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1. **Which of the following statements are correct about Sabarmati River?**

   1. **It Originates from Aravalli hills near Tepur village in Gujrat.**
   2. **It flows through South East direction.**
   3. **Kakrapar Project is built on this river.**

   A. 1 and 2 only

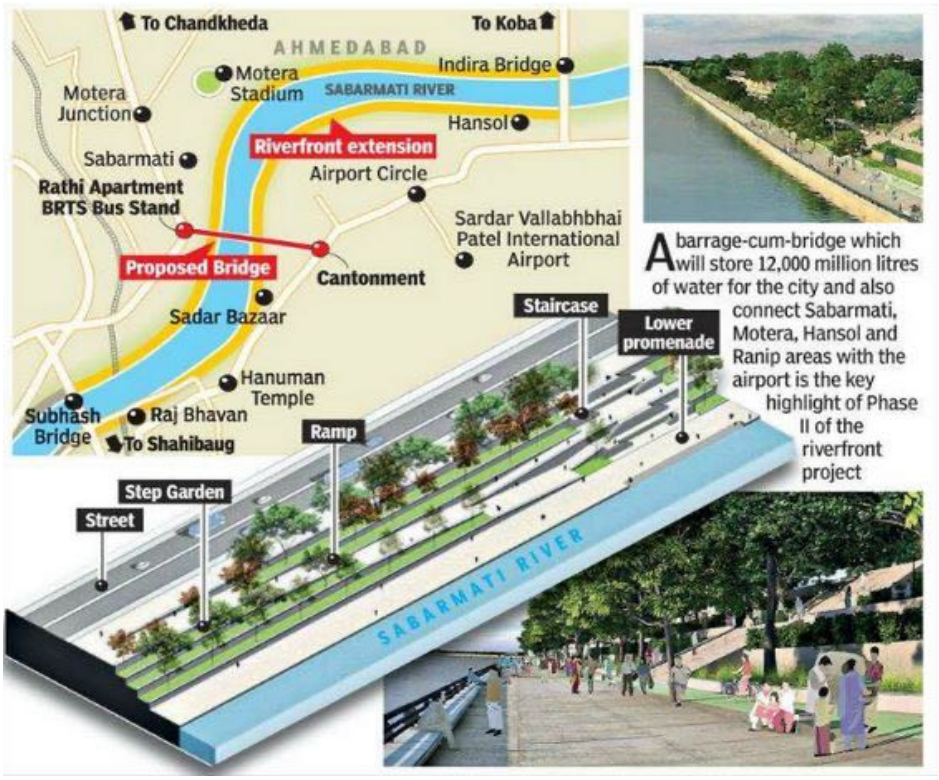
   B. 2 and 3 only

   C. 1 and 3 only

   D. None of the above

Answer: D

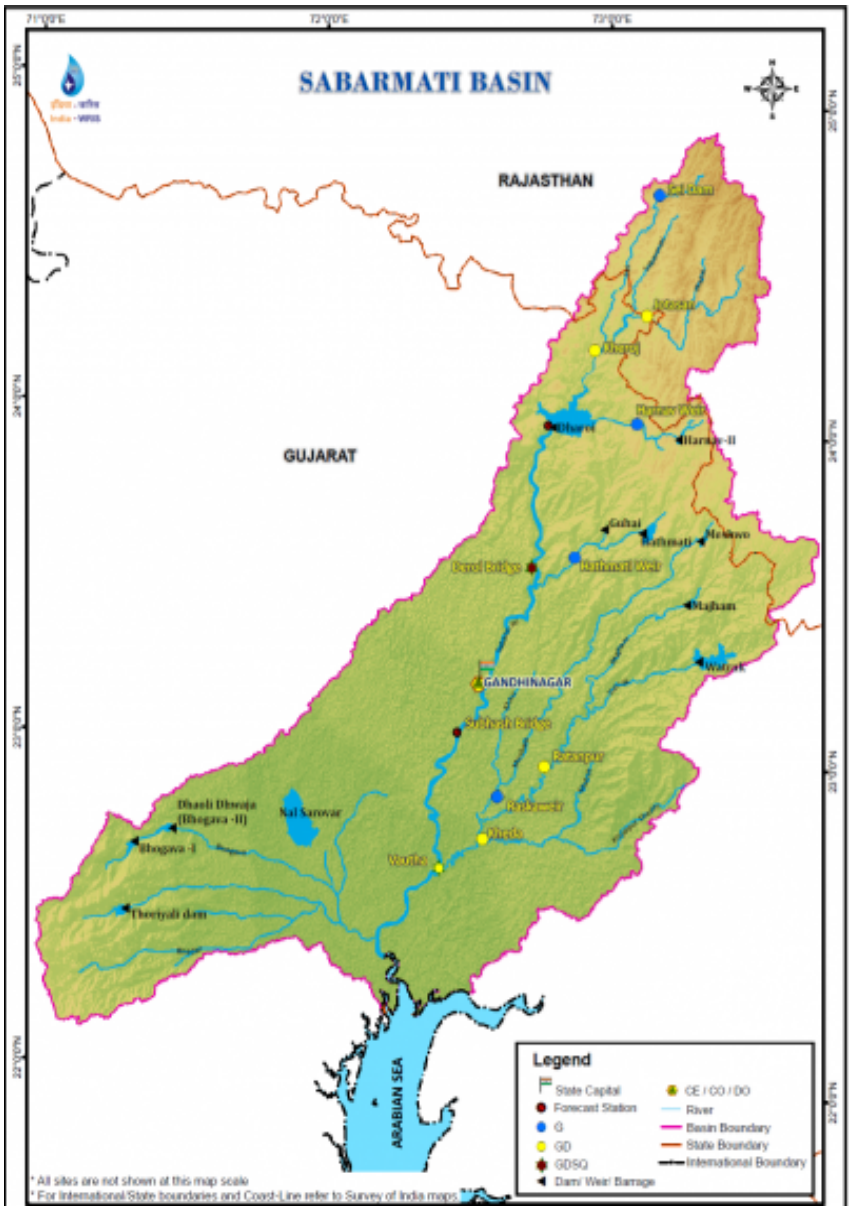
Explanation



- The Ahmedabad Municipal Corporation, in its draft budget for 2021-22, has set aside Rs 1050 crore for the Sabarmati River Front Development phase 2, work on which is to begin soon.
- Sabarmati Riverfront Development Project.
- The SRDP is an environmental improvement, social uplift and urban rejuvenation project that will renew Ahmedabad.
- The project is being developed by the Sabarmati Riverfront Development Corporation Ltd. (SRFDCL), a company wholly owned by the Ahmedabad Municipal Corporation.
- The project will reclaim approximately 200 hectares of land from the riverbed.
- To reclaim the land, protect low lying developments from floods, and prevent erosion of the river banks, retaining walls have been built on both sides of the river.
- Since Sabarmati is a seasonal river, water is channelled into the river from the Narmada canal, which intersects the river upstream from Ahmedabad and is retained in the river using the Vasna Barrage which is located downstream.
- The project has won Prime Minister's National Award for Excellence in Urban Planning and Design in the year of 2003.

Sabarmati River

- It is one of the west flowing rivers along with Narmada and Tapti.
- It Originates from Aravalli hills near Tepur village in Udaipur Dist of state Rajasthan. It flows through South West direction.
- Mouth of the river : Gulf of Cambey (Khambhat)
- Ahmedabad city is located along the bank of this river.



Tributaries

- Right Tributaries :
  - ✓Sei
  - ✓Siri
  - ✓Dhamni
- Left Tributaries
  - ✓Wakal
  - ✓Harnav
  - ✓Hathmati
  - ✓ Khari
  - ✓Watrak

- The river runs through two states Rajasthan and Gujarat .
- The basin is bounded by: Aravalli hills on the north and North East, Rann of Kutch on the west ,Gulf of Khambhat on the south.
- The river basin is roughly triangular in shape.
- Most of its tributaries rises from Aravalli hills and joins with Sabarmati river at different points .
- Harnav river rises at Kulalia hills in the state of Rajasthan.
- Watrak River rises at Panchara hills in the state of Rajasthan
- Dharoi Dam is located on the Main Sabarmati River .
- Other Dams
  - ✓Hathmati Dam
  - ✓Harnav Dam
  - ✓Guhai Dam

✓ Meshvo Reservoir

✓Mazam Dam

✓Watrak Dam.

2. Asia's Largest Tulip Garden is situated in

A. Uttarakhand

B. Jammu Kashmir

C. Himachal Pradesh

D. Sikkim

Answer: B

Explanation

- Asia's largest Tulip Garden in Srinagar, Jammu & Kashmir, is scheduled to be opened for general public and tourists from March 25, 2021.
- Tulip flowers have blossomed in the lap of Zabarwan Hills along the banks of Dal Lake in Srinagar city.
- Around 15 lakh flowers of more than 64 varieties are in full bloom nowadays in the garden
- Indira Gandhi Memorial Tulip Garden : The garden was previously known as Model Floriculture Center. It is the largest tulip garden in Asia spread over an area of 74 acres.
- It is situated on the foothills of Zabarwan Range in Dal Lake of Srinagar.
- Tulip garden was inaugurated in 2007 with the aim of boosting floriculture and tourism in Kashmir Valley.
- It is built on a sloping ground in terraced fashion comprising of seven terraces.
- Many other species of flowers like daffodils, hyacinths, and ranunculus have also been added to the garden.
- Tulip festival is an annual celebration that showcase the range of flowers in tulip garden as a part of tourism efforts by the state Government.
- Festival is organized on the onset of spring season in Kashmir valley.
- Tulips are a genus of spring-blooming perennial herbaceous bulbiferous geophytes.
- Tulips are generally large, showy and brightly coloured.
- They have a different coloured blotch at the base of their tepals internally. The flower is a member of lily family called Liliaceae.

Zabarwan Range

- It is a 32 km long sub-mountain range between Pir Panjal and Great Himalayan Range located in central part of Kashmir Valley. It borders central part of Kashmir Valley to the east.

- It is surrounded specifically by Sind Valley in North, Lidder Valley in south, Zanskar Range in east and Jehlum Valley in west.
- Shankaracharya Temple is built on edge of the central part of Zabarwan Range.
- Highest peak of the range is Mahadev Peak.

3. The term "Phumdis'' is related to which of the following lakes

A. Sangetsar Lake

B. Loktak Lake

C. Umiam Lake

D. Palak Lake

Answer: B

Explanation

Loktak lake

- It is the largest freshwater lake in North -East India and is famous for the phumdis (heterogeneous mass of vegetation, soil and organic matters at various stages of decomposition) floating over it.
- Keibul Lamjao is an integral part of the lake and is the only floating national park in the world.
- It is located near Moirang in Manipur.
- The etymology of Loktak is Lok = "stream" and tak = "the end".
- The largest of all the phumdis covers an area of 40 km2 (15 sq mi) and is situated on the southeastern shore of the lake.
- This ancient lake plays an important role in the economy of Manipur.
- It serves as a source of water for hydropower generation, irrigation and drinking water supply.
- The lake is also a source of livelihood for the rural fishermen who live in the surrounding areas and on phumdis and catch their fish by using various nets and indigenous traps.
- Human activity has led to severe pressure on the lake ecosystem.
- There are 55 rural and urban hamlets around the lake which have a population of about 100,000 people.
- There have been rising urbanisation and land-use change over the years in and around the Loktak Lake.
- The lake has become a dump-yard for the city's municipal waste, ranging from plastic refuse to chemical runoff from farming.
- The situation worsens during years of floods.
- Though the Loktak Lake is yet to see worrying levels of pollution, early signs suggest that there is a need to be wary.

✓ Major Pollutant Instead of Carbon Dioxide, Nitrogen is a major pollutant in the lake.

✓ pH of the lake: The pH of the lake, as per measurements so far, varies from 6.8-7.2 (ideally the pH of a healthy lake should be slightly below 7).

- However, studies of ocean acidification have shown that even a 0.1 increase in pH can cause (harmful) decalcification.

Calcium anomalies

- There are signs of calcium anomalies in some of the mollusc and other aquatic life in the lake.
- This is similar to the phenomenon of coral bleaching in oceans, where rising sea surface temperature cause organisms that live on corals to disengage, thereby killing the corals themselves.

Effect on Phumdis

- The health of the lake also affects the Phumdis (the unique 'floating islands') of the Loktak lake.
- These islands are made of a mix of vegetation and soil.
- These coalesce to form a thick mat that, for centuries, have hosted huts and fishing settlements.
- Considering the ecological status and its biodiversity values, the lake was initially designated as a wetland of international importance under the Ramsar Convention on 23 March 1990.
- It was also listed under the Montreux Record on 16 June 1993.
- Montreux Record is a record of Ramsar sites where changes in ecological character have occurred, are occurring or are likely to occur.

4. State of the Global Climate report is released by

A. United Nations Environment Programme

B. The International Union for Conservation of Nature

C. United Nations Framework Convention on Climate Change

D. World Meteorological Organization

Answer: D

Explanation

- The World Meteorological Organization(WMO) releases the annual State of Global Climate Report to keep a track of global warming.

Key Highlights from the 2020 report

- Hottest Year: 2020 will be one of the three hottest years just behind 2016 and 2019.
- Rise in Global Temperature: The global mean surface temperature for January-October 2020 was 1.2 degree Celsius higher than the pre-industrial baseline (1850-1900).For that period, 2020 is the second- warmest year on record.
- High Temperature over Ocean Surfaces: 80% of ocean areas have experienced at least one marine heat wave (MHW) so far in 2020.

- Global sea-level rise was also similar to 2019 value.This was mainly due to the increased melting of the ice sheets in Greenland and Antarctica.
- Consequences: Extreme weather events such as tropical cyclones, floods, heavy rainfall and droughts were the consequence of global warming that impacted many parts of the world.
- World Meteorological Organization(WMO):
  - ✓It is an intergovernmental organization established by the ratification of the WMO Convention in 1950.
  - ✓Members: 193 Member States and Territories.
  - ✓Significance: It is a specialized agency of the United Nations (UN).
  - ✓Headquarters: Geneva, Switzerland.

5. Which of the following statements are correct about Zero Budget Natural Farming (ZBNF) ?

1. Mulching is associated with ZBNF.

2. Vermicomposting is an integral part of ZBNF.

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

Explanation

- Zero Budget Natural Farming (ZBNF) is a type of chemical-free farming where the total cost of growing and harvesting plants comes out to be zero (taking into consideration the costs incurred by the farmers are recovered through inter-cropping) .
- The topic, 'Zero Budget Natural Farming,' gained prominence when Finance Minister mentioned it in her 2019 budget speech, speaking of it as a source of doubling farmers' income.
- Subash Palekar (Indian Agriculturist and Padma Shri Recipient) is the father of Zero Budget Natural Farming.
- He developed it in the mid-1990s as an alternative to the Green Revolution methods.
- Jeevamrutha' is applied in farming. Jeevamrutha is the mixture of:
  - ✓Fresh desi cow dung
  - ✓Aged desi cow urine
  - ✓Jaggery
  - ✓Pulse flour Water and Soil

- It helps in the addition of nutrients in the soil and also in catalysing the microbial activities in the soil.
- A mixture called 'Bijamrita' ('Bija' stands for seed) is used for the treatment of seeds while another mixture of neem leaves and pulp, tobacco and green chillies is used as an insecticide
- Acchadana is Mulching, associated with Zero Budget Natural Farming while Whapasa is a condition where there is a presence of both air molecules and water molecules in the soil.
- Whapasa helps in reducing irrigation requirements.
- Apart from the least cost incurred in this type of farming, the Zero Budget Natural Farming also promotes:
  - ✓Soil aeration
  - ✓Minimal watering
  - ✓Intercropping
  - ✓Bunds and
  - ✓Topsoil mulching
- Intensive irrigation and deep ploughing is not promoted in Zero Budget Farming.
- Vermicomposting which is a method of using earthworms as a means to enhance organic waste conversion; is not supported in Zero Budget Natural Farming.
- Palekar mentioned that European Red Wiggler (Most common composting Earthworm) that are used in vermicomposting absorb toxic metal and poison the soil.

6. Based on the following statements, identify the reserve

1. **It is located in the Vindhya Hills of the Umaria district in Madhya Pradesh.**
2. **It is known for the Royal Bengal Tigers.**
3. **It was declared as a national park in 1968.**
4. **Its name has been derived from the most prominent hillock of the area of Umaria.**
5. **It consists of mixed vegetation ranging from tall grasslands to thick Sal forest.**
6. **It resides on the extreme north eastern border of Madhya Pradesh and the northern edges of the Satpura mountain ranges.**

A. Pachmarhi Biosphere Reserve

B. Bandhavgarh National Park

C. Kanha National Park

D. Madhav National Park

Answer: B

Explanation

- The wildfire was reported a few days back in parts of the
- Bandhavgarh Tiger Reserve (BTR) located in Umaria district.
- Burning of leaves to collect Mahua flowers, lighting a fire to keep wild elephants away or a burning cigarette butt left by someone may have caused the recent blaze in Madhya Pradesh's Bandhavgarh Tiger Reserve.
- Bandhavgarh National Park is spread at Vindhya hills in Madhya Pradesh.
- It is known for the Royal Bengal Tigers.
- The density of the Tiger population at Bandhavgarh is the highest known in India.
- Bandhavgarh National Park consists of mixed vegetation ranging from tall grasslands to thick Sal forest and so is the perfect habitat of variety of animals and birds.
- Bandhavgarh was declared a national park in 1968 and then became Tiger Reserve in 1993.
- The word Bandhavgarh is a combination of two words: Bandhav+ Garh where Bandhav means brother and Garh means Fort.
- The name Bandhavgarh given to the reserve is due to the presence of an ancient fort in the hillock of the Vindhya ranges of Umaria.
- It has been believed that Lord Rama gifted this amazing fort to his younger brother Lakshmana.
- In the 2019 census Madhya Pradesh state recorded the most number of estimated tigers at 526, thus earning the title "Tiger State".

7. Which of the following hold true about the criterion to declare a protected area as a Biosphere Reserve?

1. **A site must contain a protected and minimally disturbed buffer area of value of nature conservation.**
2. **Core area must be a bio-geographical unit and should be large enough to sustain a viable populations representing all trophic levels.**
3. **The involvement of local communities and use of their knowledge in biodiversity preservation.**
4. **Areas potential for preservation of traditional tribal or rural modes of living for harmonious use of the environment.**

A. 1 ,2 and 3 only

B. 1 and 4 only

C. 2, 3 and 4 only

D. 1, 2, 3 and 4

Answer: C

Explanation

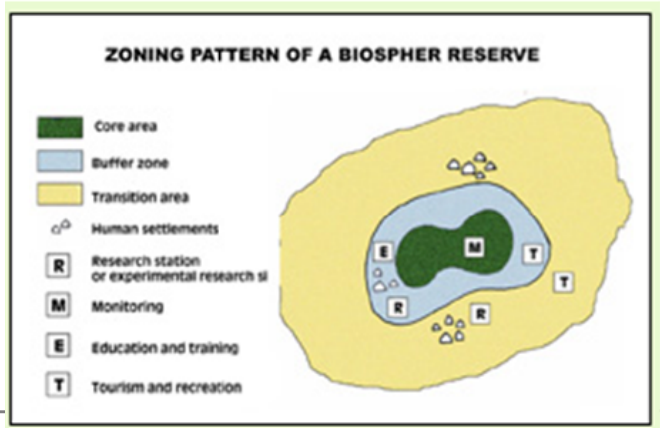
- The Odisha government has proposed a second biosphere reserve in the southern part of the state at Mahendragiri, a hill ecosystem having rich biodiversity.
- The 5,569-square kilometre Similipal Biosphere Reserve is Odisha's first such reserve and was notified May 20, 1996.
- Mahendragiri Biosphere Reserve is around 470,955 hectares and is spread over Gajapati and Ganjam districts in the Eastern Ghats.
- The hill ecosystem acts as a transitional zone between the flora and fauna of southern India and the Himalayas, making the region an ecological estuary of genetic diversities.
- Mahendragiri is inhabited by the Soura people, a particularly vulnerable tribal group as well as the Kandha tribe.
- Biosphere Reserve (BR) is an international designation by United Nations Educational, Scientific and Cultural Organization (UNESCO) for representative parts of natural and cultural landscapes extending over large areas of terrestrial or coastal/marine ecosystems or a combination of both.
- Biosphere Reserves tries to balance economic and social development and maintenance of associated cultural values along with the preservation of nature.
- The concept of Biosphere Reserves was launched in 1971 as a, part of United Nations Educational, Scientific and Cultural Organization (UNESCO)'s 'Man and Biosphere Programme'.

Aim of Biosphere Reserve

- conservation of genetic resources, species, and ecosystems; scientific research and monitoring; and
- Promoting sustainable development in communities of the surrounding region.

Zonation:

- Core Areas:
  - ✓Includes protected areas-these act as reference points on the natural state of the ecosystems represented by the biosphere reserves
  - ✓non-destructive research and other low-impact activities(such as ecotourism) are generally undertaken
- Buffer Zone:
  - ✓Surrounds or is contiguous to the core area.
  - ✓Activities are organized so they do not hinder the conservation objectives of the core area, but rather help to protect it.
  - ✓It is used for cooperative activities compatible with sound ecological practices Human activities are less intensive than that in the transition zone
- Transition Zone or Area of Cooperation:



✓ May contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, NGOs, and other stakeholders work together to manage and sustainably develop the area's resources.

✓ The term 'area of cooperation' underscores the role of cooperation as the main tool to achieve the objectives of the biosphere reserve.

