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ADVANCED INTEGRATED MENTORSHIP

ENVIRONMENT ASSESSMENT TEST-12

(To be filled by candidate)

Test Code : TC313

Name of Candidate : Abhishek Singh

NEXT IAS Roll No. : AIM24GCL1035 **Date of Examination :** 11-09-2023

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☒

GENERAL INSTRUCTIONS

This Question-cum Answer (QCA) Booklet contains 32 pages. Immediately on receipt of the booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

SUBJECT/PAPER

GENERAL STUDIES 3

Invigilator's Sign. :

[To be filled by the STUDENT]

Student's Queries for the Evaluator (if any write them below)

[To be filled by the EXAMINER]

Evaluator's response

(For filling by Examiners only)

Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	1			
2	3			
3	5			
4	7			
5	9			
6	11			
7	14			
8	17			
9	20			
10	23			
Grand Total				

Signature

MACRO COMMENTS

NEXT IAS

Roll No.

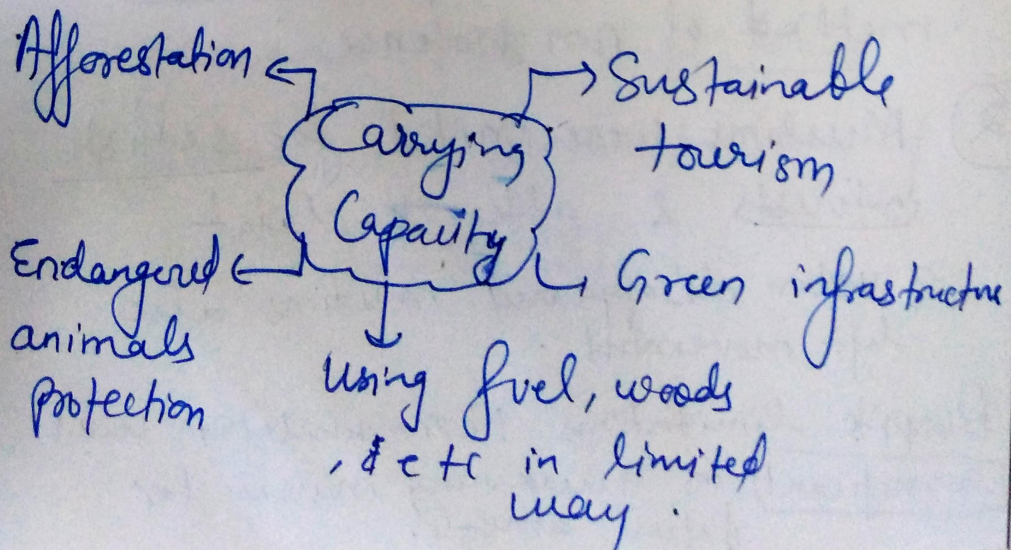
Test Name & No.

Q1

Define the Concept of the Carrying Capacity of an ecosystem as relevant to an Environment. Explain how the understanding this concept is vital like Planning for the Sustainable dev. of a region.

Carrying Capacity can be defined as maximum limit up to which resources of an ecosystem can be Utilised without damaging the ecological character of that ecosystem.

for eg:- "Wise use" Concept of Ramsar sites.



Understanding Carrying Capacity for Sustainable dev. & planning

- ① Land use planning : no adverse use of land e.g. No house construction in CRZ zones.
- ② Watershed development : Rivers, wells etc. rejuvenation drive.
e.g. Namami Gange programme
- ③ Local Community : Involving tribals in Conservation efforts
e.g. Bishnoi, Khond etc Community.
- ④ Respect for nature : Awareness generation among tourists about Sustainable practices.

Madhav Gadgil Committee report has talked about carrying capacity & how to manage it. Its recommendations should be implemented seriously.

Q2

Critically evaluate the role of ocean thermal energy in improving overall energy security in India. Why has India failed to capture the the potential of ocean thermal energy?

Ocean thermal energy can be defined as the heat derived out of Temperature difference between top and bottom layers of the ocean waters.

