

Prelims PYQ - Marathon Session

Environment (2015 - 2021)

Q1.) Which of the following National Parks is unique in being a swamp with floating vegetation that supports a rich biodiversity?

- a) Bhitarkanika National Park
- b) Keibul Lamjao National Park
- c) Keoladeo Ghana National Park
- d) Sultanpur National Park



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d) Sultanpur National Park

- The Keibul Lamjao National Park is a national park in the state of Manipur in India.
- The park is situated on the southern shore of the Loktak Lake - the largest fresh water lake in Eastern India, which has been declared a Ramsar site. (Rudrasagar lake - Tripura)
- It is only floating park in the world.
- It is characterized by floating decomposed plant material locally called phumdi (floating mass of entangled vegetation formed by the accumulation of organic debris and biomass with soil)
- Forest Type - Moist semi evergreen forests
- Threats from dwindling water quality of Loktak Lake and changes in the water regime due to the National Hydro-Electric Project Corporation (NHPC)'s Ithai barrage.



- The sangai is an endemic and endangered subspecies of Eld's deer found only in Manipur.
- It is also the state animal of Manipur.
- It is also fondly called Manipur's dancing deer because of its delicate gait as it negotiates its way along the floating wetlands
- Sangai is listed as 'Endangered' in the IUCN Red List of Threatened Species and Schedule I of the Indian Wild Life (Protection) Act, 1972.
- Sangai is also included in Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Threats from low genetic variability (inbreeding depression - reduced survival and fertility of offspring of related individuals), disease susceptibility (immune system is compromised), etc.
- Relocation to Pumlun Pat??, a fresh-water lake second largest in the state after Loktak Lake

Sangai



Conservation status



Endangered (IUCN 3.1)^[1]

Q2.) What can be the impact of excessive/inappropriate use of nitrogenous fertilizers in agriculture ?



1. Proliferation of nitrogen fixing microorganisms in soil can occur.
2. Increase in the acidity of soil can take place.
3. Leaching of nitrate to the ground water can occur.

Select the correct answer using the codes given below:

- a) 1 and 3 only
- b) 2 only
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- d) 1, 2 and 3

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- More nitrogen in the soil leads to less need for nitrogen-fixing bacteria.
- Excessive/ inappropriate use of nitrogenous fertilizers increases the acidity of soil (due to the release of H ions) and leaching of nitrate to the groundwater.



Q3.) With reference to the International Union for Conservation of Nature and Natural Resource (IUCN) and the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), which of the following statements is/are correct ?

1. IUCN is an organ of the United Nations and CITES is an international agreement between governments.
2. IUCN runs thousands of field projects around the world to better manage natural environments.
3. CITES is legally binding on the States that have joined it, but this Conventional does not take the place of national laws.

Select the correct answer using the codes given below:

- a) 1 only
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CITES



- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement to which States and regional economic integration organizations adhere voluntarily.
- CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN).
- The aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
- The CITES Secretariat is administered by UNEP (The United Nations Environment Programme) and is located at Geneva, Switzerland.
- Although CITES is legally binding on the Parties, it does not take the place of national laws.
- Rather, it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.



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Appendix I

Trade permitted only in exceptional circumstances - 3% of all species



(Example: African rhinoceros - threatened with extinction)

Appendix II

Trade strictly controlled - 97% of all species



(Example: Orchidaceae - at risk of becoming threatened)

Appendix III

Request for assistance in controlling trade of species protected in a specific country



(Example: Chilean toad)



IUCN

- The IUCN is a membership Union uniquely composed of both government and civil society organisations.
- Created in 1948, it is the global authority on the status of the natural world and the measures needed to safeguard it.
- It is headquartered in Switzerland.
- The IUCN Red List of Threatened Species, is the world's most comprehensive inventory of the global conservation status of plant and animal species.

Q4.) With reference to 'dugong', a mammal found in India, which of the following statements is/are correct ?



1. It is a herbivorous marine animal.
2. It is found along the entire coast of India.
3. It is given legal protection under Schedule I of the Wildlife (Protection) Act, 1972.

Select the correct answer using the codes given below:

- a) 1 and 2
- b) 2 only
- c) 1 and 3
- d) 3 only

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- d) 3 only

DUGONG

- The dugong (*Dugong dugon*), also called the sea cow, is a herbivorous mammal.
- They can grow upto three meters long, weigh about 300 kilograms, and live for about 65 to 70 years, grazing on seagrass and coming to the surface to breathe.
- They are found in over 30 countries and in India are seen in the Gulf of Mannar, Gulf of Kutch, Palk Bay, and the Andaman and Nicobar Islands.
- The dugongs that inhabited waters off the Odisha, West Bengal and Andhra Pradesh coasts two centuries back became extinct now.
- IUCN Red List status: Vulnerable
- Wild (Life) Protection Act, 1972: Schedule I
- CITES: Appendix I
- Government of Tamil Nadu will set up India's first Dugong Conservation Reserve in the Palk Bay.
- The conserve will cover an area of 500 Kms.



Q5.) Which one of the following is the national aquatic animal of India?

- a) Saltwater crocodile
- b) Olive ridley turtle
- c) Gangetic dolphin
- d) Gharial



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Gangetic Dolphin (Susu)

- The Ganges river dolphin can only live in freshwater and is essentially blind. (Ultrasonic
- It is a reliable indicator of the health of the entire river ecosystem.
- It was recognised as the National Aquatic Animal in 2009, by the Government of India.
- Official animal of the Indian city of Guwahati.
- A stretch of the Ganges River between Sultanganj and Kahlgaon in Bihar has been declared a dolphin sanctuary and named Vikramshila Gangetic Dolphin Sanctuary, the first such protected area.
- On the occasion of the 74th Independence Day, 15 August 2020, the Indian Ministry of Environment, Forest and Climate Change announced 'Project Dolphin' to boost conservation of both river and oceanic dolphins.
- Wildlife (Protection), Act 1972: Schedule I.
- IUCN: Endangered.
- CITES: Appendix I
- CMS: Appendix II
- National Mission for Clean Ganga celebrates 5th October as National Ganga River Dolphin Day.



Q6.) Which one of the following regions of India has a combination of mangrove forest, evergreen forest and deciduous forest?



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- a) North Coastal Andhra Pradesh
- b) South-West Bengal
- c) Southern Saurashtra
- d) Andaman and Nicobar Islands



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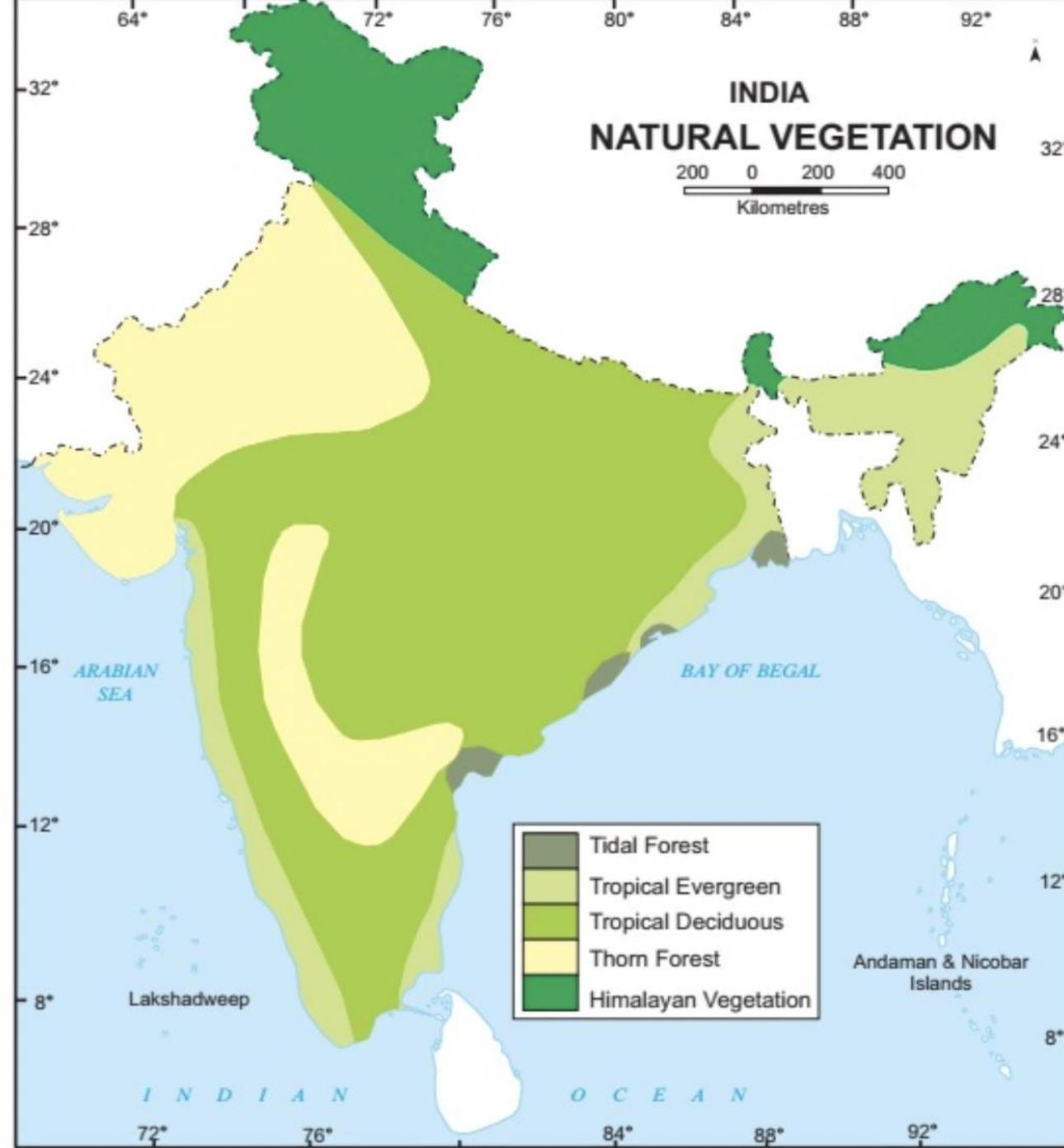


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Tropical evergreen forests of India are found in the Andaman and Nicobar Islands, the Western Ghats, which fringe the Arabian Sea, the coastline of peninsular India, and the greater Assam region in the north-east.

The states where these forests are predominantly identified are :

1. Tamil Nadu
2. Kerala
3. Karnataka
4. Maharashtra
5. Assam
6. Arunachal Pradesh
7. Nagaland
8. Tripura
9. Meghalaya
10. West Bengal
11. Andaman and Nicobar Islands.



- The mangrove cover in India is 4,992 sq km, which is 0.15% of the country's total geographical area.
- West Bengal has the highest percentage of area under total Mangrove cover followed by Gujarat and Andaman Nicobar Islands.

Mangrove Cover Assessment 2021						(in sq km)
Sl. No.	State/UT	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change with respect to ISFR 2019
1.	Andhra Pradesh	0	213	192	405	1
2.	Goa	0	21	6	27	1
3.	Gujarat	0	169	1,006	1,175	-2
4.	Karnataka	0	2	11	13	3
5.	Kerala	0	5	4	9	0
6.	Maharashtra	0	90	234	324	4
7.	Odisha	81	94	84	259	8
8.	Tamil Nadu	1	27	17	45	0
9.	West Bengal	994	692	428	2,114	2
10.	A&N Islands	399	168	49	616	0
11.	D&NH and Daman & Diu	0	0	3	3	0
12.	Puducherry	0	0	2	2	0
Total		1,475	1,481	2,036	4,992	17



Q7.) Which one of the following is associated with the issue of control and phasing out of the use of ozone-depleting substances?

- a) Bretton Woods Conference
- b) Montreal Protocol
- c) Kyoto Protocol
- d) Nagoya Protocol



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- The Montreal Protocol on Substances that Deplete the Ozone Layer is the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances (ODS).
- When released to the atmosphere, those chemicals damage the stratospheric ozone layer, Earth's protective shield that protects humans and the environment from harmful levels of ultraviolet radiation from the sun.
- Adopted on 15 September 1987, the Protocol is to date the only UN treaty ever that has been ratified every country on Earth - all 198 UN Member States.

Q8.) What is the Rio+20 Conference, often mentioned in the news?



- a) It is the United Nations Conference on Sustainable Development.
- b) It is a Ministerial Meeting of the World Trade Organization.
- c) It is a Conference of the Inter Government Panel on Climate Change.
- d) It is a Conference of the Member Countries of the Convention on Biological Diversity.

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- The United Nations Conference on Sustainable Development - or Rio+20 - took place in Rio de Janeiro, Brazil on 20-22 June 2012.
- It resulted in a focused political outcome document which contains clear and practical measures for implementing sustainable development.
- In Rio, Member States decided to launch a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals and converge with the post 2015 development agenda.
- Since there is twenty years of gap (2012-1992) between the two summits, the latest RIO Summit is nicknamed “RIO +20”.



Q9.) Which of the following statements regarding 'Green Climate Fund' is/are correct?



1. It is intended to assist the developing countries in adaptation and mitigation practices to counter climate change.
2. It is founded under the aegis of UNEP, OECD, Asian Development Bank and World Bank.

Select the correct answer using the codes given below:

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- The Green Climate Fund is a fund established within the framework of the UNFCCC as an operating entity of the Financial Mechanism to assist developing countries in adaptation and mitigation practices to counter climate change.
- It was set up in 2010.
- It is the world's largest climate fund, mandated to support developing countries raise and realize their Nationally Determined Contributions (NDC) ambitions towards low-emissions, climate-resilient pathways.
- The GCF is based in Incheon, South Korea.

Q10.) The Genetic Engineering Appraisal Committee is constituted under the



- a) Food Safety and Standards Act, 2006
- b) Geographical Indications of Goods (Registration and Protection) Act, 1999
- c) Environment (Protection) Act, 1986
- d) Wildlife (Protection) Act, 1972

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- The Genetic Engineering Appraisal Committee (GEAC) is the apex body constituted in the Ministry of Environment and Forests under 'Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells 1989', under the Environment Protection Act, 1986.
 - It was formed as the Genetic Engineering Approval Committee and was renamed to its current name in 2010.
 - It functions under the Ministry of Environment, Forests & Climate Change.
 - The body regulates the use, manufacture, storage, import and export of hazardous microorganisms or genetically-engineered organisms and cells in India.

Q11.) Which one of the following National Parks has a climate that varies from tropical to subtropical, temperate and arctic?



- a) Khangchendzonga National Park
- b) Nandadevi National Park
- c) Neora Valley National Park
- d) Namdapha National Park

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- Namdapha NP has the elevation range from 300 to 4,500 m and vegetation zones from evergreen, moist deciduous to temperate broadleaved and coniferous forest types to alpine vegetation.
- **Khangchendzonga National Park** also **Kanchenjunga Biosphere Reserve** is named after the mountain Kangchenjunga (alternative spelling *Khangchendzonga*), which is the third-highest peak in the world at 8,586 metres. It is one of the few high-altitude National parks of India and was recently included as a mixed-criteria UNESCO World Heritage site.

- The Nanda Devi National Park or Nanda Devi Biosphere Reserve, established in 1982 is a **national park situated around the peak of Nanda Devi (7816 m) in Chamoli Garhwal district of Uttarakhand, in northern India**. The entire park lies at an elevation of more than 3,500 m (11,500 ft) above mean sea level.
- Neora NP sustains a unique ecosystem where tropical, sub-tropical, sub-temperate, and temperate vegetative system still harbours a wealth of flora and fauna.

Q12.) With reference to an organization known as 'BirdLife International', which of the following statements is/are correct?



1. It is a Global Partnership of Conservation Organizations.
2. The concept of 'biodiversity hotspots' originated from this organization.
3. It identifies the sites known/referred to as 'Important Bird and Biodiversity Areas'.

Select the correct answer using the code given below:

- a) 1 only
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- BirdLife International is a global partnership of non-governmental organizations that strives to conserve birds and their habitats.
- BirdLife International has identified 13,000 Important Bird and Biodiversity Areas and is the official International Union for Conservation of Nature's Red List authority for birds.
- BirdLife International publishes a quarterly magazine, *BirdLife: The Magazine*, which contains recent news and authoritative articles about birds and their conservation.
- The Bombay Natural History Society (BNHS - one of the largest non-governmental organisations in India engaged in conservation and biodiversity research) and Birdlife International have identified 467 IBAs in India.
- Forty percent of these IBAs fall outside the PA network and thus form an important tool for landscape-level conservation planning.
- BNHS has also prepared a list of 96 new/potential sites which can be designated as IBAs in the future.
- The British biologist Norman Myers coined the term "biodiversity hotspot" in 1988 .