8. National Wildlife Genetic Resource Bank is located in

A. Goa

B. Chennai

C. Dehradun

D. Hyderabad

Answer: D

Explanation

- National Wildlife Genetic Resource Bank was inaugurated at Centre for Cellular and Molecular Biology's (CCMB) Laboratory of Conservation of Endangered Species (LaCONES) facility in Hyderabad, Telanagana.
- It is India's first genetic resource bank where genetic material will be stored for posterity which will further the cause of conservation of endangered and protected animals.
- It is equipped with sophisticated equipment to preserve the genetic resources that could be utilised to virtually resurrect an animal species in case it goes extinct.
- It will cryopreserve living cell lines, gametes and embryos of endangered wild animal species in India.
- For cryogenic preservation, researchers at CCMB-LaCONES will use liquid Nitrogen that is cooled down to as low as minus 195 degrees Celsius.
- It will aid wild life conservation efforts by taking up artificial reproduction, conducting studies in evolution biology and wildlife medicine.
- Thus, it will also help in protecting India's biodiversity and environment.
- So far this bank has collected and preserved genetic resources of 23 species of Indian wild animals.

9. Which of the following statements about REDD+ are correct

1. **It is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).**
2. **It creates an ecological value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.**
3. **Developing countries receive results-based payments for results-based actions.**

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: C

Explanation

- A new study by Delhi-based non-profit Centre for Science and Environment (CSE) has revealed that Reducing Emissions from Deforestation and Forest Degradation (REDD+), the programme initiated by the United Nations in 2005 to mitigate climate change through enhanced forest management in developing countries, has largely failed to achieve its objectives.(news from 2018)
- Large-scale finance for REDD+ has been a major issue as carbon markets have not materialised and international funding commitments for REDD+ have been much lower than expected.
- REDD+ implementation costs have been high and benefits for local communities from REDD+ projects have been minimal.
- There is need to rethink the REDD+ mechanism based on these experiences and the findings emerging from new research on the potential of forests to mitigate climate change.
- India's REDD+ strategy Complying with the UNFCCC decisions on REDD+, India has prepared its National REDD+ Strategy.
- The Strategy builds upon existing national circumstances which have been updated in line with India's National Action Plan on Climate Change, Green India Mission and India's Nationally Determined Contribution (NDC) to UNFCCC.
- The strategy report has been prepared by Indian Council of Forestry Research & Education (ICFRE), Dehradun.

REDD+

- In simple terms, REDD+ means "Reducing Emissions from Deforestation and forest Degradation", conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing countries.
- REDD+ is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
- It creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.
- Developing countries would receive results-based payments for results-based actions.
- REDD+ goes beyond simply deforestation and forest degradation and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
- Since its formalisation in 2006, REDD+ had emerged as the most prominent global mechanism to integrate the role of forests in climate change.

- It was touted as a win-win situation for biodiversity conservation, carbon sequestration and local livelihoods.
- More than 300 REDD+ initiatives have taken off since 2006.
- The mechanism has been enshrined in the Paris Agreement of 2015, and its implementation is transitioning from smaller, isolated projects to larger, jurisdictional programmes with support from bilateral and multilateral agencies.

10. Consider the following

1. **.Left Tributaries – Burhner , Banjar, Sher, Shakkar, Dudhi, Tawa, Ganjal, Kundi, Goi, Karjan**
2. **Right Tributaries – Hiran , Tendoni, Barna, Kolar, Man, Uri , Hatni, Orsang**
3. **It is bounded by - the Vindhyas on the north, the Maikala range on the east, the Satpuras on the south, the Arabian Sea on the west.**

Identify the river

A. Chambal

B. Narmada

C. Betwa

D. Godavari

Answer: B

Explanation

- Narmada is the largest west flowing river of the peninsular India.
- Narmada basin lies in the states of Madhya Pradesh, Gujarat, Maharashtra and Chhattisgarh.

- The total area of this river basin is 98,796 Sq.km. It is bound by -

✓the Vindhyas on the north,

✓ the Maikala range on the east,

✓ the Satpuras on the south

✓ the Arabian Sea on the west.

- It rises from Maikala range near Amarkantak in Anuppur district of Madhya Pradesh. Narmada drains into the Arabian Sea through the Gulf of Khambhat.
- The major part of basin is covered with agriculture accounting to 56.90%.

Left Tributaries

- The Burhner
- The Banjar
- The Sher
- The Shakkar
- The Dudhi
- The Tawa
- The Ganjal
- The Kundi
- The Goi
- The Karjan

Right Tributaries

- The Hiran
- The Tendoni
- The Barna
- The Kolar
- The Man
- The Uri
- The Hatni
- The Orsang

The major Hydro Power Project in the basin are Indira Sagar, Sardar Sarovar, Omkareshwar, Bargi & Maheshwar.

- Dams in Narmada river -

✓ Sardar Sarovar Dam- Gujarat

✓ Indira Sagar Dam – Madhya Pradesh

✓ Omkareshwar Dam – Madhya Pradesh

✓Maheshwar Dam – Madhya Pradesh

✓Bargi Dam – Madhya Pradesh

✓Maan Dam – Madhya Pradesh

✓Jobat Dam – Madhya Pradesh

✓Tawa Dam – Madhya Pradesh

11. Consider the following

1. **Bio-venting**
2. **Bio-augmentation**
3. **Bio-reactors**

Which of the above is/are In-situ bio-remediation techniques?

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: A

Explanation

- Bioremediation techniques are destruction techniques to stimulate the growth of micro-organisms, using the contaminants as a food and energy source.
- These techniques have been successfully used to remediate soils/sludges & groundwater contaminated by petroleum hydrocarbons, solvents, pesticides, wood preservatives, and other organic chemicals.
- Oxygen, water & nutrients are added, and the temperature and pH are controlled.
- In situ
  - ✓Bio Sparging
  - ✓Bio-venting
  - ✓Bioslurping
  - ✓Phyto-remediation
- Ex situ
  - ✓Bio-reactor
  - ✓Land farms
  - ✓Bio- piles

12. Which of the following are the Ecological Causes of Coral Bleaching?

1. **Xenobiotics**
2. **Temperature**
3. **Sedimentation**
4. **Epizootics**

Choose the correct option from below

A. 1, 3 and 4 only

B. 1, 2 and 3 only

C. 2 and 3 only

D. 1, 2, 3 and 4

Answer: D

Explanation

- Coral Bleaching Bleaching, or the paling of coral colour occurs when
  - ✓ the densities of zooxanthellae decline and
  - ✓ the concentration of photosynthetic pigments within the zooxanthellae fall.
- Ecological causes of coral bleaching -
  - ✓ Temperature (Major Cause)
  - ✓ Sub aerial Exposure-Sudden exposure of reef flat corals to the atmosphere during events such as extreme low tides,
  - ✓ ENSO-related sea level drops or tectonic uplift can potentially induce bleaching.
  - ✓ Sedimentation
  - ✓ Fresh Water Dilution
  - ✓ Inorganic Nutrients(e.g. ammonia and nitrate)
  - ✓ Xenobiotics
  - ✓ Zooxanthellae loss occurs during exposure of coral to elevated Concentrations of various chemical contaminants, such as Cu, herbicides and oil.
  - ✓ Epizootics

13. Forest-PLUS 2.0 has been launched by

A. India's Ministry of Environment and UNFCCC

B. World Bank and UNFCCC

C. World Bank and US Agency for International Development

D. India's Ministry of Environment and US Agency for International Development

Answer: D

Explanation

- US Agency for International Development (USAID) and India's Ministry of Environment, Forest and Climate Change (MoEF&CC) officially launched Forest-PLUS 2.0 on September 25, 2019.
- It is a five-year programme initiated in December 2018 that focuses on developing tools and techniques to bolster ecosystem management and harnessing ecosystem services in forest landscape management.
- Tetra Tech ARD, a consulting and engineering company headquartered in the US, was given the contract to implement the programme and IORA Ecological Solutions, a New Delhi-based environmental advisory group, is its implementation partner.
- Forest-PLUS 2.0, the second set of pilot projects, is meant to enhance sustainable forest landscape management after Forest-PLUS completed its five years in 2017.
- The programme's first set focused on capacity building to help India participate in Reducing Emissions from Deforestation and forest Degradation (REDD+).
- It included four pilot projects in Sikkim, Rampur(HP), Shivamogga(Karnataka) and Hoshangabad(MP).

14. Consider the following statements with respect to N2O emission.

1. **It has the highest concentration in our atmosphere among greenhouse gases responsible for global warming.**
2. **As per recent study, a major proportion of the N2O emissions in the last four decades came from the agricultural sector.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- It has the third-highest concentration — after CO2 and methane — in our atmosphere among greenhouse gases responsible for global warming.
- As per recent study, a major proportion of the N2O emissions in the last four decades came from the agricultural sector.

- The research was conducted through an international collaboration between the International Nitrogen Initiative (INI) and the Global Carbon Project of Future Earth, a partner of the World Climate Research Programme.
- This is the most comprehensive study of global nitrous oxide emissions ever published, as it combines both natural and anthropogenic (man-made) sources.
- The study found that 43% of the total emissions came from human sources and most N2O emissions came from emerging countries like India, China and Brazil.
- A major proportion of the N2O emissions in the last four decades came from the agricultural sector, mainly because of the use of nitrogen-based fertilisers.

15. Consider the following statements with respect to Brown to Green Report

1. **The Brown to Green Report is the world's most comprehensive review of BRICS climate action.**
2. **The report is been published by Climate Transparency. Which of the above statements is/are correct?**

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- The Brown to Green Report is the world's most comprehensive review of G20 climate action.
- The report is been published by Climate Transparency.
- It provides concise and comparable information on G20 country mitigation action, finance and adaptation.
- Developed by experts from 14 research organisations and NGOs from the majority of the G20 countries, the report covers 80 indicators.
- It informs policy makers and stimulates national debates.
- The Summary Report 2019 provides a comprehensive overview of all G20 countries, whether – and how well – they are doing on the journey to transition towards a net-zero emissions economy. The report draws on the latest emissions data from 2018 and covers 80 indicators on decarbonisation, climate policies, finance and vulnerability to the impacts of climate change. Providing country ratings, it identifies leaders and laggards in the G20.
- India's greenhouse gas (GHG) emissions are – per capita – far below the G20 average.

16. Which of the following statements are correct about National Level Climate Vulnerability report?

1. **The Common Framework for Vulnerability Assessment was created based on the Assessment report of the Intergovernmental Panel on Climate Change.**
2. **It is being released by The Department of Science and Technology.**

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

Explanation

- The Department of Science and Technology is to release a National Level Climate Vulnerability report.
- The title of the report is "Climate Vulnerability Assessment for Adaptation Planning in India using a Common Framework".
- The report was generated based on a joint exercise by the Swiss Agency for Development and Cooperation and Department of Science and Technology.
- The report identifies the most vulnerable states and districts to climate change. Around 24 states and two Union territories participated in the nation-wide exercise.
- Several climate vulnerability assessments for different states and districts already exists.
- However, these assessments cannot be compared with each other as the framework used for the assessment is different.
- This limits the decision-making capabilities at administrative and policy levels. Thus, a Common vulnerability Framework was created.
- The Common Framework for Vulnerability Assessment was created based on the fifth Assessment report of the Intergovernmental Panel on Climate Change.
- This framework was developed by IISc Bangalore, IIT Guwahati and IIT Mandi.
- The framework was applied to the Indian Himalayan regions involving twelve states.
- It was highly successful. Thus, the framework was rolled out based on the framework for the entire country.
- This vulnerability is highly important, especially in developing countries like India. It will help to develop suitable adaptation projects and programmes.
- The report will help policy makers to initiate appropriate climate actions. The DST is implementing two main national missions.
- They are National Mission on Strategic Knowledge for Climate Change and National Mission for Sustaining the Himalayan Ecosystem.

17. Based on the following statements, identify the river?

1. **It is a river in Meghalaya.**
2. **It is considered to be India's clearest river.**
3. **The river attracts many tourists to Dawki bordering Bangladesh.**
4. **The river is the natural boundary between Jaintia Hills and Khasi Hills.**

A. Umngot

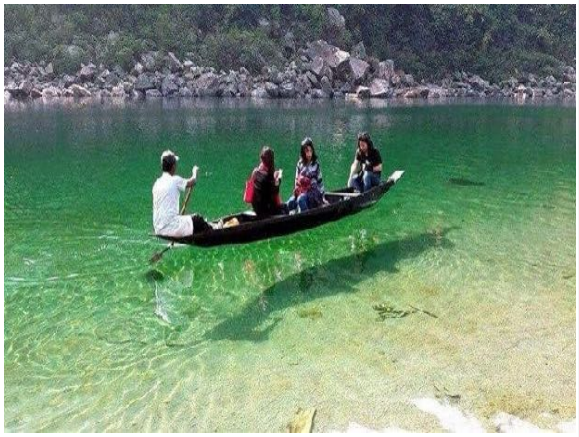
B. Thenad

C. Dihing

D. Tlawng

Answer: A

Explanation



- There is a stiff resistance from at least 12 villages in Meghalaya on a 210 MW hydroelectric project on Umngot.
- The villages are near the border with Bangladesh in East Khasi Hills district but the dam is proposed upstream in the adjoining West Jaintia Hills district.
- The locals fear that the project, if executed, would cause irreparable losses by wiping out their areas from the tourism map, besides affecting many villages in the downstream areas dependent on the Umngot.
- The project documents say people of 13 villages along the Umngot are likely to lose 296 hectares of land due to submergence if the dam comes up.
- Not all villages are opposed to the project, though. People of at least four of them have mobilised support for the dam.
- The Umngot river attracts many tourists to Dawki bordering Bangladesh.
- The water of the river is so clear that boats seem to rest on a crystal glass surface besides casting their shadows on the river bed.

18. Which of the following statements are correct about One Horned Rhinos?

1. **These are the only Rhinos found in India.**
2. **It is the largest of the rhino species.**
3. **IUCN Red List - Endangered.**
4. **They are the only Omnivorous Rhinos.**

A. 1, 2 and 3 only

B. 1 and 2 only

C. 3 and 4 only

D. None of the above

Answer: B

Explanation

- Two adult one-horned rhinos were recently translocated from Pobitora Wildlife Sanctuary to Manas National Park, under the aegis of the Indian Rhino Vision 2020 (IRV 2020).
- With this last leg of wild-to-wild translocation under IRV2020, a total of 22 rhinos have been translocated from Pobitora Wildlife Sanctuary (12) and Kaziranga National Park (10) to Manas National Park.
- About the Indian Rhino Vision 2020 (IRV 2020)
  - ✓ It was launched in 2005.
  - ✓IRV 2020 is an initiative led by the Forest Department, Government of Assam, in partnership with WWF India, International Rhino Foundation, and several other organizations.
  - ✓The goal of IRV2020 was to increase the rhino population in Assam to 3,000 by establishing populations in new areas.
  - ✓Rhinos are now found in four Protected Areas in Assam - Pobitora Wildlife Reserve, Rajiv Gandhi Orang National Park, Kaziranga National Park, and Manas National Park.

One- horned rhinos

- Only the Great One-Horned Rhino is found in India.
- Also known as Indian rhino, it is the largest of the rhino species.
- It is identified by a single black horn and a grey-brown hide with skin folds.
- They primarily graze, with a diet consisting almost entirely of grasses as well as leaves, branches of shrubs and trees, fruit, and aquatic plants
- IUCN Red List: Vulnerable.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): Appendix I (Threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial, for instance for scientific research).
- Wildlife Protection Act, 1972: Schedule I.
- 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.

- The Ministry of Environment Forest and Climate Change (MoEFCC) has begun a project to create DNA profiles of all rhinos in the country.
- National Rhino Conservation Strategy: It was launched in 2019 to conserve the greater one-horned rhinoceros.

19. Mettur-Sarabanga lift irrigation project is being built in which state?

A. Karnataka

B. Telangana

C. Kerala

D. Tamil Nadu

Answer: D

Explanation

- National Green Tribunal has allowed the Tamil Nadu government to proceed with the Mettur-Sarabanga lift irrigation project and has dismissed an application seeking a stay on the project.
- The application claimed that prior environmental clearance was not obtained before work for the project commenced.
- It also alleged irregularity in the construction of the project and said the project was envisaged in total disregard of riparian rights of the delta farmers.
- Also, since the project involved the interests of Tamil Nadu, Karnataka and Kerala, clearance from the Central government was required.

NGT Ruling

- The proposed irrigation area under the project was 4,238 acres of land, which was less than 2,000 hectares and as per the amended 2018 EIA Notification, the project fell under the category of minor irrigation systems that are expressly exempted from the requirement of environmental clearance.
- Besides, the water received from Karnataka was only being regulated and that water from the Mettur dam was not being shared by any two States and was being utilised only for the benefit of Tamil Nadu. Hence, there was no necessity for obtaining permission from any other authorities.

About the Project

- Being implemented by Tamil Nadu Government.
- The project is aimed at irrigating 4,200 acres of land in Edappadi, Omalur, Sankagiri and Mettur taluks, diverting surplus water from Mettur reservoir through 100 tanks, lakes and ponds.

20. Recently heard in news, Monkeydactyl is related to which of the following?

A. Zoonosis

B. African Fever

C. Reptile

D. Lantana

Answer: C

Explanation

- It is a flying reptile with the 'oldest opposable thumbs'.
- The new pterosaur fossil was discovered in the Tiaojishan Formation of Liaoning, China, and is believed to be 160 million years old.
- It has been named Kunpengopterus antipollicatus, also dubbed "Monkeydactyl".
- The pterosaur species were reptiles, close cousins of dinosaurs and the first animals after insects to evolve powered flight
- Opposability of the thumb is being able to "simultaneously flex, abduct and medially rotate the thumb" in a way that one is able to bring the tip of the thumb to touch the tips of the other fingers.
- Along with humans, some ancient monkeys and apes also had opposable thumbs.

21. An ecological succession that started life on newly exposed coastal sand is termed as

A. Lithosere

B. Hydrosere

C. Psammosere

D. Halosere

Answer: C

Explanation

- A psammosere is an ecological succession that started life on newly exposed coastal sand.
- In addition, sand dune systems are the dynamic elements of the landscape and they're the most common psammoseres.
- Also, what defines the growth of the sand dunes is the interrelationship between the sand and the vegetation.
- In a psammosere, the organisms nearest to the ocean are pioneer species, salt- tolerent species.
- For instance, littoral algae and glasswort with marram grass stabilize the dunes. The natural successions of dunes are determined by the progressing inland.
- For example, as the land becomes more compact and has better soils, the drainage slows down, the proportion of seashell fragments diminishes, pH drops and the total amount of humus augments.

- Furthermore, birch, willow or rowan are typically the first trees that emerge from the ground.
- With time, however, they will get replaced by slow-growing, bigger trees such as oak and ash.
- This is also known as the climax community, explained as the point where a plant succession does not evolve any further because it has reached equilibrium with its surroundings, peculiarly the climate.
- In a flawless coastal psammosere model, the pH of the soil is regularly alkaline/neutral with a pH of 7.0/8.0 at the seaward border of the sand dune, where shell fragments spare a meaningful component of the sand.
- On top of that, at the climax, mature podsols develops with a pH of 3.5-5.4, followed by a tracking inland across the dunes with a pH of 5.0/4.0.

22. Which of the following characteristics are related to persistent Organic Pollutants (POP'S)?

1. **Synthetically produced organic chemicals**
2. **Potential for long range Transport**
3. **Ability to Biomagnify and bio accumulate in the ecosystem**

A. 1 and 2 only

B. 3 only

C. 2 and 3 only

D. All of the above

Answer: D

Explanation

- Persistent organic pollutants (POPs) are organic compounds that, to a varying degree, resist photolytic, biological and chemical degradation.
- Due to persistence, the pollutants are capable of long-range transport, bioaccumulation and biomagnification.
- Most of the POPs include pesticides, Industrial solvents, polyvinyl chloride, and pharmaceuticals.
- The Other words used are PBTs (Persistent, Bio-accumulative and Toxic) or TOMPs (Toxic Organic Micro Pollutants.)
- The persistent Organic Pollutants generally have -
  - ✓Low Water solubility
  - ✓High lipid solubility - This property leads them to bioaccumulation in animal tissues.
  - ✓Semi volatile - The property of their physico - chemical characteristics that permit these compounds to occur either in the vapour phase or adsorbed on atmospheric particles, thereby facilitating their long range transport through the atmosphere
  - ✓The POPs with higher Molecular weights are more toxic and more persistent generally.

✓Most of the POPs are halogenated and many have Chlorine as a component.

23. Which among the following are the outcomes of Eutrophication?

1. **Algal Bloom**
2. **Depletion of Coral Reefs**
3. **Formation of Swamps**

A. 1 and 3 only

B. 1 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: D

Explanation

- Eutrophication derives from the Greek word eutrophos, meaning nourished or enriched.
- Eutrophication refers to the addition of artificial or non- artificial substances, such as nitrates and phosphates, through fertilizers or sewage, to a fresh water system.
- It can be anthropogenic or natural.It leads increase in the primary productivity of the water body or "bloom" of phytoplankton.
- The overgrowth causes the loss of oxygen in the water leading to severe reductions in fish and other animal populations.

24. Which of the following Ramsar sites is a man made lake?

A. Rudrasagar Lake

B. Bhoj Wetland

C. Chilika Lake

D. Loktak Lake

Answer: B

Explanation

Bhoj Wetland

- The Bhoj Wetland consists of two lakes located in the city of Bhopal.
- The two lakes are the Bhojtal and the Lower Lake, which lie to the west of the city centre.
- It is a manmade reservoir.
- A total of more than 20,000 birds are observed annually.