Role of Ocean thermal energy in enhancing energy security

- ① Alternative way of sustainably using ocean resources
- ② Reducing import bills of fossil fuel.
- ③ 24 hours availability
- ④ Reducing dependence on other renewable sources

⑤ Promoting hybrid energy concept

failure to capture ocean thermal energy

① Absence of technology : India lacks cutting edge tech.

② More focus on solar, wind and hydro energy

③ Very costly to extract it

④ Environmental Concerns : Biodiversity below water may get affected.

⑤ Lack of Institutional mechanism

Way forward → Investing in Research & development
→ Technology import from developed countries
→ funding.

'Blue economy' also includes Ocean thermal energy. More interventions are needed to fully harness this energy.

Q 3

What are the challenges that rising plastic waste poses to the terrestrial & aquatic ecosystems? suggest measures to effectively combat the rising menace of plastic pollution globally.

As per the report of NITI Aayog 'Alternatives to plastic products', India produces 4.17 mn tonnes of plastic wastes every year.

Challenges posed by plastic wastes

(A) Terrestrial ecosystem

① Human health: microbeads may enter blood stream
e.g.: Cooling crystals of Colgates.

② Emission: burning of plastic emits green house gases

③ Blocking of sewer & drainage pipelines.

13) Aquatic ecosystem

- ① Wildlife : many fishes & mammals eat plastics & die.
- ② Filtration of sea water: Desalination becomes more costly.
- ③ Entering food chain of humans via fish products.

Measures to effectively combat Plastic pollution :

- ① Recycling of waste : Circular economy should be promoted
- ② LIFE campaign : Avoid plastic use whenever possible.
- ③ Alternatives of plastics like organic packaging bags, jute bags etc
- ④ Strict regulation by authorities
SDG 12 calls for sustainable consumption & production pattern.
It is our responsibility to take small & consistent steps to end plastic pollution.

Q 4

Invasive alien species are threat to the ecological sensitivity of native species which adversely impacts the biodiversity in India. In this regard, critically evaluate the recent amendment in WPA to regulate invasive alien species in India. provide other measures as well.

Ans

As per "Convention on Biological diversity" (CBD) Invasive species are those ^{alien species} which pose significant threat to native ecosystem.

For eg: Lantana Camara.

Threat to ecological sensitivity of native species

↳ wide reproduction rate replaces

native species

for eg: water hyacinth.