Q13.) Which one of the following is the best description of the term 'ecosystem'?



- a) A community of organisms interacting with one another.
- b) That part of the Earth which is inhabited by living organisms.
- c) A community of organisms together with the environment in which they live.
- d) The flora and fauna of a geographical area.

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- An ecosystem is a system consisting of biotic and abiotic components that function together as a unit.
- It is the structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment.



Q14.) In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of Air Quality Index?



1. Carbon dioxide
2. Carbon monoxide
3. Nitrogen dioxide
4. Sulfur dioxide
5. Methane

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 2, 3 and 4 only
- c) 1, 4 and 5 only
- d) 1, 2, 3, 4 and 5

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- Launched by the Environment Ministry in April 2015.
- Initiative under 'Swachh Bharat'.
- It helps the common man to judge the air quality within his vicinity.
- There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe.
- Pollutants considered - It considers eight pollutants (PM10, PM2.5, NO2, SO2, CO, O3, NH3, and Pb).

- The government is executing a nation-wide programme of ambient air quality monitoring known as NAMP.
- The network consists of 703 manual operating stations covering 307 cities/towns in 28 states and 8 Union Territories of the country.
- Under NAMP, four air pollutants viz. SO₂, NO₂, suspended particulate matter (PM₁₀), and fine particulate matter (PM_{2.5}) have been identified for regular monitoring at all the locations.



- In addition, there are 134 real-time Continuous Ambient Air Quality Monitoring stations (CAAQMS) in 71 cities across 17 states, monitoring 08 pollutants viz.
- PM10, PM2.5, SO2, NO_x, ammonia (NH₃), CO, ozone (O₃), and benzene.



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Q.15) With reference to the Agreement at the UNFCCC Meeting in Paris in 2015, which of the following statements is/are correct?



1. The Agreement was signed by all the member countries of the UN and it will go into effect in 2017.
2. The Agreement aims to limit the greenhouse gas emissions so that the rise in average global temperature by the end of this century does not exceed 2o C or even 1.50 C above pre-industrial levels.
3. Developed countries acknowledged their historical responsibility in global warming and committed to donate \$ 1000 billion a year from 2020 to help developing countries to cope with climate change.

Select the correct answer using the code given below:

- a) 1 and 3 only
- b) 2 only
- c) 2 and 3 only
- d) 1, 2 and 3



Select the correct answer using the code given below:

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3



- The Paris Agreement is a **legally binding international treaty on climate change**.
- It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.
- Its goal is to **limit global warming** to well below 2, **preferably to 1.5 degrees Celsius**, compared to pre-industrial levels.
- To achieve this long-term temperature goal, countries aim to **reach global peaking of greenhouse gas emissions as soon as possible** to achieve a climate neutral world by mid-century.
- Developed countries acknowledged their historical responsibility in global warming and committed to donate \$ **100 billion a year** from 2020 to help developing countries to cope with climate change.



- The Paris Agreement works on a **5- year cycle** of increasingly ambitious climate action carried out by countries.
- By 2020, countries submit their plans for climate action known as **nationally determined contributions (NDCs)**.
- To better frame the efforts towards the long-term goal, the Paris Agreement invites countries to formulate and submit by 2020 **long-term low greenhouse gas emission development strategies (LT-LEDS)**.

.



Q16.) Consider the following statements:



1. The Sustainable Development Goals were first proposed in 1972 by a global think tank called the 'Club of Rome'.
2. The Sustainable Development Goals have to be achieved by 2030.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

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- a) 1 only
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- The **Sustainable Development Goals (SDGs)** or **Global Goals** are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all".
- The SDGs were set up in 2015 by the United Nations General Assembly (UN-GA) and are intended to be achieved by 2030.
- The '**Club of Rome**' is a global think tank which in its 1972 book "Limits to Growth" talked about sustainability.



Q17.) The term 'Intended Nationally Determined Contributions' is sometimes seen in the news in the context of



- a) pledges made by the European countries to rehabilitate refugees from the war-affected Middle East.
- b) plan of action outlined by the countries of the world to combat climate change.
- c) capital contributed by the member countries in the establishment of Asian Infrastructure Investment Bank.
- d) plan of action outlined by the countries of the world regarding Sustainable Development Goals.

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- Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals.
- NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.
- The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve.
- Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

India's first NDC has three main elements (Government of India, 2015):

- An economy-wide emissions intensity target of 33%–35% below 2005 levels;
- A electric power capacity target of 40% installed capacity from non-fossil-based energy resources by 2030, to be achieved with international support); and
- A carbon sink expansion target of creating an additional (cumulative) carbon sink of 2.5–3 GtCO₂e through additional forest and tree cover by 2030.



Q18.) What is/are the importance/ importances of the 'United Convention to Combat Desertification'?



1. It aims to promote effective action through innovative national programmes and supportive international partnerships.
2. It has a special/particular focus on South Asia and North Africa regions, and its Secretariat facilitates the allocation of major portion of financial resources to these regions.
3. It is committed to bottomup approach, encouraging the participation of local people in combating the desertification.

Select the correct answer using the code given below:

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- The **United Nations Convention to Combat Desertification** is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.



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- The Convention, the only convention stemming from a direct recommendation of the Rio Conference's Agenda 21, was adopted in Paris, France, on 17 June 1994 and entered into force in December 1996.
- It is the only internationally legally binding framework set up to address the problem of desertification.
- The Convention is based on the principles of participation, partnership and decentralization—the backbone of good governance and sustainable development.
- It has 197 parties, making it near universal in reach.
- The implementation of the UNCCD is organized around these five regional implementation annexes.
- Five world regions – Africa, Asia, Latin America and the Caribbean (LAC), Northern Mediterranean, Central and Eastern Europe - have the important job of deciding how to implement the United Nations Convention to Combat Desertification (UNCCD).



COP 14	2 to 13 September 2019	New Delhi (India)	Adoption of <i>The New Delhi Declaration: Investing in Land and Unlocking Opportunities</i> ^[5]
COP 15	9 to 20 May 2022	Abidjan (Côte d'Ivoire)	

Q19.) In which of the following regions of India are you most likely to come across the 'Great Indian Hornbill' in its natural habitat?



- a) Sand deserts of northwest India
- b) Higher Himalayas of Jammu and Kashmir
- c) Salt marshes of western Gujarat
- d) Western Ghats

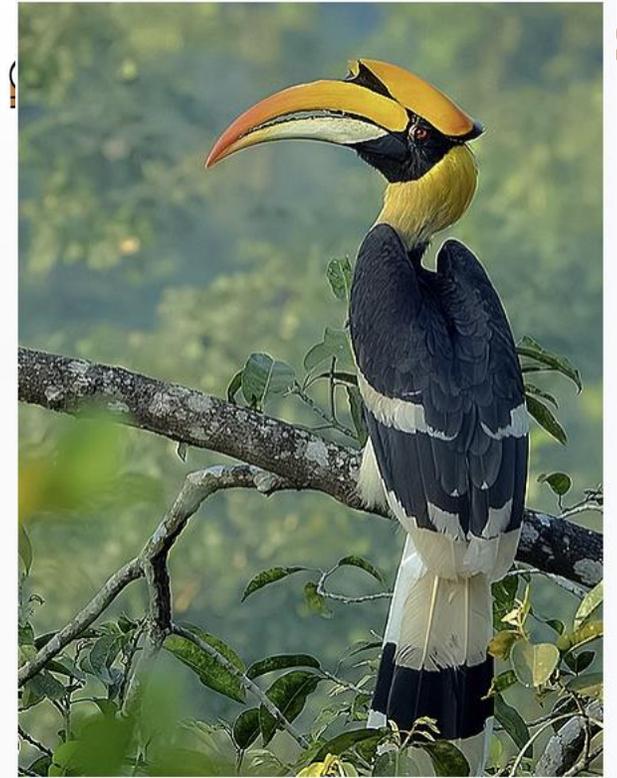
Q19.) In which of the following regions of India are you most likely to come across the 'Great Indian Hornbill' in its natural habitat?



- a) Sand deserts of northwest India
- b) Higher Himalayas of Jammu and Kashmir
- c) Salt marshes of western Gujarat
- d) Western Ghats**

- The **great hornbill** (*Buceros bicornis*), also known as the **concave-casqued hornbill**, **great Indian hornbill** or **great pied hornbill**, is one of the larger members of the hornbill family.
- It is found in the Indian subcontinent and Southeast Asia.
- Its distribution is fragmented in the **Western Ghats** and in the **foothills of the Himalayas**.
- The **great hornbill** is the **state bird of Arunachal Pradesh and Kerala**.
- The **Hornbill festival** celebrated in **Nagaland** is named after the bird – Hornbill which is the most revered and admired bird for the Nagas.

Great hornbill



- Referred to as ‘**forest engineers**’ or ‘**farmers of the forest**’ for playing a key role in dispersing seeds of tropical trees, hornbills indicate the prosperity and balance of the forest they build nests in.
- Hornbills are **hunted** for their casques – upper beak – and feathers for adorning **headgear**.
- They are also **poached** for their **meat** and **medicinal value** of their body part
- **Schedule I - Wildlife Protection Act, 1972.**
- **Appendix I - CITES**
- **Vulnerable - IUCN**

Conservation status



Q20).The FAO accords the status of 'Globally Important Agricultural Heritage System (GIAHS)' to traditional agricultural systems. What is the overall goal of this initiative?



1. To provide modern technology, training in modern farming methods and financial support to local communities of identified GIAHS so as to greatly enhance their agricultural productivity.
2. To identify and safeguard eco-friendly traditional farm practices and their associated landscapes, agricultural biodiversity and knowledge systems of the local communities
3. The provide Geographical Indication status to all the varieties of agricultural produce in such identifies GIAHS



Select the correct answer using the code given below

- a) 1 and 3 only
- b) 2 only
- c) 2 and 3 only
- d) 1, 2 and 3



Select the correct answer using the code given below

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

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- The Globally Important Agricultural Heritage Systems (GIAHS) represent not only stunning natural landscapes but also agricultural practices that create **livelihoods** in rural areas while combining **biodiversity, resilient ecosystems** and **tradition** and **innovation** in a unique way.
- GIAHS aims to **identify and safeguard eco-friendly traditional farm practices** and their associated landscapes, agricultural biodiversity and knowledge systems of the local communities.
- Since 2005, FAO has designated **62 systems** in 22 countries as agricultural heritage sites, and currently, **15 new proposals** from 8 different countries were received.

- GIAHS aims to **protect traditional agricultural systems**.
- It will not **provide** any modern technology and training.



Q21).Consider the following pairs:

Terms sometimes seen in the news : Their origin

1. Annex-I Countries : Cartagena Protocol
2. Certified Emissions Reductions : Nagoya Protocol
3. Clean Development Mechanisms : Kyoto Protocol

Which of the pairs given above is/are correctly matched?

- a) 1 and 2 only
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- The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997.
- Due to a complex ratification process, it entered into force on 16 February 2005.
- The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords."
- Its first commitment period started in 2008 and ended in 2012.
- In short, the Kyoto Protocol is what "operationalizes" the Convention.
- It commits industrialized countries to stabilize greenhouse gas emissions based on the principles of the Convention.



- Under the Protocol, countries must meet their targets primarily through national measures.
- However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms.
- The Kyoto mechanisms are
 - International Emissions Trading
 - Clean Development Mechanism (CDM)
 - Joint implementation (JI)
- The mechanisms help to stimulate green investment and help Parties meet their emission targets in a cost-effective way.
- The CDM and JI are called "project-based mechanisms," in that they generate emission reductions from projects.
- The difference between IET and the project-based mechanisms is that IET is based on the setting of a quantitative restriction of emissions, while the CDM and JI are based on the idea of "production" of emission reductions.
- The CDM is designed to encourage production of emission reductions in non-Annex I Parties, while JI encourages production of emission reductions in Annex I Parties.



- Annex I parties are the industrialized (developed) countries and "economies in transition" (EITs).
- Annex II Parties are required to provide financial and technical support to the EITs and developing countries to assist them in reducing their greenhouse gas emissions (climate change mitigation) and manage the impacts of climate change (climate change adaptation).
- Annex B - Parties listed in Annex B of the Kyoto Protocol are Annex I Parties with first or second round Kyoto greenhouse gas emissions targets.
- Non-Annex I - Parties to the UNFCCC not listed in Annex I of the Convention are mostly low-income developing countries. Developing countries may volunteer to become Annex I countries when they are sufficiently developed.
- Least-developed countries (LDCs -49 Parties are LDCs, and are given special status under the treaty in view of their limited capacity to adapt to the effects of climate change.



Q22).Which of the following best describes/ describe the aim of 'Green India Mission' of the Government of India?



1. Incorporating environmental benefits and costs into the Union and State Budgets thereby implementing the 'green accounting'
2. Launching the second green revolution to enhance agricultural output so as to ensure food security to one and all in the future
3. Restoring and enhancing forest cover and responding to climate change by a combination of adaptation and mitigation measures

Select the correct answer using the code given below

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- c) 3 only**
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- Green India Mission was launched in 2014.
- It is one of the eight missions launched under the National Action Plan on Climate Change (NAPCC).
- The primary aim is to protect, restore and enhance India's diminishing forest cover.



Q23).What is/are unique about 'Kharai camel', a breed found in India?



1. It is capable of swimming up to three kilometers in seawater.
2. It survives by grazing on mangroves.
3. It lives in the wild and cannot be domesticated.

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- Kharai camels' name is derived from the local word *khara*, meaning saline.
- Location - Kutch, a coastal region of Gujarat, which is also a large desert land, has two camel breeds. One is the popular Kutchi breed and the other, the Kharai breed, native to the region.
- The Kharai breed has the special ability to survive on both dry land and in the sea, making it an ecotonal breed.
- Recognised as a separate breed a few years ago by the National Bureau of Animal Genetic Resources (NBAGR), the Kharai camel is probably the only domesticated breed of camel that lives in dual ecosystems.
- Feeding - Kharai camels are known to feed on mangroves on the island offshore. And to eat this salty marine food, they sometimes swim for hours.



Q24).With reference to an initiative called 'The Economics of Ecosystems and Biodiversity (TEEB)', which of the following statements is/are correct?



1. It is an initiative hosted by UNEP, IMF and World Economic Forum.
2. It is a global initiative that focuses on drawing attention to the economic benefits of biodiversity.
3. It presents an approach that can help decisionmakers recognize, demonstrate and capture the value of ecosystems and biodiversity.

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- The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on “making nature’s values visible”.
- Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels.
- It aims to achieve this goal by following a structured approach to valuation that helps decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making.



Q25).With reference to 'Red Sanders', sometimes seen in the news, consider the following statements:



1. It is a tree species found in a part of South India.
2. It is one of the most important trees in the tropical rain forest areas of South India.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

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- Red Sanders is an endemic tree of South India.
- They are found in Tropical Dry Deciduous forest of the Palakonda and Seshachalam hill ranges of Andhra Pradesh and also found in Tamil Nadu and Karnataka.
- The International Union for Conservation of Nature (IUCN), an international organisation for nature conservation, has now reclassified red sanders (*Pterocarpus santalinus*) as 'near threatened' from the earlier 'endangered'.



Q26.) Which of the following statements is/are correct?
Proper design and effective implementation of UNREDD+ Programme can significantly contribute to



1. protection of biodiversity
2. resilience of forest ecosystems
3. poverty reduction

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 3 only
- c) 2 and 3 only
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- REDD+ is a framework created by the UNFCCC Conference of the Parties to guide activities in the forest sector that reduces emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries.
- It is estimated that globally, deforestation and forest degradation account for around 11 percent of CO₂ emissions. Halting deforestation is a cost-effective action that has a clear impact in reducing global GHG emissions.
- It aims at the implementation of activities by national governments to reduce human pressure on forests that result in greenhouse gas emissions at the national level, but as an interim measure also recognizes subnational implementation.
- The implementation of REDD+ activities is voluntary and depends on the national circumstances, capacities and capabilities of each developing country and the level of support received.



