika virus. Which initiatives shall be undertaken by government to safeguard India from Zika virus.

(12.5 Marks)

Ans The diseases which can spread from the infected person to a healthy person through the medium of air, water or vector are known as communicable disease.

India is facing major threat from diseases like malaria (recent outbreak in Delhi), dengue, chikungunya etc.

The vulnerabilities from Zika Virus :-

- (i) Being a subtropical country, India's vulnerability is high.
- (ii) High mosquito population ~~exists~~ in India which acts as the vector for Zika virus.
e.g. Aedes species
- (iii) NO sincere efforts towards controlling the mosquito population.

Precisely discuss more specific reasons.

Remarks

Needed Initiatives Include:

- (i) Pro-actively investing in the research and development of treatment for Zika virus.
- (ii) Augmenting the International effort against Zika.
- (iii) Reducing mosquito population using modern gene technology.
- (iv) Awareness campaign to check the breeding and proliferation of the mosquitoes.
- (v) Special emphasis on pregnant women
- (vi) Distribution of mosquito nets etc.

Conclusion required for every ans.

Remarks

Q14. It is far easier to define the Corporate Crimes than acts of pollution. Elaborate upon the ill effects of emission violations started through corporate emission scam much recently. What could be the steps taken Globally to mitigate such problems in future?

(12.5 Marks)

Ans

Corporate Crimes can be easily defined and caught by vigilance agencies, but the acts of pollutions are difficult to catch due to the lack of effective monitoring and auditing mechanisms.

Define it

Supplement with example

Ill effects of emission violations. (Try to be specific and precise)

- (i) Harmful effect on the health of the workers
 - (ii) Pollution in the nearby habitations regarding
 - (iii) Loss of biodiversity and ecological wealth aspects and dimensions
- examples include the mercury pollution in Kodaikanal, Tamil Nadu.

Adequate steps are needed to mitigate and prevent such problems in the future such as:-

- (i) Stringent penal provisions against the violating firms

Include more ill-effects

Remarks

(ii) Liability of the insurance of the nearby households in cases of any disaster caused by the factory should be on the owners.

(iii) Health insurance of the workers should be made compulsory by the employer.

(iv) Frequent Audits by environment officials.

(v) Preventing the cases of collusion corruption.

(vi) A global convention to protect such corporate scams should be adopted by the countries.

Therefore, to prevent such scams in future, pro-active measures are needed by the governments all over the world.

Strengthening regulatory framework as way forward

Q15. Realizing the worth of science and technology in economic growth, modern India has had a strong focus on development of science and technology. Critically analyze the development of science and technology in India pre and post independence.

(12.5 Marks)

Ans

The importance of science and technology in Indian society has been recognised since ancient times e.g. contributions by Aryabhatta.

However, the emphasis on science and technologies in India has not been in pace with the global standards in modern times.

Science and technology in pre-independence India :-

The development in this field was dismal in the 16-17th century, this is one of the main reasons that the Britishers were able to ~~colonize~~ India.

Under the British rule there was no much improvement because the policies of the foreign government was towards the socio-economic exploitation of India.

Remarks

Precisely and factually discuss the developments during British period

Post - Independence India

The science and Technology got a restart after independence under the leadership of the first PM JN Nehru.

He considered development of science and technology cardinal for economic growth of the country. Towards this effort IITs were instituted at different parts of the country.

More post-independence developments related facts

Atomic Energy Council was formed under the supervision of Dr Bhabha to develop India's nuclear capabilities.

Moreover, budgetary allocations were made for various research projects in terms of agriculture, space (ISRO was set up), electronics, medical etc.

4

Always conclude your ans

Remarks

Q16. Wetlands are ecologically sensitive and adaptive best lands which sometimes are taken as wastelands in urbanization. Demarcate the significance of wetlands in urban environment sustainability and conservation? What are the factors associated with the loss of wetlands and their impacts in India? Critically analyze the role of wetland conservation strategies and initiatives in India. (12.5 Marks)

Ans

Wetlands are the marshy areas where the water collected from various channels seeps underground. They are ecologically important as they form the boundary between aquatic and terrestrial ~~to~~ flora and fauna.

Significance of Wetlands:

- Important for drainage in the city
- Supporting marine life with high biodiversity
- Supporting forest green covers.
- Groundwater replenishing
- ~~Source of oasis in~~ Act as oasis in urban heat-deserts.

Factors leading to loss of wetlands:

- Rising population and diversion of wetlands.

Remarks

- Impudent building practices.
 - Collusion between authorities and builders
- Wetlands are important for the drainage and very effective check against the floods.
Loss of wetlands can lead to water logging and floods as seen in the case of Chennai floods.

