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EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

SECTION-A

- (1) Seven Billion Dreams. One Planet.
Consume with care.

"There is enough on this planet for
everybody's need, ~~not~~ everybody's greed"

- Mahatma Gandhi

The Industrial revolution in England
in the 18th century gave impetus
to the concept of 'economic growth',
which symbolised mercantalism
and pursuit of pure 'economic growth'/profit motive.
With development of human thinking,
this pursuit expanded to include
the social advancement of man
in the form of the concept of
'economic development'. Further
advancement finally led to the
concept of 'sustainable development'
in 1987, which accounted for needs of
the future generations in utilization
of resources.

Earth is a unique planet, blessed
with huge amount of resources

like minerals, water, natural resources like forests, wetlands, etc. which favour and support human life.

However, modern man has indiscriminately exploited these natural resources in his quest for short term gains and technology aided leisure & pleasure activities.

As a result, we are now left with only 50-75 years worth of mineral resources and caused irreversible climate damage, which may make sustenance of life for that period itself, a daunting task. This is reason enough to necessitate a change in mindset towards a conservation approach and emphasize the importance of consumption of resources with care. We need a paradigm shift to bring home

the point that every consumption has a cost attached to it and not every cost is monetary in nature. Hence, the need to promote the culture of 'thrift' in not just monetary spending, but also resource spending. This is important at the ~~level~~ individual, national and international levels.

Individual level

The widening rich-poor divide can be safely said to be one of the primary reasons for wasteful expending of resources. The 'rich man' has numerous luxury cars with large carbon footprint, whilst he needs only one. He wastes food, accumulates property for further wealth, disregards energy and wastes electricity with profligate consumption.

It can be said that he enjoys the fruits of his hard labour. But what is the opportunity cost? It is the one extra meal that a poor man may get, or a few more hours worth electricity in his one room hut, or the right to clean air which he cycles to make ends meet. This is the importance of consumption with care in day-to-day lives of individuals.

One may ask - what difference would the thrift of one person make? On an ideological level, it is important to note that the principles of divisibility and discrimination threshold in 'rights-based' discourse & jurisprudence necessitate that every additional effort matters. It together adds

up to make something big. In simple terms, Rome was not built in a day - it was done brick by brick, wall by wall. Hence, each person's consumption with care would leave enough for the deprived sections and result in lesser consumption overall.

For the religiously motivated individuals, it must be said that all religions, whether it is Hinduism, Islam & Christianity, promote respect for mother nature and the spirit of accommodation in favour of fellow brethren. Even traditionally alternate 'religions' like Buddhism & Jainism promote simple living, such that is enough for man's need.

Therefore, a habitual change in general day to day living would go a long way in decreasing our carbon footprint. This can include simple steps like cycling to work or over short distances, switching off the lights and fan while exiting a room, turning off the water tap when not required, etc.

We have already exceeded the carrying capacity of our ecology and overdrawn on the carbon budget. It is only action by each individual that can save our planet for future generations, that way we received it from preceding generations.

For this, we need an educational revolution as well.

A spirit of accommodation is the order of the day, which can be brought about by awareness, sensitization of our youth from a young age. This needs constructive programs, which brings the role of the state at the National level.

National level

The role of the state in inculcating a culture of shift is paramount. This does not mean shifting to socialistic politics which further equity and prohibit profit motive. It simply means sensitizing citizens with the need to shift to usage of resources with a restrained mindset, to save for others and the future generations. Its role in education and youth sensitization has been emphasized.

Indiscriminate usage of resources has led to problems in agriculture. We have used excessive water from northern rivers, which has led to decreased soil quality and soil erosion. In other areas, we have exhausted our groundwater resources. Level of productivity is on the decline and scientific alternatives are not forthcoming. If this continues unabated, our future generations may not even be left with basic food to eat. The state must promote sustainable agricultural practices, like organic farming, inter cropping, and mixed farming.

Even geographically, weather patterns have undergone a change due to climate change.

This has accentuated the lack of urban planning/rural development to lead to heavy disasters like flooding, droughts, etc. unplanned development has worsened the situation. We need to check our urbanisation process and create master plans, if resources are to be conserved for all and the future.