Q27.) What is 'Greenhouse Gas Protocol'?



- a) It is an international accounting tool for government and business leaders to understand, quantify and manage greenhouse gas emissions.
- b) It is an initiative of the United Nations to offer financial incentives to developing countries to reduce greenhouse gas emissions and to adopt ecofriendly technologies.
- c) It is an intergovernmental agreement ratified by all the member countries of the United Nations to reduce greenhouse gas emissions to specified levels by the year 2022.
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- The Paris Agreement commits countries to reduce greenhouse gas emissions to keep the global temperature rise below 1.5 degrees Celsius, in order to avoid the worst impacts of climate change.
- The GHG Protocol arose out of the need to help countries and companies account for, report, and mitigate emissions, based on a report that identified an action agenda to address climate change that included the need for standardized measurement of GHG emissions.



- The Greenhouse Gas Protocol (GHGP) provides accounting and reporting standards, sector guidance, calculation tools and trainings for businesses and local and national governments.
- It has created a comprehensive, global, standardized framework for measuring and managing emissions from private and public sector operations, value chains, products, cities and policies to enable greenhouse gas reductions across the board.
- The Greenhouse Gas (GHG) Protocol has been developed by World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD).

Q28.) With reference to 'Agenda 21', sometimes seen in the news, consider the following statements:



1. It is a global action plan for sustainable development.
2. It originated in the World Summit on Sustainable Development held in Johannesburg in 2002.

Which of the statements given above is/are correct?

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- Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development.
- It is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment.
- It is a product of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992.
- Agenda 21 initiative is that every local government should draw its own local Agenda 21.
- Its aim initially was to achieve global sustainable development by 2000, with the "21" in Agenda 21 referring to the original target of the 21st century



Q29.) 'Gadgil Committee Report' and 'Kasturirangan Committee Report', sometimes seen in the news, are related to



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- a) constitutional reforms
- b) Ganga Action Plan
- c) linking of rivers
- d) protection of Western Ghats



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- To conserve and protect the bio diversity of Western Ghats while allowing for sustainable and inclusive development of the region, Government of India had constituted a High Level Working Group under the Chairmanship of Dr. Kasturirangan.
- The Committee had recommended that identified geographical areas falling in the six States of Kerala, Karnataka, Goa, Maharashtra, Gujarat and Tamil Nadu may be declared as Ecologically Sensitive Areas.
- The Committee recommended bringing just 37% of the Western Ghats under the Ecologically Sensitive Area (ESA) zones – downing from the 64% suggested by the Gadgil Committee report.

Q30).With reference to 'Global Climate Change Alliance', which of the following statements is/are correct?



1. It is an initiative of the European Union.
2. It provides technical and financial support to targeted developing countries to integrate climate change into their development policies and budgets.
3. It is coordinated by World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Select the correct answer using the code given below:

- a) 1 and 2 only
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- b) 3 only
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- d) 1, 2 and 3

- The Global Climate Change Alliance (GCCA) is an **initiative of the European Union.**
- Its overall objective is to build a new alliance on climate change between the European Union and the poor developing countries that are most affected and that have the least capacity to deal with climate change.
- It helps mainly Small Islands Developing States (SIDS) and Least Developed Countries (LDCs) increase their resilience to climate change.

- It provides technical and financial support to targeted developing countries to integrate climate change into their development policies and budgets.
- The EU GCCA+ also supports these group of countries in implementing their commitments resulting from the 2015 Paris Agreement on Climate Change (COP21), in line with the 2030 Agenda for Sustainable Development and the new European Consensus on Development.



Q31). Biological Oxygen Demand (BOD) is a standard criterion for



- a) Measuring oxygen levels in blood
- b) Computing oxygen levels in forest ecosystems
- c) Pollution assay in aquatic ecosystems
- d) Assessing oxygen levels in high altitude regions

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- BOD is the biological method used for the measurement of the total amount of dissolved oxygen (DO) used by microbes in the biological process of metabolizing organic molecules present in water.
- It symbolizes the amount of organic pollution present in an aquatic ecosystem.
- A highly polluted water will have a high levels of biological oxygen demand (BOD).

Q32). Consider the following statements:



1. Climate and Clean Air Coalition (CCAC) to Reduce Short Lived Climate Pollutants is a unique initiative of G20 group of countries.
2. The CCAC focuses on methane, black carbon and hydrofluorocarbons.

Which of the statements given above is/are correct?

- a) 1 only
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- The **Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC)** was launched by the United Nations Environment Programme (UNEP) and six countries – Bangladesh, Canada, Ghana, Mexico, Sweden, and the United States – on 16 February 2012.
- The program is managed out of the **United Nations Environmental Programme** through a Secretariat in Paris, France.
- The CCAC aims to catalyze rapid reductions in **short-lived climate pollutants** to protect human health, agriculture and the environment.
- The Coalition's initial focus is on methane, black carbon, and HFCs.

- The coalition has 53 country partners and 17 International Governmental Organizations and 45 Nongovernmental organization partners.
- India is **not a partner country** however The Energy and Resources Institute (TERI) is a partner NGO since 2015



Q33).If you want to see gharials in their natural habitat, which one of the following is the best place to visit?



- a) Bhitarkanika Mangroves
- b) Chambal River
- c) Pullicat Lake
- d) Deepor Beel

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Gharial

- Population of Gharials are a good indicator of clean river water.
- Mainly found in Chambal river and also in Ghaghra and Gandak river, Girwa river (Katarniaghat Wildlife Sanctuary in Uttar Pradesh), the Ramganga river in Jim Corbett National Park and the Sone river(Bihar).
- The National Chambal Sanctuary is located along river Chambal on the tri-junction of Rajasthan, Madhya Pradesh and Uttar Pradesh.
- It is known for critically endangered gharials, the red-crowned roof turtle, and the endangered Ganges river dolphin.
- Critically endangered.
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).



Q34).Which of the following statements can help in water conservation in agriculture?



1. Reduced or zero tillage of the land
2. Applying gypsum before irrigating the field
3. Allowing crop residue to remain in the field

Select the correct answer using the code given below:

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- No-till farming (also called zero tillage or direct drilling) is a way of growing crops or pasture from year to year without disturbing the soil through tillage.
- No-till is an agricultural technique which increases the amount of water that infiltrates into the soil and increases organic matter retention and cycling of nutrients in the soil.
- Gypsum improves the ability of soil to drain and not become waterlogged thus increasing water-use efficiency of crops.

Q35).The term 'M-STrIPES' is sometimes seen in the news in the context of



- a) Captive breeding of Wild Fauna
- b) Maintenance of Tiger Reserves
- c) Indigenous Satellite Navigation System
- d) Security of National Highways

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- a) Captive breeding of Wild Fauna
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- c) Indigenous Satellite Navigation System
- d) Security of National Highways

- M-STrIPES, short for Monitoring System for Tigers - Intensive Protection and Ecological Status is a software-based monitoring system launched across Indian tiger reserves by the Indian government's National Tiger Conservation Authority in 2010. .
- It is a platform where modern technology is used to assist effective patrolling, assess ecological status and mitigate human-wildlife conflict in and around tiger reserves.
- It uses Global Positioning System (GPS), General Packet Radio Services (GPRS), and remote sensing, to collect information from the field, create a database using modern Information Technology (IT) based tools, analyses the information using GIS and statistical tools to provide inferences that allow tiger reserve managers to better manage their wildlife resources.

Q36).In India, if a species of tortoise is declared protected under Schedule I of the Wildlife (Protection) Act, 1972, what does it imply?



- a) It enjoys the same level of protection as the tiger.
- b) It no longer exists in the wild, a few individuals are under captive protection; and not it is impossible to prevent its extinction.
- c) It is endemic to a particular region of India.
- d) Both (b) and (c) stated above are correct in this context.

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WPA 1972



- This Act provides for the protection of the country's wild animals, birds, and plant species, in order to ensure environmental and ecological security.
- Among other things, the Act lays down restrictions on hunting many animal species.
- WPA has six schedules which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties.
- Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower.
- Schedule V includes the animals which may be hunted.
- The specified endemic plants in Schedule VI are prohibited from cultivation and planting



Vermin



- As per Section 62 of the Wildlife Protection Act, 1972, States can send a list of wild animals to the Centre requesting it to declare them vermin for selective slaughter.
- The Central Government may by notification, declare any wild animal other than those specified in Schedule I and part 11 of Schedule II of the law to be vermin for any area for a given period of time.
- As long as the notification is in force such wild animal shall be included in Schedule V of the law, depriving them of any protection under that law.



Q37).According to the Wildlife (Protection) Act, 1972, which of the following animals cannot be hunted by any person except under some provisions provided by law?



1. Gharial
2. Indian wild ass
3. Wild buffalo

Select the correct answer using the code given below:

- a) 1 only
- b) 2 and 3 only
- c) 1 and 3 only
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- Critically endangered.
- Schedule I of the Wild Life (Protection) Act, 1972.
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- India has three species of Crocodiles –
 - Gharial: Critically Endangered.
 - Mugger crocodile: Vulnerable
 - Saltwater crocodile: Least Concern (Found in coastal areas of Odisha, WB and TN)
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Indian Wild Ass

- In August 2015, the IUCN Red List has moved the Indian wild ass from the 'vulnerable' to 'endangered' category, indicating the need for heightened protection measures.
- It has been classified as 'nearly threatened' animal by IUCN in 2016.
- It is protected under Schedule 1 of the Wildlife Protection Act 1972.
- Included on Appendix I of the Convention on International Trade in Endangered Species (CITES), making international trade in this species illegal.
- Indian Wild Ass Sanctuary located in the Little Rann of Kutch is the largest wildlife sanctuary in India.
- A few years back, the Gujarat Ecological Education and Research Foundation (GEER) report had recommended that the Thar desert in Rajasthan should be developed as an alternative site for re-establishing the Indian wild ass by reintroduction a few of them.



Wild Water Buffalo

- Found in the alluvial grasslands, marshes, swamps and river valleys.
- Endangered
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Five female wild buffaloes have been translocated from Manas National Park in Assam to Udanti Wildlife Sanctuary in Raipur district, Chhattisgarh which is longest translocation in the country ever, that seeks to revive the waning population of Chhattisgarh's State animal.
- Big five of Kaziranga NP - Tiger, rhino, elephant, swamp deer, and wild water buffalo



Q38). Consider the following statements in respect of Trade Related Analysis of Fauna and Flora in Commerce (TRAFFIC)



1. TRAFFIC is a bureau under United Nations Environment Programmed (UNEP).
2. The mission of TRAFFIC is to ensure that trade in wild plants and animals is not a threat to the conservation of nature.

Which of the above statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q38). Consider the following statements in respect of Trade Related Analysis of Fauna and Flora in Commerce (TRAFFIC)



1. TRAFFIC is a bureau under United Nations Environment Programmed (UNEP).
2. The mission of TRAFFIC is to ensure that trade in wild plants and animals is not a threat to the conservation of nature.

Which of the above statements is/are correct?

- a) 1 only
- b) 2 only**
- c) Both 1 and 2
- d) Neither 1 nor 2

- **TRAFFIC**, the **Wildlife Trade Monitoring Network**, is a non-governmental organisation working globally on the trade in wild animals and plants, interested in both biodiversity and sustainable development.
- **TRAFFIC** (Trade Records Analysis of Flora and Fauna in Commerce) was originally created in 1976, as a specialist group of the Species Survival Commission of the International Union for Conservation of Nature (IUCN).
- It evolved into a strategic alliance of the World Wide Fund for Nature (WWF) and the International Union for Conservation of Nature (IUCN).
- The organisation's aim is to "ensure that trade in wild plants and animals is not a threat to the conservation of nature"

- The TRAFFIC is governed by the TRAFFIC Committee, a steering group composed of members of TRAFFIC's partner organizations, WWF and IUCN.
- TRAFFIC also works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).



Q39).In the context of solving pollution problems, what is/are the advantage/advantages of bioremediation technique?



1. It is a technique for cleaning up pollution by enhancing the same biodegradation process that occurs in nature.
2. Any contaminant with heavy metals such as cadmium and lead can be readily and completely treated by bioremediation using microorganisms.
3. Genetic engineering can be used to create microorganisms specifically designed for bioremediation.

Select the correct answer using the code given below:

- (a) 1 only
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- Bioremediation is treatment that uses naturally occurring organisms to break down hazardous substances into less toxic or non-toxic substances.
- It uses microorganisms to degrade organic contaminants in soil, groundwater, sludge, and solids.
- The microorganisms break down contaminants by using them as an energy source or comet bolizing them with an energy source.
- But not all contaminants are easily treated by bioremediation using microorganisms.
- For example, heavy metals such as cadmium and lead are not readily absorbed or captured by microorganisms.

- Genetic engineering has been used to create organisms designed for specific purposes.
- Genetically engineered microorganisms (GEMs) have shown potential for bioremediation of soil, groundwater and activated sludge, exhibiting the enhanced degrading capabilities of a wide range of chemical contaminants
- For e.g. bacterium *Deinococcus radiodurans* (the most radioresistant organism known) has been modified to consume and digest toluene and ionic mercury from highly radioactive nuclear waste

Q40).Due to some reasons, if there is a huge fall in the population of species of butterflies, what could be its likely consequence/consequences?



1. Pollination of some plants could be adversely affected.
2. There could be a drastic increase in the fungal infections of some cultivated plants.
3. It could lead to a fall in the population of some species of wasps, spiders and birds.

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Statement 1 and 3 are correct

- Butterflies are pollinating insects. They help in pollination of many flowering plants.
- Butterflies also act as a lower member of the food chain. A number of animals, including birds and mice feed on butterfly. As populations of butterfly diminish, so will populations of birds and other animals that rely on them as a food source. This loss of the butterfly is the beginning of the “butterfly effect.”

Statement 2 is *not correct*



Q41).It is possible to produce algae based biofuels, but what is/are the likely limitation(s) of developing countries in promoting this industry?



1. Production of algae based biofuels is possible in seas only and not on continents.
2. Setting up and engineering the algae based biofuels production requires high level of expertise/ technology until the construction is complete.
3. Economically viable production necessitates the setting up of large scale facilities which may raise ecological and social concerns.

Select the correct answer using the code given below:

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Third Generation of Biofuels

- The Third Generation of biofuels takes advantage of **specially engineered energy crops such as algae.**
- The algae are cultured to act as a **low-cost, high-energy and entirely renewable feedstock.**
- It is **potentially carbon neutral (the same amount of carbon is absorbed and emitted).**



- Algae biofuels may provide a viable alternative to fossil fuels; however, this technology must overcome a number of hurdles before it can compete in the fuel market and be broadly deployed.
- Production of algal biofuel is possible both in seas and on continents. Algae can also be grown using land and water unsuitable for food production.
- Algae can also be grown using land and water unsuitable for food production.
- They can grow on marginal or non-crop land and also on brackish or polluted water. Land based systems are more developed than sea based systems.

- Developing and engineering ABB technology requires a high level of expertise until construction is finished.
- Innovation for higher productivity also requires some knowledge and/or experience. All Algal based biofuel concepts require significant capital investment. Access to this technology by the poor may be difficult. Large -scale facilities are more economically viable, but are also more likely to have higher social and ecological impacts.



Q42).In the context of mitigating the impending global warming due to anthropogenic emissions of carbon dioxide, which of the following can be potential sites for carbon sequestration?



1. Abandoned and uneconomic coal seams
2. Depleted oil and gas reservoirs
3. Subterranean deep saline formations

Select the correct answer using the code given below:

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- Carbon sequestration is **the process of capturing and storing atmospheric carbon dioxide.**
- It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change.
- Geological sequestration involves the storage of CO₂ underground in depleted oil and gas reservoirs, saline formations or deep, unminable coal beds.



Q43).Which of the following leaf modifications occur(s) in the desert areas to inhibit water loss?