↳ Difficult to remove

↳ Threat to wildlife

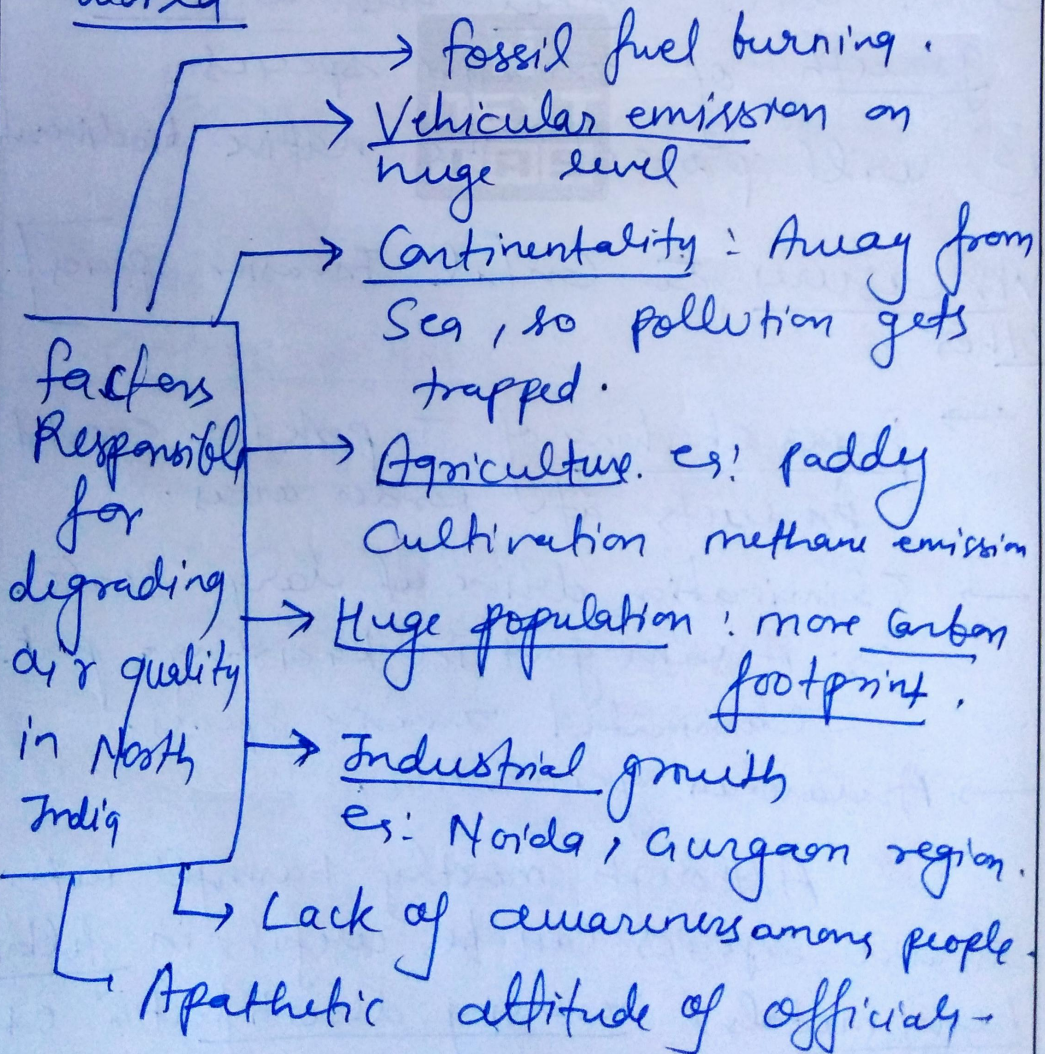
eg: Black Rat (worst as per IUCN)

Although mostly harmful but
Invasive species can be useful in filtering
heavy metals, reversing desertification etc.

Q5

The ~~menace~~ menace of air pollution remains one of the major environmental concerns of North India. What factors can be responsible for the degrading air quality in North India? Suggest some measures to effectively tackle this problem.

As per the report of WHO (world health report), Air pollution is the 4th largest killer in the world



Measures to tackle problem of air pollution $\rightarrow$

- ① using clean coal technology to decrease Sulphur Content in Coal
- ② filters like electrostatic precipitator, scrubbers etc should be used in Industries
- ③ Smart agriculture : using organic farming, practicing Direct seeding of rice etc
- ④ Totally shifting to BS VI norms, promoting electric vehicles
- ⑤ Awareness generation eg: life campaigns

A multistakeholder, holistic and multipronged approach from all sections of society is the need of the hour.

Q6 The recently concluded water bodies census has brought the issues of depleting water bodies in India to the fore. In this context, elaborate on the ecological & environmental challenges faced by natural & artificial water bodies in India. Also suggest measures to prevent depletion of water bodies & improve the status of water bodies in India.

Recently ministry of Jal Shakti conducted water bodies Census on first a large scale.

Ecological & Environmental challenges faced by water bodies :

- ① Aquaculture development is an ~~not~~ unsustainable way
e.g. Shrimp farming & dredging bottom of water bodies.
- ② Industrial waste : untreated waste containing chemicals flow into it

for ex: Kanpur region most
polluted water bodies,

③ Eutrophication : Nutrients like
Nitrogen & phosphorus in huge
quantity flow into water bodies
& cause Algal bloom &
death of lakes.

④ Drying of lakes : due to
overirrigation & extraction.

⑤ Urbanization causing land use
change by filling up old
water bodies

Measures to prevent water bodies
depletion: → (& improve status of
water bodies)

① Treating of Industrial wastes.
Containing heavy metals.

② Proper implementation of

National wetland Conservation rules 2017

- ③ using precision farming through drip irrigation, $\Rightarrow$ reduce water use.
- ④ 'Catch the rain Campaign' to do water harvesting.
- ⑤ using geotextiles & creating bunds on boundaries of lakes to stop erosion.
- ⑥ Afforestation near water bodies.
↳ Agroforestry, Social forestry.
- ⑦ Designating more sites as 'Ramsar Sites'
- ⑧ Awareness Campaign.

