SCHEME OF EVALUATION

Type: MCQ

Q1. Seasonal variations in the atmospheric CO_2 content can be observed by (0.5)

1. Studying the Kuznets curve.
2. Studying ice core data.
3. **Studying Keeling curve.
4. All the above.

Q2. Choose the incorrect statement from the following (0.5)

1. Income inequality can be decreased by focusing on GDP.
2. Tragedy of the commons is derivative of 'self-interest' for a common resource.
3. Sustainable growth is not equal to Environmental sustainability .
4. **Quantity of atmospheric CO_2 content is same as that emitted by burning fossil fuels.

Q3. Which of the following does not constitute watershed management programme (0.5)

1. Rehabilitate the deteriorating lands.
2. **Decrease infiltration of rainwater.
3. Reduce the effect of sediment yield.
4. Moderate flood

Q4. Which one of the following facts is incorrect (0.5)

1. **Eutrophication is observed in agricultural land.
2. Deeper borewells are saline.
3. Weaker monsoon depleted aquifer.
4. A horizon has high organic content.

Q5. Hydropower project cannot lead to (0.5)

1. Siltation of reservoirs
2. Salinity of land
3. Earthquakes
4. **None of the above

Q6. Which of the following is characterized by stunted trees with canopy density less than ten percent (0.5)

1. Non forest
2. Open forest
3. **Shrub
4. Moderate dense forest

Q7. Secondary microplastics are not formed by (0.5)

1. Thermal degradation of meso plastics
2. Photodegradation

3. **Bioremediation
4. Hydrolysis

Q8. Non recyclable plastics does not support the following treatment option (0.5)

1. Energy recovery.
2. Plasma pyrolysis.
3. Coprocessing in cement kiln.
4. **Converting waste to oil

Q9. Which of the following statement with respect to plastic waste management is not true (0.5)

1. Nanoplastic leads to bioaccumulation of chemicals
2. **Plastics in the surface ocean have a very short lifetime
3. Mesoplastic size range from 2.5cm-5 mm
4. All the above

Q10. Which of the following plastic is ideal for curb side recycling programme (0.5)

1. **Polypropylene
2. Polystyrene
3. Polyvinyl chloride
4. All the above

Type: DES

Q11. Discuss the socio environmental impacts of green revolution. (4)

Ans:

- Heavy pesticide and fertilize use coupled with resource intense crops have deteriorated the micronutrient content of soil in Punjab.
- Heavy dependence on irrigation from borewells coupled with weak monsoons has severely depleted the underground aquifers, forcing the farmers to dig deeper borewells than ever before.
- Deeper borewell waters are also more saline and cause damage to crop roots and the soil, further decreasing their productivity.
- Heavy pesticide and fertilizer use have had some serious health consequences for the farmers
- Intensification of irrigation and machine farming has increased farmers debt causing a sharp rise in drug use and their suicide rates

Q12. Explain the scientific contribution of Charles keeling towards global warming and its relationship with the carbon dioxide concentration in the atmosphere. (4)

Ans:

Charles David Keeling was a geochemist who built the first instrument to take precise measurements of CO_2 in the atmosphere, inorder to understand about global warming and its relation with the carbondioxide concentration in atmosphere. His study had **three** major breakthroughs.

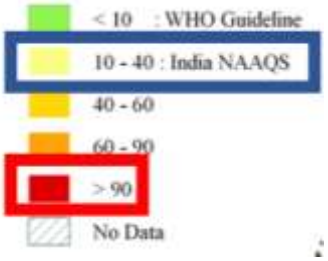
- CO_2 conc. in the atmosphere is not a constant. It varies according to season. In the spring and summer seasons, trees grow leaves in the northern hemisphere which reduces the amount of CO_2 in the atmosphere. In fall and winter seasons, these trees shed leaves and also lose their CO_2, which causes a rise of CO_2 in the atmosphere.
- **Second** breakthrough was that if you were draw a trend line through this graph, you would see a slight uptick. He roughly calculated this uptick is at the same rate of fossil fuel emissions in the world.
- **Third,** though the rate is the same, the total estimated quantity of CO_2 increase in the atmosphere is not the same as the amount emitted in the atmosphere by fossil fuels. He conjectured that some of it was being absorbed by natural systems like forests and oceans (and hence not all of it was being absorbed back by earth systems).
- Scientists have been able to reconstruct earth's $CO_2$and avg. Antarctic temperature history for the past 800,000 years through ice cores data and it shows temperature and CO_2 is strongly correlated which is a matter of concern. Keelings study have helped in understanding this correlation effectively.