1. Hard and waxy leaves
2. Tiny leaves
3. Thorns instead of leaves

Select the correct answer using the code given below:

- a) 2 and 3 only
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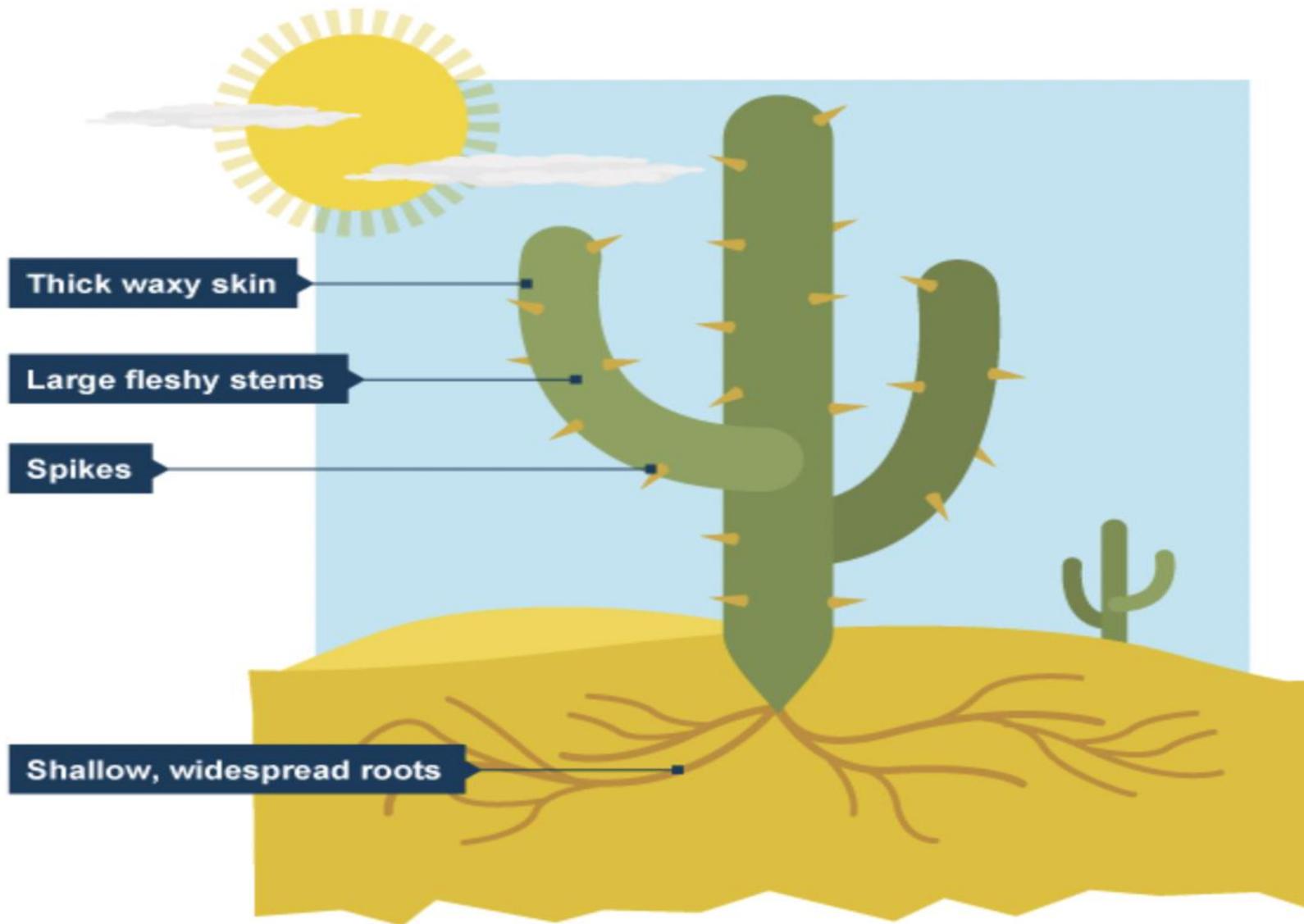
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- Adaptation is any attribute of the organism (morphological, physiological, behavioural) that enables the organism to survive and reproduce in its habitat.
- In the desert, plants and animals have to cope with very little water.
- There is also a big variation in temperature between day and night - the **diurnal range**.





- thick, waxy skin to reduce loss of water and to reflect heat
- their stomata arranged in deep pits to minimise water loss through transpiration.
- large, fleshy stems to store water
- thorns and thin, spiky or glossy leaves to reduce water loss and the photosynthetic function is taken over by the flattened stems.
- spikes protect cacti from animals wishing to use stored water

- deep roots to tap groundwater
- long shallow roots which spread over a wide area
- plants lie dormant for years until rain falls
- They also have a special photosynthetic pathway (CAM) that enables their stomata to remain closed during day time.

Q44).How is the National Green Tribunal (NGT) different from the Central Pollution Control Board (CPCB)?



1. The NGT has been established by an Act whereas the CPCB has been created by an executive order of the Government.
2. The NGT provides environmental justice and helps reduce the burden of litigation in the higher courts whereas the CPCB promotes cleanliness of streams and wells, and aims to improve the quality of air in the country.

Which of the statements given above is/are correct?

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- The National Green Tribunal (NGT) is a statutory body that was established in 2010 by the National Green Tribunal Act.
- It was set up to handle cases and speed up the cases related to environmental issues.
- The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.
- The Tribunal is mandated to make and endeavor for disposal of applications or appeals finally within 6 months of filing of the same.

- The Central Pollution Control Board (CPCB), statutory organization, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974.
- Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.
- It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986.
- Principal Functions of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981,)
 - To promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and
 - to improve the quality of air and to prevent, control or abate air pollution in the country



Q45).With reference to the 'Global Alliance for Climate-Smart Agriculture (GACSA)', which of the following statements is/are correct?

1. GACSA is an outcome of the Climate Summit held in Paris in 2015.
2. Membership of GACSA does not create any binding obligations.
3. India was instrumental in the creation of GACSA.

Select the correct answer using the code given below:

- a) 1 and 3 only
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- The term Climate-Smart Agriculture was first coined by FAO in 2010 as a means to attract climate finance to its agricultural programmed in Africa.
- GACSA is an inclusive, voluntary and action-oriented multi-stakeholder platform on Climate -Smart Agriculture (CSA). GACSA was launched in September 2014 in the margins of the UN Climate Summit.
- GACSA's vision is to improve food security, nutrition and resilience in the face of climate change.
- GACSA works towards three aspirational outcomes to:
 - Improve farmers' agricultural productivity and incomes in a sustainable way;
 - Build farmers' resilience to extreme weather and changing climate;
 - Reduce greenhouse gas emissions associated with agriculture, when possible.



- The GACSA alliance is made up of a diverse set of members that includes governments, NGOs, intergovernmental organizations (including UN and the African Union Commission), research/extension/education organizations, farmer organizations, financing institutions and the private sector.
- Key donor organizations engaging with GACSA include the governments of Canada, France, Japan, Netherlands, Norway, Switzerland, the United Kingdom and the United States of America.
- India is just a signatory to GACSA but was not instrumental in its creation.



Q46).With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following fall under the Conservation Agriculture?

1. Avoiding the monoculture practices
2. Adopting minimum tillage
3. Avoiding the cultivation of plantation crops
4. Using crop residues to cover soil surface
5. Adopting spatial and temporal crop sequencing/crop rotations

Select the correct answer using the code given below:

- a) 1, 3 and 4
- b) 2, 3, 4 and 5
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- Conservation Agriculture (CA) is a farming system that can prevent losses of arable land while regenerating degraded lands.
- Despite high variability in the types of crops grown and specific management regimes, all forms of conservation agriculture share three core principles. These include:
 - maintenance of permanent or semi -permanent soil cover (using either a previous crop residue or specifically growing a cover crop for this purpose)
 - minimum soil disturbance through tillage (just enough to get the seed into the ground)
 - regular crop rotations to help combat the various biotic constraints.
- It helps farmers to maintain and boost yields and increase profits, while reversing land degradation, protecting the environment and responding to growing challenges of climate change





- To reduce soil disturbance, farmers practice zero-tillage farming, which allows direct planting without plowing or preparing the soil.
- The farmer seeds directly through surface residues of the previous crop.
- Zero tillage is combined with intercropping and crop rotation, which means either growing two or more crops at the same time on the same piece of land or growing two different crops on the same land in a sequential manner.



Q47).Which of the following statements best describes. "carbon fertilization"?

- a) Increased plant growth due to increased concentration of carbon dioxide in the atmosphere
- b) Increased temperature of Earth due to increased concentration of carbon dioxide in the atmosphere
- c) Increased acidity of oceans as a result of increased concentration of carbon dioxide in the atmosphere
- d) Adaptation of all living beings on Earth to the climate change brought about by the increased concentration of carbon dioxide in the atmosphere



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- As human-caused emissions add more carbon dioxide to the atmosphere, forests across the globe are using it to grow faster, reducing the amount that stays airborne.
- It is the phenomena that the increase of carbon dioxide in the atmosphere increases the rate of photosynthesis in plants.
- Tropical forests absorb 1.4 billion metric tonnes of carbon dioxide out of a total global absorption of 2.5 billion - more than what is absorbed by forests in Canada, Siberia and other northern regions, called boreal forests.
- Plants actually benefit from an oversupply because high CO₂ concentrations mean they must open their pores only briefly to absorb the gas. This way they lose less water and can better survive droughts.



Q48).Which of the following is/are the possible consequence/s of heavy sand mining in riverbeds?



1. Decreased salinity in the river
2. Pollution of groundwater
3. Lowering of the water table

Select the correct answer using the code given below:

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- Sand is in high demand in the construction sector.
- Sand mining is thus a lucrative business and fuels illegal extraction.
- Illegal and unscientific sand mining is turning out to be one of the biggest ecological disasters in modern India.
- Excessive sand mining can alter the river bed, force the river to change course, erode banks and lead to flooding.
- It also destroys the habitat of aquatic animals and micro-organisms besides affecting groundwater recharge.
- Depletion of sand in the streambed causes the deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets. It leads to saline-water intrusion.



- Sand mining transforms the riverbeds into large and deep pits; as a result, the groundwater table drops leaving the drinking water wells on the embankments of these rivers dry. For locations close to the sea, saline water may intrude into the fresh waterbody.
- Increased riverbed and bank erosion increases suspended solids in the water at the excavation site and downstream. Suspended solids may adversely affect water users and aquatic ecosystems.



Q49).With reference to agricultural soils, consider the following statements:

1. A high content of organic matter in soil drastically reduces its water holding capacity.
2. Soil does not play any role in the Sulphur cycle.
3. Irrigation over a period of time can contribute to the salinization of some agricultural lands.

Which of the statements given above is/are correct?

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- Increased levels of organic matter and associated soil fauna lead to greater pore space with the immediate result that water infiltrates more readily and can be held in the soil.
- The improved pore space is a consequence of the bioturbating activities of earthworms and other macro - organisms and channels left in the soil by decayed plant roots.

- Sulphur is one of three nutrients that are cycled between the soil, plant matter and the atmosphere.
- Sulfur is primarily found in sedimentary rocks.
- Sulfur is released by weathering of rocks and minerals.
- Water, temperature and chemical reactions break down minerals releasing their component elements.

- Primary salinization occurs naturally where the soil parent material is rich in soluble salts, or in the presence of a shallow saline groundwater table. In arid and semiarid regions, where rainfall is insufficient to leach soluble salts from the soil, or where drainage is restricted, soils with high concentrations of salts (“salt - affected soils”) may be formed.
- Secondary salinization occurs when significant amounts of water are provided by irrigation, with no adequate provision of drainage for the leaching and removal of salts, resulting in the soils becoming salty and unproductive.
- Salt -affected soils reduce both the ability of crops to take up water and the availability of micronutrients.
- They also concentrate ions toxic to plants and may degrade the soil structure.



Q50).The Partnership for Action on Green Economy (PAGE), a UN mechanism to assist countries transition towards greener and more inclusive economies, emerged at

- a) The Earth Summit on Sustainable Development 2002, Johannesburg
- b) The United Nations Conference on Sustainable Development 2012, Rio de Janeiro
- c) The United Nations Framework Convention on Climate change 2015, Paris
- d) The World Sustainable Development Summit 2016, New Delhi.



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- The Partnership for Action on Green Economy (PAGE) was **launched in 2013** as a response to the **call at Rio+20** to support those countries wishing to embark on greener and more inclusive growth trajectories
- PAGE seeks to put sustainability at the heart of economic policies and practices **to advance the 2030 Agenda for Sustainable Development** and supports nations and regions in reframing economic policies and practices around sustainability to foster economic growth, create income and jobs, reduce poverty and inequality, and strengthen the ecological foundations of their economies.
- PAGE **brings together five UN agencies** – UN Environment, International Labour Organization, UN Development Programme, UN Industrial Development Organization, and UN Institute for Training and Research – whose mandates, expertise's and networks combined can offer integrated and holistic support to countries on inclusive green economy, ensuring coherence and avoiding duplication.



Q51). Why is a plant called Prosopis juliflora often mentioned in news?

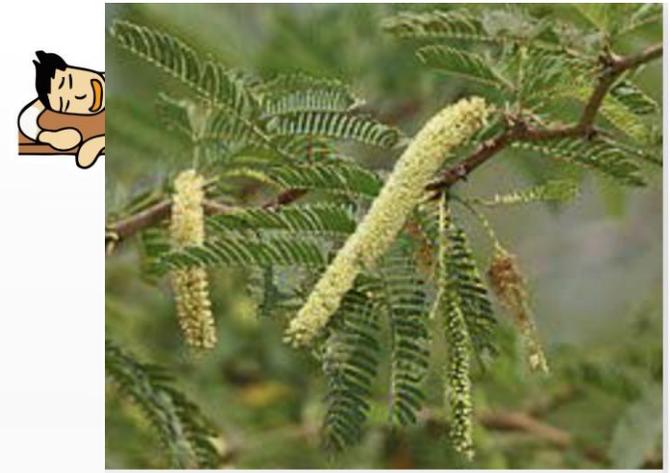


- a) Its extract is widely used in cosmetics.
- b) It tends to reduce the biodiversity in the area in which it grows.
- c) Its extract is used in the synthesis of pesticides.
- d) None of these

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- *Prosopis juliflora* (Vilaiti Keekar), a non-native and invasive tree species, belongs to South and Central America.
- It is a shrub or small tree, commonly known as Seemai Karuvelam.
- It has superior ability to adapt and establish itself in the given environment as it is capable of growing in a wide variety of soils and climatic conditions
- *Prosopis* was introduced into India's arid landscapes in the late 19th century owing to misplaced beliefs that deserts and grasslands were wastelands and hence needed trees.
- It has encroached over half Banni, one of Asia's largest grasslands in Gujarat.
- Fuelwood was another reason for its introduction.
- *Prosopis* was introduced in Banni to keep the salt flats of the Rann of Kachchh in check.



- A recent study has shown that apart from threatening local plants, with whom it competes for resources, this tree is also affecting the nesting success of birds as it produces less oxygen and more carbon dioxide.
- It causes drying up of water bodies and ground water as it absorbs more than 4 litres of water to obtain one kg of biomass.
- It causes stomach poisoning in livestock by inducing a permanent impairment of its ability to digest cellulose.

Q52). "Momentum for Change : Climate Neutral Now" is an initiative launched by



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- b) The UNEP Secretariat
- c) The UNFCCC Secretariat
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- The Paris Climate Change Agreement's central aim is to strengthen the global response to climate change by keeping a global temperature rise well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.
- To do so effectively requires that we achieve a climate neutral world by the second half of this century.
- The UNFCCC secretariat launched its Climate Neutral Now initiative in 2015.
- The following year, the secretariat launched a new pillar under its UN Global Climate Action Awards focused on Climate Neutral Now, as part of larger efforts to showcase successful climate action around the world.



Q53).In which one of the following States is Pakhui Wildlife Sanctuary located?



