Type: MCQ

Q1. The productivity of the planet's ecological assets to regenerate its natural resources and absorb the wastes and carbon emissions generated is termed as : (0.5)

Ecological footprint
Ecological reserves
Ecological deficit
**None of above

Q2. The following is not the drivers of Resource demand and consumption. (0.5)

**Declining average income
Growing population
Increasing urbanization
Expanding industrial and service related production

Q3. A form of energy conversion in which heat energy from within earth is captured and harnessed for cooking, bathing, space heating, electrical power generation, and other uses. (0.5)

Solar energy
Hydrogen energy
** Geothermal energy
None of the above

Q4. Remove the odd one out of the following (0.5)

Sluice gate
**Heat pumps
Barrage
Turbine

Q5. The following are not the online platforms for the citizen science initiatives. (0.5)

ebird
India biodiversity portal
iNaturalist
**None of the above

Q6. Which of the following is a part of the altitudinal belt (0.5)

Alvar
Alpine
Montane
**All of these

Q7. Which of the following is an exsitu method of biodiversity conservation (0.5)

Biosphere reserves
**Zoological garden
National park
Sanctuaries

Q8. Which of the following management method can be used for non recyclable plastic (0.5)

Road construction
Waste to oil
** Pyrolysis
None of the above

Q9. Which of the following is a wrong statement (0.5)

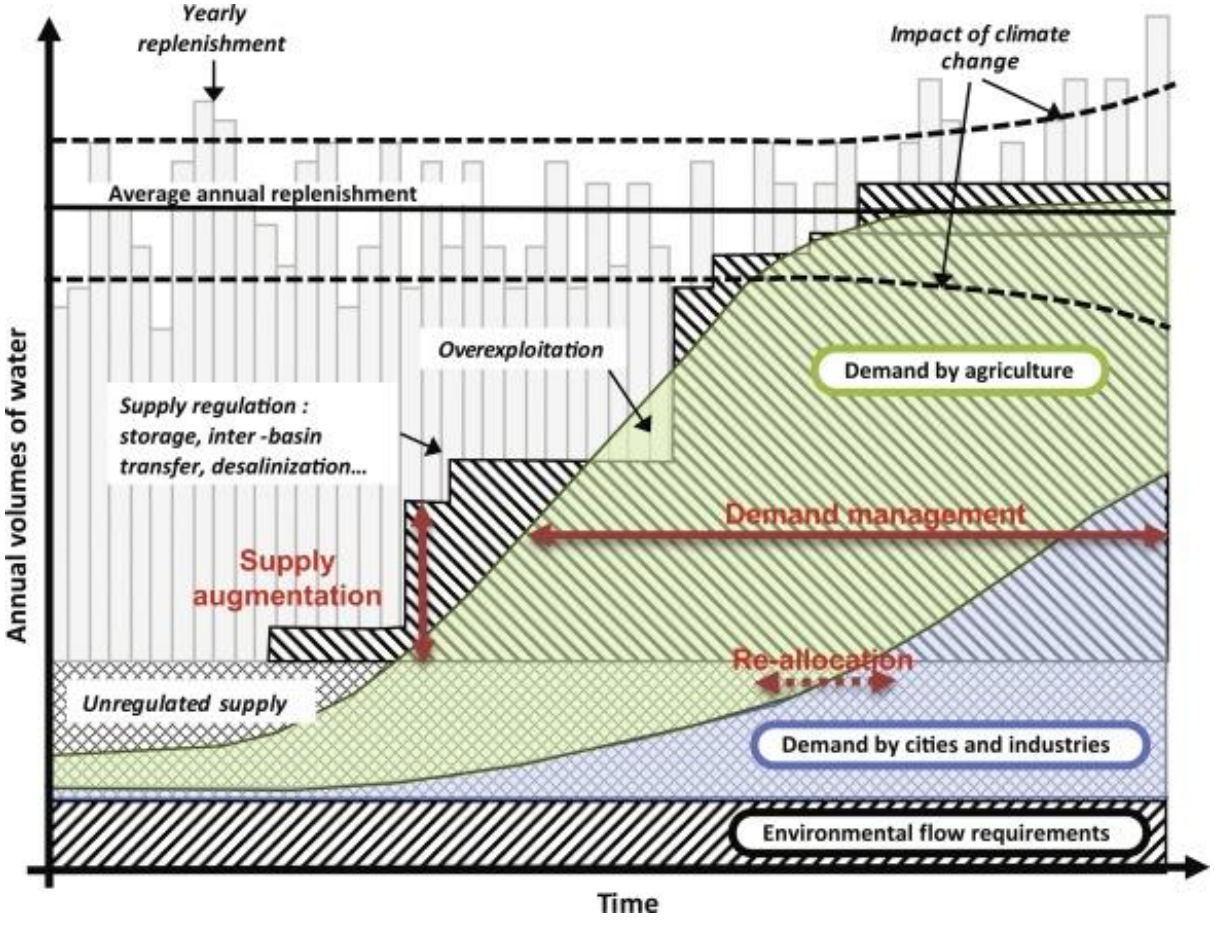
Grassland and pelagic zone has the highest biodiversity
**Energy pyramid can be inverted in a healthy ecosystem
In a foodweb, multiple organism can exist in a trophic level
Nutrient cycles are multidirectional

