

**SCIENCE & TECHNOLOGY  
AND ENVIRONMENT**

Time Allowed: 3 hr.

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/part is indicated against it.</li><li>• Answer the questions in NOT MORE THAN 200 words each. Contents of the answer is more important than its length.</li><li>• Answers must be written in the space provided.</li></ul> <p>Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.</p>
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Name Digvijay Borkhe

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

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

Date 17/11/2015

Signature \_\_\_\_\_

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Remarks

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

U.S

**GS SCORE**  
GS MAINS TEST SERIES 2015

Q1. Nano-Technology is an "enabling technology" which influences a wide range of products and processes with far-reaching implications for development. Discuss the applications of nano-technology in water purification and food processing sector and how can it contribute for societal development? (125 Marks)

Nano technology once considered as a technology of the future has truly arrived on the scene because of its varied applications.

● Food processing:

• Nano technology can be used to detect flaws in designs of food cans.

• Nano technology can be used for preserving food for longer times.

● Water purification:

• Nano technology can be used to purify water of newer contaminants which have emerged in recent years. ∴ Arsenic, Uranium etc.

• Nano technology represents a cost effective solution for water purification in rural areas.

• Nano technology is used in seawater filtration techniques.

The above two sectors show some of the varied applications of nano technology. It can contribute

towards societal development  
because:

- Cost effective solutions are always  
welcome in a developing country.
- Nanotechnology find immense  
application in the field of healthcare  
eg: ① targetting plaques in arteries.  
② Targetting cancer.  
③ Minimally invasive surgeries.
- Nanotechnology finds multiple  
application in the field of telecomm-  
unication which are vital  
arteries of modern economies.
- Nanotechnology ~~is~~ brings about  
investments in the economy.

Thus nanotechnology has  
potential to contribute for societal  
development in varied ways.

Q

Q2. Recovery of radioactive wastes in Delhi's biggest scrap market, and the subsequent death and illnesses of the workers has raised serious concerns regarding the safe disposal of radioactive waste in India. Discuss the regulatory structure for dealing with waste in India and lacunas in it. (12.5 Marks)

In today's modern world, various types of ~~wastes~~ wastes are generated like:

- Household waste.
- Hospital waste.
- Radioactive waste.
- Industrial waste
- Hazardous waste.
- Agricultural waste.
- e-waste.

These wastes are dealt by regulatory structure as follows:

- The responsibility of handling household waste rests with urban local bodies / Panchayats.
- The hospital wastes are dealt with by Biomedical rules.
- The e-waste is unregulated in real sense.
- Radioactive waste is dealt with by Atomic Energy Rules.
- Agricultural waste & Industrial wastes are regulated by pollution control boards at central & state levels.

- Thus the regulatory structure has following drawbacks:
- The regulatory structure is highly diversified & no single co-ordinating authority present.
- The regulatory structure is not able to ensure strict enforcement.
- The regulatory structure doesn't adequately protect the lives & health of workers engaged in managing these wastes.
- The structure can be easily bypassed with the use of various loopholes in the rules formulated.

Hence there is a need for co-ordinated regulatory structure in handling wastes in India with strict enforcement.

elaborate on HWRP & the role played by it

Q

Q3. The idea of empowering citizen and economic development just by increasing internet penetration through digital India programme is a misnomer. Discuss. (12.5 Marks)

Although Digital India programme has a futuristic vision in many ways, it alone cannot solve the problems of empowering Indians & economic development because:

- Digital ~~Empowerment~~ <sup>connectivity</sup> would mean nothing without physical connectivity through infrastructure since the advantages offered by digital penetration can be enjoyed. eg: Ankodara, India's 1st digital village had well physical connectivity before digital one.

- Merely increasing internet penetration would not suffice without changing social mindsets.

Given India's patriarchal caste based society, prejudices would work against empowering citizens. eg: a woman through internet may come to know about a job opportunity, but social customs would prevent her from working.

- Mere digital connectivity cannot solve India's acute problems like poverty, hunger & malnourishment, sexual violence against women because such problems need institutional reforms.