- a) Arunachal Pradesh
- b) Manipur
- c) Meghalaya
- d) Nagaland

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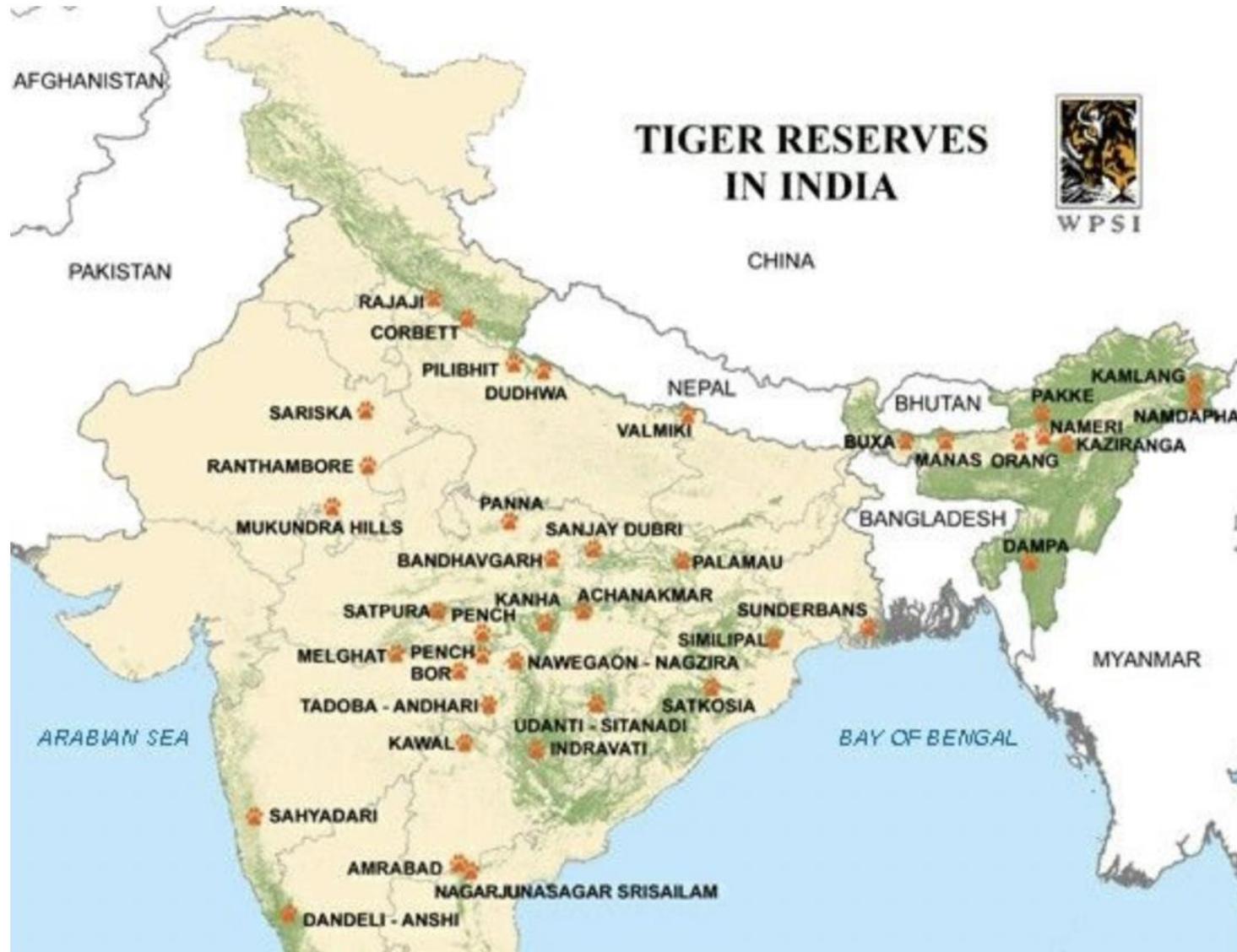
b) Manipur

c) Meghalaya

d) Nagaland

- Pakhui is a Wildlife Sanctuary and a dedicated Tiger Reserve (also known as the Pakke Tiger Reserve) in the district of East Kameng in Arunachal Pradesh, India.
- It falls within the Eastern Himalaya Biodiversity Hotspot.
- It is bordered by the Kameng River and Pakke River, which are important sources of water for the animals and the irrigation of the vegetation.
- It is also known for its amazing sightings of four resident hornbill species.
- The Government of Arunachal Pradesh is planning to build a 692.7 km highway through the 862 sq km Pakke Tiger Reserve (PTR) in East Kameng district, Arunachal Pradesh. Named the East-West Industrial Corridor, the highway aims to connect Arunachal Pradesh with Assam. It has been argued that corridor will also be a threat to the adjoining Nameri Tiger Reserve in Assam.





- The government of Arunachal Pradesh on January 20 declared the Pakke Paga Hornbill Festival (PPHF)–the state’s only conservation festival, as a —state festival.
- The first-ever PPHF was held on January 16–18, 2015.
- The organizers had a number of objectives in mind—to recognise the role played by the resident Nyishi tribe in conserving hornbills in the Pakke Tiger Reserve (PTR), to devise alternative sources of income for a region that relies on hunting and logging, and to tell the rest of the country about the wonders of the PTR and its surrounding areas.



Q.54) In India, 'extended producer responsibility' was introduced as an important feature in which of the following?



- a) The Bio -medical Waste (Management and Handling) Rules, 1998
- b) The Recycled Plastic (Manufacturing and Usage) Rules, 1999
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- EPR is a policy approach under which producers are given a significant responsibility – **financial and/or physical** – for the treatment or disposal of post-consumer products.
- Assigning such responsibility could in principle provide incentives to prevent wastes at the source, promote product design for the environment and support the achievement of public recycling and materials management goals.



Q55.) Consider the following statements:



1. As per law, the Compensatory Afforestation Fund Management and Planning Authority exists at both National and State levels.
2. People's participation is mandatory in the compensatory afforestation programmes carried out under the Compensatory Afforestation Fund Act, 2016.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
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- **Compensatory afforestation** means that every time forest land is diverted for non-forest purposes such as mining or industry, the user agency pays for planting forests over an equal area of non-forest land, or when such land is not available, twice the area of degraded forest land.
- As per law, the Compensatory Afforestation Fund Management and Planning Authority exists at both National and State levels.
- It does not provide for mandatory people participation in the compensatory afforestation programmes carried out under the Compensatory Afforestation Fund Act, 2016.

Compensatory Afforestation Fund



- The CAF Act was passed by the centre in 2016 and the related rules were notified in 2018.
- The CAF Act was enacted to manage the funds collected for compensatory afforestation which till then was managed by **ad hoc Compensatory Afforestation Fund Management and Planning Authority (CAMPA)**.
- As per the rules, **90% of the CAF money is to be given to the states while 10% is to be retained by the Centre.**

Q56.) Consider the following statements:



1. As per recent amendment to the Indian Forest Act, 1927, forest dwellers have the right to fell the bamboos grown on forest areas.
2. As per the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, bamboo is a minor forest produce.
3. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forests Rights) Act, 2006 allows ownership of minor forest produce to forest dwellers.

Which of the statements given above is/are correct?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 3 only
- d) 1, 2 and 3



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- The Indian Forest (Amendment) Ordinance, 2017 exempts bamboo grown in non-forest areas from definition of tree, thereby dispensing with the requirement of felling/transit permit for its economic use.
- Minor Forest Produce (MFP) is defined under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, as all non-timber forest produce of plant origin, and includes bamboo, brushwood, stumps, canes, Tusser, cocoon, honey, waxes, Lac, tendu/kendu leaves, medicinal plants and herbs, roots, tuber and the like.
- The Forest Rights Act 2006 defines forest rights as inclusive of 'Right of ownership, access to collect, use and dispose of minor forest produce which have traditionally been collected within or outside village boundaries'.
- Individuals, communities and gram sabhas having rights under this particular section of the Act will not only have the rights to use but also rights of ownership over MFPs.



Q57.) Consider the following statements: The Environment Protection Act, 1986 empowers the Government of India to



1. state the requirement of public participation in the process of environmental protection, and the procedure and manner in which it is sought
2. lay down the standards for emission or discharge of environmental pollutants from various sources

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

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- b) 2 only**
- c) Both 1 and 2
- d) Neither 1 nor 2

- EPA 1986 was enacted in the wake of Bhopal gas tragedy under article 253 of constitution.
- It implements agenda of UN conference on human environment.
- It regulates environmental pollution, laying down procedures and standards for industrial waste, emissions, hazardous waste.
- As per Section 3 of the Environment Protection Act, the Government of India is empowered to make rules in the laying down standards for emission or discharge of environmental pollutants from various sources.
- No mention of public participation in the act.
- Eco sensitive zones are included under this act.

Q58.) As per the Solid Waste Management Rules, 2016 in India, which one of the following statements is correct?



- a) Waste generator has to segregate waste five categories.
- b) The Rules are applicable to notified urban local bodies, notified towns and all industrial townships only.
- c) The Rules provide for exact and elaborate criteria for the identification of sites for landfills and waste processing facilities.
- d) It is mandatory the part of waste generator that the waste generated in one district cannot be moved to another district.

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- The SWM Rules 2016 provide for detailed criteria for setting -up solid waste processing and treatment facility, solid waste management in hilly areas, for waste to energy process, for Sanitary Landfills, for site selection, development of facilities at the sanitary landfills, specifications for land filling operations and closure on completion of landfilling, pollution prevention, Closure and Rehabilitation of Old Dumps etc.



Q59.) Consider the following statements:

1. Asiatic lion is naturally found in India only.
2. Double-humped camel is naturally found in India only.
3. One-horned rhinoceros is naturally found in India only.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
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- Gir National Park and Wildlife Sanctuary, also known as Sasan Gir, is a forest and wildlife sanctuary in Gujarat, India, is the only natural habitat of Asiatic lions.
- People mostly link Gir with "Maldharis" who have survived through the ages by having symbiotic relationship with the lion.
- They are religious pastoral communities living in Gir.
- Their settlements are called "nesses".
- Endangered
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- The "Asiatic Lion Conservation Project" has been launched by the Union Ministry of Environment, Forests and Climate Change (MoEFCC).
- Under Project Lion, six new sites apart from the Kuno-Palpur Wildlife Sanctuary (Madhya Pradesh) have been identified under Project Lion that was announced in August 2020.



- There are three species of rhino in Asia – Greater one-horned (*Rhinoceros unicornis*), Javan and Sumatran.
- Only the Great One-Horned Rhino is found in India.
- It is the largest of the rhino species. (Habitat- India and Nepal)
- The Indian rhinoceros is regionally extinct in Pakistan.
- The five rhino range nations (India, Bhutan, Nepal, Indonesia and Malaysia) have signed a declaration ‘The New Delhi Declaration on Asian Rhinos 2019’ for the conservation and protection of the species.
- Indian Rhino Vision 2020 - Launched in 2005, it is an ambitious effort to attain a wild population of at least 3,000 greater one-horned rhinos spread over seven protected areas in the Indian state of Assam by the year 2020.



- Great One-Horned Rhino/Indian Rhino: Vulnerable.
- Black Rhino: Smaller of the two African species.
- White Rhino: Recently, researchers have created an embryo of the northern white rhino by using In vitro Fertilization (IVF) process.
- Javan Rhino: Critically endangered in IUCN Red List.
- Sumatran Rhino: Recently gone extinct in Malaysia.



- The **Bactrian camel** also known as the **Mongolian camel** or **domestic Bactrian camel**, is a large ungulate native to the steppes of Central Asia.
- It has two humps on its back, in contrast to the single-humped dromedary camel.
- Its population of 2 million exists mainly in the domesticated form



Q60.) In the context of which of the following do some scientists suggest the use of cirrus cloud thinning technique and the injection of sulphate aerosol into stratosphere?



- a) Creating the artificial rains in some regions.
- b) Reducing the frequency and intensity of tropical cyclones.
- c) Reducing the adverse effects of solar wind on the Earth.
- d) Reducing the global warming.

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- The geo-engineering technique known as stratospheric aerosol injection (SAI) could limit rising temperatures that are causing climate change.
- This would introduce aerosols into the stratosphere to create a cooling effect via global dimming, which occurs naturally from volcanic eruptions.
- It appears that stratospheric aerosol injection, at a moderate intensity, could counter most changes to temperature and precipitation, take effect rapidly, have low direct implementation costs, and be reversible in its direct climatic effects.



- Cloud thinning strategy would be used to shoot powder over cirrus clouds, which would thin out their coverage and alter their radiative effects over Earth.
- Thinning the clouds, according to some researchers could allow more heat to escape into space.



Q61.) In the context of which one of the following are the terms 'pyrolysis and plasma gasification' mentioned?



- a) Extraction of rare earth elements
- b) Natural gas extraction technologies
- c) Hydrogen fuel-based automobiles
- d) Waste-to-energy technologies

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- b) Natural gas extraction technologies
- c) Hydrogen fuel-based automobiles
- d) Waste-to-energy technologies**

- Pyrolysis is a common technique used to convert plastic waste into energy, in the form of solid, liquid and gaseous fuels.
- Pyrolysis is the thermal degradation of plastic waste at different temperatures (300–900°C), in the absence of oxygen, to produce liquid oil
- Plasma Gasification: Plasma gasification is an extreme thermal process using plasma which converts organic matter into a syngas (synthesis gas - a mixture of carbon monoxide (CO) and hydrogen (H₂) which is primarily made up of hydrogen and carbon monoxide.
- These technologies are sometimes known as Advanced Thermal Technologies or Alternative Conversion Technologies.

Q62.) Which of the following are in Agasthyamala Biosphere Reserve?



- a) Neyyar, Peppara and Shendurney Wildlife Sanctuaries; and Kalakad Mundanthurai Tiger Reserve.
- b) Mudumalai, Sathyamangalam and Wayanad Wildlife Sanctuaries; and Silent Valley National Park.
- c) Kaundinya, Gundla Brahmeswaram and Papikonda Wildlife Sanctuaries; and Mukurthi National Park.
- d) Kawal and Sri Venkateswara Wildlife Sanctuaries; and Nagarjunasagar -Srisaïlam Tiger Reserve.

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- d) Kawal and Sri Venkateswara Wildlife Sanctuaries; and Nagarjunasagar -Srisailem Tiger Reserve.



- Located in the Western Ghats in the south of the country, the Agasthyamala Biosphere Reserve is a unique genetic reservoir of cultivated plants.
- Three wildlife sanctuaries, Shendurney, Peppara and Neyyar, are located in the site, as well as the Kalakad Mundanthurai Tiger reserve.



Q63.) Consider the following statements:

1. Some species of turtles are herbivores.
2. Some species of fish are herbivores.
3. Some species of marine mammals are herbivores.
4. Some species of snakes are viviparous.

Which of the statements given above are correct?

- a) 1 and 3 only
- b) 2, 3 and 4 only
- c) 2 and 4 only
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- Green sea turtles eat seagrasses and algae, though juveniles snack on crabs, sponges, and jellyfish. In the wild, they can live up to 80 years and grow up to five feet long. Once mature, it is the only sea turtle that is strictly herbivorous.
- Parrotfish are algae eaters. They obtain the algae by ripping small chunks of coral from a reef. Many other herbivores thrive among the fish population.
- Sea cows, marine mammal, live in shallow coastal areas and feed on sea vegetation.
- Snakes that are viviparous nourish their developing young through a placenta and yolk sac, something that is highly unusual among reptiles.



Q64.) Consider the following pairs: Wildlife Naturally found in



1. Blue-finned Mahseer : Cauvery River
2. Irrawaddy Dolphin : Chambal River
3. Rusty-spotted Cat : Eastern Ghats

Which of the pairs given above are correctly matched?

- a) 1 and 2 only
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- Blue-finned Mahseer is found naturally in the Cauvery river.
- Irrawaddy Dolphin is found in coastal areas in South and Southeast Asia, and in three rivers: the Irrawaddy (Myanmar), the Mahakam (Indonesian Borneo) and the Mekong (China).
- Around 6000 have been reported from Bangladesh.
- Their distribution in Chilika is considered to be the highest single lagoon population.
 - Gangetic dolphin - Endangered
 - Indus River Dolphin - Endangered
 - Irrawaddy Dolphin - Endangered
- Rusty Spotted Cat is one of the world's smallest feline. The rusty spotted cat, one of the few wild cats that inhabit the forests of Andhra Pradesh, is among the animals in the Eastern Ghats.



Q65.) Why is there a great concern about the 'microbeads' that are released into environment?



- a) They are considered harmful to marine ecosystems.
- b) They are considered to cause skin cancer in children.
- c) They are small enough to be absorbed by crop plants in irrigated fields.
- d) They are often found to be used as food adulterants.

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- Microplastics are small plastic pieces of less than five millimeters in size.
- Microplastic includes microbeads which are solid plastic particles of less than one millimeter in their largest dimension and are used in cosmetics and personal care products, industrial scrubbers which are used for aggressive blast cleaning, microfibers used in textiles and virgin resin pellets used in plastic manufacturing processes.
- They are most frequently made of polyethylene but can be of other petrochemical plastics such as polypropylene and polystyrene.
- Microbeads are washed down the drain, can pass unfiltered through the sewage treatment plants and make their way into rivers and canals, resulting in plastic particle water pollution.
- A variety of wildlife, from small fish, amphibians and turtles to birds and larger mammals, mistake microbeads for their food source.
- This ingestion of plastics introduces the potential for toxicity not only to these animals but to other species higher in the food chain.