Our constitution provides for redistribution of resources to the poor by progressively taxing the rich. This, along with the Directive Principles of State Policy (DPSP) encourage some reduction of wasteful usage of resources by the rich. Our laws now mandate Corporate Social Responsibility (CSR), which is also a way of fulfilling dreams of the less advantaged.

In the energy sector, we have realised the need to restrain the use of carbon and substitute it with solar energy, wind energy, adopt technologies like LED's and role of state in disseminating such technology to reduce overall burden on the environment. India has recently committed towards reducing environment affecting measures of development on the global scale by announcing its INDC contributions and promoting renewals.

International cooperation

Just like the individual level, the developed-developing ^{responsible} country divide is ~~responsible~~ for shaping usage of resources in

favour of the historically advanced developed countries.

The damage to environment, which has been realised to be irreversible, has brought together nations to collectively fight for availability of resources for everyone.

International collaboration for the Montreal Protocol for protection of ozone layer has been a huge success. Phasing out of refrigerant gases and HFC's has actually seen results over 20 odd years, in terms of decreasing of the ozone hole.

Recently, the Paris climate talks to the Kyoto Protocol have also seen wide participation and commitment. Although

Developing countries blame developed countries for the situation & usage of resources, there is ~~also~~ a proposal of redistribution of resources through climate funds which would aid in adaptation and mitigation of climate change.

Further, countries have now passed sustainable development goals [SDG's], which are 17 goals to be achieved by 2030, which would help in preserving our planet for the future generations and creating a culture of thrift in usage of resources to fulfil all seven Billion dreams, particularly in the spheres of health, education, and social advancement.

Conclusion

Hence, at the individual, national and international levels, what is required is a respect for natural resources, putting a price on each usage, not necessarily monetary in nature and developing a culture of thrift, accommodation to give way to fulfilment of all human dreams, without compromising on ability of future generations to fulfil theirs.

SECTION-B

(2) If basic science has to thrive, then India needs to revamp its thought process.

Recorded ancient history is proof of the fact that India was a beacon of hope in general science at a time when the ~~rest~~ of the world was not even on the map of scientific advancements. The United Nations recently celebrated International Yoga day and International day of zero to recognise India's contribution to health and mathematics.

It is well known that Aryabhatta invented the number zero. 'Sulvasutras' contain principles on which modern geometry has been heavily

Reliant. Arya Bhatta's contributions to astronomy are also laudable. He also espoused the present day planetary movements theory. Sushruta and Charaka were way ahead of their times in surgery and medicines. Their treatises served as a guiding force for times to come. The present day focus on AYUSH system of medicine is based on traditional Indian systems of Yoga, Siddha, Unani, Naturopathy, Homeopathy and Sowa Rigpa. Even metallurgical systems were very advanced.

However, despite India's glorious past in general sciences, we are struggling to hold our own in the modern day. A major reason is that developments

In science and scientific education were not on the agenda of the British. Thus, there was a lack of development for those 150-200 years, a time when the rest of the world grew by leaps and bounds, as beneficiaries of the renaissance and new inventions. India could not partake in all developments that reduced human effort and introduced economies of scale. This is where we started to lag behind.

In the modern day however, we have made substantial improvements in every sphere. But this does not compare with the contemporary world, as a result of which, we are beneficiaries

of the 4th Industrial Revolution,
but not the drivers of it. To
establish our dominance,
we must change the way we
think about science.

~~[Cross]~~

Educational Sector

The first much needed change
is in our education system
and the way we teach science
to the youth. We need to
move beyond 'knowledge
based' system to 'thinking
based' education system and
interactive pedagogy. Learning
facts from theories established
by western scientists must be
replaced by the spirit of
innovations and inventions.
We must move from just being

in the classroom to the labs
for conducting experiments
and challenging prevalent
thought.

Indians ^{have} ~~are~~ aptitude for this
change. This is evidenced from
the fact that our IIT's
produce scientists who go
abroad and engage in scientific
inventions and leadership.
Satya Nadella and Sumel Pichai
are prime examples. Hence,
it is our approach / our
thinking and our facilitative
systems that need a change.
India spends only 1.5% of GDP
on education, with very
little focus on research and
development. We need
heavy involvement and
political will from the state,

to bring about a generational change.