Q10. Which of the following is the least recyclable of all plastics (0.5)

**Polyvinyl chloride
High density polyethylene
Polypropylene
None of the above

Type: DES

Q11. Depict with respect to Time vs Annual volumes of water, the water scarcity and need of watershed management. (2)



Q12. Comment on the functional attributes of an ecosystem (2)

The major functional attributes of ecosystem are :

- Energy Flow
- Nutrients cycling
- Productivity and decomposition
- Development and stabilization

The primary functions of an ecosystem have to do with distribution of energy and nutrients through it. Those factors combined with climate, geography, biological productivity (for example, the diversity of flora growing or the amount of tree cover in an area) of the area and the rate of decomposition lead to formation of “niches” (pronounced “neeshes”) which enable development of life in the ecosystem. Once all the niches of an ecosystem are filled, the degree of diversity stabilizes.

Q13. Write a short note on : (a) O, A and E horizons (b) Sustainable mining (1.5 X 2 = 3)

(a) O horizon : It is a top soil layer which contains loose and partly decayed organic matter. (0.5)

A horizon : A top soil layer containing mineral matter mixed with some humus. A zone of high biological activity (animals live here). Together the O and A horizons make up topsoil. (0.5)

E horizon : A layer with little organic matter, containing light colored mineral particles and also a zone of eluviation and leaching. (0.5)

(b) Sustainable mining : (1.5)

- Sustainability principles have application for all stages of mine life cycle – exploration, mine planning, construction, mineral extraction, mine closure and post-closure reclamation and rehabilitation.
- Detailed EIA report has to be prepared and submitted to ecological & environment dept. of GOI for clearance of mining project to safeguard the public interest.
- Dust has to be suppressed.
- The mined area has to be back-filled with excavated materials & restored to the original condition.
- A green-belt has to be created.
- If houses & villages are to be displaced, adequate rehabilitation and welfare measures need to be taken.

Q14. Describe briefly the types of microplastics and their impact on the aquatic ecosystem.(3)

Microplastics, which are derived from the consequent breakdown of larger plastic debris, are less than 5mm in length, facilitating their ingestion by marine species and, ultimately, by human beings at the end of the food chain.

- 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.

- Secondarymicroplastics 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.
- Nanoplastics are plastic fragments with < 1 µm size, and all these microplastics and nanoplastics have potential implications for the bioamplification and bioaccumulation of various chemicals and pollutants. Microplasctics

Microplastics and additives are ingested by animals affecting their movement and reproductive output. Many sea turtles, birds and mammals die due to the ingestion of microplastics or get entangled by plastics.