Q13. Discuss how lax standards could lead to aggravating air pollution in India. (3)

Ans:

This can be disussed with the gollowing observation

- PM 2.5 is considered one of the most serious pollutant for human respiratory health in the atmosphere. India follows the NAAQS (National Ambient Air Quality Standards) which is a standard it formed itself.
- WHO guidelines says that up to 10 ug/m^3 is safe, after which it is can be detrimental. NAAQS limit is 4 times above WHO limits. And even with these exaggerated limits, many parts of the country to do not satisfy it. For example in US At 20 ug/m^3, government announces health advisories, and generally discourage people from going out of their houses. So India with a standard of 40 ug/m^3 could lead to detrimental effects on health of people.



Q14.The Indian agricultural productivity increased to a point where it became self-sufficient. Explain. (3)

Ans:

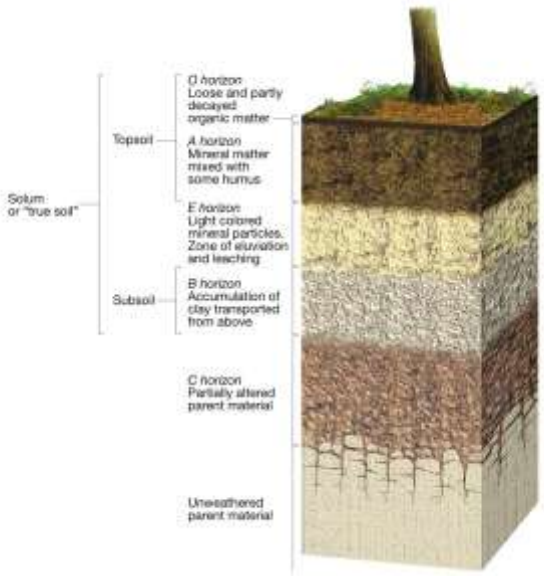
Post independence, India did try to boost agricultural productivity but it frequently fell below the requirements of the steadily growing nation which forced it to import grains. This was a huge burden on the coffers of an already impoverished country. Furthermore, successive droughts such as those in the years 1966-67 (highlighted in the graphs on the left) severely compromised the country's food security.

It was quickly becoming imperative for India to strengthen its agriculture to improve its self-sufficiency/sovereignty, economy, food security and the general well-being of its citizens. That is

why in the 1960s and 1970s, Government of India introduced a string of policies which included introduction of high-yield variety (HYV) seeds, irrigation facilities, pesticides, fertilizers and land consolidation for agriculture. Together, these policies culminated as what we now call as the “green revolution” in India. Punjab was the first state to be subjected to these policies by receiving HYV dwarf wheat seeds imported from Mexico because it was more water secure than the rest of the country and had a successful agricultural history.

Q15. With a neat sketch discuss the layers of soil formation. (3)

Ans



O horizon – organic matter

A horizon – organic and mineral matter. High biological activity (animals live here).Together the O and A horizons make up topsoil

E horizon – little organic matter. Zone of leaching (loss of nutrients from soil)

B horizon – zone of accumulation

C horizon – partly altered parent material

Q16. List the efforts taken towards curbing plastic waste pollution in India. (3)

Ans:

- Plastic items which are intended to be used once before disposing or recycling prominently called as single use plastics are banned . Manufacture, import, stocking, distribution, sale and use of all single-use plastic commodities will be prohibited under amended rules
- In order to deal with the menace of huge uncollected waste across the country, the Centre has also increased thickness of polythene bags from 50 microns to 120 microns to allow their reuse.
- The Plastic Waste Management Rules 2016 recommend local bodies to encourage the usage of plastic waste in construction of roads as per the Indian Road Congress guidelines. Reports have pointed to developers being mandated to use plastic waste in construction of roads within 50 kms of the periphery of any city.

Q17. Discuss the relevance of community initatives in ecosystem restoration . (3)

Ans:

- Climate change and soil deterioration affected farming. Trained on vermicomposting, the vermipits initiative driven by local women is helping to sustain such challenges.
- Community seed bank- The seed banks are of rare indigenous grains native to the region which provides food security beside improvement of soil health and showing resilience to climate change and pest attack.
- Groundwater Recharge & Multipurpose use of stream water through community participation – Installation of check dams by use of boulders to impede rapid flow of water. It also allows water storage and diverts it to the irrigation fields. The pool of water shared by 5 tribal families is also used as fish pond. Moreover, it allows groundwater recharge during the wet season instead of dissipation as runoff

Q18. Differentiate between primary and secondary microplastic. (2)

Ans:

- Primary microplastics are micro-sized synthetic polymers and used as exfoliates of various processes such as chemical formulations, sandblasting media, maintenance of various plastic products and also in the manufacturing of synthetic clothes.
- Secondary microplastics are the fragmented product of macro or meso plastics and mostly generated under the effect of various environmental processes such as biodegradation, photodegradation, thermo-oxidative degradation, thermal degradation and hydrolysis.