1) High level of illiteracy.  
2) Digital divide.  
etc.

- Also for economic development to be sustainable, increased internet penetration may not offer any solutions.

However, the Digital India programme indirectly adds up to measures which can solve India's problems

- eg: ① Digital India would bring investments in rural areas & thus would create jobs.
- ② Digital India could help government better provide services through e-governance at low cost, helping the poor & marginalised.
- ③ Increased internet access would open up traditional Indian society to more diverse ideas, marking beginning of a social change.
- ④ It can help us devise cost effective solutions within broad policy guidelines.

Thus Digital India & ~~etc.~~ <sup>internet</sup> penetration, alone cannot solve all problems but are a part of a major process aimed towards citizen empowerment & development.



(W)

Q4. To approve developmental projects in protected areas, monitoring and evaluation, strengthening of infrastructure, addressing man-animal conflict and raising awareness is required. None of these are possible only through meetings in Delhi, but require local action on the ground. Critically analyse with respect to the functioning of National Board for Wildlife. (12.5 Marks)

The National Board of Wildlife setup to address various issues related to wildlife & human interaction has been a top down approach.

Issues like strengthening of infrastructure, addressing man animal conflict etc require local action on the ground because:

- India's huge diversity means the challenges appear similar on the face of it but in reality have deeper underpinnings.
- Local considerations can help us take into account the social aspect of the challenge.
- Such issues when addressed with local participation, ensure sustainable solutions. Top-down approach means locals get disenchanted with the process.
- Raising of awareness has to take care of aspects like local language, literacy levels, penetration of civil society etc, which cannot be ascertained by a top down approach.

As a result, the functioning of National Board of Wildlife has been not at par. Even the State Boards for Wildlife are a top down approach seen from a local level.

The solution has to be devised at local levels. They must be given due freedom. Local solutions can be fitted within sub-guidelines brought by state boards which in turn have to be in consonance with broad guidelines of National Board. The National Board should strengthen its regulatory capacities & state boards its implementation capacities. Participation for civil society should be ensured so as to help locals get to understand certain governmental compulsions.

Thus only an inclusive, bottom up approach with effective implementation could be the panacea for the problems <sup>related to</sup> wildlife.

3.5

Q5. Radio frequency spectrum is a limited natural resource, it should be used judiciously and for common good rather than for private gains. Discuss the above statement with respect to the issue of Net Neutrality.

(125 Marks)

Radio frequency spectrum which is needed for running the internet, is should be used judiciously. This ~~argument~~ <sup>debate</sup> has gained more traction with respect to the issue of net neutrality.

Net neutrality demands every packet of data on the internet be ~~used~~ treated similarly. Several telecom operators have tried to breach this principle by running/loading certain websites/applications at a ~~faster speed~~ <sup>worldwide</sup> than others. By doing this they are allocating more spectrum to such sites & hence are going against the principle of equality.

By Breaching this principle, the operators are justifying the move on the grounds of promoting internet penetration by making available internet at low cost/free of cost by striking deals with certain websites by loading their websites faster.

Although the intent may seem sanguine but in reality, the operators are consuming excess spectrum for private gains, because they can charge faster loaded cellsites a higher rate.

Thus it becomes necessary that radiofrequency spectrum being a limited natural resource should be used judiciously for common good.

Q

Q6. For ensuring transparency in the clearance of land for development projects, government has started online submission of application for Environment and Forest Clearances. Discuss the lacunas of this process and steps needed for strengthening forest clearance projects. (125 Marks)

Online submission of application for environmental clearances has been done to make the process transparent, which prevent the stalled project. However there are certain lacunas of this process:

- When applications are sent online with self certification by project proponent, there are chances that they have not fully complied with the regulations.
- Such a process can lead to extra diversion of forest land than required because of lack of physical verification on the ground.
- Such a process can be misused for getting clearances for unintended purposes since there is no little physical interaction with the authorities.
- Such a process doesn't fully verify the findings of EIA & SEA. This could harm the people project affected people through large scale displacement.
- The above process becomes even more vulnerable given dilution of certain environmental regulations & EIA reports.