Intellectual Property Rights

A case in point of misdirected thinking in the Indian system is our latest IPR Policy, 2016.

It endeavours to promote the 'spirit of inventions' by freely granting patents to inventors.

The real purpose of a forward looking IPR regime is free flow of information and limiting licensing. Free flow of information leads to more inventions.

This is not to say that patents should not be granted at all - just that they shouldn't be at the drop of a hat, for any and every invention.

Disaster Preparedness

Basic sciences like ~~all~~ weather prediction to prevent or mitigate effect of disasters is lacking in India. Japan has advanced early warning systems suited to their needs. We must garner political will and promote basic sciences in this regard to reduce loss of lives and economic burden on the State.

Agriculture.

We still have a situation where farmers grow crops unsuited to the kind of ~~crop~~ soil and weather conditions. Although the new Soil Health Card scheme

is a step in the right direction, we are still far away from a developed and adapted basic science on this that can be shared with farmers effectively.

Defence

We are the world's largest arms importer despite having the scientific mind to be self sufficient in defence production. Our technology is outdated and defence budgets almost dysfunctional.

Role of DRDO is overstated & application of science to give impetus to inventions is lacking. This must be rectified from both a policy and economic perspective.

Space

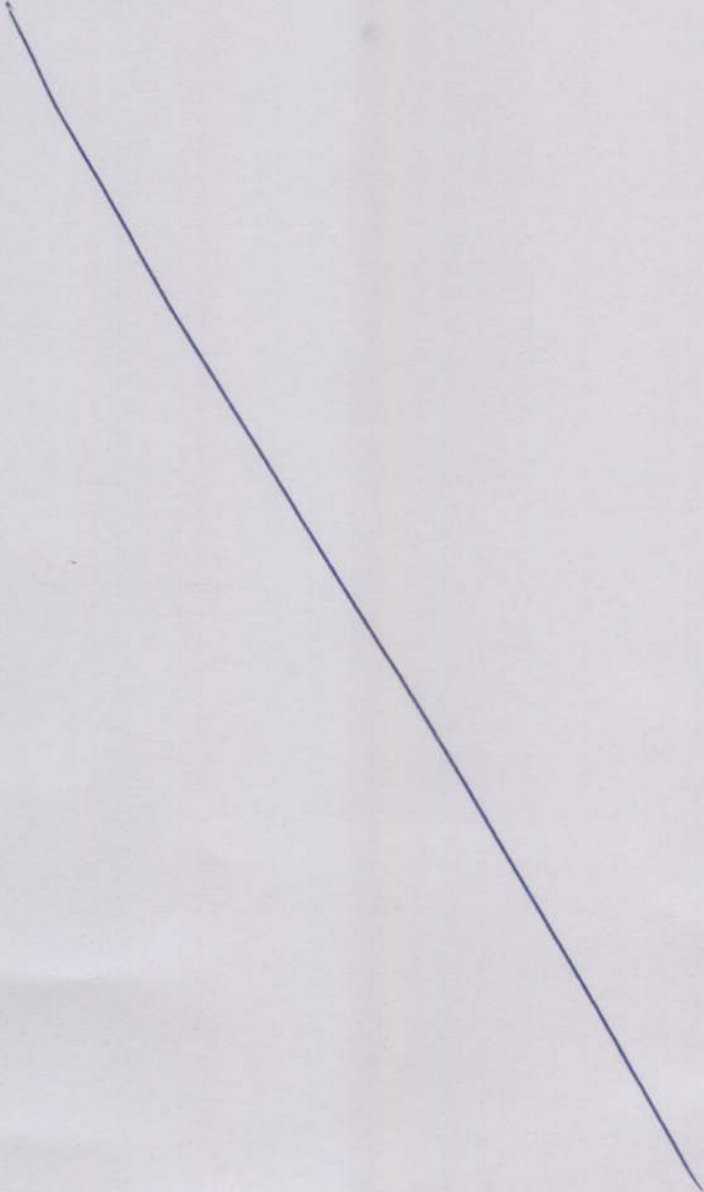
Although it is the most advanced science, we must learn from our approach and ISRO's success story.