Q66.) Which one of the following National Parks lies completely in the temperate alpine?



- a) Manas National Park
- b) Namdahpa National Park
- c) Neora Valley National Park
- d) Valley of Flowers National Park

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- c) Neora Valley National Park
- d) Valley of Flowers National Park**

- Valley of Flowers National Park is an Indian national park which was established in 1982.
- It is located in Chamoli in the state of Uttarakhand and is known for its meadows of endemic alpine flowers and the variety of flora.
- The valley is situated at a very remarkable area, which is the confluence point of Himalayan ranges, Zaskar and Western and Eastern Himalayas.

Q67.) Consider the following statements:



1. Agricultural soils release nitrogen oxides into environment.
2. Cattle release ammonia into environment.
3. Poultry industry releases reactive nitrogen compounds into environment.

Which of the statements given above is/are correct?

- a) 1 and 3 only
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- c) 2 only
- d) 1, 2 and 3

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- A major direct source of nitrous oxide from agricultural soils is that of synthetic fertilizer use. Where large applications of fertilizer are combined with soil conditions favorable to denitrification, large amounts of nitrous oxide can be produced and emitted to the atmosphere.
- Ammonia is a common by - product of animal waste due to the often inefficient conversion of feed nitrogen into animal product. Emissions of ammonia from livestock farming are responsible for the acidification and eutrophication of deposited ammonia in the environment.
- Reactive nitrogen includes – ammonia, nitrate, nitric oxide (NO), nitrous oxide (N₂O). Livestock and Poultry are both responsible for emissions of these.



Q68.) In the context of proposals to the use of hydrogen - enriched CNG (H -CNG) as fuel for buses in public transport, consider the following statements:



1. The main advantage of the use of H -CNG is the elimination of carbon monoxide emissions.
2. H -CNG as fuel reduces carbon dioxide and hydrocarbon emissions.
3. Hydrogen up to one -fifth by volume can be blended with CNG as fuel for buses.
4. H -CNG makes the fuel less expensive than CNG.

Which of the statements given above is/are correct?

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- c) 4 only
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- HCNG is a hydrogen-enriched compressed natural gas (CNG).
- H -CNG is a blend of hydrogen and CNG, the ideal hydrogen concentration being 18%. Compared to conventional CNG, use of H - CNG can reduce emission of carbon monoxide up to 70% and 15% reduction in total hydro carbon emissions, besides enabling up to 5% savings in fuel.
- In its report to the Supreme Court, the EPCA has estimated that to fuel Delhi's 5,500 buses, about 400 tonnes H -CNG would be needed per day. Setting up four fuel -dispensing facilities would cost Rs 330 crore, which can be funded from the Environment Compensation Charge (ECC) fund made up of cess on commercial vehicles entering Delhi, it said.
- For consumers who pay Rs 42 per kg for CNG, the cost of H -CNG would not be more than Rs 43 per kg.

Q69.) Consider the following states:

1. Chhattisgarh
2. Madhya Pradesh
3. Maharashtra
4. Odisha

With reference to the States mentioned above, in terms of percentage of forest cover to the total area of State

Which one of the following is the correct ascending order?

- a) 2-3-1-4
- b) 2-3-4-1
- c) 3-2-4-1
- d) 3-2-1-4

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The percentage of forested area in 2021 by state as published by the Forest Survey of India in ascending order is:

- Maharashtra (16.51%), Madhya Pradesh (25.14%), Odisha (32.98%), Chhattisgarh (41.21%).



Q70.) Which of the following statements are correct about the deposits of 'methane hydrate'?



1. Global warming might trigger the release of methane gas from these deposits.
2. Large deposits of 'methane hydrate' are found in Arctic Tundra and under the seafloor.
3. Methane in atmosphere oxidizes to carbon dioxide after decade or two.

Select the correct answer using the code given below:

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- c) 1 and 3 only
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- c) 1 and 3 only
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- **Methane hydrate** is formed when hydrogen-bonded water and methane gas come into contact at high pressures and low temperatures in oceans.
- Methane hydrate is a crystalline solid that consists of a methane molecule surrounded by a cage of interlocking water molecules.
- Owing to melting of ice, global warming might trigger the release of methane gas from these deposits.
- Four Earth environments have the temperature and pressure conditions suitable for the formation and stability of methane hydrate. These are:
 - sediment and sedimentary rock units below Arctic permafrost;
 - sedimentary deposits along continental margins;
 - deep -water sediments of inland lakes and seas; and,
 - under Antarctic ice.



- Methane is relatively short - lived in the atmosphere; a molecule of methane is oxidized to water and carbon dioxide after a decade or so, mainly by reaction with another trace gas, the hydroxyl radical $\text{OH} \cdot$.
- Thus, unlike the case of carbon dioxide (which stays in the atmosphere longer than methane), a concerted effort to reduce methane emissions would have almost immediate results in terms of reduction of greenhouse effect.

Q71.) Consider the following:

1. Carbon monoxide
2. Methane
3. Ozone
4. Sulphur dioxide

Which of the above are released into atmosphere due to the burning of crop/biomass residue?

- a) 1 and 2 only
- b) 2, 3 and 4 only
- c) 1 and 4 only
- d) 1, 2, 3 and 4

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- Crop residues / biomass burning are cheap and easiest method to dispose the leftover crop residues (wheat, rice, sugarcane etc.) after harvesting, for land clearing and pest control.
- Burning of crop residues is a common approach to eliminate waste after harvesting all over the world.
- Burning of these residues emit gases like sulphur dioxide (SO_2), oxides of nitrogen (NO_x), carbon dioxide (CO_2), carbon monoxide (CO), black carbon (BC), organic carbon (OC), methane (CH_4), volatile organic compounds (VOC), non-methane hydrocarbons (NMHCs), ozone (O_3), and aerosols etc which affect the global atmospheric chemistry and climate.

Q72.) In India, the use of carbofuran, methyl parathion, phorate and triazophos is viewed with apprehension. These chemicals are used as

- a) pesticides in agriculture
- b) preservatives in processed foods
- c) fruit-ripening agents
- d) moisturizing agents in cosmetics



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- d) moisturizing agents in cosmetics

- Banned pesticides - carbofuran, phorate, methyl parathion, monocrotophos, methyl demethon, prophenophos and triazophos.



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Q73.) Consider the following statements:



1. Under Ramsar Convention, it is mandatory on the part of the Government of India to protect and conserve all the wetlands in the territory of India.
2. The Wetlands (Conservation and Management) Rules, 2010 were framed by the Government of India based on the recommendation of Ramsar Convention.
3. The Wetlands (Conservation and Management) Rules, 2010 also encompass the drainage area or catchment regions of the wetlands as determined by the authority.

Which of the statements given above is/are correct?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 3 only
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- Article 4 of the Ramsar Convention states that "Each Contracting Party shall promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands, whether they are included in the List or not, and provide adequately for their wandering." It is not mandatory on the part of the Government of India to protect and conserve all the wetlands in the territory of India.
- Article 3 of the Ramsar Convention states that "The Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory."
- As per Wetlands (Conservation and Management) Rules, 2010, a "wetland" means an area or of marsh, fen, peatland or water; natural or artificial, permanent or temporary, with water that is static or



flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres and includes all inland waters such as lakes, reservoir, tanks, backwaters, lagoon, creeks, estuaries and manmade wetland and the zone of direct influence on wetlands that is to say the drainage area or catchment region of the wetlands as determined by the authority.



Q74.) Which of the following are the reasons/factors for exposure to benzene pollution?



1. Automobile exhaust
2. Tobacco smoke
3. Wood burning
4. Using varnished wooden furniture
5. Using products made of polyurethane

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 2 and 4 only
- c) 1, 3 and 4 only
- d) 1, 2, 3, 4 and 5

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- b) 2 and 4 only
- c) 1, 3 and 4 only
- d) 1, 2, 3, 4 and 5

- Benzene is a chemical that is a colorless or light yellow liquid at room temperature. It has a sweet odor and is highly flammable.
- Benzene evaporates into the air very quickly. Its vapor is heavier than air and may sink into low-lying areas.
- Benzene dissolves only slightly in water and will float on top of water.
- Benzene is formed from both natural processes and human activities.
- Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

- A major source of benzene exposure is **tobacco smoke**.



- Outdoor air contains low levels of benzene from tobacco smoke, gas stations, **motor vehicle exhaust**, and industrial emissions.
- Automobile exhaust accounts for the largest source of benzene in the general environment.
- Indoor air generally contains levels of benzene higher than those in outdoor air.
- The benzene in indoor air comes from products that contain benzene such as glues, **paints, furniture wax**, and detergents.

Q75.) What are the advantages of fertigation in agriculture?



1. Controlling the alkalinity of irrigation water is possible.
2. Efficient application of Rock Phosphate and all other phosphatic fertilizers is possible.
3. Increased availability of nutrients to plants is possible.
4. Reduction in the leaching of chemical nutrients is possible.

Select the correct answer using the code given below:

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- b) 1, 2 and 4 only
- c) 1,3 and 4 only
- d) 2, 3 and 4 only

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- c) 1,3 and 4 only**
- d) 2, 3 and 4 only

- **Fertigation** is a method of fertilizer application in which fertilizer is incorporated within the irrigation water by the drip system.
- Fertigation has some specific advantages over broadcast and band fertilization:
 - A frequent supply of nutrients reduces fluctuation of nutrient concentration in soil.
 - There is efficient utilization and precise application of nutrients according to the nutritional requirements of the crop.
 - Fertilizers are applied throughout the irrigated soil volume and are readily available to plants.
 - Nutrients can be applied to the soil when soil or crop conditions would otherwise prohibit entry into the field with conventional equipment.



- Alkalinity of a fertigation system can be controlled by adding Acid. The injection of acid to the irrigation water should be, as much as possible, uniform and continuous, throughout the entire duration of the irrigation.
- Drip fertigation increases water and nitrogen use efficiency. Drip fertigation reduced dissolved inorganic and organic N leaching by 90%..
- Soluble fertilizers like urea, potash and a wide variety of fertilizer mixtures available in the market could be well mixed with irrigation water, filtered and then passed through the irrigation unit.
- Rock Phosphate and some other mineral fertilizers containing phosphorus are insoluble in water as well as in citric acid.

Q76.) With reference to India's Desert National Park, which of the following statements are correct?



1. It is spread over two districts.
2. There is no human habitation inside the Park.
3. It is one of the natural habitats of Great Indian Bustard.

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

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- Desert National Park is a national park situated in the Indian state of Rajasthan, near the towns of **Jaisalmer and Barmer**.
- This is one of the largest national parks, covering an area of 3162 km².
- The Desert National Park is an excellent example of the ecosystem of the Thar Desert.
- The Thar desert is the most thickly populated desert in the world with an average density of 83 persons/km²
- However, the human population within the DNP is low (4-5 persons per km²).
- There are 73 villages and also settlements or Dhanis existing within the Park.

- The DNP is the most important site for the long-term survival of the Globally Threatened Great Indian Bustard and other endemic fauna and flora.
- It is one of the heaviest flying birds in the world.
- It is the State bird of Rajasthan. (mostly to Rajasthan and Gujarat)
- It is considered the flagship grassland species, representing the health of the grassland ecology.
- But with less than 200 GIBs remaining in the world, most of them found in Rajasthan's Desert National Park.
- Critically endangered and Schedule I of the Wildlife (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- The Great Indian Bustard, Asian Elephant and Bengal Florican have been included in Appendix I of the UN Convention on Migratory Species at the 13th Convention on Migratory Species (CMS) in Gandhinagar (Gujarat).



Q77.) Consider the following statements:



1. 36% of India's districts are classified as "overexploited" or "critical" by the Central Ground Water Authority (CGWA).
2. CGWA was formed under the Environment (Protection) Act.
3. India has the largest area under groundwater irrigation in the world.

Which of the statements given above is/are correct?

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- Central Ground Water Authority (CGWA) was constituted under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 for the purposes of regulation and control of ground water development and management in the country.
- The Authority is engaged in various activities related to regulation of ground water development to ensure its long-term sustainability.



- To effectively regulate the groundwater extraction, the Centre, following the NGT's directions, has divided areas with declining water tables in three categories:
 1. Overexploited – Areas in which groundwater extraction rate is more than the groundwater recharge rate
 2. Critical – Areas where groundwater extraction rate is 90-100% of the recharge
 3. Semi-critical – Areas with an extraction rate of 70-100% of groundwater recharge
- These categories are together called the OCS areas.
- Of the 6,584 groundwater units in India, 1,034 are 'overexploited'; 253 are 'critical'; and 681 are 'semi-critical' – making up 1,968 OCS units in all.
- Around 80,000 industrial units run in these OCS areas.
- Most of them are in the Delhi-NCR region.



- At 39 million hectares (67% of its total irrigation), India has the world's largest groundwater well equipped irrigation system (China with 19 mha is second, USA with 17 mha is third).
- India, Pakistan, and Bangladesh are, respectively, the first, fourth and sixth largest users of groundwater globally.
- India pumps more than the US and China combined - the second and third-largest users, respectively.



Q78.) Among the following Tiger Reserves:

which one has the largest area under "Critical Tiger Habitat"?



- a) Corbett
- b) Ranthambore
- c) Nagarjunsagar-Srisailam
- d) Sunderbans

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- Critical 'tiger' habitats (CTHs), also known as **core areas of tiger reserve**.
- They are identified under the Wild Life Protection Act, 1972 based on scientific evidence that "such areas are required to be kept as inviolate for the purpose of tiger conservation, without affecting the rights of the Scheduled Tribes or such other forest dwellers".
- The notification of CTH is done by the state government in consultation with the expert committee constituted for the purpose.
- **Nagarjunsagar -Srisailam Tiger Reserve** is the largest tiger reserve in India.
- The total area of the tiger reserve is 3,728 km² (1,439 sq mi).



Q79.) If a particular plant species is placed under Schedule VI of The Wildlife Protection Act, 1972,



what is the implication?

- a) a license is required to cultivate that plant.
- b) Such a plant cannot be cultivated under any circumstances.
- c) It is a Genetically Modified crop plant.
- d) Such a plant is invasive and harmful to the ecosystem.

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- There are six schedules under the Wildlife Protection Act, 1972.
- The specified endemic plants in Schedule VI are prohibited from cultivation and planting.
- It further states that "Cultivation of specified plants without license prohibited. –
 - (1) no person shall cultivate a specified plant except under, and in accordance with a license granted by the Chief Wildlife Warden or any other officer authorized by the State Government in this behalf;
 - 2) Every license granted under this section shall specify the area in which and the conditions, if any, subject to which the licensee shall cultivate a specified plant."
- Placement in Schedule VI provides for regulation in cultivation of a specified plant and restricts its possession, sale and transportation.
- Both cultivation and trade of specified plants can only be carried out with prior permission of competent authority.



Q80.) What is/are the advantage/ advantages of zero tillage in agriculture?



1. Sowing of wheat is possible without burning the residue of previous crop.
2. Without the need for nursery of rice saplings, direct planting of paddy seeds in the wet soil is possible.
3. Carbon sequestration in the soil is possible.

Select the correct answer using the code given below:

- a) 1 and 2 only
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- Tillage is an agriculture land preparation through mechanical agitation which includes digging, stirring and overturning.
- No-till farming is an agricultural technique for growing crops or pasture without disturbing the soil through tillage.
- Wheat will be planted after rice harvest without any operation.
- Hundreds of farmers are following the same system and getting more yields and profits by reducing the cost of cultivation.

- Direct seeded rice (DSR) has received much attention because of its low - input demand.
- It involves sowing pre -germinated seed into a puddled soil surface (wet seeding), standing water (water seeding) or dry seeding into a prepared seedbed (dry seeding).
- Adopting no -tillage in agro -ecosystems has been widely recommended as a means of enhancing carbon (C) sequestration in soils.

Q81.) According to India's National Policy on Biofuels, which of the following can be used as raw materials for the production of biofuels?