Following steps can be taken for strengthening forest clearance projects:

- Environment Impact Assessment & Social Impact Assessment process should be strengthened by:
  - Accreditation of EIA agencies & agents.
  - Public hearing at early stage of EIA.
  - Including data of entire year rather than of 1 particular season.
  - State funding for EIA.
  - Making EIA report independent of project proponent.
- Also use of technology through satellite imaging <sup>can be to</sup> get ground picture on real time basis.
- The enforcement of laws should be strict enough so that they create a deterrent effect.
- Participation of <sup>genuine</sup> civil society is necessary for protecting interests of locals. However given the vested interests of some NGOs, they should be verified before their participation.

2504

Q7. Smarter cities should be driven by goal of Self-sufficiency rather being hub of smarter technologies only. Discuss. (12.5 Marks)

Smart cities generally means smart ICT technologies governing the functioning of the city. While such a technological aspect has many uses like enhanced security, cost effectiveness, faster completion of tasks among others, the other aspects of smart cities should not be ignored.

Self-sufficiency is a goal which should define our smart cities. They should be self-sufficient in the sense of waste disposal, labour requirements, water & power requirements, housing facilities, employment opportunities among others.

This self sufficiency in vital aspects is needed because a city cannot be a burden for surrounding areas. If it becomes one, then problems like slum developments, broken drainages, power & water shortages ensue. Self sufficiency ensures a city functions at top efficiency & doesn't leave behind a its footprint.

Also of clusters of self-sufficient

① space management especially open area management.  
② High speed transit system etc.

Cities are conducive to economic development by the way of agglomeration effect.

However the self sufficiency aspect is easier said than done. Apart from having huge investment needs, the self sufficiency would be difficult to achieve because of geographical factors. eg: self sufficiency in water supply in desert areas.

Thus newer & traditional methods of resource conservation should be adopted to achieve self sufficiency. eg: Rainwater harvesting, solar energy etc.

Moreover self sufficiency becomes impossible in today's globalised world in cases of human capital which is highly mobile.

Thus our smart cities should be self sufficient in basic needs whereas <sup>on</sup> the advanced needs <sup>they</sup> can remain dependent on other areas.



7.5

Q8. What do you understand by Environmental Justice? Discuss the role played by National Green Tribunal in achieving the Environmental Justice in India. Also elaborate the major hurdles faced by NGT. (12.5 Marks)

Environmental Justice means that in the use of environmental resources & their exploitation, the stakeholders should benefit as per the confines of the law made for such a purpose.

Environmental justice is thus like ordinary justice, with matters concerning environment & rights of the stakeholders like locals, project proponent & general public at large.

The National Green Tribunal constituted for enforcing justice in environment related cases, has been instrumental in doing justice. eg: ① Recent crackdown on diesel vehicles older than 10 yrs in Delhi.

Moreover it disposes off cases within a specified time limit, thus ensuring quick justice.

National Green Tribunal thus shares the burden of cases on the country's courts by dealing with environmental matters.

The NGT has after awarded compensation to those adversely

affected by the flouting of environmental laws.

However the NBT faces following hurdles in its functioning:

- The evidence is difficult to gather in cases related to environment.

- More often than not, the conflicting parties are poor local tribals and big corporates. Thus the justice process often gets compromised by due to such asymmetries of powers.

- Certain issues like climate change are out of the ambit of NBT.

- The NBT has also been faced with the problem of determining environmental costs of damage done, since it is always difficult to quantify in monetary terms.

Despite such hurdles, NBT carries forward the task of ensuring environmental justice in right earnest.