- The Upper Lake acts as the lifeline of the city supplying 40% of its potable water.
- White storks, black-necked storks, bar-headed geese, spoonbills, etc., that have been rare sightings in the past, have started appearing.
- A recent phenomenon is the gathering of 100-120 sarus cranes in the lake. The largest bird of India, the sarus crane (Grus antigone) is known for its size, majestic flight and lifetime pairing.

25. Which of the following can be an effective source of blue Carbon sink in preventing Ocean acidification?

1. **Sea Grass**
2. **Marshes**
3. **Mangroves**

A. 1, 2 and 3

B. 1 and 3 only

C. 2 and 3 only

D. 1 and 2 only

Answer: A

Explanation

- Carbon Sequestration is the process of capture and long-term storage of carbon dioxide, either from the atmosphere or directly from the point of production (e.g. carbon capture and storage).
- When this process is involved in coastal ecosystem through the mangrove forests, seagrass meadows or intertidal salt marshes, then the stored carbon is known as 'Blue Carbon'.
- Carbon is stored in the soils or the sediments below the vegetation.
- As compare to the rates of terrestrial carbon sequestration, coastal ecosystem sequestration is lower and the deposition of carbon dioxide can continue over a span of 1000 years but it can store carbon for. Along period. Earth surface is covered by two third of water.
- Hence, Coastal ecosystem becomes more relevant for carbon sink.
  - ✓It reduces the negative impact of climate change because coastal ecosystem can trap carbon for long periods of time.
  - ✓It assimilates pollutants like heavy metals, nutrients and suspended matter which will be helpful for improving water quality.
  - ✓It prevents eutrophication (Excessive nutrients in a lake or other body of water, usually caused by runoff of nutrients).
  - ✓It provides jobs and income to local people by improving the health of fisheries ecosystem.
  - ✓It will improve tourism industry, as well as materials for building or ingredients for medicines.
  - ✓it can store carbon for a long period.

26. Which of the following statement(s) is/are incorrect regarding Tso Kar wetland?

1. **It is a part of Ramsar list.**
2. **In 2020, it was added to Montreux Record.**

Select the correct code using the options given below

A. 1 Only

B. 2 Only

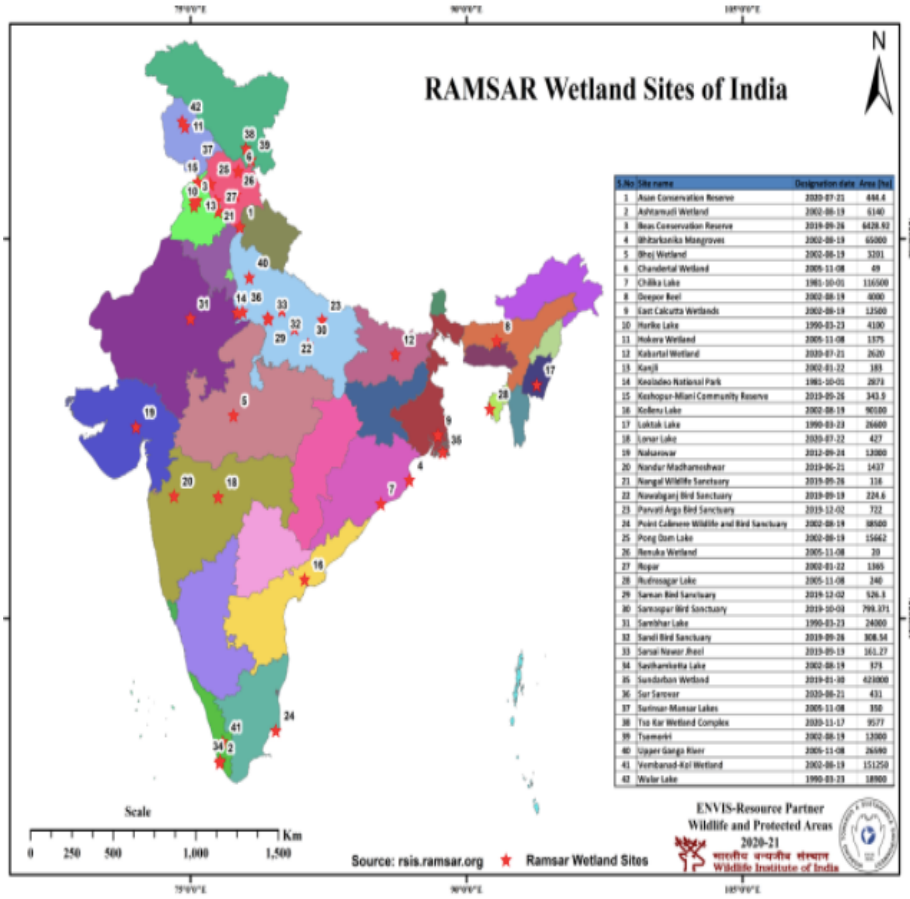
C. Both 1 and 2

D. Neither 1 nor 2

Answer: B

Explanation

Second statement is incorrect.



- At present, two wetlands of India are in Montreux Record,
  - ✓Keoladeo National Park (Rajasthan) and
  - ✓Loktak Lake (Manipur).
- Chilika Lake (Odisha) was placed in the record but later removed from it.
- Recently, India has added Tso Kar Wetland Complex in Ladakh as its 42nd Ramsar site, a conservation status conferred by International Ramsar Convention on Wetlands.
- Previously, the Lonar lake in Maharashtra and Sur Sarovar (also known as Keetham lake) in Agra were added to the list of Ramsar sites.

27. With reference to biospheres of India, which of the following statement(s) is/are correct regarding 'Similipal Biosphere Reserve'?

1. **It brought under Project Tiger in the year 1973.**
2. **Geographically, it lies in the eastern end of the eastern ghat.**

3. **In 2020, it was added to UNESCO World Network of Biosphere Reserve**

Select the correct code using the options given below

A. 1 and 2 only

B. 2 and 3 only

C. 2 only

D. 1, 2 and 3

Answer: A

Explanation

- Third statement is incorrect.
- It has been part of the UNESCO World Network of Biosphere Reserve since 2009.
- Recently, a massive fire broke out in the Similipal Biosphere Reserve in Odisha.
- The core area of the biosphere was untouched by the fire, however the fire is threatening damage to its rich biodiversity.
- Similipal, which derives its name from 'Simul' (silk cotton) tree, is a national park and a tiger reserve situated in the northern part of Odisha's Mayurbhanj district.
- Similipal and the adjoining areas, comprising 5,569 sq km, was declared a biosphere reserve by the Government of India on June 22, 1994, and lies in the eastern end of the eastern ghat.
- It was declared a biosphere reserve by the Government of India in June, 1994 and has been part of the UNESCO World Network of Biosphere Reserve since 2009.

Similipal Biosphere Reserve

- It includes three protected areas — Similipal Tiger Reserve, Hadgarh Wildlife Sanctuary with 191.06 km2 (73.77 sq mi) and Kuldiha Wildlife Sanctuary.
- It is the abode of 94 species of orchids and about 3,000 species of plants.
- The identified species of fauna include 12 species of amphibians, 29 species of reptiles, 264 species of birds and 42 species of mammals, all of which collectively highlight the biodiversity richness of Similipal.
- Sal is a dominant tree species.
- Similipal and the adjoining areas, comprising 5,569 sq km, was declared a biosphere reserve by the Government of India on June 22, 1994, and lies in the eastern end of the eastern ghat.
- This protected area is part of the UNESCO World Network of Biosphere Reserves since 2009.
- Eucalyptus trees planted recently in Similipal Tiger Reserve (STR) and other forests in Odisha may be among the reasons the reserve witnesses fires.
- Eucalyptus trees, which are prone to fire, were planted in large tracts of the forest by clearing medicinal plants and other native trees

✓ The leaves of these contain a highly inflammatory oil that ignites easily. The trees catch fire as the ground beneath the trees is usually littered with leaves.

✓ It is illegal for the forest department to plant eucalyptus trees instead of native ones such as sal, mahuli, asan, karang, arjun, jack-fruits and other trees for which the forest fire is spreading.

✓ The state forest department started planting eucalyptus trees in Joshipur and Kaling forest areas of Similipal for the first time in 1977.

28. With reference to biodiversity of India, which of the following statement(s) is/are correct regarding "Caracal"?

1. **In 2020, caracal has been listed as Least Concern on the IUCN Red List**
2. **In India, Caracals are mainly found in the Ranthambore National Park 3. They are slender, medium-sized wild cats.**

Select the correct code using options given below

A. 1 and 2 only

B. 2 and 3 only

C. 3 only

D. 1, 2 and 3

Answer: D

Explanation

- Recently, the National Board for Wildlife and the Ministry of Environment, Forest and Climate Change has included the caracal in the list of critically endangered species.
- They are slender, medium-sized wild cats.
- The iconic ears give the animal its name caracal, which comes from the Turkish word 'karakulak', meaning black ears.

Caracal

- Besides India, the caracal is found in several dozen countries across Africa, the Middle East, Central and South Asia.
- While it flourishes in parts of Africa, its numbers in Asia are declining. The wildcat has long legs, a short face, long canine teeth, and distinctive
- ears — long and pointy, with tufts of black hair at their tips.
- The iconic ears are what give the animal its name — caracal comes from the Turkish karakulak, meaning 'black ears'.
- In India, it is called siya gosh, a Persian name that translates as 'black Ear'.

- It finds mention in Abul Fazl's Akbarnama, as a hunting animal in the time of Akbar (1556-1605).
- Descriptions and illustrations of the caracal can be found in medieval texts such as the Anvar-i-Suhayli, Tutinama, Khamsa-e-Nizami, and Shahnameh.

29. Recently 'Himalayan Serow' was in news. Which of the following statement(s) is/are correct regarding it?

1. They are herbivores.

2. They are included in IUCN red list vulnerable category. 3. They are found in the Trans Himalayan region.

Select the correct code from the given options

A. 1 and 2 only

B. 2 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: A

Explanation

- Third statement is incorrect.
- They are known to be found in the eastern, central, and western Himalayas, but not in the Trans Himalayan region.
- The Himalayan Serow has been spotted for the first time in Assam.
- It has been described as resembling a cross between a goat, a donkey, a cow, and a pig.
- It's a medium-sized mammal with a large head, thick neck, short limbs, long, mule- like ears, and a coat of dark hair.

- There are several species of serows, and all of them are found in Asia.
- They are herbivores, and are typically found at altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet).It is considered a flagship species due to its specialized habitat requirements of dense and undisturbed forests.
- The Himalayan serow, or Capricornis sumatraensis thar, is restricted to the Himalayan region. Taxonomically, it is a subspecies of the mainland serow (Capricornis sumatraensis).
- Previously assessed as 'near threatened', the Himalayan serow is now been categorised as 'vulnerable' in the IUCN Red List of Threatened Species
- It is listed under Schedule I of The Wildlife Protection Act, 1972, which provides absolute protection.
- CITES - Appendix I

30. Which of the following statement(s) about World Sustainable Development Summit 2021 is/are correct?

1. **The theme of the Summit "World Sustainable Development Summit 2021" was 'Redefining our common future: Safe and secure environment for all'.**
2. **It is organised by TERI.**

Select the correct code from the given options

A. 1 Only

B. 2 Only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

Explanation

- Recently, the Prime Minister inaugurated the World Sustainable Development Summit 2021.
- The theme of the Summit is 'Redefining our common future: Safe and secure environment for all'.
- It s the annual flagship event of The Energy and Resources Institute (TERI). Instituted in 2001, the Summit series has marked 20 years in its journey of
- making 'sustainable development' a globally shared goal.
  The Prime Minister emphasised climate justice for fighting against climate change.
- Climate justice is inspired by a vision of trusteeship - where growth comes with greater compassion to the poorest. Climate justice also means giving developing countries enough space to grow.
- The country is committed to reducing the emissions intensity of GDP by 33 to 35 percent from 2005 levels.

31. Which of the following statements are correct about particulate pollutants?

1. **They are present in vehicular emissions.**
2. **Their effect on human health is independent of their particulate size.**
3. **They may be composed of living organisms.**

A. 1 only

B. 1 and 2 only

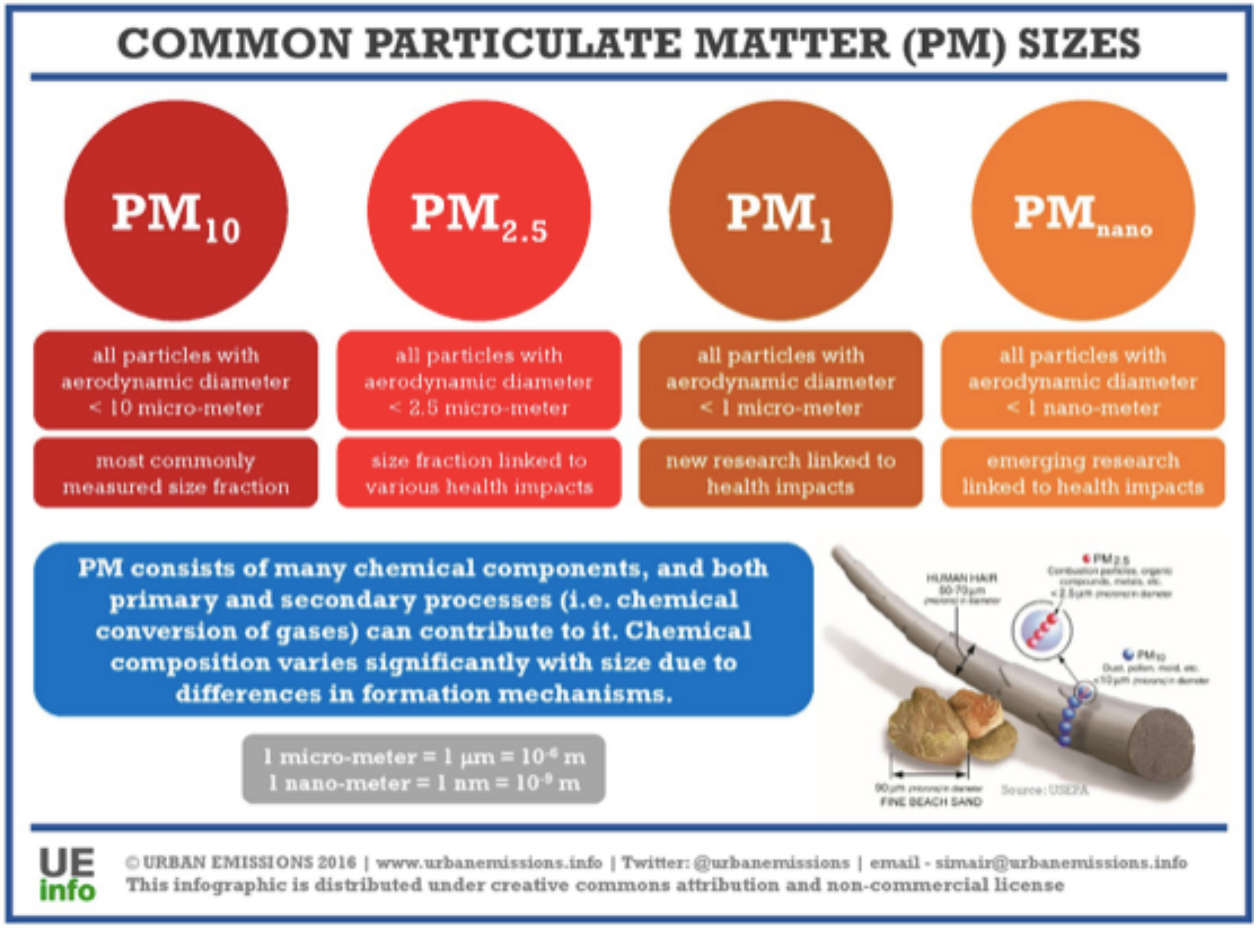
C. 1 and 3 only

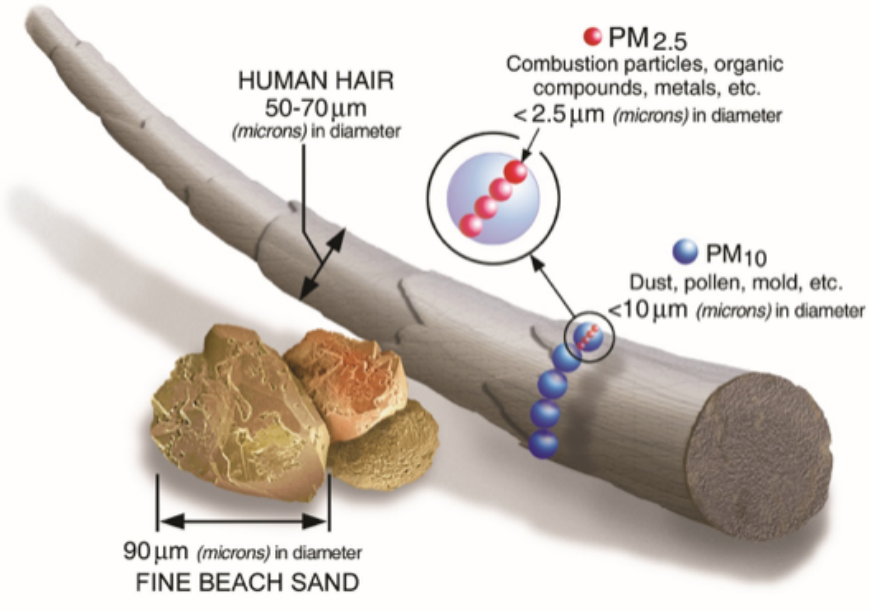
D. All of the above

Answer: C

Explanation

- Suspension of microscopic solids and liquids particles present in the form of droplets floating in the air or atmosphere refers to as Particulate pollution.
- Particulate pollution/ particulate matter/ Atmospheric particulate matter is called PM.
- The source of the particle can either be natural or anthropogenic.





32. With reference to Acid rain, consider the following statements,

1. **It is caused due to oxides of Sulphur and Nitrogen in the atmosphere.**
2. **It can lead to leaching of heavy metals into the supply of drinking water.**
3. **Its likelihood decreases with the presence of particulate matter in the air.**

Which of the statements given above are correct?

A. 1 and 2 only

B. 1 only

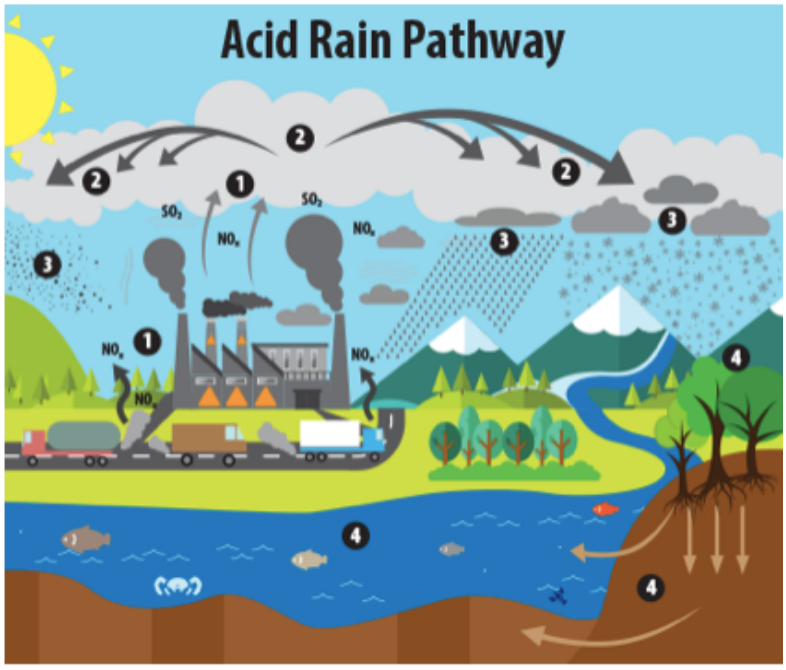
C. 2 and 3 only

D. 1 and 3 only

Answer: A

Explanation

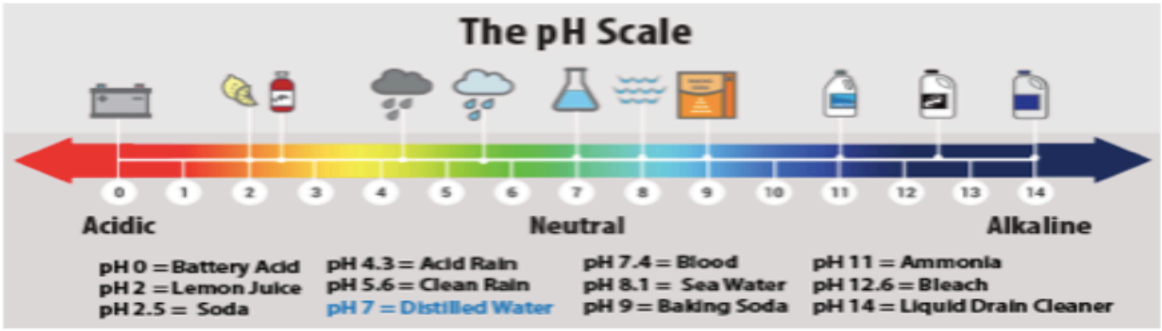
- Acid rain or acid deposition is a broad term that includes any form of precipitation with acidic components, such as sulfuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms.
- This can include rain, snow, fog, hail or even dust that is acidic.
- Acid rain results when sulphur dioxide (SO2) and nitrogen oxides (NOX) are emitted into the atmosphere and transported by wind and air currents.
- The SO2 and NOX react with water, oxygen and other chemicals to form sulfuric and nitric acids.
- These then mix with water and other materials before falling to the ground.
- While a small portion of the SO2 and NOX that cause acid, rain is from natural sources such as volcanoes, most of it comes from the burning of fossil fuels.