SDG-6 calls for Conservation of water resources. We should take above steps on a war footing basis.

Q7

MISHTI initiative was recently launched in Budget 2023-24 in order to ensure sustainable growth of mangroves in India. Elaboration on the features of MISHTI programme while highlighting the importance & threats to mangroves in India.

As per the report by ~~ISFR~~ Forest Survey of India (ISFR 2021), India has 0.15 % of mangrove area in Country.

Features of MISHTI programme :

- ① Protection of mangrove ecosystem
- ② Involving local communities in conservation efforts
- ③ Livelihood generation of locals
- ④ Land use planning for mangrove plantation.
- ⑤ Awareness generation about

Importance of mangroves

Importance of mangroves ecosystem

- ① Nutrient cycling
- ② filtering of harmful chemicals & heavy metals.
- ③ Protection from volcanic storms & gusty winds to coastal communities.
- ④ Huge biodiversity of species living in mangroves
- ⑤ Providing timber, fuel & medicinal products to locals
- ⑥ Absorb the devastating impacts of floods, tides, etc.

Threats to mangroves:

- ① Conversion into Agricultural land e: Paddy cultivation.
- ② Promotion of Shrimp farming & destroying mangroves.
- ③ untreated Industrial wastes flowing into it e: vedanta.
- ④ Violation of Coastal regulation Zones rules & creating of Infrastructure like hotels etc.
- ⑤ Climate change : Change in temperature kills biodiversity.

Way forward → Community participation
 ↳ Global alliance for mangrove (at COP-27)
 ↳ Coastal zone management authority ⇒ give more powers to it

mangroves are the ~~too~~ rich heritage of biodiversity. SDG goal 15 calls for protection of life above land.

Q8

Discuss global warming & mention its effects on the global climate. Explain the control measures to bring down the level of GHGs that cause global warming, in the light of Kyoto protocol, 1997.

Global warming is the long term change in overall temperature of atmosphere (increase in temperature).

Causes of global warming

- vehicular emission
- fossil fuel burning
- ~~per~~ permafrost thaw → positive feedback
- Agriculture emission: eg CH_4 by Paddy.

Effects on global climate

- ① Melting of glaciers: of Arctic, Himalayas etc

- ② Rising Sea level → threatening Coastal region ex: Jakarta.
- ③ Severe Heat waves & Cold waves ex: California, Europe.
- ④ Wildfires ex: Australia bushfire
- ⑤ Unpredictable & Severe climatic events ex: floods, droughts
- ⑥ Increasing frequency of EL-Niño, La-Niña etc.
- ⑦ Disturbing Jet stream circulation
↳ affects weather of mid latitudes
ex: Severe Cold in USA.

Control measures to bring down GHGs:

- ① Kyoto protocol
↳ legally binding emission reduction targets on developed countries to reduce six major

- green house gas ex: CO_2 , CH_4 , SO_2 etc.
- ↳ 1st Commitment period (1997-2012)
 - ↳ to reduce GHG by 5.2%
 - ↳ 2nd Commitment period (2013-2020)
 - reduce GHG by 18%

- ② Mechanisms like
- ↳ Clean development initiative
 - ↳ Joint implementation
 - ↳ Certified emission reduction
 - ↳ establishing "Carbon credit" trading market..

- ③ failure of kyoto : led to emergence of paris agreement (2015-2030)

- ④ Common but differentiated responsibilities & respective capabilities $\Rightarrow$ INDC targets of

- ⑤ LIFE Campaign by India Countries,

SDG goal 13 calls for taking measures to fight climate change.
Paris deal should be strictly followed for the same purpose.

Q9

"Clean energy is the order of the day." Describe briefly the India's Changing policies towards climate change in various international fora in the context of geopolitics.

Clean energy also refers to the renewable energy which does not emit green house gases.

Clean energy

- ↳ Solar power
- ↳ Wind energy
- ↳ Nuclear energy
- ↳ Small & large hydro projects
- ↳ Electric vehicles.