1. Cassava
2. Damaged wheat grains
3. Groundnut seeds
4. Horse grams
5. Rotten potatoes
6. Sugar beet

Select the correct answer using the code given below:

- a) 1, 2, 5 and 6 only
- b) 1, 3, 4 and 6 only
- c) 2, 3, 4 and 5 only
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- Under the National Policy on Biofuels 2018, 'bioethanol' is defined as ethanol produced from biomass such as sugar containing materials, like sugar cane, sugar beet, sweet sorghum etc.; starch containing materials such as corn, cassava, rotten potatoes, algae etc.; and, cellulosic materials such as bagasse, wood waste, agricultural and forestry residues or other renewable resources like industrial waste.
- For Ethanol Production the following raw materials may be potentially used: B-Molasses, Sugarcane juice, biomass in form of grasses, agriculture residues (Rice straw, cotton stalk, corn cobs, saw dust, bagasse etc.) , sugar containing materials like sugar beet, sweet sorghum, etc. and starch containing materials such as corn, cassava, rotten potatoes etc., Damaged food grains like wheat, broken rice etc. which are unfit for human consumption, Food grains during surplus phase.
- Algal feedstock and cultivation of sea weeds can also be a potential feedstock for ethanol production.



- For Biodiesel Production: Nonedible Oilseeds, Used Cooking Oil (UCO), Animal tallow, Acid Oil, Algal feedstock etc.
- For Advanced Biofuels: Biomass, MSW, Industrial waste, Plastic waste etc.



Q82.) Which one of the following statements best describes the term 'Social Cost of Carbon'? It is a measure, in monetary value, of the



- a) long-term damage done by a tonne of CO₂ emissions in a given year.
- b) requirement of fossil fuels for a country to provide goods and services to its citizens, based on the burning of those fuels.
- c) efforts put in by a climate refugee to adapt to live in a new place.
- d) contribution of an individual person to the carbon footprint on the planet Earth.

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- The social cost of carbon (SCC) is an estimate, in dollars, of the economic damages that would result from emitting one additional ton of greenhouse gases into the atmosphere.
- The SCC puts the effects of climate change into economic terms to help policymakers and other decision makers understand the economic impacts of decisions that would increase or decrease emissions.
- A higher SCC generally means that the benefits of a particular climate policy to cut CO₂ justify its cost; a low SCC makes a policy seemingly cost more than the benefits it ultimately delivers.
- Theoretically, the SCC should increase over time because physical and economic systems will become more stressed as the impacts of climate change accumulate.

Q83.) In the context of India, which of the following is/are considered to be practice(s) of eco-friendly agriculture?



1. Crop diversification
2. Legume intensification
3. Tensiometer use
4. Vertical farming

Select the correct answer using the code given below:

- a) 1, 2 and 3 only
- b) 3 only
- c) 4 only
- d) 1, 2, 3 and 4

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- c) 4 only
- d) 1, 2, 3 and 4**

- Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value-added crops with complementary marketing opportunities.
- Legumes fix the atmospheric nitrogen, release in the soil high-quality organic matter and facilitate soil nutrients' circulation and water retention. Based on these multiple functions, legume crops have high potential for conservation agriculture, being functional either as growing crop or as crop residue.
- A tensiometer in soil science is a measuring instrument used to determine the matric water potential in the vadose zone. When the water pressure in the tensiometer is determined to be in equilibrium with the water pressure in the soil, the tensiometer gauge reading represents the matric potential of the soil. Such tensiometers are used in irrigation scheduling to help farmers and other irrigation managers to determine when to water.

- Vertical farming is the practice of growing crops in vertically stacked layers. It often incorporates controlled - environment agriculture, which aims to optimize plant growth, and soilless farming techniques such as hydroponics, aquaponics, and aeroponics. In vertical farming, crops are grown indoors, under artificial conditions of light and temperature. Japan has been one of the early pioneers in vertical farming. It holds the largest share in the global vertical farming market.



Q84.) With reference to Indian elephants, consider the following statements:



1. The leader of an elephant group is a female.
2. The maximum gestation period can be 22 months.
3. An elephant can normally go on calving till the age of 40 years only.
4. Among the States in India, the highest elephant population is in Kerala.

Which of the statements given above is/are correct?

- a) 1 and 2 only
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- c) 3 only
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- The Indian elephant is one of three extant recognised subspecies of the Asian elephant and native to mainland Asia.
- The oldest female in an elephant herd is always the leader.
- Elephants have the longest gestation period of all mammals. The average gestation period of an elephant is about 640 to 660 days, or roughly 95 weeks.
- Female elephants live for 60 to 70 years, but only have about four offspring throughout their lifetime.
- Fertility decreases after age 50 in elephants, but the pattern differed from a total loss of fertility in menopausal women with many elephants continuing to reproduce at least until the age of 65 years.
- Therefore it is not till the age of 40 years only.
- Karnataka leads the table with 6,049 elephants followed by Kerala.



Q85.) With reference to India's biodiversity, Ceylon frogmouth, Coppermith barbet, Gray -chinned minivet and White -throated redstart are



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- a) Birds
- b) Primates
- c) Reptiles
- d) Amphibians



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- The Sri Lanka frogmouth, Sri Lankan frogmouth or Ceylon frogmouth is a small frogmouth (The frogmouths are a group of nocturnal birds) found in the Western Ghats of south India and Sri Lanka.
- The coppersmith barbet, also called crimson -breasted barbet and coppersmith, is an Asian barbet with crimson forehead and throat, known for its metronomic call that sounds similar to a coppersmith striking metal with a hammer. It is a resident bird in the Indian subcontinent and parts of Southeast Asia.
- The grey -chinned minivet is a species of bird in the family Campephagidae. It is found from the Himalayas to China, Taiwan and Southeast Asia.
- The white -throated redstart is a species of bird in the family Muscicapidae. It is found in Nepal, Bhutan, central China and far northern areas of Myanmar and Northeast India. Its natural habitat is temperate forests. Hence option (a) is the correct answer.



Q86.) Which one of the following protected areas is well known for the conservation of a sub-species of the Indian swamp deer (Barasingha) that thrives well on hard ground and is exclusively graminivorous?

- a) Kanha National Park
- b) Manas National Park
- c) Mudumalai Wildlife Sanctuary
- d) Tal Chhapar Wildlife Sanctuary



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- Three subspecies are currently recognized –
 - Western swamp deer - Indogangetic plains.
 - Southern swamp deer - Kanha National Park.
- **Southern Swamp Deer** - The State animal of Madhya Pradesh - Hard Ground Barasingha is found exclusively in Kanha Tiger Reserve.
- It is the first tiger reserve in India to officially introduce a mascot, “Bhoorsingh the Barasingha”.
- It was reintroduced into Satpura Tiger Reserve.
- **Eastern swamp deer** - Kaziranga and Dudhwa National Parks).
- It is the state animal of the Indian states of Madhya Pradesh and Uttar Pradesh.
- Vulnerable
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).



Q87.) Steel slag can be the material for which of the following?



1. Construction of base road
2. Improvement of agricultural soil
3. Production of cement

Select the correct answer using the code given below:

- a) 1 and 2 only
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- **Steel slag** is an industrial byproduct obtained from the steel manufacturing industry.
- It is produced during the separation of the molten steel from impurities in steel -making furnaces. One of the ingredients of asphalt is steel slag, a by -product of the steel and iron production processes.
- Asphalt roads are made of a mixture of aggregates, binders and fillers.
- The aggregates are typically iron and/or steel slag, sand, gravel or crushed rock, and they are bound together with asphalt itself, which is a bitumen.
- Steel slags can be used in several activities, such as construction and paving, and also in the agricultural sector due to its ability to correct soil acidity, as it contains some nutrients for the plants and also as silicate fertilizer that is capable of providing silicon to the plants.



- Steel slag can also replace granulated blast furnace slag up to 10% in the manufacture of Portland Slag Cement.
- Steel slag has been used successfully to treat acidic water discharges from abandoned mines.



Q88.) Which of the following are the most likely places to find the musk deer in its natural habitat?



1. Askot Wildlife Sanctuary
2. Gangotri National Park
3. Kishanpur Wildlife Sanctuary
4. Manas National Park

Select the correct answer using the code given below:

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- Musk deer is a small compact deer belonging to the family Cervidae.
- A solitary shy animal, the musk deer lives in mountainous regions from Siberia to the Himalayas
- **Askot Musk Deer Sanctuary** is located 54 km from Pithoragarh near the town of Askot in Uttarakhand. As the name suggests, the sanctuary has been set up primarily for the conservation of musk deer and its natural habitat.
- **Gangotri National Park** is a national park in Uttarkashi District of Uttarakhand in India. Various rare and endangered species like bharal or blue sheep, black bear, brown bear, Himalayan Monal, Himalayan Snowcock, Himalayan Thar, musk deer and Snow leopard are found in the park.
- **The Kishanpur Wildlife Sanctuary** is a part of the Dudhwa Tiger Reserve near Mailani in Uttar Pradesh, India.

- **Manas National Park or Manas Wildlife Sanctuary** is a national park, UNESCO Natural World Heritage site, a Project Tiger reserve, an elephant reserve and a biosphere reserve in Assam, India.



Q89.) In rural road construction, the use of which of the following is preferred for ensuring environmental sustainability or to reduce carbon footprint?



1. Copper slag
2. Cold mix asphalt technology
3. Geotextiles
4. Hot mix asphalt technology
5. Portland cement

Select the correct answer using the code given below:

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- c) 4 and 5 only
- d) 1 and 5 only

- The use of copper slag in cement and concrete provides potential environmental as well as economic benefits for all related industries, particularly in areas where a considerable amount of copper slag is produced.
- Cold asphalt mix is produced by mixing unheated mineral aggregate with either emulsified bitumen or foamed bitumen.
- Unlike hot mix asphalt (HMA), cold asphalt mix does not require any heating of aggregate which makes it economical and relatively pollution-free (no objectionable fumes or odours).

- Production of cold asphalt mix does not require high investment in equipment, which makes it economical.
- It is also suitable for use in remote areas.
- Cold asphalt mixes can be used both for initial construction (100% virgin mixes) and for recycling of asphalt pavements.
- Hot mix asphalt technology is major CO₂ emitter.
- Geotextiles are mostly used in road construction, especially to fill gaps between the roads to improve soil structure. Geotextile makes poor soil more beneficial for use and then easy to build in difficult places also. It helps to prevent the erosion of soil but allows the water to drain off.
- Portland cement that binds concrete together is energy intensive and emits enormous amounts of carbon dioxide (CO₂) as well as numerous other pollutants.



Q90.) Consider the following statements:

1. Coal ash contains arsenic, lead and mercury.
2. Coal-fired power plants release sulphur dioxide and oxides of nitrogen into the environment.
3. High ash content is observed in Indian coal.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 and 3 only
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- c) 3 only
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- Coal ash is the waste that is left after coal is combusted (burned).
- It includes fly ash (fine powdery particles that are carried up the smoke stack and captured by pollution control devices) as well as coarser materials that fall to the bottom of the furnace.
- Coal itself isn't a particularly toxic material.
- But after it's burned, what remains in the ash includes lead, mercury, cadmium, chromium, arsenic, and selenium, all in levels that may threaten human health.
- Thermal power plants produce large amounts of nitrogen oxides and sulfur dioxide—the pollutants that cause acid rain—when they burn fossil fuels, especially coal, to produce energy.
- India's domestic coal reserves have a high ash content—up to 40 to 45 percent.



Q91.) What is the use of biochar in farming?



1. Biochar can be used as a part of the growing medium in vertical farming.
2. When biochar is a part of the growing medium, it promotes the growth of nitrogen-fixing microorganisms.
3. When biochar is a part of the growing medium, it enables the growing medium to retain water for longer time.

Which of the statements given above is/are correct?

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- Biochar is a charcoal-like material produced by heating biomass in the absence of oxygen.
- The use of biochar in vertical farming can increase output significantly.
- Adding biochar to soil increases its carbon content and could help mitigate greenhouse gas emissions.
- Biochar is shown to have an increased abundance of mycorrhizal fungi, assisting nutrient uptake by plants.



- In addition to supporting the life of nitrogen - fixing microorganisms, biochar can also decrease soil N_2O emission, and increase nitrogen use efficiency and nitrogen retention in the soil.
- Biochar is characterized by large pore surface area.
- Because of its porous nature, biochar can improve your soil's water retention and water holding capacity – defined as the amount of water that a soil can hold for its crops – so that your plants will have more water available to them for a longer period of time.



Q92.) Why is there a concern about copper smelting plants?



1. They may release lethal quantities of carbon monoxide into environment.
2. The copper slag can cause the leaching of some heavy metals into environment.
3. They may release sulphur dioxide as a pollutant.

Select the correct answer using the code given below:

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- Copper smelting plants separate elemental copper from copper concentrates through multiple sulphide oxidizing stages.
- Smelting is a process of applying heat to ore in order to extract a base metal.
- The copper concentrates are fed through the flash smelting furnace with oxygen -enriched air.
- In the furnace, the concentrates are instantly oxidized, after which they melt and separate by their own reaction heat into copper matte with a grade of 65% and slag consisting of iron oxide, silica, and other compounds.

- Extractive metallurgical and smelting processes can be highly polluting activities.
- Some facilities that carry out metal and smelting processes are known to emit high quantities of air pollutants such as hydrogen fluoride, sulfur dioxide, oxides of nitrogen, offensive and noxious smoke fumes, vapors, gases, and other toxins.
- Due to the application of pyro - metallurgical processes in copper smelters, significant air pollution occurs with suspended particles.
- These particles contain high concentrations of Lead (Pb), Cadmium (Cd), Nickel (Ni) and Arsenic (As).
- The carbon (or carbon monoxide derived from it) **removes oxygen from the ore, leaving the elemental metal.**
- The carbon thus oxidizes in two stages, producing first carbon monoxide and then carbon dioxide.



Q93.) With reference to furnace oil, consider the following statements:



1. It is a product of oil refineries.
2. Some industries use it to generate power.
3. Its use causes sulphur emissions into environment.

Which of the statements given above are correct?

- a) 1 and 2 only
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- c) 1 and 3 only
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Q93.) With reference to furnace oil, consider the following statements:



1. It is a product of oil refineries.
2. Some industries use it to generate power.
3. Its use causes sulphur emissions into environment.

Which of the statements given above are correct?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3**

- Fuel oil (also known as heavy oil, marine fuel, bunker, furnace oil, or gasoil) is a fraction obtained from petroleum distillation.
- Diesel-based power plants may use Diesel, Furnace Oil, Heavy Fuel Oil (HFO), Low Sulfur Fuel Oil (LSFO) or Low Sulfur Heavy Stock (LSHS).
- The oxides of sulphur (SO_x ; $\text{SO}_2 + \text{SO}_3$) emissions are a direct result of the sulphur content of the fuel oil.
- During the combustion process this fuel-bound sulphur is rapidly oxidised to sulphur dioxide (SO_2).
- A small fraction of the SO_2 , some 3-5% may be further oxidised to sulphur trioxide (SO_3) within the combustion chamber and exhaust duct.

Q94.) In the nature, which of the following is/are most likely to be found surviving on a surface without soil?



1. Fern
2. Lichen
3. Moss
4. Mushroom

Select the correct answer using the code given below:

- a) 1 and 4 only
- b) 2 only
- c) 2 and 3
- d) 1, 3 and 4

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- A fern is a member of a group of vascular plants that reproduce via spores and have neither seeds nor flowers. Ferns require indirect sunlight, moist soil, and a humid atmosphere. Ferns prefer potting soil with good drainage and high organic content.
- Lichens are a complex life form that is a symbiotic partnership of two separate organisms, a fungus and an alga. They only require an undisturbed surface, time, and clean air. Lichens grow on any undisturbed surface--bark, wood, mosses, rock, soil, peat, glass, metal, plastic, and even cloth.
- Mosses are non-flowering plants which produce spores and have stems and leaves, but don't have true roots. Moss is very low maintenance and needs virtually nothing except shade and moisture to thrive. Hence option 3 is correct.

- A mushroom or toadstool is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground, on soil, or on its food source. Mushrooms can be cultivated hydroponically as fungi.



Q95.) Which one of the following is used in preparing a natural mosquito repellent?