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Q9. With the increment in the space initiatives in India formulation of National Space Act for regulating space activities in India is must. Illustrate the contemporary issues for handling of which Space Act is needed. (12.5 Marks)

Indian Space Research Organisation (ISRO) has made tremendous strides in the field of space technology & missions. This increased space activity calls for formulation of national space act to deal with related issues like:

- Space missions require top quality materials with absolute zero defect. Manufacturing of such materials needs to be better regulated to fix responsibility if anything goes wrong.
- ISRO is increasingly being engaged in commercial space missions involving satellites of foreign nations. Thus in case of disaster, litigation & accountability issues may arise.
- With the remarkable success of ISRO's mission, the government may in future may open up space & related activities for the private sector. Thus need for regulation will arise.
- India also needs to comply with

with international commitments  
while dealing with space activities.  
eg: treaty with China for ban on  
testing weapons in space.

- Space activities are having  
increasing application in day to day  
working of a nation. eg: weather  
forecast, internet spectrum, remote  
sensing application. Thus they  
affect lives of millions.

As a result of these, there is  
a need for to regulate space  
activities by formulating a nation-  
nal space act.

So as to  
1) encourage to private sector  
participation.

2) space debris mitigation

3) insurance issue for space  
activities.  
etc.

(C)

Q10. Clean Ganga Mission is old wine in a new bottle with the same focus on sewerage treatment plants. Elaborate. Discuss the major roadblocks in achieving the objectives of the project. (12.5 Marks)

Cleaning Ganga river has been the task left ~~unaccomplished~~ by many governments ~~partly~~ due to its challenging nature & ~~partly~~ due to using same ~~tried & tested~~ methods.

Although ~~Clean Ganga Mission~~ has focus on sewerage treatment plants, it cannot be called as old wine in new bottle completely because of ~~the~~ introduction of new aspects like:

- Mobile apps like Bhuvan Ganga.
- Participation of experts from IITs. (eg: recent filtration technique devised by IIT Bombay student).
- Improved co-ordination between centre & states.
- Immense political will by the ~~old~~ <sup>new</sup> government.

But despite these efforts the progress has been slow because:

- We have focussed on treating the sewage & not on reducing the sewage at source itself.
- Moreover the ~~to~~ industries & factories which add to pollution in Ganga (eg: tanneries in Kanpur) are largely unregulated.

- It The technologies developed have not been yet installed at ground level.

Considering the above scenarios, following are the major roadblocks in achieving the objectives of the project:

- It is very difficult to relocate the polluting industries off the banks of Ganga.
- The headwaters too are seen to be polluted, which generally are pure, here a problem extends across the course of the long river.
- The efforts of state governments are lacking due to lack of interest & stake despite 100% central funding for the project.

- Cleaning Ganga has become a mere rhetoric in political circles with no real public/media pressure.

Thus, coordinated & sustained efforts along with citizen participation are needed to achieve this mammoth task.

W

Q11. What is Digital Locker? Highlights the major benefits of Digital Locker system. How does Digital Locker differ from other such systems?  
(12.5 Marks)

Digital locker is an online repository or locker for documents of a person. It is an e-service under the Digital India programme.

The locker on the internet world has the following main benefits:

- It reduces the need to always carry physical documents since the documents can be accessed by the authority from the digital locker.
- It is secure & identity specific, since the locker can be accessed only by a password given to authorised user.
- One can digitally sign the document stored in a digital locker.
- The digital locker is seeded with Aadhar & mobile phone number of a person, enabling easy transaction of business across multiple services like birth certificate, passport document, marriage certificate.
- Such a system facilitates e-governance in providing essential services by government.

- Such a system is useful when <sup>physical</sup> documents get destroyed during calamities like floods, earthquakes etc.

The digital locker differs from other such systems in the following way:

- It has 2 main components: Repository Gateway & Access Gateway

The repository gateway ensures storage of documents & access gateway ensures secure access for the users.

This system is highly differentiated functional systems.

- Such a system is <sup>works</sup> ~~enabled~~ well with other enablers such as internet connection, Aadhar number, mobile number.

- This system can also be seeded with a person's Facebook or Google account, enabling easier retrieval of user identity.

This digital locker is a step ahead in e-governance in India.