India's Changing policies in various international fora $\rightarrow$

① International Solar alliance

to harness the sun's infinite energy across the globe with

the motto of "Sun never sets"

② At Cop-26 India made
five Commitments [panchamrit]

↳ Net zero by 2070

↳ Reducing emission intensity by
45% till 2030.

↳ Reducing projected Carbon
emission by 1 billion
tonnes by 2030

↳ 500 Gw of energy by non-
fossil fuels

↳ 50% energy by non fossil fuel.

③ Greater Concessions to developing
world : India as a leader of
Global South demanded this
for emerging needs
e.g. finance transfer from west to
east.

④ Taking leadership roles : for eg.
Life Campaign launched by India
at COP-26.

⑤ Proactive engagement : especially
with Small Islands developing
States (SIDS).

⑥ funding to poor countries
for eg: grants to merit

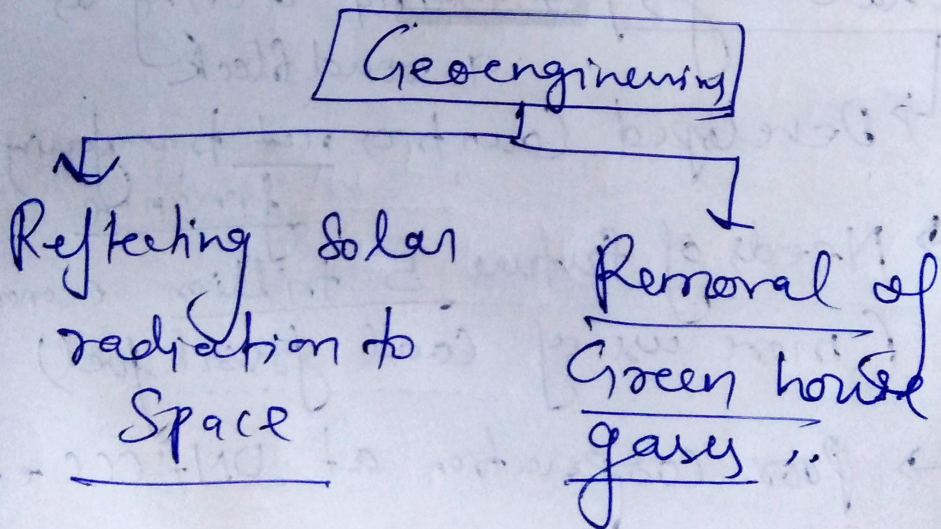
Challenges → China acting as
a roadblock
→ Developed countries not transferring
finance
→ Needs of future 5 trillion economy
(more use of coal fossil fuel)
→ Poor cooperation at UNFCCC etc

SDG goal 7 calls for creating
Clean and affordable energy. Despite
Challenges India has taken a
leadership role on this issue.

0→10

Geoengineering proposes practical solutions to the problems of climate change. what is geoengineering & how ~~it~~ can it help in fixing the issues of climate change? Substantiate with examples.

Geoengineering refers to the large scale change in natural ecosystem to avert the effects of climate change using Technologies.



Geoengineering technologies & climate change issues →

- ① Deploying large scale solar radiation reflector in space.
- ② Aerosols injection ^{in sky} to prevent solar radiation from reaching earth.
- ③ Ocean fertilization : Iron nodules to be dissolved in ocean $\Rightarrow$ Increases CO_2 absorption Capacity of ocean.
- ④ Increasing alkalinity of ocean by dissolving alkaline salts like Carbonates into it.
- ⑤ Carbon, Capture & Utilization Technologies
- ⑥ large scale Afforestation

Challenges in Geoengineering

- ① Interference with natural ecosystem may have long term bad consequences.
- ② Biodiversity may be destroyed at a particular region
eg: Amazon forests (if solar radiation doesn't reach)
- ③ Less Research & development on the subject $\Rightarrow$ Unintended consequences.
- ④ Ethical question: Do we have right to disturb natural phenomenon.
- ⑤ Covid-19 was example of excessive interference with nature.

Geoengineering may be useful. But as per IPCC 5th report more Research & Development is needed on such technologies.