Role of ~~water~~ wetland conservation strategies:

- Prudent building plans to make space for wetlands.
- National policy for conservation of wetlands
- Strict punishment for offenders.
- Reducing rural-urban migration.

4/2

Ref hints

Properly explain points and try to cover all relevant points

Remarks

Q17. What is understood by crypto-currency? How it can find a transforming role in developing economies like India? What is e-wallet, elaborate what benefits it provides over the traditional money and plastic money? (12.5 Marks)

Ans

Crypto currency is the digital currency which can be obtained by the process of mining. e.g. Bitcoins, Leximicoins etc.

They can serve as the instrument to achieve cashless economy and trade in financial markets. Corruption can be controlled in a cashless economy which is a major issue in countries like India. However, there is issue of money-laundering related to crypto-currency.

e-wallet: It is an online service provided by various companies where a person can keep money in digital form and to it to pay for online shopping, bill payments etc.

- Benefits over traditional and plastic money:
- Issues related to theft of money are resolved.
 - Since ~~every~~ transactions will be online, IT department can track every transaction and hence black money generation will be prevented.

Lacking concept clarity

Remarks

• Accessible, reliable and easy to use

27

Corruption, leakages etc can be prevented.

Remarks

Introductory para required
for every ans.

Q18. (a) Discuss the strategy adopted by India for Tiger Conservation and also suggest some measures to improve it.

(b) The natural hybridization methods like in DMH-11 can even pose a greater threat to indigenous biodiversity. Explain. (12.5 Marks)

Ans (a) Strategies adopted by India for Tiger Conservation. Specifically name the programme or National policy for Tiger Conservation is launched. Strict laws in cases of encroachment. Mention more initiative

Further ways to improve:

• ~~Eng~~ Better surveillance of National parks and Sanctuaries using ~~the~~ ~~best~~ modern technologies.

• Training of forest officials repeatedly.

• Check on the activities of tourists which can be harmful to Tigers.

(b) The natural hybridization methods like in DMH-11, ~~also~~ also alter the genetic make up of the indigenous species leading to a permanent.

Remarks

change in the genomic structure which is perpetuated through generations.

Since, hybrid crops like DMH-11 are more productive than the traditional crops, farmers will tend to shift to the new variety leading ~~to~~ the indigenous variety to oblivion.

Lacking knowledge regarding the issue.

2½

Remarks

Precisely mention the features

Q19. Discuss the significance and importance of development of Cryogenic Engine in space research for India. Elaborate upon the benefits of NASA-ISRO joint missions.

(12.5 Marks)

Ans. Cryogenic Engines are the rocket engine which work on cryogenic fuels that are super-cooled gases mainly hydrogen and oxygen.

- Cryogenic engines provide better thrust than the solid or liquid fuel engines.
- Indigenous Cryogenic Engines will establish the credibility of ISRO world over in terms of space technology.
- ISRO will benefit from launching satellites from other countries, earning foreign currency for the country.
e.g. recently GSLV ~~rocket~~ was used to put U.K. satellites into orbits.
- India can undertake space missions on its own saving nearly $\frac{3}{4}$ th of the cost when compared to launches from other countries.

Remarks

Benefits of NASA - ISRO Joint mission:-

- Quality Knowledge and experience for ISRO scientists.
- Exchange of ideas.
- Motivation to students in India towards space research.
- Increment in credibility of ISRO
- Improved technologies, cost-effectiveness, better enhanced research as compared to working in isolation.

④ Therefore, collaboration between ISRO-NASA holds benefits for both the agencies and future space research.

Discuss mentioned points

Q20. Elaborate how the present concept of Gravitational Waves can bring a new outlook in space research? How significant has Indian research been in understanding Gravitational Waves? What are the advantages that India can gain from Neutrino Research?

(125 Marks)

Ans. Gravitational waves ^(GW) are the waves which propagate gravitational force through space-time. First hypothesized by Einstein ^{Albert}.

New outlook in space-research because:

- ~~Now~~ ~~Now~~ New medium to study space, earlier only electromagnetic spectrum was available. (X-rays, visible light, Infrared)

LTGO

- Since GW do not ~~interact~~ get absorbed by matter and can travel billions of light years, they can help in solving the mysteries of universe like Big Bang, dark matter, Black holes etc.

Indian ~~science~~ research have also contributed to the understanding of GW. Many Indian scientists are part of the Gravitational Waves Interferometer Experiment

INDIGO

Remarks

Moreover, government has approved the project for Indian version of the detection experiment.

Advantages of Neutrino Research to India

- They do not interact with matter there hold information about farthest universe.
- ~~Sp~~ Understanding of cosmo-energy will be improved
- They can also provide information about interior of the earth.

4 If India gets any breakthrough, it will establish the metal of India research and development worldwide which in turn increase foreign students to study in India.

Conclusion required