- The major sources of SO2 and NOX in the atmosphere are:
  - ✓ Burning of fossil fuels to generate electricity.
  - ✓ Two thirds of SO2 and one fourth of NOX in the atmosphere come from electric power generators.
  - ✓ Vehicles and heavy equipment.

✓Manufacturing, oil refineries and other industries.

✓Winds can blow SO2 and NOX over long distances and across borders making acid rain a problem for everyone and not just those who live close to these sources.



33. Sulphur Dioxide (SO2) emissions can lead to:

1. **Corrosion of metals**
2. **Discolouration of building**
3. **Global warming**

Select the correct answer using the code below:

A. 1 and 2 only

B. 2 and 3 only

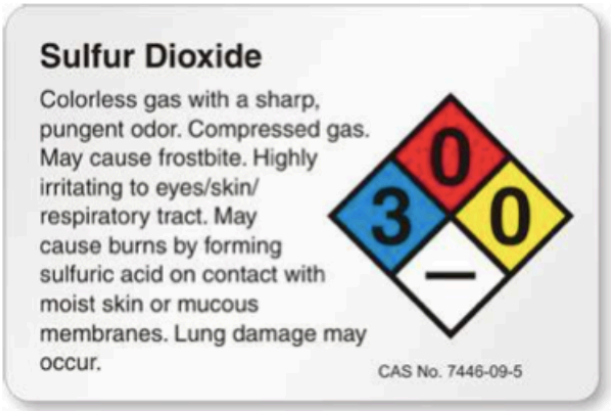
C. 1 and 3 only

D. All of the above

Answer: A

Explanation

- Sulphur dioxide is known for its aggressiveness towards steel and other metal alloys.
- While the compound in its pure form does not react strongly with metal, it can be highly corrosive when exposed to the atmosphere.
- When sulfur dioxide reacts with moisture (water) and oxygen, sulfuric acid is formed.
- This acidic compound is highly corrosive and can result in the accelerated deterioration of steel infrastructures.



- The sulfate ions formed on the surface of the moisture layer is considered to be the main contributor to accelerated corrosion on metallic surfaces.

34. Which of the following statements are incorrect about atmospheric carbon dioxide?

1. **It is released during the manufacturing of cement.**
2. **An increase in its amount is mainly responsible for ocean acidification.**

A. 1 only

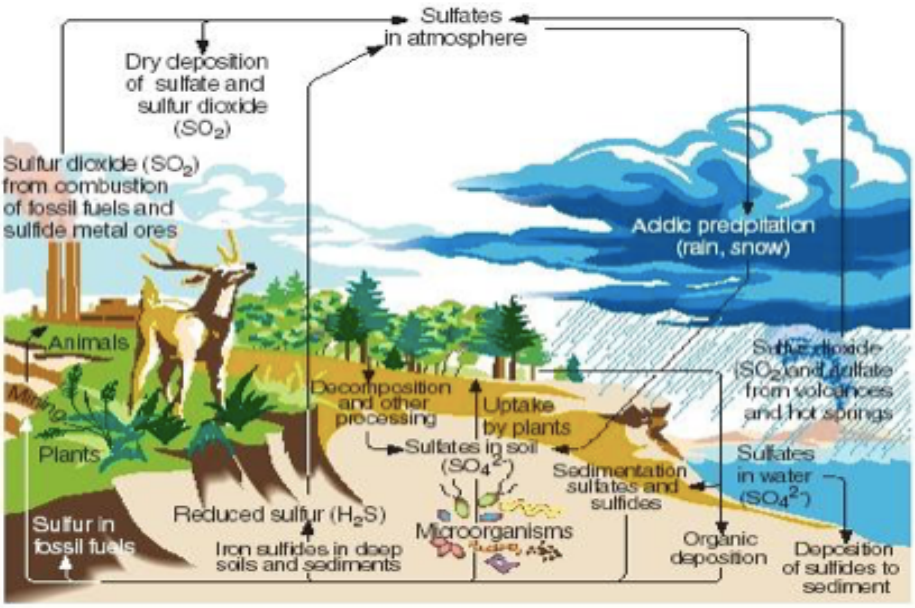
B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: D

Explanation

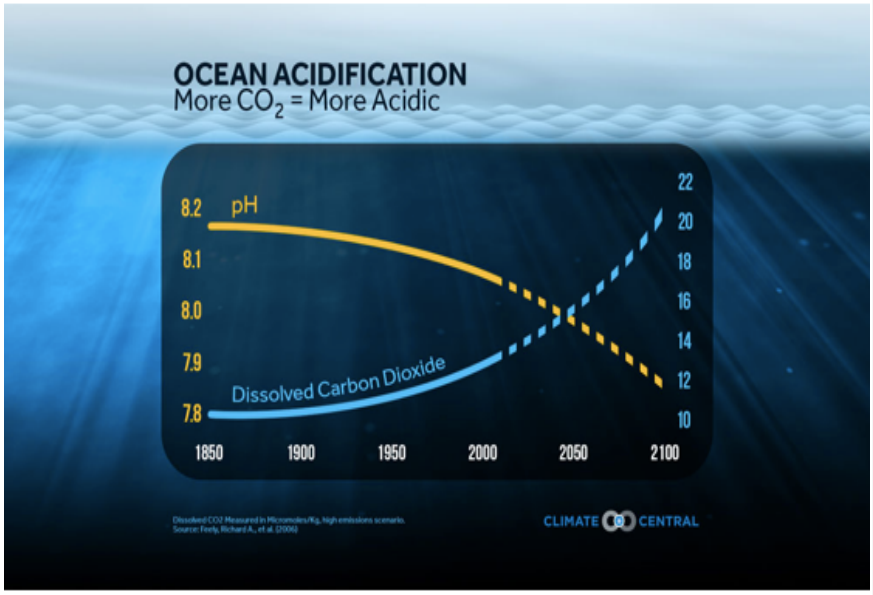


- Cement industry accounts for around 5 percent of global carbon dioxide (CO2) emissions.
- The production of cement releases greenhouse gas emissions both directly and indirectly, the heating of limestone releases CO2 directly, while the burning of fossil fuels to heat the kiln indirectly results in CO2 emissions.
- The direct emissions of cement occur through a chemical process called calcination.
- Calcination occurs when limestone, which is made of calcium carbonate, is heated, breaking down into calcium oxide and CO2.
- This process accounts for ~50 percent of all emissions from cement production.

Ocean Acidification

- Around 1/4th of the carbon dioxide released into the atmosphere via various processes either natural or artificial, is absorbed by the ocean.

- Initially, the scientists assumed it to be an eco-friendly process since it reduced the carbon dioxide percentage in the atmosphere, but like any other natural processes or mechanisms once the threshold is crossed, the actual threat reveals itself.
- When carbon dioxide dissolves in seawater, the water becomes more acidic and the ocean's pH drops.
- Even though the ocean is immense, enough carbon dioxide can have a major impact.



- In the past 200 years alone, ocean water has become 30 percent more acidic—faster than any known change in ocean chemistry in the last 50 million years.

Consequences of Ocean Acidification

- Ocean acidification increases the amount of energy needed by many small marine organisms in constructing their carbonate shells and structures.
- In some places it will become impossible for these organisms to live as the seawater will turn corrosive to the shells and skeletons of numerous marine organisms, affecting their reproduction and physiology.

35. The presence of which of the following results in the formation of photochemical smog?

1. **Nitric Oxide**
2. **Acrolein**
3. **Formaldehyde**
4. **Sulphur Dioxide**

Select the correct answer using the code given below?

A. 1 and 2 only

B. 1 and 4 only

C. 3 and 4 only

D. 1, 2 and 3

Answer: D

Explanation

- Smog is air pollution that reduces visibility.

- The term 'smog' was first used in 1905 by H.A. Des Voeux to describe a blend of 'fog' and 'smoke' found over many British towns.
- Smog can be of two types - classical or sulfurous smog and photochemical smog or industrial smog.

What is Photochemical Smog

- Photochemical smog, also known as 'summer smog,' is formed when ultraviolet (UV) light from the sun reacts with nitrogen oxides (NOx) and volatile organic compounds (VOCs).
- It is visible as a yellow-brown haze during the morning and in the afternoon.
- Photochemical smog tends to occur more often on dry summer days when the region experiences the most sunlight.
- It is characteristic of urban areas and is thus commonly found in densely populated cities such as Los Angeles, Sydney, Mexico, New Delhi, and Beijing, among many others.
- It is also sometimes referred to as 'Los Angeles Smog.' Photochemical smog requires neither smoke nor fog.
- It mainly consists of nitrogen dioxide (NO2), ozone (O3), peroxyacetyl nitrate (PAN), and organic compounds containing the aldehyde group.

36. Consider the following statements with respect to niche of an organism

1. **It refers to role played by an organism in the ecosystem.**
2. **Ecological niche is unique for every species. Which of the above statements is/are correct?**

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

Explanation

- In ecology, a niche is the match of a species to a specific environmental condition.
- It describes how an organism or population responds to the distribution of resources and competitors (for example, by growing when resources are abundant, and when predators, parasites and pathogens are scarce) and how it in turn alters those same factors (for example, limiting access to resources by other organisms, acting as a food source for predators and a consumer of prey).
- A niche is unique for a species while many species share the habitat.
- The type and number of variables comprising the dimensions of an environmental niche vary from one species to another and the relative importance of particular environmental variables for a species may vary according to the geographic and biotic contexts.

37. Consider the following statements

1. **Kamlang Tiger reserve is situated in Himachal Pradesh**
2. **Tiger is a Eurythermal animal.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: B

Explanation

- The Kamlang Wildlife Sanctuary, established in 1989, is the 50th Tiger reserve in India.
- The Sanctuary is rich with floral and faunal diversity.
- Located in tropical and sub-tropical climatic zones, the sanctuary is the habitat of the four big cat species of India: tiger, leopard, clouded leopard and snow leopard.
- It is situated in the Lohit District of the northeastern Indian state of Arunachal Pradesh.
- The park is named after the Kamlang River which flows through it. Various tribals include Mishmi, Digaro Mishmi, and Miju Mishmi, etc.

- Eurythermal animals are able to tolerate a wide range of temperature levels.
- Eurythermal animals include cat, dog, man, goat, tiger, etc.

38. Which of the following is the appropriate reason for the rare presence of small animals in the polar region?

A. Thermoregulation is energetically expensive for small animals in polar region.

B. Their body has small surface area compared to their volumes which makes them lose heat slowly.

C. C. Presence of predators makes their presence vulnerable.

D. Harsh climatic conditions render them difficulty to adapt.

Answer: A

Explanation

- Thermoregulation is the ability of an organism to keep its body temperature within certain boundaries, even when the surrounding temperature is very different.

- A thermo conforming organism, by contrast, simply adopts the surrounding temperature as its own body temperature, thus avoiding the need for internal thermoregulation.
- The internal thermoregulation process is one aspect of homeostasis, a state of dynamic stability in an organism's internal conditions, maintained far from thermal equilibrium with its environment (the study of such processes in zoology has been called physiological ecology).
- Temperature regulation is difficult in small animals.

39. Talley Valley wildlife sanctuary is located in which of the following states?

A. Arunachal Pradesh

B. Meghalaya

C. Assam

D. Manipur

Answer: A

Explanation

- Talley Valley Wildlife Sanctuary is a protected area in Arunachal Pradesh, India, with an area of 337 km2.
- It was established in 1995.
- It is located at a distance of 32 kms from Ziro towards the north east.
- Comprising sub-tropical and alpine forests it has a variety of flora and fauna, many of which are endangered.

40. Which among the following are the UNESCO natural world heritage sites of India?

1. **Great Himalayan National Park**
2. **Kaziranga National Park**
3. **Sunderbans National Park**
4. **Manas Wildlife Sanctuary**

A. 1, 2 and 3 only

B. B. 1, 2 and 4 only

C. C. 2, 3 and 4 only

D. All of the above

Answer: D

Explanation

- India has 38 world heritage sites that include 30 Cultural properties, 7 Natural properties and 1 mixed site.

1.	Kaziranga National Park (1985)	Assam
2.	Keoladeo National Park (1985)	Rajasthan
3.	Manas Wildlife Sanctuary (1985)	Assam
4.	Sunderbans National Park (1987)	West Bengal
5.	Nanda Devi and Valley of Flowers National Parks (1988, 2005)	Uttarakhand
6.	Western Ghats (2012)	Karnataka, Kerala, Maharashtra,Tamil Nadu
7	Great Himalayan National Park (2014)	Himachal Pradesh

Biodiversity

41. Based on the following statements identify the animal?

1. **It is a Schedule-1 animal according to the Wild Life (Protection) Act, 1972.**
2. **It is considered as 'Least Concern' according to the Red Data Book.**
3. **It is the state animal of Andhra Pradesh.**
4. **It is locally known as Krushnasara Mruga.**

A. Blackbuck

B. Swamp deer

C. Elk

D. Migratory Woodland Caribou

Answer: A

Explanation

- Odisha's blackbuck population has doubled in the last six years, according to figures from the latest population census released recently by the chief conservator of forest (wildlife).
- The Indian Blackbuck (Antilope cervicapra), is one of the three species of antelopes found in Odisha.
- The other two are Nilgai (Boselaphus tragocamelus) and the Chowsingha (Tetracercus quadricornis).
- Blackbuck is considered to be the fastest animal in the world next to Cheetah.

- There has been a dissolute decline in the population of Blackbucks throughout the country due to poaching and habitat loss.
- In the recent past, this endemic animal was most numerous, commonly seen large wild mammal in the Indian subcontinent.
- Subsequently, within a short span of time, this animal has suffered much reduction in numbers. Blackbuck is included in the Schedule-I of Wildlife (Protection) Act, 1972 and is designated as Least Concern as per Red Data Book.
- It is now one of the most popular exhibits in most of the zoos of the country and elsewhere.

Distribution and Status

- In India the species is wide spread in Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu and other areas throughout peninsular India.
- In 1982, the estimated population of Blackbuck in India was between 22,500 to 24,500.
- According to 1993 estimation, the population of Blackbuck in India was between 10,000 and is stable or increasing.

Past distribution in Odisha

- This species was widely spread in Balesore and Puri Districts but scarcely seen in Bolangir, Kalahandi and in coastal sand dunes of Bhitarkanika and Kujang area.
- Until the 1960s, the Blackbuck number reported was 1200 -1300.
- During 1918, a Britisher known as "Green saheb" and the 'Sardar' of the locality, Sri Madeshi Chandramani Dora, took an initiative for the protection of these species and published a notification in the Oriya newspaper "Prajamitra" prohibiting killing of the Blackbuck.

42. Which of the following statements about Bhitarkanika National Park are correct?

1. **It is a mangrove forest.**
2. **Gahirmatha Marine Sanctuary is its integral part.**
3. **Bhitarkanika is located in the estuary of Brahmani, Baitarani, Dhamra, and Mahanadi river systems.**

A. 1 and 2 only

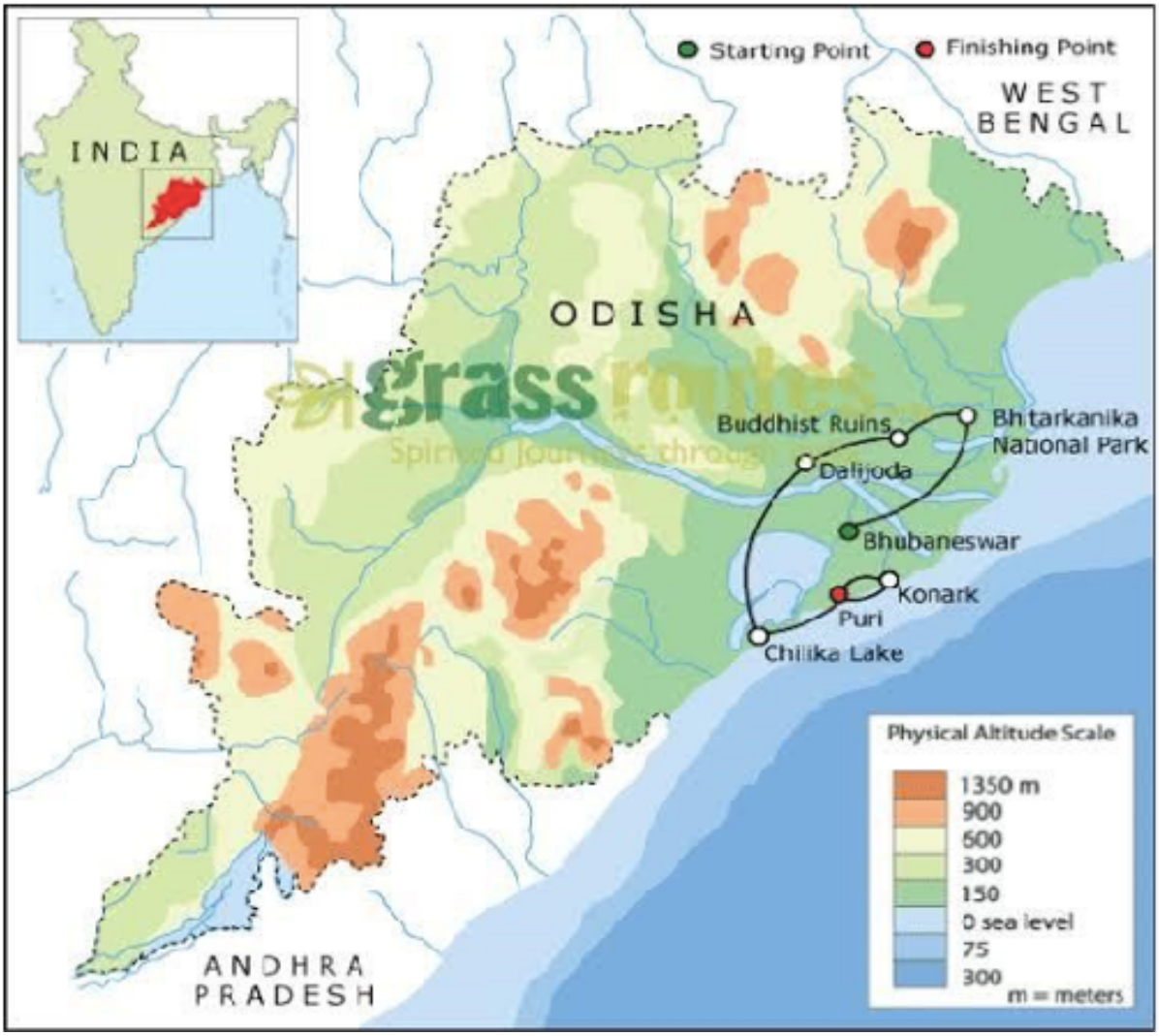
B. 2 and 3 only

C. 1 and 3 only

D. All of the above

Answer: D

Explanation



- Cyclone Yaas resulted in huge devastation of hundreds of trees in Bhitarkanika.
- Bhitarkanika National Park, located in Odisha, is famous for its mangroves, migratory birds, turtles, estuarine crocodiles, and countless creeks.
- It is India's second-largest mangrove forest.
- The Bhitarkanika is represented by 3 Protected Areas, the Bhitarkanika National Park, the Bhitarkanika Wildlife Sanctuary and the Gahirmatha Marine Sanctuary.
- Bhitarkanika is located in the estuary of Brahmani, Baitarani, Dhamra, and Mahanadi river systems.
- It is said to house 70% of the country's estuarine or saltwater crocodiles, conservation of which was started way back in 1975.
- Bhitarkanika is home to a wide range of fauna, including 3,000 spotted deer, bird species and other species such as wild boars, jackal, hyenas, jungle cat, fishing cats, water monitor lizards, rhesus macaques, common languor, Indian civet cat and hare.
- The area was designated a national park in September 1998 and as a Ramsar site by UNESCO in August 2002.

43. Which of the following statements about Rishi Ganga River are correct?

1. **It springs from the Uttari Nanda Devi Glacier in the Chamoli district, Uttarakhand.**
2. **It flows through Jim Corbett National Park before finally merging into the Ganges.**

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

Explanation

- In February 2021, a flooding disaster occurred all along the river and its gorge following a landslide, avalanche or glacial lake outburst flood.
- Following reports that cracks had developed in glaciers at the origin of Rishiganga in Chamoli, a team of scientists carried out an aerial survey and found nothing wrong.
  - ✓ Rishiganga is a river in the Chamoli district, Uttarakhand, India.
  - ✓ It springs from the Uttari Nanda Devi Glacier on the Nanda Devi mountain.
  - ✓ It is also fed from the Dakshini Nanda Devi Glacier.
  - ✓ Continuing through the Nanda Devi National Park, it flows into the Dhauliganga River near the village Rini.
  - ✓ Ramganga flows through Jim Corbett National Park.

44. BioHub Initiative recently heard in related to which of the following?

A. Ministry of Environment & Forests (MOEFCC)

B. World Health Organization (WHO)

C. National Geographic Society (NGS)

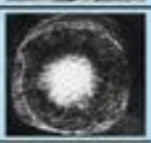
D. All of the above

Answer: B

Explanation

- BioHub will be a global facility for pathogen storage, sharing and analysis. The sharing of pathogens is currently done bilaterally between countries; WHO BioHub will expedite the process.
- WHO and Switzerland have signed a Memorandum of Understanding (MoU) to launch this facility.