- a) Congress grass
- b) Elephant grass
- c) Lemongrass
- d) Nut grass

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- a) Congress grass
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- c) Lemongrass**
- d) Nut grass

- Lemongrass is a tall herb that is abundantly found in tropical and sub-tropical areas of Asia, Africa, and Australia.
- China and India accounts for the maximum production of Lemongrass.
- The Lemongrass plant is known to be **an excellent mosquito repellent**.
- It contains a compound citronella that helps to mask the scents that mosquitoes rely on to target hosts.

Q96.) Consider the following kinds of organisms:

1. Copepods
2. Cyanobacteria
3. Diatoms
4. Foraminifera

Which of the above are primary producers in the food chains of oceans?

- a) 1 and 2
- b) 2 and 3
- c) 3 and 4
- d) 1 and 4

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- Copepods are a group of small crustaceans found in nearly every freshwater and saltwater habitat.
- Copepods are major secondary producers in the World Ocean.
- They are an important source of food for many fish species but also a significant producer of detritus.
- Cyanobacteria, also called bluegreen algae, are microscopic organisms found naturally in all types of water. Cyanobacteria are important primary producers and form a part of the phytoplankton.

- Diatoms are photosynthesising algae, they have a siliceous skeleton (frustule) and are found in almost every aquatic environment including fresh and marine waters.
- Foraminifera are single-celled organisms, members of a phylum or class of amoeboid protists characterized by streaming granular ectoplasm for catching food and other uses.



Q97.) Consider the following animals:

1. Hedgehog
2. marmot
3. Pangolin to reduce the chance of being captured by predators

Which of the above organisms rolls up/roll up and protects/protect its/their vulnerable parts?

- a) 1 and 2
- b) 2 only
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- d) 1 and 3

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- Hedgehogs are a small mammal with short limbs and a body low to the ground.
- When they are frightened, or annoyed, hedgehogs will roll into a ball so that a predator will feel the full brunt of its sharp spines and will then leave the hedgehog alone. Marmots are relatively large ground squirrels.
- These herbivores are active during the summer when often found in groups, but are not seen during the winter when they hibernate underground.
- They are the heaviest members of the squirrel family. They do not roll up when threatened.
- Pangolins are uniquely covered in tough, overlapping scales.
- These mammals eat ants and termites using an extraordinarily long, sticky tongue, and are able to quickly roll themselves up into a tight ball when they feel threatened.



Q98.) With reference to the 'New York Declaration on Forests', which of the following statements are correct?



1. It was first endorsed at the United Nations Climate Summit in 2014.
2. It endorses a global timeline to end the loss of forests.
3. It is a legally binding international declaration.
4. It is endorsed by governments, big companies and indigenous communities.
5. India was one of the signatories at its inception.

Select the correct answer using the code given below:

- a) 1, 2 and 4
- b) 1, 3 and 5
- c) 3 and 4
- d) 2 and 5

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- The New York Declaration on Forests (NYDF) is a political declaration calling for global action to protect and restore forests.
- It offers a common, multi-stakeholder framework for forest action, consolidating various initiatives and objectives that drive forest protection, restoration, and sustainable use.
- Adopted in 2014 and refreshed in 2021, the NYDF is the major reference point for global forest action.
- Its ten goals include halting natural forest loss by 2030, restoring 350 million hectares of degraded landscapes and forestlands, improving governance, increasing forest finance, and reducing emissions from deforestation and forest degradation as part of the Paris Agreement.



- It is a voluntary and non-legally binding political declaration which grew out of dialogue among governments, companies and civil society, spurred by the United Nations Secretary-General's Climate Summit held in New York in 2014.
- The declaration includes ambitious targets to end natural forest loss by 2030, with a 50% reduction by 2020 as a milestone toward its achievement.
- The Declaration is currently endorsed by over 190 entities including more than 50 governments, more than 50 of the world's biggest companies, and more than 50 influential civil society and indigenous organizations. It is not endorsed by India.

Q99.) Magnetite particles, suspected to cause neurodegenerative problems, are generated as environmental pollutants from which of the following?



1. Brakes of motor vehicles
2. Engines of motor vehicles
3. Microwave stoves within homes
4. Power plants
5. Telephone lines

Select the correct answer using the code given below:

- a) 1, 2, 3 and 5 only
- b) 1, 2 and 4 only
- c) 3, 4 and 5 only
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- Magnetite is a mineral and one of the main iron ores, with the chemical formula $\text{Fe}^{2+}\text{Fe}^{3+}_2\text{O}_4$.
- It is one of the oxides of iron, and is ferrimagnetic; it is attracted to a magnet and can be magnetized to become a permanent magnet itself.
- It is the most magnetic of all the naturally occurring minerals on Earth.
- Magnetite can have potentially large impacts on the brain due to its unique combination of redox activity, surface charge and strongly magnetic behaviour.
- Airborne magnetite pollution particles $< \sim 200$ nm in size can access the brain directly via the olfactory and/or trigeminal nerves, bypassing the blood -brain barrier.



- They are generated by a wide variety of processes, both natural and fabricated, including forest fires and wood - burning stoves, road traffic pollution, and many high - temperature industrial processes .
- In addition to occupational settings (including, for example, exposure to printer toner powders), higher concentrations of magnetite pollution nanoparticles may arise in the indoor environment from open fires or poorly-sealed stoves used for cooking and/or heating, and in the outdoor environment from vehicle (tailpipe and brake wear) and/or industrial PM sources.



Q100.) Which one of the following is a filter feeder?

- a) Catfish
- b) Octopus
- c) Oyster
- d) Pelican



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- d) Pelican



- Filter Feeder is an animal (such as a clam or baleen whale) that obtains its food by filtering organic matter or minute organisms from a current of water that passes through some part of its system.
- Oysters are natural filter feeders.
- This means they feed by pumping water through their gills, trapping particles of food as well as nutrients, suspended sediments and chemical contaminants.

Q101.) In case of which one of the following biogeochemical cycles, the weathering of rocks is the main source of release of nutrient to enter the cycle?



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- a) Carbon cycle
- b) Nitrogen cycle
- c) Phosphorus cycle
- d) Sulphur cycle



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- c) Phosphorus cycle**
- d) Sulphur cycle

- **Gaseous cycles include those of nitrogen, oxygen, carbon, and water;**
- **sedimentary cycles include those of iron, calcium, phosphorus, and other more earthbound elements.**
- Much of the phosphorus on Earth is tied up in rock and sedimentary deposits, from which it is released by weathering, leaching, and mining.
- Phosphorus moves in a cycle through rocks, water, soil and sediments and organisms.
- Over time, rain and weathering cause rocks to release phosphate ions and other minerals.
- This inorganic phosphate is then distributed in soils and water.

Q102.) Which of the following are detritivores?

1. Earthworms
2. Jellyfish
3. Millipedes
4. Seahorses
5. Woodlice

Select the correct answer using the code given below:

- a) 1, 2 and 4 only
- b) 2, 3, 4 and 5 only
- c) 1, 3 and 5 only
- d) 1, 2, 3, 4 and 5

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- a) 1, 2 and 4 only
- b) 2, 3, 4 and 5 only
- c) 1, 3 and 5 only**
- d) 1, 2, 3, 4 and 5

- Detritivores are heterotrophs that obtain nutrients by consuming detritus (**dead or decaying plants or animals as food**)
- By doing so, all these detritivores contribute to decomposition and the nutrient cycles.
- Detritivores include microorganisms such as bacteria and larger organisms such as fungi, insects, worms, and some crustaceans.
- Examples of detritivores are earthworms, blowflies, millipedes, maggots, and woodlice.

Q103.) The 'Common Carbon Metric', supported by UNEP, has been developed for



- a) assessing the carbon footprint of building operations around the world
- b) enabling commercial farming entities around the world to enter carbon emission trading
- c) enabling governments to assess the overall carbon footprint caused by their countries
- d) assessing the overall carbon foot-print caused by the use of fossil fuels by the world in a unit time



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- Leading experts from around the world have, through extensive international cooperation, developed a universal method of measuring a building's carbon footprint.
- Supported by the United Nations Environment Programme, this new 'Common Carbon Metric' will allow emissions from buildings around the world to be consistently assessed and compared, and improvements measured.



Q104.) Which of the following have species that can establish symbiotic relationship with other organisms?



1. Cnidarians
2. Fungi
3. Protozoa

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

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Select the correct answer using the code given below:

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- c) 1 and 3 only
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- Cnidarian, also called coelenterate are mostly marine animals. They include the corals, hydras, jellyfish, etc.
- The relationship between cnidarians and dinoflagellate algae is termed as "symbiotic", because both the animal host and the algae are benefiting from the association.
- It is a mutualistic interaction.
- Fungi have several mutualistic relationships with other organisms. In mutualism, both organisms benefit from the relationship.
- Two common mutualistic relationships involving fungi are mycorrhiza and lichen.

Q105.) How is the permaculture farming different from conventional chemical farming?



1. Permaculture farming discourages monocultural practices but in conventional chemical farming, monoculture practices are predominant.
2. Conventional chemical farming can cause increase in soil salinity but the occurrence of such phenomenon is not observed in permaculture farming.
3. Conventional chemical farming is easily possible in semi - arid regions but permaculture farming is not so easily possible in such regions.
4. Practice of mulching is very important in permaculture farming but not necessarily so in conventional chemical farming.

Select the correct answer using the code given below:

- a) 1 and 3
- b) 1, 2 and 4
- c) 4 only
- d) 2 and 3



Select the correct answer using the code given below:

a) 1 and 3

b) 1, 2 and 4

c) 4 only

d) 2 and 3



- Permaculture is, amongst others, an approach to land management that adopts arrangements observed in flourishing natural ecosystems.
- **Permaculture is an innovative framework for creating sustainable ways of living.**
- **It is a practical method of developing ecologically harmonious, efficient and productive systems that can be used by anyone, anywhere.**
- Permaculture discourages monoculture and serves to open up the possibility of growing a wide range of food grains, fruits and vegetables and thereby expanding the food basket; thus permaculture also contributes to community health.

- Application of permaculture methods and introducing permaculture techniques like swales, natural mulching, rainfall harvesting, legume cultivation, have a clear role in improving soil properties, increasing soil organic matter content and reducing soil salinity.
- Due to its focus on water conservation and region specific crops, it is very much suitable for arid and semi arid regions.
- Mulch is a material placed on the soil surface to maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions.
- Mulching can help to improve crop yield and optimise water use which is an essential component of permaculture.

Q106.) With reference to 'palm oil', consider the following statements:



1. The palm oil tree is native to Southeast Asia.
2. The palm oil is a raw material for some industries producing lipstick and perfumes.
3. The palm oil can be used to produce biodiesel.:

Which of the statements given above are correct?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
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- a) 1 and 2 only
- b) 2 and 3 only**
- c) 1 and 3 only
- d) 1, 2 and 3

- Palm oil is an edible vegetable oil derived from the mesocarp (reddish pulp) of the fruit of the oil palms.
- Palm oil tree is native to Africa.
- Our palm oil trees are grown in Malaysia and Indonesia, which represents 85% of the world's palm oil supply.
- Palm oil is a vegetable oil used in cosmetics for its moisturising and texturising properties
- Palm oil is used in lipstick as it holds color well, doesn't melt at high temperatures, and has a smooth application and virtually no taste.
- Also, palm oil makes perfumed and deodorants more effective and helps the fragrance to last longer
- Palm oil is considered as an alternative and promising feedstock to further diversified the biodiesel production in the global market.

Q107.) Consider the following statements:



1. The Global Ocean Commission grants licences for seabed exploration and mining in international waters.
2. India has received licences for seabed mineral exploration in international waters.
3. 'Rare earth minerals' are present on seafloor in international waters.

Which of the statements given above are correct?

- a) 1 and 2 only
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- The Global Ocean Commission was an international initiative between 2013 and 2016 to raise awareness, and promote action to address, the degradation of the ocean and help restore it to full health and productivity.
- Licences for seabed exploration and mining in international waters are granted by International Seabed Authority (ISA).
- India has been exploring deep sea for minerals since 1981. In 2017, India's exclusive rights to explore polymetallic nodules from seabed in Central Indian Ocean Basin (CIOB) have been extended by five years.
- The deep seabed contains two potential sources for rare earth elements: polymetallic nodules which typically contain manganese, nickel, copper, cobalt and rare earth minerals; and seafloor hydrothermal vents which pump out rare-earth elements dissolved in their hot fluids.
- UNESCO has declared 2021-2030 as 'Ocean Decade' with focus on sustainable development models for clean, healthy, safe, productive and engaging oceans by developing multi-hazard warning systems, acting on pollution, deep sea mining and so on.



Q108.) In the context of India's preparation for ClimateSmart Agriculture, consider the following statements:



1. The 'Climate-Smart Village' approach in India is a part of a project led by the Climate Change, Agriculture and Food Security (CCAFS), an international research programme.
2. The project of CCAFS is carried out under Consultative Group on International Agricultural Research (CGIAR) headquartered in France.
3. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India is one of the CGIAR's research centres.

Which of the statements given above are correct?

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- Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate.
- In Climate-Smart Villages, farmers and researchers test and implement portfolios of climate smart agricultural practices, technologies, and services, which can be combined together to make the best out of an increasingly difficult situation.
- Climate Change, Agriculture and Food Security (CCAFS) is an international programme to address the increasing challenge of global warming and declining food security on agricultural practices, policies and measures through a strategic collaboration between CGIAR and Future Earth.
-

- CGIAR is a global partnership that unites international organizations engaged in research about food security headquartered in France.
- CCAFS Climate -Smart Villages (CSVs) have successfully combined global knowledge with local action to help farmers sustainably produce more food, while curbing greenhouse gas emissions and increasing resilience to climate change. Hence, statement 1 is correct.
- ICRISAT, a CGIAR Research Center, is a non -profit, non -political public international research organization that conducts agricultural research for development in Asia and sub - Saharan Africa with a wide array of partners throughout the world.

Q109.) The vegetation of savannah consists of grassland with scattered small trees, but extensive areas have no trees. The forest development in such areas is generally kept in check by one or more or a combination of some conditions.

Which of the following are such conditions?

1. Burrowing animals and termites
2. Fire
3. Grazing herbivores
4. Seasonal rainfall
5. Soil properties

Select the correct answer using the code given below:

- a) 1 and 2
- b) 4 and 5
- c) 2, 3 and 4
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- c) 2, 3 and 4**
- d) 1, 3 and 5

- Savanna ecosystems are heterogeneous environments characterized by the presence of trees, bushes, and grasses.
- Nutrient and soil moisture availability are usually the limiting factors affecting the biomass growth in savannas, and overall biomass is impacted by competition, fire, grazing, and harvesting.



Q110.) Consider the following statements:



1. Moringa (drumstick tree) is a leguminous evergreen tree.
2. Tamarind tree is endemic to South Asia.
3. In India, most of the tamarind is collected as minor forest produce.
4. India exports tamarind and seeds of moringa.
5. Seeds of moringa and tamarind can be used in the production of biofuels.

Which of the statements given above are correct?

- a) 1, 2, 4 and 5
- b) 3, 4 and 5
- c) 1, 3 and 4
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- c) 1, 3 and 4
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- Moringa oleifera is a plant that is often called the drumstick tree, the miracle tree, the ben oil tree, or the horseradish tree.
- Moringa has been used for centuries due to its medicinal properties and health benefits.
- It also has antifungal, antiviral, antidepressant, and anti-inflammatory properties.
- It can be evergreen or semi-deciduous.
- Because of which is extensively being grown in semiarid regions in India. Tamarind Tree: Tamarind (*Tamarindus indica*) is a leguminous tree bearing edible fruit that is indigenous to tropical Africa. It is native to Africa or Indian-sub continent and grown in Southeast Asia and Africa as well. Hence, statement 2 is not correct. Most of the tamarind is collected as minor forest produce. Hence, statement 3 is correct. India is one of the largest exporters of both Tamarind and Seed of Moringa. Hence, Statement 4 is correct. Read more on Sarthaks.com - <https://www.sarthaks.com/2801486/consider-following-statements-moringa-drumstick-leguminous-evergreen-tamarind-endemic>

- Tamarind (*Tamarindus indica*) is a leguminous tree bearing edible fruit that is indigenous to tropical Africa.
- It is native to Africa or Indian-sub continent and grown in Southeast Asia and Africa as well.
- Most of the tamarind is collected as minor forest produce.
- The country is also the largest moringa exporter and meets 80 per cent of its world demand.
- Tamarind is exported from India to about 60 countries. Karnataka is the largest producer of tamarind in the country.