In space, we are not only self-sufficient, but leading the world today. We conduct launches for other countries, pioneer inventions and have assumed a leadership role in space science.

Conclusion

It is the way we approach general sciences that needs a transformation. What is required is a multi-pronged approach across sectors that will augment India's leadership in science.

we must learn the spirit
of innovation and its
propagation from our
glorious ancient past and
from ISRO's success story;



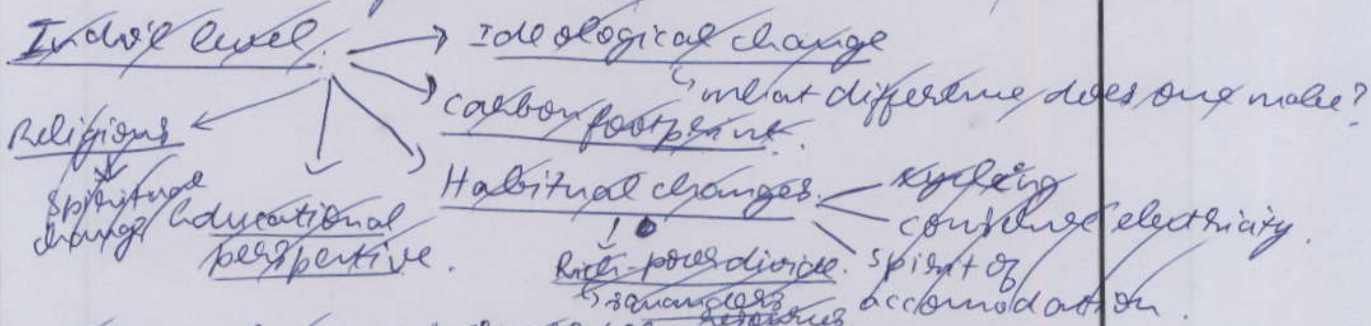
Intro

Section A

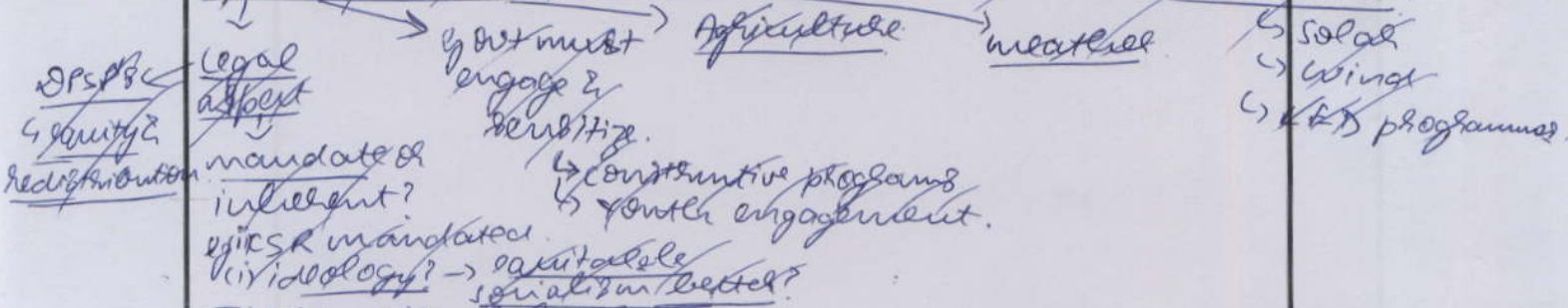
* Shift is not just money.

- (1) Growth - enough for everyone's need, not greed.
Industrial Revolution - indiscriminate use of resources.
finally 'growth' - development - SD (1987) - to care for future generations
why? → moral, resources - last for 50 years or so.
(2) damage to environment - irreversible.

Indiv'l level



National level → energy sector → focus on ~~renewables~~ renewables



International level

- ↳ Is time cooperation successful.
 ↳ Environment → Montreal, Kyoto (G46's)
 ↳ Biodiversity - CBD - Wetlands, CITES, etc.
 ↳ Sustainable development - SDG's

Section - B

India

↳ Traditional science - ancient history - geology, then, British rule
 ↳ neglected.

Since, repercussions of the past ✓

Now → education system [shining eg - ISRO]
 ↳ IPR protection
 ↳ defense