- The move is significant in the view of the novel coronavirus disease (COVID-19) pandemic and the need to underline the importance of sharing pathogen information to assess risks and launch countermeasures.

Type of pathogen	Description	Human diseases caused by pathogens of that type
Bacteria *Escherichia coli* 	Single-celled organisms without a nucleus	Strep throat, staph infections, tuberculosis, food poisoning, tetanus, pneumonia, syphilis
Viruses *Herpes simplex* 	Thread-like particles that reproduce by taking over living cells	Common cold, flu, genital herpes, cold sores, measles, AIDS, genital warts, chiken pox, small pox
Fungi *Death cap mushroom* 	Simple organisms, including mushrooms and yeasts, that grow as single cells or thread like filaments	Ringworm, athlete's foot, tinea, candidiasis, histoplasmosis, mushroom poisoning
Protozoa *Giardia lamblia* 	Single-celled organism with a nucleus	Malaria, "traveler's diarrhea" giardiasis, trypanosomiasis ("sleeping sickness")

45. Based on the following statements identify the conservation reserve?

1. **It is Maharashtra's oldest and largest national park.**
2. **It is a predominantly southern tropical dry deciduous forest with dense woodlands comprising about eighty seven per cent of the protected area.**
3. **Teak is the predominant tree species.**
4. **It is divided into three separate forest ranges, i.e. north range, south range, and Morhurli range, which is sandwiched in between the first two.**

A. Gugamal national Park

B. Chandoli national Park

C. Sanjay Gandhi National Park

D. Tadoba National Park

Answer: D

Explanation

- Maharashtra Chief Minister asked the state forest department to submit a proposal for rehabilitation of villages in the Tadoba-Andhari Tiger Reserve for its expansion due to a rise in big cat numbers.
- There were 312 tigers in Chandrapur district, which in turn had increased instances of man-animal conflict.

- Maharashtra's oldest and largest National Park, the "Tadoba National Park", also known as the "Tadoba Andhari Tiger Reserve" is its oldest and largest NP.
- It lies in the Chandrapur district of Maharashtra state and is approximately 150 km from Nagpur city.
- The total area of the tiger reserve is 1,727 Sq.km, which includes the Tadoba National Park, created in the year 1955.
- The Andhari Wildlife Sanctuary was formed in the year 1986 and was amalgamated with the park in 1995 to establish the present Tadoba Andheri Tiger Reserve.
- The word 'Tadoba' is derived from the name of God "Tadoba" or "Taru," which is praised by local tribal people of this region and "Andhari" is derived from the name of Andhari river that flows in this area
- The Tadoba National Park is divided into three separate forest ranges, i.e. Tadoba north range, Kolsa south range, and Morhurli range, which is sandwiched in between the first two.
- There are two lakes and one river in the park, which gets filled every monsoon, the 'Tadoba Lake,' 'Kolsa Lake,' and 'Tadoba River.'
- These lakes and rivers provide vital ingredients needed to sustain the park's life.

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

A. Kanha National Park

B. Manas National Park

C. Mudumalai Wildlife Sanctuary

D. Tal Chhapar Wildlife Sanctuary

Answer: A

Explanation

- Kanha Tiger Reserve, also known as Kanha– Kisli National Park, is one of the tiger reserves of India and the largest national park of the state of Madhya Pradesh.
- The State animal of Madhya Pradesh in the "Barasingha", also called swamp deer.
- It is also the first tiger reserve in India to officially introduce a mascot, Bhoorsingh the Barasingha.

47. Consider the following statements about India's Biennial Update Report III (BUR III)

1. **India's emission intensity of gross domestic product (GDP) has reduced by 24 per cent between 2005 and 2016.**
2. **India's installed capacity of solar energy is more than that of wind energy,**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

Explanation

- In its third biennial update report (BUR-III), submitted to the United Nations Framework Convention on Climate Change (UNFCCC) on February 20, India declared that the country's emission intensity (per unit of GDP) has reduced by 24% between 2005 and 2016 and therefore it is "on track to meet its voluntary declaration to reduce the emission intensity of GDP by 20-25% from 2005 levels by 2020".
- The BUR-III, carrying details of India's GHG inventory for the year 2016, shows that the country had emitted 2.8 billion tonnes of greenhouse gases (GHG) with energy sector alone accounting for 75% of the total emissions.
- India had submitted it first BUR to the UNFCCC in 2016 and the second one in 2018.
- Analysis of India's all three BURs presents an interesting trend, showing a consistent decline in share of agriculture sector in total emission since 2010.
- On the other hand, emission from energy sector has been growing while shares of industries and waste sectors remain constant.
- The agriculture sector is the main source of methane (CH4) and nitrous oxide (N2O) emissions.
- The CH4 emissions occur from this sector mainly due to livestock rearing (enteric fermentation and manure management) and paddy cultivation while N2O is principally emitted due to the application of fertilizers to agricultural soils.
- Judicious use of fertilizers, crop diversification and better manure management may by the reason of this decline.
- In the energy sector, electricity production was the single largest source in this category, accounting for about 40% of the national total GHG emissions in 2016 while manufacturing industries and construction together emitted over 18% of total emissions.
- Though the BUR-III gave details on how the share of non-fossil sources (renewable and nuclear) in total installed capacity of electricity generation increased to over 38% by November last year, it emphasized on the need to continue coal consumption in the country.
- Currently, India is the fourth in terms of overall global GHG emission with China, the USA and EU+UK being the top three.

- In terms of per capital emission, India's figure is nearly one-third of the global average and nearly one-seventh of the biggest historical polluter, the USA.

48. Consider the following statements regarding Nitrogen Use Efficiency

1. **It is the fraction of applied nitrogen that is absorbed and used by the plant.**
2. **A higher number denotes low wastage.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

Explanation

- Nitrogen use efficiency (NUE) is the fraction of applied nitrogen that is absorbed and used by the plant.
- Improving a plant's ability to utilize nitrogen is a key component in enhancing environmental sustainability.
- A higher number denotes low wastage.
- With the efficiency on the decline, farmers use more fertiliser in the hope of raising yield.
- This in turn worsens NUE.
- Efficiency is reduced by seasonal conditions, crop diseases, losses of N from the soil as gases, N leaching or immobilisation of N into organic forms.
- Crops generally use up 30 per cent of nitrogen fertiliser applied; the rest seeps into the environment, harming health and adding to climate change.
- Agriculture leads to 70 per cent of nitrous oxide emissions in India.Of this, 77 per cent is contributed by fertilisers, mostly urea, according to the Indian Nitrogen Assessment published in 2017.
- This greenhouse gas (GHG) is 300 times more potent than carbon dioxide.
- It has replaced methane as the second-largest component of GHG emissions from Indian agriculture in past 15 years.
- Cereals consume over 69 per cent of nitrogen fertilisers in India; rice tops the list with 37 per cent, followed by wheat (24 per cent).
- Fertilisers like urea emit ammonia, which can deposit on particulate matter and impact human health.
- N-fertilisers also cause water pollution and algal blooms, killing fish and affecting livelihoods.

- As per Indian Nitrogen Assessment (2017), India is emerging as one of the global hotspots of nitrogen pollution of water and air, adversely affecting our health and climate change.
- Indian government has also piloted the first-ever United Nations resolution on sustainable nitrogen management in 2019.
- Indian biotechnologist have identified candidate genes for nitrogen use efficiency (NUE) in rice in what is a major boost to the scientific efforts for crop improvement to save nitrogenous pollution and fertilisers worth billions.

49. Which of the following statements accurately defines "Greenwashing"?

A. Use of environment friendly green products for whitewash.

B. Process of land reclamation under the aegis of UN Decade of Ecosystem Restoration.

C. When green marketing is deceptively used to persuade the public that an organisation's products, aims and policies are environmentally friendly.

D. None of the above

Answer: C

Explanation

- Greenwashing (a compound word modelled on "whitewash"), also called "green sheen",is a form of marketing spin in which green PR (green values) and green marketing are deceptively used to persuade the public that an organization's products, aims and policies are environmentally friendly.
- The term greenwashing was coined by New York environmentalist Jay Westervelt in a 1986 essay regarding the hotel industry's practice of placing placards in each room promoting reuse of towels ostensibly to "save the environment".
- Producers label or project objects as "green" with the sole purpose of maximising profits through sales, which is dubbed "greenwashing".
- The scope of greenwash is amazing and its power intense at this moment when our collective sense of guilt about what we are doing to our planet is on the rise.
- Bottled water companies that choke the ocean with plastic bottles try to alleviate users' worries by simply stamping their bottles as recyclable material.
- The recycling never happens, but consumers feel that they are helping the environment by buying that water.

50. Consider the following statements related to Lumpy Skin Disease

1. **It is caused by a bacteria.**
2. **It is commonly found in cattle.**

Which of the following statements is/are correct?

A. A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: B

Explanation

- Lumpy skin disease (LSD) is an infectious disease in cattle caused by a virus of the family Poxviridae, also known as Neethling virus.
- The disease is characterized by fever, enlarged superficial lymph nodes and multiple nodules (measuring 2–5 centimetres (1–2 in) in diameter) on the skin and mucous membranes (including those of the respiratory and gastrointestinal tracts).
- The virus has important economic implications since affected animals tend to have permanent damage to their skin, lowering the commercial value of their hide.

- Additionally, the disease often results in chronic debility, reduced milk production, poor growth, infertility, abortion, and sometimes death.
- Outbreaks of LSDV are associated with high temperature and high humidity,It is usually more prevalent during the wet summer and autumn months, especially in low-lying areas or near bodies of water, however, outbreaks can also occur during the dry season.
- Blood-feeding insects such as mosquitos and flies act as mechanical vectors to spread the disease.
- The Bihar government sounded an alert and issued an advisory May 6, 2021 about the likely spread of lumpy skin disease (LSD), a viral illness that causes prolonged morbidity in cattle and buffaloes.

51. T**he acidification of ocean is increasing.Why is this phenomenon a cause of concern?**

1. **Coral reef may be adversely affected.**
2. **The population of jellyfishes will drastically decrease.**
3. **Impair digestion of fish species**

Select the correct answer using codes given below:

A. 1 and 2 only

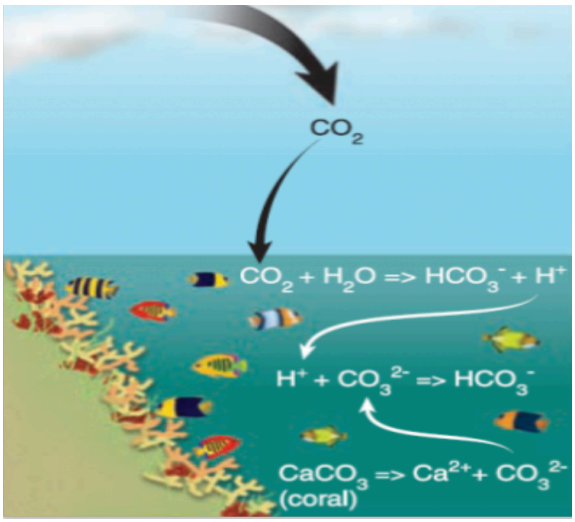
B. 1 and 3 only

C. 2 and 3 only

D. All of the above

Answer: B

Explanation



52. Ozone depletion is a cause of concern. Which of the following condition responsible for ozone depletion in polar areas:

1. **Low polar temperature**
2. **Formation of Polar vortex**
3. **Polar stratospheric clouds**
4. **Denitrification**

Select the correct answer using codes Codes given below:

A. 1 and 2 only

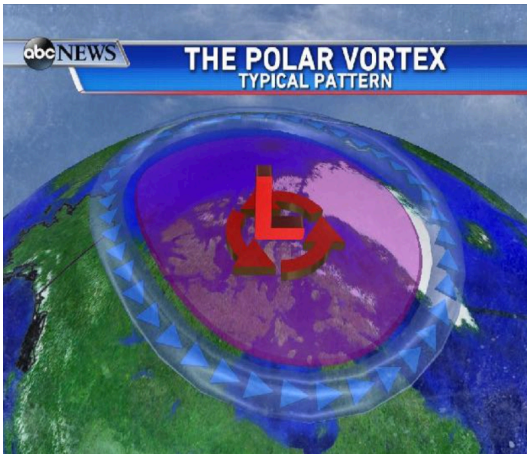
B. 1 ,2 and 3 only

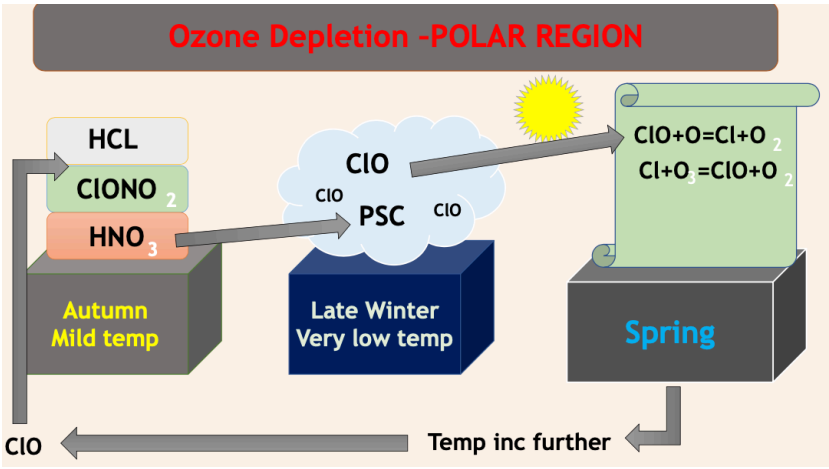
C. 2 , 3 and 4 only

D. All of the above

Answer: D

Explanation





53. The term 'solidarity and just transition Silesia' was in news recently is related to:

A. Global stocktake

B. Biofuel policy

C. Brexit

D. Workers

Answer: D

54. Which among the following is an incorrect statement

A. Both stratospheric and tropospheric ozone absorb Infrared radiation.

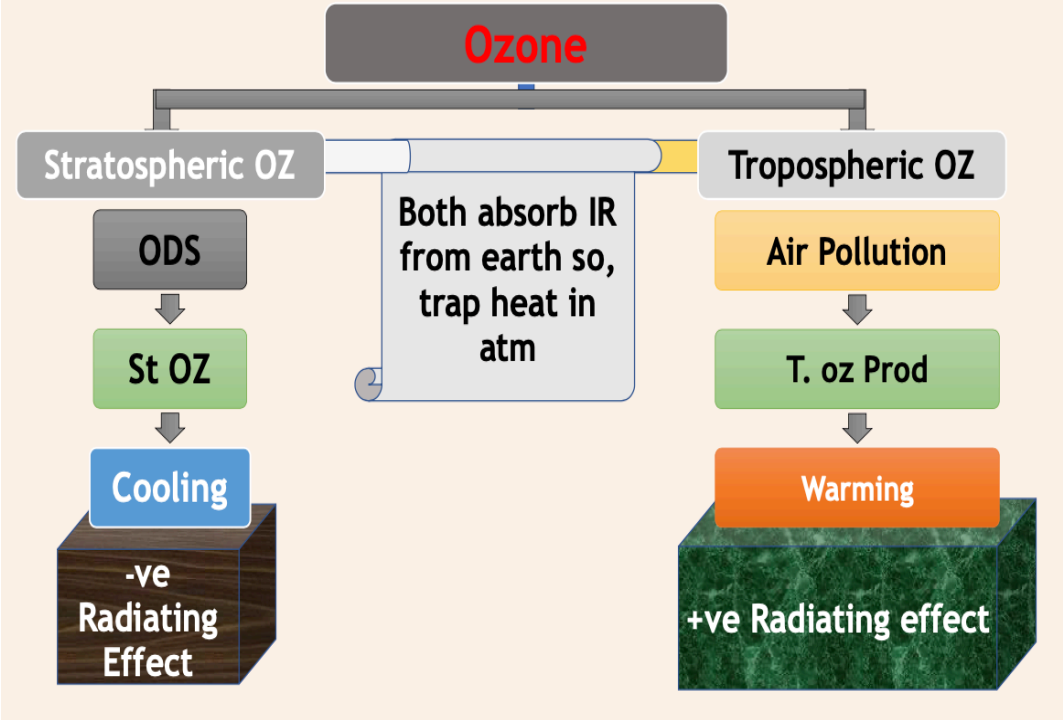
B. Depletion of stratospheric ozone lead to cooling effect.

C. Tropospheric ozone causing warming effect

D. Both tropospheric and stratospheric ozone are principally responsible for present day climate change.

Answer: D

Explanation



55. Which of the following is included in India's REDD+ activities

1. **Grassland**
2. **Forest area > 1 ha & 10% canopy**
3. **All forest irrespective of coverage**
4. **Mangroves**

Select the correct answer using codes given below

A. 1 and 2 only

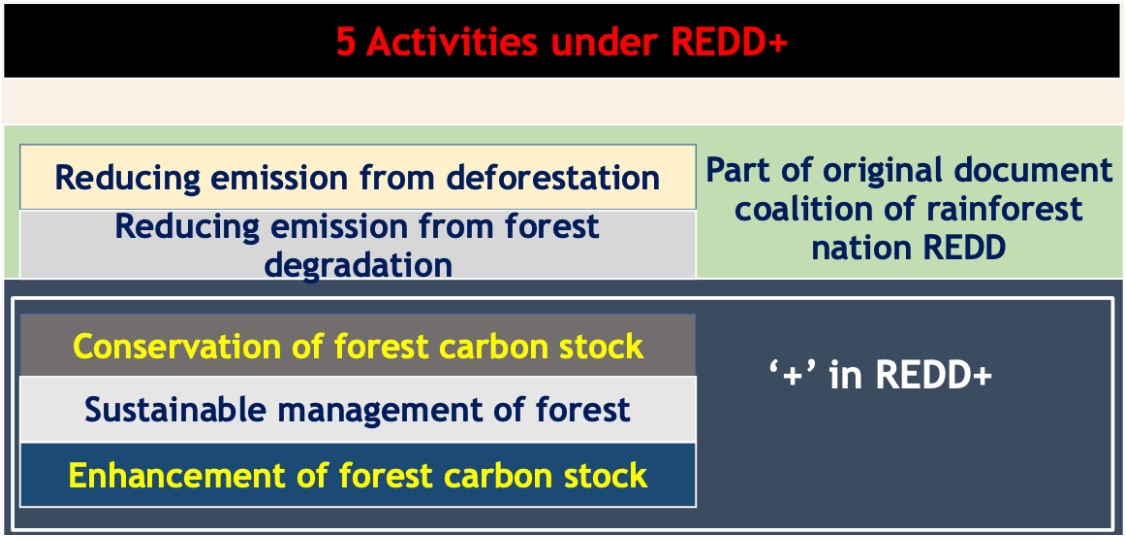
B. 2 only

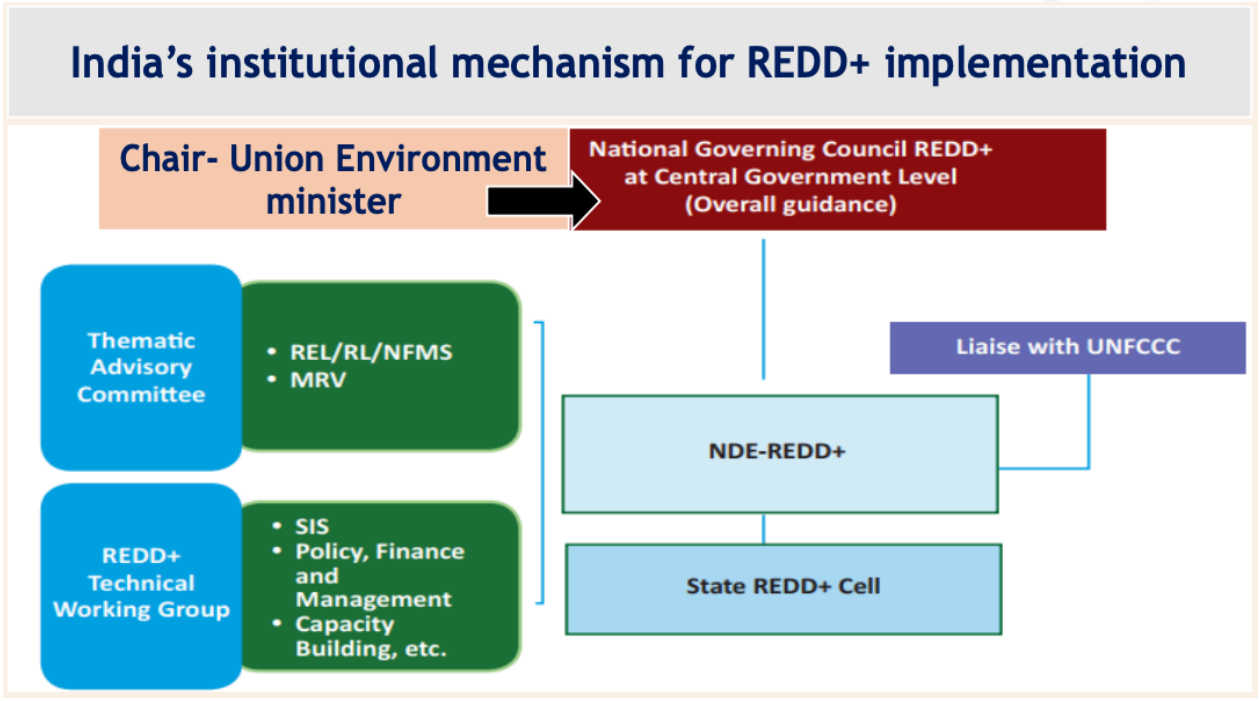
C. 2 , 3 and 4 only

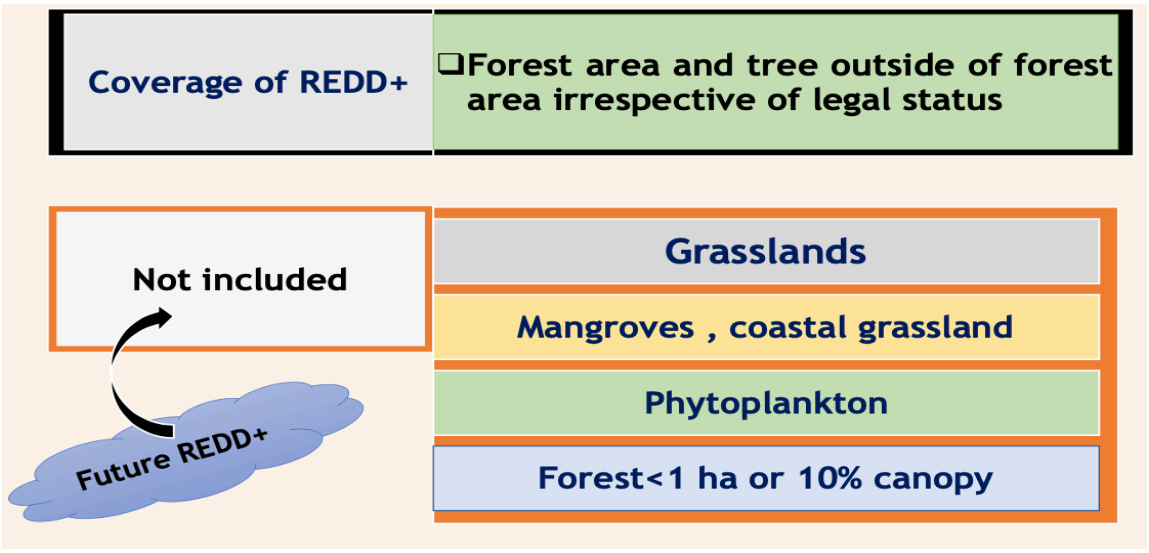
D. All of the above

Answer: B

Explanation







56. What do you understand by Ecological footprint?

1. **It is promoted by Global Footprint Network.**
2. **An index of the area of a productive ecosystem required to produce the resources used and to assimilate the wastes produced by a defined population.**