4

Q12. Discuss the major factors responsible for increasing Urban Air Pollution in developing countries like India. Also suggest some concrete measures to overcome this problem. (125 Marks)

Following are major factors for increasing Urban Air pollution in developing countries:

- Rising middle class, hence the number of private vehicles on road has increased.
- Poor state of public transport which forces people to travel by private vehicles.
- The emission standards of vehicles aren't high enough (eg: India still follows Bharat II in major cities, whereas Europe has higher Euro VI standards).  
Moreover, enforcement of such standards is poor in developing countries.
- Developing countries are beginning to industrialise, which contributes to urban air pollution.
- There is adulteration of vehicular fuel by kerosene which adds to the vehicular pollution.
- Still in urban peripheries, wood is used for cooking, causing pollution of particulate matters.
- Urban areas also have many sources of indoor air pollution. eg: tobacco smoke, refrigerators, air conditioners, aerosol cans etc.
- Increasing urban congestion contributes to enhanced pollution.

Following measures can be taken to overcome this problem:

- Promotion of electric cars.
- Promotion of public transport through improving its quality.
- Taxing the fossil fuels highly to discourage their use.
- Promoting healthy travel for short distances through bicycles. (eg: National Urbanisation policy includes this).
- Enforcing higher emission standards.
- Measures like Air Quality Index to make general public aware of air quality. This could bring public pressure on authorities to keep air clean.
- Ensuring natural gas for cooking & phasing out use of wood for pollution.
- Shifting industries on the  outskirts of cities.
- Reducing indoor pollution through energy efficient appliances.
- Role of NBQs to hold government accountable.

W.S

Q13. Discuss the major physical and economic effects of climate change on water resources across the globe. (125 Marks)

Climate change refers to rise in global temperatures above 2°C from preindustrial revolution levels.

Following are the effects of climate change on water resources of the world:

Physical:

• The sea levels are bound to rise, causing salty sea water intruding in freshwater resources near the coast and under the ground, causing a scarcity of freshwater.

• The ice caps will melt due to increased temperatures. Hence the rivers originating from ice caps would be affected by frequent floods.

• The precipitation amount & patterns are bound to change, hence the watersheds will change & catchment areas would be different quantities of flows.

Also water table levels are bound to fluctuate.

• The melt of ice caps will reduce freshwater resources across the globe.

• The lakes could get dried up & also salinity of lakes could increase due to capillary action near the lakes.

Economic:

- The cost of freshwater for supplying to industries & households would increase.
- The cost of hydroelectric power could increase.
- The interstate disputes & inter-county disputes on trans country rivers could increase.
- Investments would flow in those technologies which can treat saltwater.
- The biodiversity in rivers & lakes would suffer, hence fishing & related maritime economic activities could suffer.
- Melting of ice caps would be deleterious for life, property & agriculture.

Thus concerted action at global, national & local level is required to mitigate & adapt to effects of climate change on water resources.

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Q14. An innovation ecosystem is a combination of two distinct economies, knowledge economy and the commercial economy. In this context illustrate the major challenges faced by India's innovation ecosystem and entrepreneurship. (12.5 Marks)

Two major factors determine the nature of innovation ecosystem:

- ① Technology i.e. Research & development (knowledge economy)
- ② Market for new products (commercial economy).

In this context following are the major challenges faced by India's innovation ecosystem & entrepreneurship,

- The MSME sector which is quite large in India suffers from lack of capital to invest in R&D. eg MODRA bank is a step ~~is~~ <sup>to</sup> address this challenge.
- The expenditure of firms is mainly on salaries, land & market strategies with little focus on innovation.
- There is lack of collaboration between firms for innovation. eg: Many big firms outsource jobs to MSMEs, but not many invest in MSMEs innovation ecosystem.
- The education system in India is out of date with focus on rote learning & little incentive for out of the box thinking. eg: RTE act with no direction policy & other initiatives tries to address this.

- Innovation ecosystem isn't adequately promoted by the government.  
eg: Atal Innovation Mission, self Employment Talent utilisation Mission etc have only been started.