Which of the above is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

Explanation

- The ecological footprint is a method promoted by the Global Footprint Network to measure human demand on natural capital, i.e. the quantity of nature it takes to support people or an economy.
- It tracks this demand through an ecological accounting system.
- The accounts contrast the biologically productive area people use for their consumption to the biologically productive area available within a region or the world (biocapacity, the productive area that can regenerate what people demand from nature).
- In short, it is a measure of human impact on the environment. It can be calculated for a single individual, city, region, country and the entire planet.
- Many countries are "in the red," which means they use more natural resources (Ecological Footprint) than their ecosystems can regenerate (biocapacity). They are running an "ecological deficit."
- When a country's biocapacity is greater than its population's Ecological Footprint, on the other hand, the country boasts an "ecological reserve."

Earth Overshoot Day

- When the entire planet is running an ecological deficit, we call it "overshoot."
- At the global level, ecological deficit and overshoot are the same, since there is no net import of resources to the planet.
- Overshoot occurs when:
  - ✓HUMANITY'S ECOLOGICAL FOOTPRINT > EARTH'S BIOCAPACITY
  - ✓Earth Overshoot Day marks the date when humanity's demand for ecological resources and services (Ecological Footprint) in a given year exceeds what Earth can regenerate in that year (biocapacity).
  - ✓In 2021, Earth Overshoot Day lands on July 29.
  - ✓In 2020, it was on August 22, more than three weeks later than last year.

57. Consider the following statements about Ocean Health Index (OHI+)

1. **OHI+ assessments are independently led assessments using the OHI+ framework that are conducted by any group external to the OHI team.**
2. **OHI+ assessments are often conducted at national and continental scales to assess the overall health of oceans.**

Which of the above is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

Explanation

- The OHI is a tool to measure the benefits and services that the ocean provides for people now and into the future.
- Assessments are developed with the support of local stakeholders to better understand how to sustainably balance current and future ocean use.
- The Ocean Health Index (OHI) is the first assessment framework that provides a common platform for scientifically combining and comparing all key elements from all dimensions of the ocean (ecological, social, economic, and physical) to measure how sustainably people are using ocean and coastal resources.
- The OHI+ framework is repeatable, transparent, quantitative, and goal- driven, and the inputs to the OHI+ assessments use the same overarching framework as OHI global, while utilizing data, indicators, reference points, and preferences and priorities specific to the local context.
- Repeated assessments are valuable because they can be used to track and monitor the progress of ocean health through time.
- Even a first effort of OHI+ is valuable because it establishes a baseline against which to monitor change.
- Such a flexible framework allows OHI+ assessments to adapt to local conditions while still being useful for management.
- Researchers from around the world have changed the goals models and data in their assessments in an ever-evolving process that characterises the Index. Neither 1 nor 2.

58. Lichenometry is a technique used to determine

1. **Rate of decay of an ecosystem**
2. **Age of exposed rock surfaces**
3. **Acidic content of water bodies**

A. 1 and 2 only

B. 3 only

C. 2 only

D. 1 and 3 only

Answer: C

Explanation

- In archaeology, palaeontology, and geomorphology, lichenometry is a geomorphic method of geochronologic dating that uses lichen growth to determine the age of exposed rock, based on a presumed specific rate of increase in radial size over time.
- Measuring the diameter of the largest lichen of a species on a rock surface can therefore be used to determine the length of time the rock has been exposed.
- Lichen can be preserved on old rock faces for up to 10,000years, providing the maximum age limit of the technique, though it is most accurate (within 10% error) when applied to surfaces that have been exposed for less than 1,000 years.

59. With reference to Biotope, consider the following statements

1. **It is an ecological area that is usually larger than an ecosystem.**
2. **It is synonymous with biocoenosis.**

Which of the above is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: D

Explanation

- A biotope is an area of uniform environmental conditions providing a living place for a specific assemblage of plants and animals.
- An ecosystem is a group of numerous populations of animal and plant species that share resources in the same area.
- In this area of life, we can distinguish the living beings (vegetation, animals) which constitute the biocoenosis and the geological environment (nature of the soils, climate, water), which constitute the biotope. The association of the biocoenosis and the biotope constitutes an ecosystem.

60. Discount rate tool is usually applied in environmental analysis to

A. Evaluate the carbon sequestration derived from a particular initiative.

B. Understand the interconnection between ecological services.

C. Calculate the inflation by using GDP deflator.

D. Determine the present value of future benefits.

Answer: D

Explanation

- The discount rate is the rate at which society as a whole is willing to trade off present for future benefits.
- When weighing the decision to undertake a project with long-term benefits (e.g., wetland protection programs) versus one with short- term benefits and long-term costs (e.g., logging forests near aquatic ecosystems), the discount rate plays an extremely important role in determining the outcome of the analysis. Indeed, a number of reasonable decision measures (e.g., net present value, benefit-cost ratio, internal rate of return, return on investment) depend critically on the chosen discount rate
- Discount rates are needed because a dollar received today is considered more valuable than one received in the future.
- There are four primary reasons for applying a positive discount rate.
  - ✓First, positive rates of inflation diminish the purchasing power of money over time.
  - ✓Second, money can be invested today, earning a positive rate of return.
  - ✓Third, there is uncertainty surrounding the ability to obtain promised future income.
  - ✓That is, there is the risk that a future benefit (e.g., enhanced fish catches) will never be realised.
  - ✓Finally, humans are generally impatient and prefer instant gratification to waiting for long-term benefits.
- Discount rates are used to compress a stream of future benefits and costs into a single present value amount. Thus, present value is the value today of a stream of payments, receipts, or costs occurring over time, as discounted through the use of an interest rate.
- Present value calculations of benefits and costs are then compared to determine benefit-cost ratios.

61. If a particular plant species is placed under Schedule VI of The Wildlife Protection Act, 1972, what is the implication? (2020)

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.

Answer: A

Explanation

- The WPA - 1972 is an Act of the Parliament of India enacted for the protection of plants and animal species.

- All the animals in Schedule I of the Wildlife Protection Act are granted protection from poaching, killing, trade etc. Those committing crimes under this Act are liable to be punished with the severest punishment under Indian Law for such crimes.
- There are Six Schedules in this act which is divided into eight chapters. These Schedules gives different standard of protection.
- Species that are listed in Schedule I and part II of Schedule II get absolute protection. Offences under these are prescribed the highest penalties.
- Species that are listed in Schedule III and Schedule IV are also protected, but the penalties are comparatively much lower.
- Schedule V includes the animals which can be hunted.
- 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(Chief Wildlife Warden).

62. 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:

A. 1 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: B

Explanation

- Excessive instream sand-and-gravel mining causes
  - ✓ degradation of river
  - ✓ bank erosion
  - ✓ threat to bridges, river banks and nearby structures
  - ✓ affects the adjoining groundwater system
  - ✓ destruction of aquatic and riparian habitat through large changes in the channel morphology.
  - ✓ deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets which may also lead to saline-water intrusion from the nearby sea.
  - ✓ bed degradation, bed coarsening, lowered water tables near the streambed, and channel instability.

✓The effect of mining is compounded by the effect of sea level rise. Any volume of sand exported from streambeds and coastal areas is a loss to the system.

✓extra vehicle traffic, which negatively impairs the environment.

63. Consider the following statements:

1. **Asiatic lion 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 (2019)**

Which one of the statement given above is/are correct?

A. 1 only

B. 2 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: A

Explanation

Asiatic lion

- Scientific Name: Panthera leo persica
- Population: 523
- Status: Listed in Schedule I of Wildlife (Protection) Act 1972, in Appendix I of CITES and as Endangered on IUCN Red List
- The current population of these big cats now consists of one isolated population in the Gir Forest Preserve of Gujurat in northwestern India.

Double-humped Camels

- Besides India, double-humped camels are found throughout the highlands of central Asia from Turkistan to Mongolia and their total population is around 20 million.

One-horned Rhinoceros

- The recovery of the greater one-horned rhino is among the greatest conservation success stories in Asia. Thanks to strict protection and management from Indian and Nepalese wildlife authorities, the greater one-horned rhino was brought back from the brink.
- Today populations have increased to around 3,700 rhinos in northeastern India and the Terai grasslands of Nepal.
- Javan rhinoceros, (Rhinoceros sondaicus), also called lesser one-horned rhinoceros, one of three Asian species of rhinoceroses, found only on the island of Java in Indonesia.

64. With reference to India's Desert National Park, which of the following statements are correct? (2020)

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 the Great Indian Bustard.**

Select the correct answer using the code given below.

A. 1 and 2 only

B. 2 und 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: C

Explanation

- 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.
- It is only place where Rajasthan State Bird (Great Indian Bustard), State animal (Chinkara) and State tree (Khejri) and State flower (Rohida) are found naturally.
- Today, population of Great Indian Bustard is confined mostly to Rajasthan and Gujarat. Small population occur in Maharashtra, Karnataka and Andhra Pradesh.
- No human activity is permitted inside the national park except for the ones permitted by the Chief Wildlife Warden of the state. 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.

65. 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

Answer: D

Explanation

- 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.
- Some industries use benzene to make other chemicals that are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of lubricants, rubbers, dyes, detergents, drugs, and pesticides.

Exposure to Benzene

- Outdoor air contains low levels of benzene from tobacco smoke, gas stations, motor vehicle exhaust, and industrial emissions.
- 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.
- The air around hazardous waste sites or gas stations can contain higher levels of benzene than in other areas.
- Benzene leaks from underground storage tanks or from hazardous waste sites containing benzene can contaminate well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposure is tobacco smoke.

66. Consider the following statements with respect to Heat Dome?

1. **Heat dome occurs when the atmosphere traps hot ocean air like a lid or cap.**
2. **Heat dome is created over a water body only.**
3. **The heat domes can also act as fuel to wildfires.**

Which of the above statements is/are correct?

A. 2 only

B. 1 and 3 only

C. 3 only

D. 1, 2 and 3

Answer: B

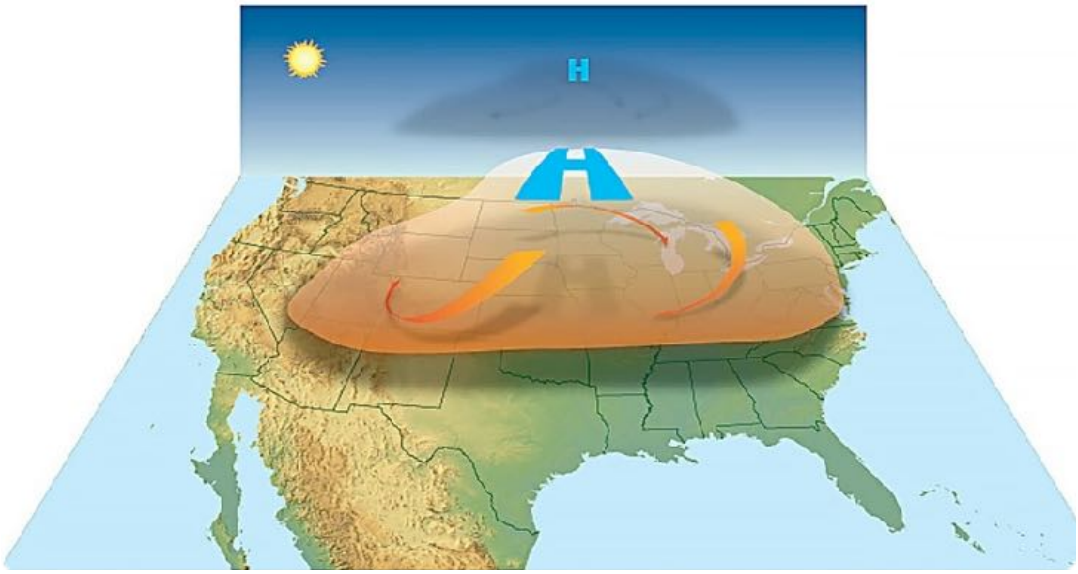
Explanation

Type: Conceptual

Difficulty: Medium-Hard

- According to National Oceanic and Atmospheric Administration (NOAA) of US department of commerce, a heat dome occurs when the atmosphere traps hot ocean air like a lid or cap.

- The phenomenon begins when there is a strong change (or gradient) in ocean temperatures. In the process known as convection, the gradient causes more warm air, heated by the ocean surface, to rise over the ocean surface, according to NOAA.
- Duration: Many weather scientists and organisations such as NOAA have studied these climatic changes and arrived at the conclusion that a heat dome typically lasts a week.
- Effect: Those living without an air conditioner see the temperatures of their homes rising to unbearably high, leading to sudden fatalities like those which are being reported in Canada and parts of the US.
  - ✓ The trapping of heat can also damage crops, dry out vegetation and result in droughts, according to weather experts.
- Climate change and heat domes: The weather scientists have been highlighting the effects of rising temperature (climate change) on more extreme heat waves.
  - ✓ According to a 2017 NOAA survey, average US temperatures have increased since the late 19th century.



67. Special Report on Global Warming of 1.5° C (SR1.5) has been released by

A. UNDP

B. UNEP

C. IPCC

D. WMO

Answer: C

Explanation

Type: Factual

Difficulty: Easy

- The Intergovernmental Panel on Climate Change (IPCC) made public a Special Report, Global Warming of 1.5° C, SR1.5, which was commissioned to specifically explore the scientific feasibility of the 1.5°C goal set in the Paris Agreement, on global warming.
- The report suggests that it has become extremely improbable to achieve the 1.5°C goal purely by reducing emission.
- As per the IPCC Report, at current rate of emissions, the world is set to breach the global warming limit of 1.5°C between 2030 and 2052.
- At present, the world is 1.2°C warmer compared to pre- industrial levels.
- It is a part of series of three reports on specific themes (Special Reports) that IPCC has published –
  - ✓Global Warming of 1.5°
  - ✓Ocean and Cryosphere in a Changing Climate- which underlined the dire changes taking place in oceans, glaciers, and ice-deposits on land and sea at the United Nations Climate Summit underway in the United States.
  - ✓Land and climate change- The report focuses on the contribution of land-related activities to global warming, that is, how the different uses of land affect the emission of greenhouse gases.

68. The World Leaders Summit at the 26th UN Climate Change Conference of the Parties (COP26) will be held in which of the following places?

A. Glasgow

B. Dublin

C. Belfast

D. None of the above

Answer: A

Explanation

Type: Factual

Difficulty: Easy

- The 26th session of the Conference of the Parties (COP 26) to the UNFCCC was originally scheduled to take place from 9-19 November 2020, in Glasgow, UK.
- The United Nations Framework Convention on Climate Change, or UNFCCC, was established in 1992 and ratified by 196 countries plus the European Union.
- It aims to develop cooperative strategies to reduce greenhouse gas concentrations to prevent the dangerous impacts of climate change.
- Each year, the UNFCCC meets at what's called the Conference of the Parties or COP to negotiate a range of issues, from global reporting on national climate change efforts to how to finance such efforts. It also allows parties to share knowledge and experiences.

Important

- In 2015, at COP21 in Paris, 197 parties agreed to establish a legal instrument that would govern climate change mitigation and adaptation efforts.
- This became known as the Paris Agreement. It includes overarching goals to keep global temperature rise below 2° C, with efforts to limit warming to 1.5 °C, and increase countries' resilience to climate impacts. It also aims to ensure sufficient financing to achieve these targets.

69. Consider the following statements with respect to Brown to Green Report.

1. **The Brown to Green Report is the world's most comprehensive review of BRICS climate action.**
2. **The report is been published by Climate Transparency.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

Type: Factual

Difficulty: Easy-Medium

- The Brown to Green Report is the world's most comprehensive review of G20 climate action.
- It provides concise and comparable information on G20 country mitigation action, finance and adaptation.
- Developed by experts from 14 research organisations and NGOs from the majority of the G20 countries, the report covers 80 indicators. It informs policy makers and stimulates national debates.
- The Summary Report 2019 provides a comprehensive overview of all G20 countries, whether – and how well – they are doing on the journey to transition towards a net- zero emissions economy.
- The report draws on the latest emissions data from 2018 and covers 80 indicators on decarbonisation, climate policies, finance and vulnerability to the impacts of climate change. Providing country ratings, it identifies leaders and laggards in the G20.
- India's greenhouse gas (GHG) emissions are – per capita – far below the G20 average.

70. Consider the following statements with respect to Decarbonizing Transport Project in India.

1. **Ministry of Environment, Forest & Climate Change and the International Transport Forum (ITF) of OECD jointly launched the 'Decarbonizing Transport in Emerging Economies' (DTEE) project in India**
2. **The ambitious five-year project will help India develop a pathway towards a low-carbon transport system through the development of modelling tools and policy scenarios.**
3. **Japan, India and Morocco are current participants of International Decarbonising Transport in Emerging Economies.**

Which of the above statements is/are correct?

A. 1 and 2 only

B. 2 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: C

Explanation

Type: Factual

Difficulty: Hard

- NITI Aayog and the International Transport Forum (ITF) of OECD jointly launched the 'Decarbonizing Transport in Emerging Economies' (DTEE) project in India.
- India, Argentina, Azerbaijan, and Morocco are current participants of International Decarbonising Transport in Emerging Economies.

Need

- The transport sector of India is the third most greenhouse gas (GHG) emitting sector, where the major contribution comes from the road transport sector. Out of the total carbon dioxide emissions in India, 13% come from the transport sector. These emissions have more than tripled since 1990.
- In India, CO2 emitted per inhabitant was just about a twentieth of that of an average OECD country, yet, India's transport CO2 emissions are likely to increase by almost 6% annually to 2030.
- The Decarbonizing Transport in India project will design a tailor-made transport emissions assessment framework for India.
- It will provide the government with a detailed understanding of current and future transport activity and the related CO2 emissions as a basis for their decision- making.
- The ITF project team will work in close cooperation and coordination with India's government agencies, local decision-makers, researchers, experts, and civil society organisations.
- Stakeholder workshops, training sessions, briefings for policymakers and mitigation action plans will support the development of policies beyond the duration of the project.