Following are the specific challenges faced by entrepreneurship:

- Archaic labour laws.
- Lack of skilled labour.
- High cost of capital.
- Lack of exit policy.
- Lack of infrastructure availability.
- Focus on technical jobs rather than management.
- Land acquisition problems.

To bring about innovation revolution in India we need to encourage collaboration between big firms & MSMEs, government institutions should provide knowledge & funds, engineering students should base their degree projects on solving local MSME problems, platforms for stakeholder interaction among others.

(4)

Q15. India has recently committed to expand the share of non-fossil fuel energy to 40% by 2030. Discuss the implications of it for the economic and sustainable growth of India. (12.5 Marks)

Following are the implications of India committing to expand the share of non-fossil fuel energy to 40% by 2030:

- The cost of power could rise in the short term because presently renewable energy is costlier. But this cost is bound to come down as technology advances.
- The imports of crude oil would come down, saving crucial foreign exchange & reducing current account deficit.
- India would become more secure on energy front because it would be less dependent on geopolitically unstable West Asian oil.
- The rising costs in the short term could fuel inflation.
- India's growth would be more sustainable because renewable energy sources are replenishable.
- The transmission & distribution infrastructure needs to be modified so as to suit the grid requirements of renewable energy.

- Since assured power would be available, companies ~~would be~~ likely to invest in India's growth story.
- The vehicles running on electricity would get a boost, stimulating the automobile industry & modify engine designs.
- However, in the near term, the cost of production could increase for agriculture, hence increase burden on small & marginal farmers.

\* Thus such an ambitious target would bring some structural changes ~~in economic growth~~ to achieve it, we've to promote renewable energy investments on a large scale. Simultaneously financial & technology transfer from developed nations should supplement domestic efforts.



(14)

Q16. Define the "Polluters Pay Principle". Discuss the major difficulties in implementing Polluter Pays Principle in developing countries like India. (12.5 Marks)

According to the "Polluters Pays Principle" laid down by the Supreme Court in India, the cost of pollution, be it environmental, social, physical has to be paid by the entity responsible for the pollution.

This principle although ensures justice is difficult to implement in developing countries like India because:

- There exists great asymmetry of power between those polluting & those suffering from the pollution.
- Since industries are clustered together, it is difficult to fix responsibility for pollution.
- The cost of determining environmental & social damage is often difficult & raised by litigation.
- The awareness of citizens about environmental laws & regulations is low, hence they are not able to hold the authorities to account.
- Connivance between major industries & administration renders citizens' voice of a little significance.

- The litigation against such issues is generally avoided because of costs & delays in it.
- The polluters are reluctant to take responsibility of their actions citing EIA reports & clearance conditions.

Following measures can be taken to implement this principle:

- Ensure active participation of civil society in monitoring the clear- ance conditions.
- The process of granting environ- mental clearances should be made transparent so that conditions are put in public domain to hold authorities to account.
- The locals should be trained in conducting social audit with the help of environmental experts to determine if rules are being followed

Hence participation of multi- ple stakeholders & public pressure is needed to enforce the principle of polluter pays principle.

Q.

Q17. Environmental sanitation is a major public health issue in India. Do you agree? Discuss various intervention strategies related to environmental sanitation in India and also highlight major challenges faced in achieving the desired outcomes. (12.5 Marks)

Yes, environmental sanitation is a major public health issue in India because:

- ~~The~~ <sup>Humans</sup> are irrevocably linked to the environment but outcomes impact man.
- Environmental sanitation has impact on health of masses eg: an urban surrounding might spread diseases across the city like diarrhoea.

Various intervention strategies related to environmental sanitation have been adopted in India like Total Sanitation Campaign, Swacha Bharat Abhiyaan.

~~These strategies~~ haven't delivered upon much because the true causes behind the issue ~~haven't~~ <sup>were not</sup> identified earlier. like public mindset <sup>change</sup>

Also earlier strategies haven't been targetted ~~adepd~~ <sup>adepd</sup> properly, with paucity of funds ensuing as a result.

However the recently launched Swacha Bharat Abhiyaan shows some promise mainly because of greater political will, focused approach

in the form of special purpose vehicle, & Swacha Bharat cess ensuring timely funds.

However following challenges are mainly faced:

- Changing mindset of the people, mainly because of low literacy levels.
- Bringing those on board who are not covered under a subsidy under campaigns, since collective efforts are essential.
- Such efforts are neglected after initial enthusiasm dies down.
- Ensuring water supply & sewerage system which require large capital requirements.
- Getting private sector to invest because of low profits, such initiatives are often neglected by the private sector.

Hence collective & co-ordinated efforts are needed to address this public health issue.

Q. 8

Q18. Define the term 'Biosimilars'. How do biosimilars differ from the original innovator medicines? What role biosimilars can play in the near future? (12.5 Marks)

Biosimilars refers to those medicines which are biologically similar to original innovator medicine.

These medicines have a vastly similar 'active ingredient' because they are derived from the same source.

Biosimilars differ from the original innovator medicine in the sense that they can be used only for the authorised time as per patent rules.

Moreover such medicines are generally much cheaper than original innovator medicines.

These medicines can help in developing cheaper drugs for developing & underdeveloped nations in the future.

Moreover they can be effective substitute if original innovator medicine ~~is~~ is rendered ineffective due to microbial resistance.



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Q19. The conventional 'Gun and Guard' method of conservation is no more effective in dealing with the socio-ecological complexity and political dimensions of biodiversity conservation. Comment. (12.5 Marks)

The conventional 'Gun & Guard' method of conservation was designed to prevent "outsiders" from disturbing the biodiversity of an area.

However, with modern development & changing social paradigms it proves to be ineffective in conservation because:

- The focus on "insiders" within the conservation areas has increased.

- Gun & Guard method could be easily hacked by bribing officials.

- Such a method doesn't involve community participation, which is worldwide being recognised as one of the best practices for conservation.

- The ecologies are becoming more inter-linked, hence guarding borders of sensitive areas isn't enough.  
eg: ^ Urban mode of life has penetrated deeper in ecologically fragile areas. Thus regulation of urban areas is forms an important aspect of conservation.

- The challenges of conservation have multiplied, given the changing scenario of climate

- The political dimension of conservation comes in with efforts by various nations & international organisations in conservation efforts. eg: Man & Biosphere programme, CITES, Bonn Convention etc.
- The focus on socio-economic development of locals, means conservation efforts cannot ignore developmental needs.

Thus there is increasingly a focus on collaborative & stakeholder approach in biodiversity conservation.

Participation of locals & civil society ~~has~~ is necessary to ensure just & sustainable outcomes.

Moreover, the political cost of environment management has increased, hence participation of entire citizenry through various platforms is the need of the hour.



9.5

Q20. E-waste export to the developing countries is governed by brute global economics in which market forces, if left unregulated, dictates that the toxic waste will always run "downhill" on an economic path of least resistance. Elaborate. (125 Marks)

E-waste generated across the world is treated only mostly in developing countries because it is cheaper to treat there. This ignores the fact that developing countries do not always have the right technology to treat e-waste & as a result the waste is not treated scientifically causing environmental pollution & health hazards.

This shows the work of market forces which always seek for cost minimisation in monetary terms but conveniently ignore social & ecological costs.

Moreover there is least resistance to this way of handling of e-waste because developing countries have developed a market for ~~the~~ treating such a waste. Hence market forces justify themselves but in reality the consequences are ignored.

Although the world has implemented the Basel Convention on transboundary movement of

hazardous wastes, the results are not to be seen in reality.

This calls for effective regulation on handling of e-waste because:

- The health effects of e-waste are fully not known because they are a recent phenomenon. However primary findings suggest much harmful effects. (eg: cancer, brain damage)
- Apart from health impacts, morality demands that people of developing countries cannot be left to bear the effects of waste generated by developed countries.

Thus the ~~states~~ nations should act upon. This scenario to ensure global rules on handling e-waste & ~~reducing~~ ensuring appropriate technology for developing nations.