71. Consider the following statements with respect to Tarballs.

1. **Tarballs are small balls of charcoal used in road construction.**
2. **They are formed from brown carbon, emitted during the burning of fossil fuels.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

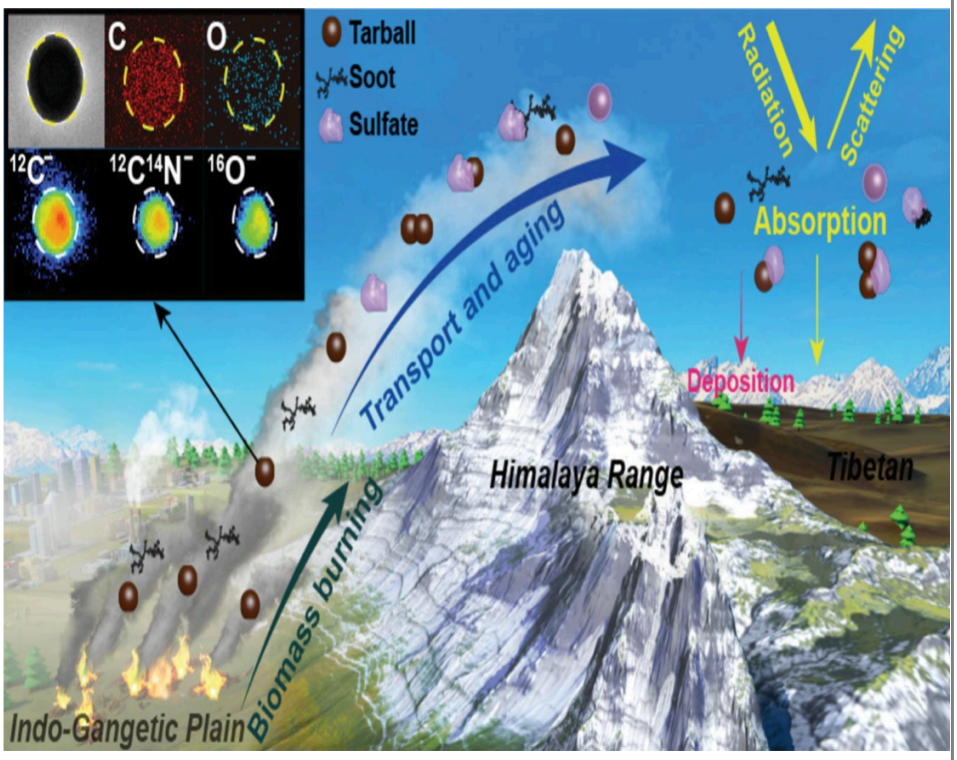
C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- Tarballs are small light-absorbing, carbonaceous particles formed due to burning of biomass or fossil fuels that deposit on snow and ice.
- The percentage of the tarballs increased on days of higher levels of pollution and could contribute to hastening of glacial melt and global warming.
- The median sizes of externally mixed tarballs and internally mixed tarballs were 213 and 348 nanometre respectively.



- Tarballs are formed from brown carbon, emitted during the burning of fossil fuels.
- Until now, black carbon was found to be transported long distances by wind to the Himalayan atmosphere; there was not sufficient direct evidence for primary BrC in the Himalayan atmosphere.

72. Consider the following statements with respect to Living Planet Report 2020.

1. **It was released by Greenpeace.**
2. **It is published every 3 years.**
3. **It presents a comprehensive review of the state of the natural world through the Living Planet Index (LPI).**

Which of the above statements is/are correct?

A. 1 and 2 only

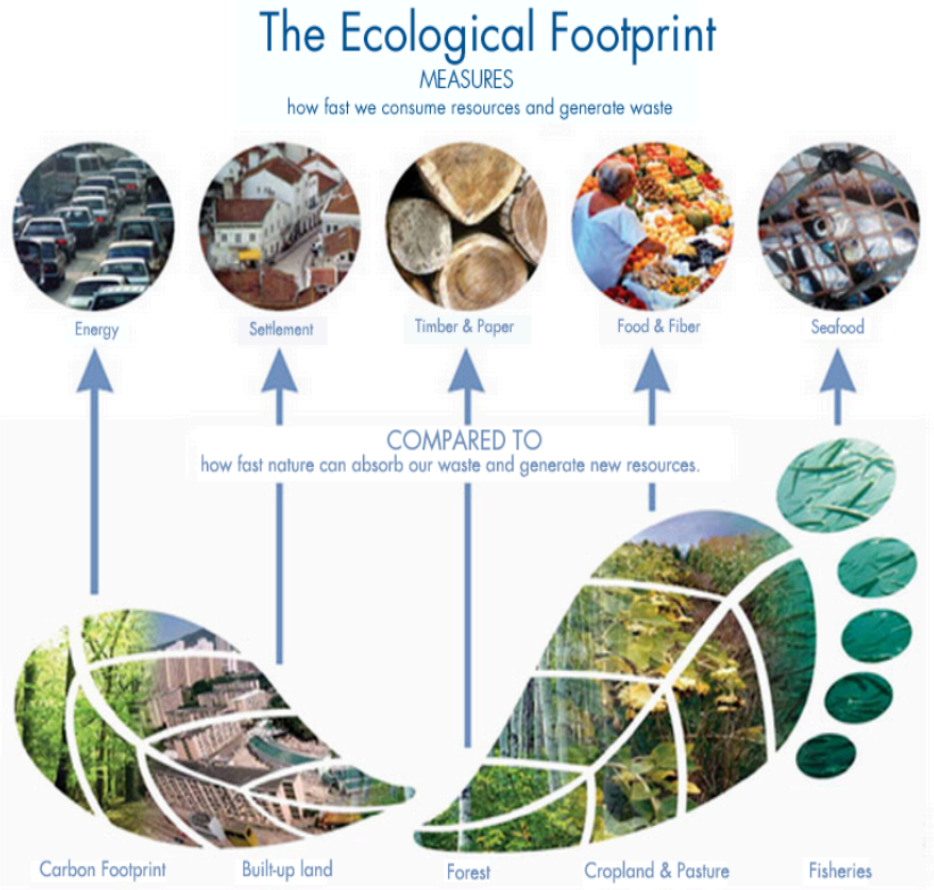
B. 2 and 3 only

C. 3 only

D. 1 and 3 only

Answer: C

Explanation



- Living Planet Report 2020, a collaboration between WWF International and the Zoological Society of London, is the 13th edition of the biennial publication tracking wildlife populations around the world.
- The Living Planet Index (LPI) shows that factors believed to increase the planet's vulnerability to pandemics, including land-use change and the use and trade of wildlife - were also some of the drivers behind the 68 per cent average decline in global vertebrate species populations between 1970 and 2016.
- India's ecological footprint per person is less than 1.6 global hectares (gha) / person (smaller than that of many large countries). But, its high population size have made the gross footprint significantly high.
- The Living Planet Index (LPI) is a measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats.
- The LPI has been adopted by the Convention of Biological Diversity (CBD) as an indicator of progress towards its 2011-2020 target to 'take effective and urgent action to halt the loss of biodiversity'.
- The LPI is based on trends of thousands of population time series collected from monitored sites around the world.
- The Ecological Footprint measures how fast we consume resources and generate waste compared to how fast nature can absorb our waste and generate resources.

73. Consider the following statements.

1. **It was established on the eve of the 1992 Rio Earth Summit.**
2. **World Bank serves as its Trustee, administering their Trust Fund.**
3. **Its assembly is composed of all 184 member countries.**
4. **The First Assembly of this organisation was held at New Delhi, India in 1998.**

Which organization is being mentioned in above statements?

A. Green Climate Fund

B. AdaptationFund

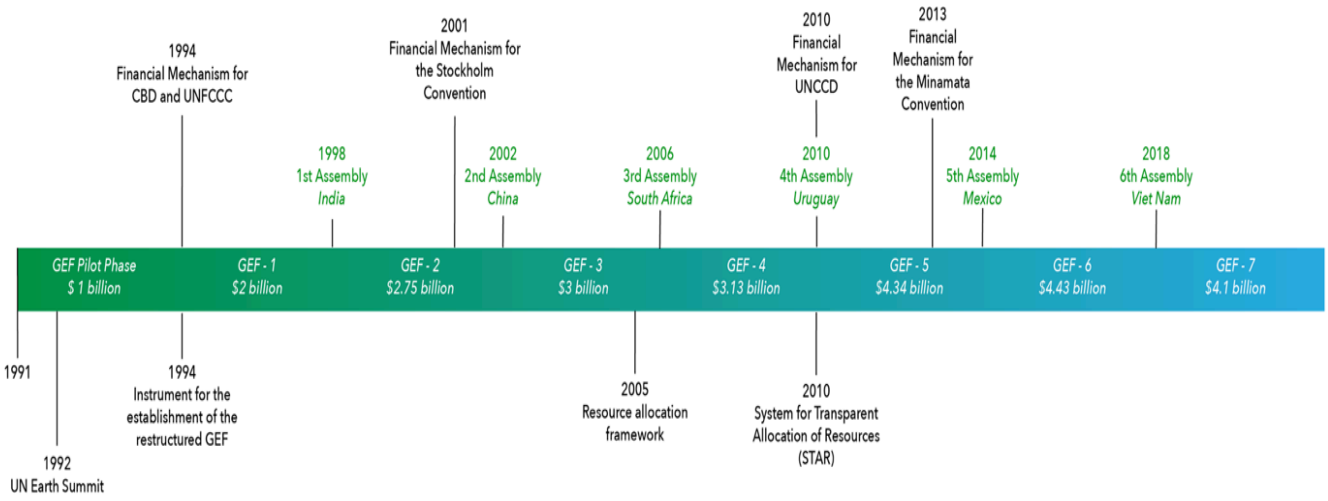
C. Global Environment Facility

D. Intergovernmental Panel on Climate Change

Answer: C

Explanation

- The Global Environment Facility (GEF) was established 30 years ago on the eve of the Rio Earth Summit to tackle our planet's most pressing environmental problems.
- Since then, it has provided more than $21.5 billion in grants and mobilized an additional $117 billion in co-financing for more than 5,000 projects and programs.
- It brings together 184 member governments in addition to civil society, international organization, and private sector partners.
- Through its Small Grants Programme, the GEF has provided support to more than 25,000 civil society and community initiatives in 135 countries.
- GEF funds are available to developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements.
- The World Bank serves as the GEF Trustee, administering the GEF Trust Fund (contributions by donors).



74. Which Tiger Reserve in Uttar Pradesh has bagged the first international award, TX2?

A. Dudhwa

B. Pilibhit

C. Bijnor

D. Kanha

Answer: B

Explanation

- The Pilibhit Tiger Reserve (PTR) and the Uttar Pradesh Forest department have bagged the first-ever international award, TX2, for doubling the number of tigers in four years against a target of 10 years.
- PTR was the first to receive the award among 13 tiger range countries.
- It achieved this goal in just four years from 2014, when it had 25 tigers which went up to 65 in 2018.

The TX2 Award

- The TX2 Award will go to one site that has achieved remarkable and measurable increase in its tiger population since 2010.

Tiger Conservation Excellence Award

- This award recognises one site that has achieved excellence in two or more of these five themes:
  - ✓Tiger and prey population monitoring and research (tiger translocation / prey augmentation)
  - ✓Effective site management (CA | TS and METT assessments)
  - ✓Enhanced Law Enforcement & protection & Ranger Welfare improvement
  - ✓Community based conservation, benefits and Human- Wildlife conflict mitigation
  - ✓Habitat and prey management

75. Consider the following statements with respect to Climate Smart Cities Assessment Framework (CSCAF) 2.0.

1. **It was launched by Ministry of Environment, Forest and Climate Change**
2. **Climate Centre for Cities under National Institute of Urban Affairs (NIUA) is supporting in implementation of CSCAF.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- ClimateSmart Cities Assessment Framework(CSCAF) is a step towards holistic, climate responsive urban development.
- This is part of the Mission's focus on 3 pillars of performance- Liveability, Economic-ability and Sustainability.
- The objective of CSCAF is to provide a clear roadmap for cities towards combating Climate Change while planning and implementing their actions, including investments.
- !In the last decade, an increasing frequency of cyclones, floods, heat waves, water scarcity and drought-like conditions have had adverse impacts on many of our cities.
- Such extreme events and risks cause loss of life as well as impact the economic growth. In this context, CSCAF initiative intends to inculcate a climate-sensitive approach to urban planning and development in India.
- The framework has 28 indicators across five categories namely;
  - ✓Energy and Green Buildings,
  - ✓Urban Planning, Green Cover & Biodiversity,
  - ✓Mobility and Air Quality,
  - ✓Water Management and
  - ✓Waste Management.
- The Climate Centre for Cities under National Institute of Urban Affairs (NIUA) is supporting MoHUA in implementation of CSCAF.

76. Consider the following statements with respect to EV100 Campaign.

1. **The initiative was launched by CDP Worldwide.**
2. **Gujarat is the first state to join EV100 Campaign.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: C

Explanation

- EV100 is a global initiative bringing together forward looking companies committed to accelerating the transition to electric vehicles (EVs).

- Launched by Climate Group (NPO)
- Companies joining EV100 make an individual commitment to transitioning their fleets to electric vehicles and/or installing charging infrastructure at their relevant premises by 2030.
- They can choose to make the commitment in one or more of four influence areas: directly controlled fleets (owned/ leased), service provider contracts, workplace charging, and customer charging.
- Maharashtra announced its partnership with Climate Group's EV100 campaign to support ambitious EV deployment targets set by the state under its new EV Policy.
- The partnership, guided by the Department of Environment and Climate Change, Government of Maharashtra, comes in the backdrop of Maharashtra's new EV Policy 2021 that aims to have 10% battery operated electric vehicles in new registrations by 2025.
- The new policy is armed with economic incentives, complementing those under FAME 2, to enhance EV purchase for personal and commercial use.

77. "Renewables Integration in India 2021" report is released by which of the following?

A. International Energy Agency (IEA)

B. International Renewable Energy Agency

C. Energy Information Administration

D. Organisation for Economic Co-operation and Development

Answer: A

Explanation

- The International Energy Agency(IEA) in association with NITI Aayog has released a report titled "Renewables Integration in India 2021".
- The report is based on the outcome of three states workshops held with the Governments of Maharashtra, Karnataka and Gujarat to understand the specific energy transition challenges faced by these renewable-rich states.
- The report highlights that India's power system can efficiently integrate renewables (175 GW by 2022 and 450 GW by 2030), but it would require identification of resources and proper planning, regulatory, policy and institutional support, energy storage and advance technology initiatives.
- This report suggests ways for India to maximise the amount and value of solar and wind power in its electricity system.

78. Consider the following statements with respect to Tso Kar Wetland Complex.

1. **This site has been proposed to include in list of Ramsar sites.**
2. **It is also an Important Bird Area (IBA) as per BirdLife International.**
3. **Black-necked Crane is also found in this region.**

Which of the above statements is/are correct?

A. 1 and 2 only

B. 3 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: C

Explanation

- The Tso Kar Basin is a high-altitude wetland complex, consisting of two principal waterbodies.
  - ✓Startsapuk Tso, a freshwater lake.
  - ✓Tso Kar itself, a hypersaline lake
- The Tso Kar Basin is an A1 Category Important Bird Area (IBA) as per Bird Life International and a key staging site in the Central Asian Flyway.
- The site is also one of the most important breeding areas of the Black-necked Crane (Grus nigricollis) in India.
- This IBA is also the major breeding area for Great Crested Grebe (Podicepscristatus), Bar-headed Geese (Anserindicus), Ruddy Shelduck (Tadornaferruginea), Brown-headed Gull (Larusbrunnicephalus), Lesser Sand-Plover (Charadriusmongolus) and many other species.

79. Recently a Draft Agarwood Policy 2021 has been released by a state. Consider the following statement with respect to same.

1. **This has been released by Meghalaya.**
2. **Agar plantations are suitable and preferable for planting in warm and high humid sub-tropical climate.**
3. **Agarwood is used in herbicides.**

Which of the above statements is/are correct?

A. 1 and 2 only

B. 2 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: B

Explanation

- Recently Tripura released Draft Tripura Agarwood Policy 2021.
- It aims to promote the state's agarwood business in a bid to develop a Rs 2000 crore economy in the state within 2025.
- Agarwood generally grows well in hilly areas greater than 750 meters above sea level.
  - ✓It has been grown in yellow, red podzolic, clay sandy soil.
  - ✓The temperature ranges from 20 0 C to 330 C at an average.
  - ✓It can be grown at rainfall between 2,000 and 4,000mm.
- It is used as incense in religious ceremonies and in spiritual practices.
- Agarwood undergo a series of steam distillation and produces different grades of oil of varying strengths costing according to the grade.

- Undiluted oil is safe to use on the skin.
- It helps the body as a stimulant, tonic, anti inflammatory, digestive, analgesic, anti arthritic, antipuritic, improves appetite and as a tranquilizer.

80. Recently, Management Effectiveness Evaluation (MEE) protected areas in the country was released. Consider the following statements with respect to the same.

1. **National Parks, Tiger Reserves and Wildlife Sanctuaries were included in this assessment.**
2. **The assessment process of India"s National Park and Wildlife Sanctuaries was adopted from European Environment Agency framework of Management Effectiveness Evaluation (MEE).**
3. **The score of Eastern Region was better than that of Northern Region.**
4. **The report was released by Ministry for Environment, Forest and Climate Change (MoEF&CC).**

Which of the above statements are correct?

A. 1, 2 and 3 only

B. 2 and 3 only

C. 3 and 4 only

D. 2, 3 and 4 only

Answer: C

Explanation

- Recently, the Ministry for Environment, Forest and Climate Change (MoEF&CC) has released Management Effectiveness Evaluation (MEE) of 146 national parks and wildlife sanctuaries (NP&WLS) in the country.

Table 2.2: Top five and bottom five scored NP&WLS

State	NP&WLS	%	Rating
Top five scored NP&WLS			
West Bengal	Jaldapara NP	80.83	Very Good
West Bengal	Raiganj WLS	81.03	Very Good
Himachal Pradesh	Sainj WLS	82.50	Very Good
Himachal Pradesh	Great Himalayan NP	84.17	Very Good
Himachal Pradesh	Tirthan WLS	84.17	Very Good
Bottom five scored NP&WLS			
Uttar Pradesh	Turtle WLS	26.66	Poor
Haryana	Khaparwas WLS	29.17	Poor
Rajasthan	Ramsagar WLS	29.31	Poor
Assam	Pani-Dihing Bird WLS	31.66	Poor
Uttar Pradesh	Jai Prakash Narayan (Surhatal) Bird WLS	31.67	Poor

- Protected area (PA) management effectiveness evaluation (MEE) is defined as the assessment of how well NP&WLS are being managed—primarily, whether they are protecting their values and achieving the goals and objectives agreed upon.
- The assessment process of India''s National Park and Wildlife Sanctuaries was adopted from International Union for the Conservation of Nature (IUCN) World Commission on Protected Areas (WCPA) framework of Management Effectiveness Evaluation (MEE).

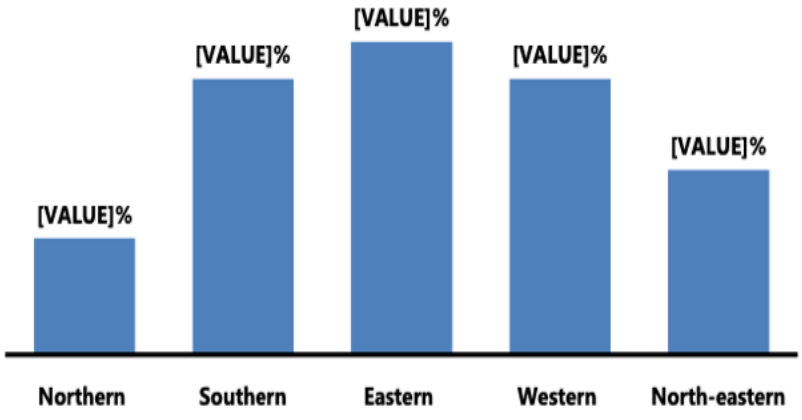


Figure 2.1: Overall Region-wise mean MEE Score

81. Consider the following statements with respect to Ozone in atmosphere.

1. **Recently, there has been an increase in abundance of ozone from 0-5 km altitude.**
2. **Any reading of up to 50 on the air quality index is considered to be an indicator of good air quality.**
3. **Ozone is formed only by chemical reactions involving solar ultraviolet radiation (sunlight) and oxygen molecules.**

Which of the above statements are correct?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: A

Explanation

- A Centre for Science and Environment study has found that ozone levels are exceeding the permitted levels even during winter in Delhi-NCR, making the smog more "toxic".
- Despite the pandemic and lockdowns, more days and locations witnessed higher and longer duration of ozone spells.
- Stratospheric ozone. Stratospheric ozone is formed naturally by chemical reactions involving solar ultraviolet radiation (sunlight) and oxygen molecules, which make up 21% of the atmosphere.

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

- Tropospheric ozone. Near Earth's surface, ozone is produced by chemical reactions involving naturally occurring gases and gases from pollution sources.

82. Which of the following Tiger Reserves in India have received accreditation of the Global Conservation Assured Tiger Standards in 2021?

1. **Corbett**
2. **Valmiki Tiger Reserve**
3. **Sunderbans**
4. **Bandipur Tiger Reserve**
5. **Ranthambore**

Select the correct code.

A. 1, 2, 3 and 4

B. 2, 3 and 4

C. 1, 4 and 5

D. 1, 2, 3 and 5

Answer: B

Explanation

- On the occasion of International Tiger Day, Union Minister for Environment, Forest and Climate Change announced that 14 tiger reserves in India have received accreditation of the Global Conservation Assured Tiger Standards (CA | TS).
- 14 Tiger Reserves:
  - ✓Manas, Kaziranga and Orang in Assam
  - ✓Satpura, Kanha and Panna in Madhya Pradesh
  - ✓Pench in Maharashtra
  - ✓Valmiki Tiger Reserve in Bihar
  - ✓Dudhwa in Uttar Pradesh
  - ✓ Sunderbans in West Bengal
  - ✓Parambikulam in Kerala
  - ✓Bandipur Tiger Reserve of Karnataka
  - ✓Mudumalai and Anamalai Tiger Reserve in Tamil Nadu
- The three most popular tiger reserves Bandhavgarh in MP, Corbett in Uttarakhand, and Ranthambore in Rajasthan are not on the list of reserves that have been granted accreditation
- Fourteen out of India's 52 tiger reserves have received the Conservation Assured Tiger Standards (CATS) accreditation for meeting a set of standards for effective conservation of big cats.

83. Recently, Carbon Border Arrangements (CBA), first dedicated climate law was signed into action by the European Parliament. Consider the following statements with respect to the same.

1. **Companies abroad that wanted to sell cement, iron, steel, aluminum, fertilizer or electricity to the EU would also be required to pay that price for each ton of carbon dioxide they emit in making their products.**
2. **The carbon border tax will be effective from 1st Jan 2022.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

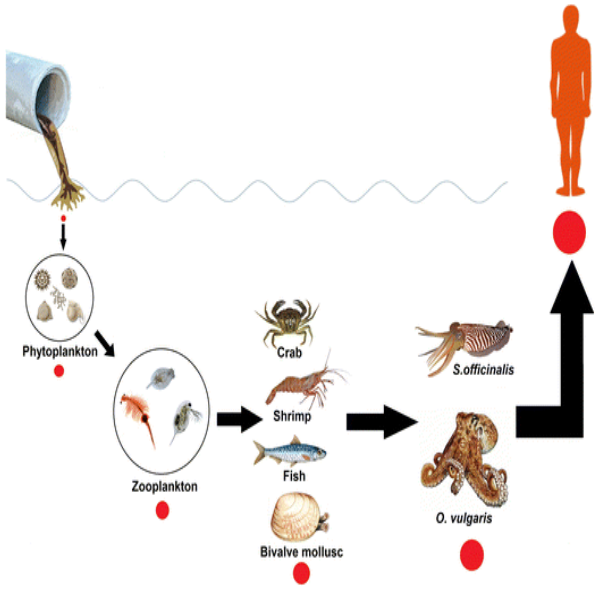
Answer: A

Explanation

- June 2021 marked a historic month, as the first dedicated climate law was signed into action by the European Parliament.

Carbon Border Arrangements (CBA) or Carbon border tax or carbon border adjustment mechanism (CBAM)

- Companies abroad that wanted to sell cement, iron, steel, aluminum, fertilizer or electricity to the EU would also be required to pay that price for each ton of carbon dioxide they emit in making their products.
- The idea would be to level the carbon playing field. The border tax would not take effect until 2026.



84. Which of the following are necessary conditions for a pollutant for its Biomagnification to occur?

1. **It should be fat soluble.**
2. **It should be water soluble.**
3. **It should be biologically inactive.**
4. **It should be short lived.**

Select the correct code.

A. 1 and 3 only

B. 2, 3 and 4 only

C. 1 and 4 only

D. 1 only

Answer: D

Explanation

- In biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another. In order for biomagnification to occur, the pollutant must be: long- lived, mobile, soluble in fats, biologically active. E.g. DDT (Dichlorodiphenyltrichloroethane)
- If a pollutant is short-lived, it will be broken down before it can become dangerous.
- If it is not mobile, it will stay in one place and is unlikely to be taken up by organisms.
- If the pollutant is soluble in water, it will be excreted by the organism. Pollutants that dissolve in fats, however, may be retained for a long time.

85. Which of the following Biosphere Reserves have been declared as UNESCO Biosphere Reserve?

1. **Manas**
2. **Simlipal**
3. **Khangchendzonga**
4. **Sunderbans**
5. **Panna**

Select the correct code.

A. 1, 2, 4 and 5

B. 2, 3 and 5

C. 2, 3, 4 and 5

D. 1, 2, 3, 4 and 5

Answer: C

Explanation

- Biosphere reserves are sites established by countries and recognized under UNESCO's Man and the Biosphere (MAB) Programme to promote sustainable development based on local community efforts and sound science.
- The programme of Biosphere Reserve was initiated by UNESCO in 1971.
- Biosphere reserves are designated by the UNESCO to resolve man-animal conflict and promote conservation of biodiversity as well as enable sustainable use of natural resources.
- Biosphere Reserves recognised by UNESCO
  - ✓Nilgiri, 2000
  - ✓Gulf of Mannar, 2001
  - ✓Sunderban, 2001
  - ✓Nanda Devi, 2004

✓Nokrek, 2009

✓Pachmarhi, 2009

✓Similipal, 2009

✓Achanakmar-Amarkantak, 2012

✓Great Nicobar, 2013

✓Agasthyamala, 2016

✓Khangchendzonga, 2018

✓Panna, 2020

86. Consider the following statements with respect to Coral Reefs.

1. **Coral reefs are naturally colorful because of algae, which lives inside of the coral, providing them with food.**
2. **Coral reefs cover less than 1% of the ocean but are home to almost 25% of all known marine species.**
3. **ReefWatch Marine Conservation is an agency under Ministry of Environment, Forest and Climate Change working on marine conservation since 1993.**

Which of the above statements is/are correct?

A. 1 only

B. 2 and 3 only

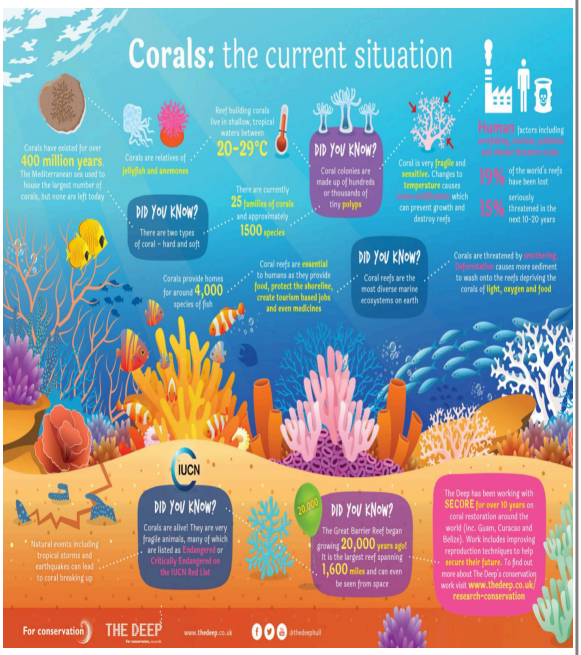
C. 1 and 2 only

D. 1 and 3 only

Answer: C

Explanation

- Coral reefs are unique and the most diverse marine ecosystems on Earth. They are believed to have existed for about 200 million years. It is estimated that it took corals about 50 million years to reach their present level of diversity.
- They play a crucial role in supporting the flora and fauna in the marine ecosystem.
- They have, since time immemorial, provided us with food, pleasure and protection from storm and other natural calamities.



- Known as "rainforests of the sea," coral reefs cover less than 1% of the ocean but are home to almost 25% of all known marine species.
- Coral reefs are the largest structures on earth of biological origin.
- Coral reefs are naturally colorful because of algae, which lives inside of the coral, providing them with food.
- The three main types of coral reefs are fringing reefs, barrier reefs, and coral atolls.
- ReefWatch Marine Conservation is an Indian NGO in the Andaman islands working on marine conservation since 1993.

87. Which of the following is true about Limiting Factors in Ecology?

1. **Limiting factor causes competition between individuals of a species population.**
2. **Extreme Sunlight in the rain forest is a limiting factor.**
3. **Moisture in the rain forest is a limiting factor.**

Choose the correct code.

A. 1 and 3 only

B. 1 and 2 only

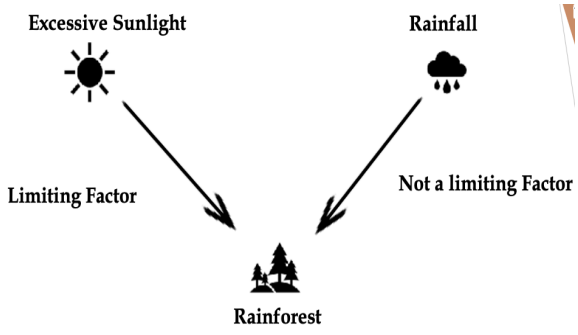
C. 2 and 3 only

D. All are correct

Answer: B

Explanation

- In ecology, common limiting factor resources are environmental conditions that limit the growth, abundance, or distribution of an organism or a population of organisms in an ecosystem.
- The limiting factor also causes competition between individuals of a species population.
- For example, space is a limiting factor, Sunlight in the rain forest is a limiting factor for plants at the floor, etc. But moisture in the rain forest is not a limiting factor as it fairly abundant.



88. Recently few species were spotted for the first time in India. Consider the following pairs with respect to the same.

Species : First sighted in

1. **Himalayan serow : Jammu and Kashmir**

2. **The Striped Hairstreak : Arunachal Pradesh**
3. **Willow warbler : Eastern Ghats**

Which of the above pairs are incorrect?

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1, 2 and 3

Answer: C

Explanation

- A Himalayan serow has been sighted for the first time in the Himalayan cold desert region.
- A biologist has described a Himalayan serow as resembling a cross between a goat, a donkey, a cow, and a pig.
- It's a medium-sized mammal with a large head, thick neck, short limbs, long, mule-like ears, and a coat of dark hair.

- Himalayan serows are herbivores, and are typically found at altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet).
- They are known to be found in eastern, central, and western Himalayas, but not in the Trans Himalayan region.
- The Striped Hairstreak (Yamamotozephyrus kwangtugenesis) was located in Vijaynagar (Arunachal Pradesh) bordering Myanmar.

- It was first recorded by Japanese entomologists in Hainan province of China.
- India now has 1,327 species of butterflies, up from 1,318 in 2015.
- Willow warbler has been sighted for the first time in the country in Thiruvanathapuram.
- It is the longest migrating bird in the 10 gms Warblers weight category.
- Willow Warbler is very difficult to identify as it is quite small and the plumage colour changes twice a year.

89. Ramadevarabetta Vulture Sanctuary, India's only vulture sanctuary is present in which of the following states?

A. Madhya Pradesh

B. Tamil Nadu

C. Kerala

D. Karnataka

Answer: D

Explanation

- India's only vulture sanctuary, Ramadevarabetta Vulture Sanctuary in Ramanagara district of Karnataka, has finally got its much-needed protective barrier and notified as an eco-sensitive zone (ESZ).
- Being very close to Bengaluru, the granite rocky hills have witnessed an indiscriminate expansion of industries and real estate activity in the last few years.
- The Central Government has notified an area from 1.30 metres to 1.80 km from the boundary of the 346- hectare area sanctuary.
- The total geographical area of the ESZ is 7.08 sq km and covers a total of six villages and one hamlet.
- It is the only place in Karnataka where the critically endangered and endemic Indian white backed vulture and long-billed vultures are found and breed naturally in the entire South.
- A rescue centre for vultures will be set up in the Bihar's Valmiki Tiger reserve's Ganauli range to increase the number of vultures.

90. In recent years, The Himalayan trillium has become one of the most traded commercial plants of the Himalayan region, due to which one of the following reason?

A. Use in textile fibre

B. Use in Bio-diesel

C. Pulp for paper industry

D. High medicinal quality

Answer: D

Explanation

- The Himalayan trillium — found across India, Bhutan, Nepal and China — is a natural source of steroidal saponins which are important components of steroidal drugs.
- The plant is popular in traditional Chinese medicine.

- The Himalayan trillium, a common herb of the Himalayas was declared 'endangered' by the International Union for Conservation of Nature (IUCN).
- Increased demands over the last decade has made its illegal collection from the wild a rather lucrative business in India: a kilogram fetches about Rs.3,000-5,000.

91. Consider the following statements with respect to Black Softshell Turtle.

1. **It is a brackish-water species.**
2. **It enjoys legal protection under the Indian Wildlife (Protection) Act of 1972.**
3. **The International Union for Conservation of Nature had in 2021 listed the turtle as 'critically endangered'.**

Which of the above statements is/are incorrect?

A. 1 only

B. 2 and 3 only

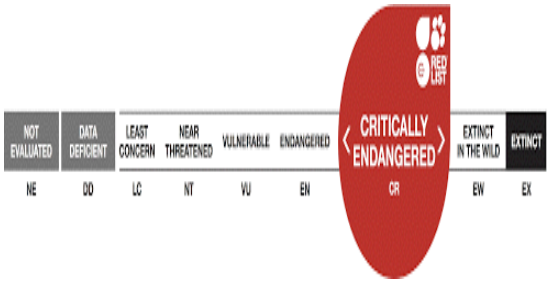
C. 2 only

D. 1 and 2 only

Answer: D

Explanation

- Until sightings along the Brahmaputra River's drainage in Assam, the black softshell turtle was thought to be 'extinct in the wild' and confined only to ponds of temples in northeastern India and Bangladesh.
- The International Union for Conservation of Nature had in 2021 listed the turtle as 'critically endangered'.
- But it does not enjoy legal protection under the Indian Wildlife (Protection) Act of 1972 although it has traditionally been hunted for its meat and cartilage, traded in regional and international markets.
- A major temple in Assam has signed a memorandum of understanding with two green NGOs, the Assam State Zoo cum Botanical Garden and the Kamrup district administration for long-term conservation of the rare freshwater black softshell turtle (Nilssonia nigricans).



92. 'Carbon Watch' was recently heard in news. Consider the following statements with respect to the same.

1. **It is a Smart Watch which will be positioned in prime regions of a city to calculate carbon emissions in that region.**
2. **Chandigarh became the first state or Union Territory in India to launch Carbon Watch.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- Chandigarh became the first state or Union Territory in India to launch Carbon Watch, a mobile application to assess the carbon footprint of an individual.
- Although the app can be accessed by everyone, it has specific options for the residents of Chandigarh to compile a detail study.
- As a person downloads the application, they will need to fill details in four parts –
  - ✓ Water
  - ✓ Energy
  - ✓ Waste Generation and
  - ✓ Transport (Vehicular movement).
- In the category of Water, the person will be required to inform about the consumption of water.
- In the Energy category, the details regarding the electricity units consumed every month at the house, monthly bill etc and usage of solar energy will have to be furnished.
- In the Waste category, the individual will need to inform about the waste generation on their part and their family.
- In the transport section, the individual will have to inform about the mode of transport used by them- four wheeler, two-wheeler or bicycle.
- With the mentioned information, the mobile application will automatically calculate the carbon footprint of the individual.

93. The report, titled Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions was recently released by which of the following?

A. Climate and Clean Air Coalition

B. United Nations Environment Programme

C. Both A and B

D. Intergovernmental Panel on Climate Change

Answer: C

Explanation

- Recently, a report, titled Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions was released by the Climate and Clean Air Coalition and the United Nations Environment Programme (UNEP).
- Key Findings:
  - ✓ Human-caused methane emissions must be cut by 45 per cent
  - ✓ to avoid the worst effects of climate change.
  - ✓ It would prevent 260,000 premature deaths, 775,000 asthma- related hospital visits annually, as well as 25 million tonnes of crop losses.
  - ✓ Methane in the atmosphere reached record levels last year, according to the data from the United States National Oceanic and Atmospheric Administration.
  - ✓ Most human-caused methane emissions came from three sectors: Fossil fuels, waste and agriculture.
- The assessment found that the mitigation potential varied between countries and regions. Europe had the greatest potential to curb methane emissions from farming, fossil fuel operations and waste management.
- The European Commission had adopted the European Union Methane Strategy in October 2020. It outlined measures to cut methane emissions in Europe and internationally.
- Three behavioural changes— reducing food waste and loss, improving livestock management and adopting healthy diets (vegetarian or with a lower meat and dairy content) — could reduce methane emissions by 65–80 million tonnes per year over the next few decades

94. Which of the following are the sites that has been recognized under the 1971 Ramsar Convention on Wetlands?

1. **Thol Lake Wildlife Sanctuary**
2. **Kabartal Wetland**
3. **Carambolim lake**

4. **Sultanpur National Park**
5. **Varthur lakes**

Select the correct code

A. 1, 2 and 4 only

B. 1, 3 and 4 only

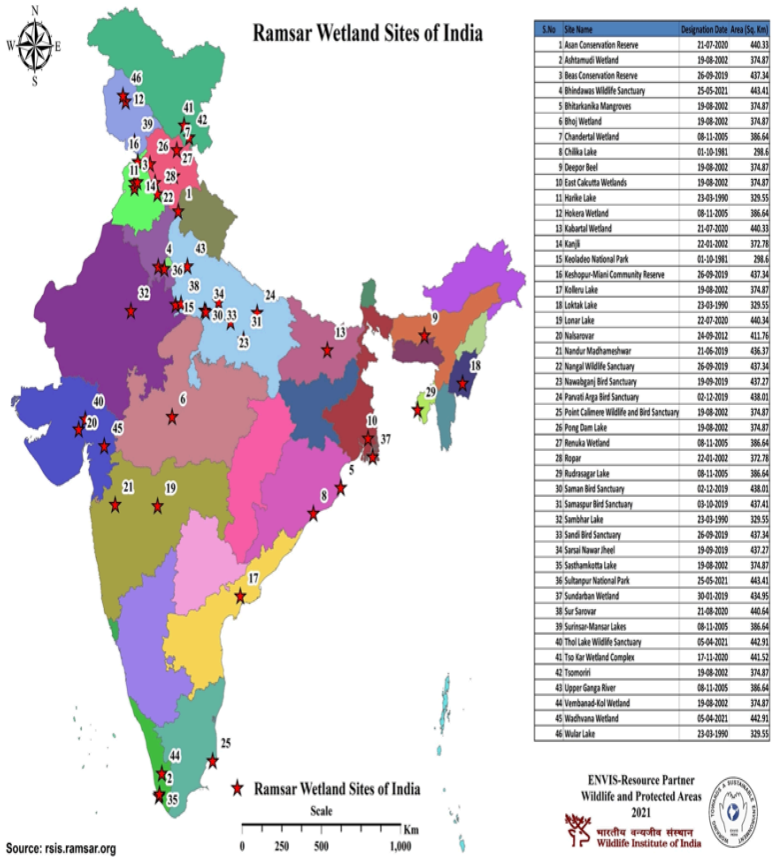
C. 1, 3, 4 and 5 only

D. 1, 2, 3, 4 and 5

Answer: A

Explanation

- India added another feather in its cap when four more sites - two each from Haryana and Gujarat - were recognised as wetlands of international importance under the Ramsar Convention.
- Sultanpur National Park in Gurgaon and Bhindawas Wildlife Sanctuary in Jhajjar (both in Haryana) have been added to the list this year. Apart from that, Thol and Wadhwana from Gujarat too have now become a part of the convention.
- The Ramsar Convention on Wetlands is an intergovernmental treaty adopted on February 2, 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea.



S.No	Site Name	Designation Date	Area (Sq. Km)
1	Asan Conservation Reserve	21-07-2020	440.33
2	Ashtamudi Wetland	19-08-2002	374.87
3	Beas Conservation Reserve	26-09-2019	437.34
4	Bhindawas Wildlife Sanctuary	25-05-2021	443.41
5	Bhitarkanika Mangroves	19-08-2002	374.87
6	Bhoj Wetland	19-08-2002	374.87
7	Chandertal Wetland	08-11-2005	386.64
8	Chilika Lake	01-10-1981	298.6
9	Deepor Beel	19-08-2002	374.87
10	East Calcutta Wetlands	19-08-2002	374.87
11	Harike Lake	23-03-1990	329.55
12	Hokera Wetland	08-11-2005	386.64
13	Kabartal Wetland	21-07-2020	440.33
14	Kanjli	22-01-2002	372.78
15	Keoladeo National Park	01-10-1981	298.6
16	Keshopur-Miani Community Reserve	26-09-2019	437.34
17	Kolleru Lake	19-08-2002	374.87
18	Loktak Lake	23-03-1990	329.55
19	Lonar Lake	22-07-2020	440.34
20	Nalsarovar	24-09-2012	411.76
21	Nandur Madhameshwar	21-06-2019	436.37
22	Nangal Wildlife Sanctuary	26-09-2019	437.34
23	Nawabganj Bird Sanctuary	19-09-2019	437.27
24	Parvati Arga Bird Sanctuary	02-12-2019	438.01
25	Point Calimere Wildlife and Bird Sanctuary	19-08-2002	374.87
26	Pong Dam Lake	19-08-2002	374.87
27	Renuka Wetland	08-11-2005	386.64
28	Ropar	22-01-2002	372.78
29	Rudrasagar Lake	08-11-2005	386.64
30	Saman Bird Sanctuary	02-12-2019	438.01
31	Samaspur Bird Sanctuary	03-10-2019	437.41
32	Sambhar Lake	23-03-1990	329.55
33	Sandi Bird Sanctuary	26-09-2019	437.34
34	Sarsai Nawar Jheel	19-09-2019	437.27
35	Sasthamkotta Lake	19-08-2002	374.87
36	Sultanpur National Park	25-05-2021	443.41
37	Sundarban Wetland	30-01-2019	434.95
38	Sur Sarovar	21-08-2020	440.64
39	Surinsar-Mansar Lakes	08-11-2005	386.64
40	Thol Lake Wildlife Sanctuary	05-04-2021	442.91
41	Tso Kar Wetland Complex	17-11-2020	441.52
42	Tsomoriri	19-08-2002	374.87
43	Upper Ganga River	08-11-2005	386.64
44	Vembanad-Kol Wetland	19-08-2002	374.87
45	Wadhvana Wetland	05-04-2021	442.91
46	Wular Lake	23-03-1990	329.55

- It came into force for India on February 1, 1982. Those wetlands which are of international importance are declared as Ramsar sites.

95. Consider the following regarding biofuels

1. **First generation biofuels are produced directly from food crops.**
2. **Third generation biofuels are aimed at capturing and storing carbon dioxide also.**

3. **Fourth generation biofuels use specially engineered energy crops such as algae.**

Which of the above statements is/are correct?

A. 1 only

B. 2 and 3 only

C. 1 and 3 only

D. 3 only

Answer: A

Explanation

- First Generation biofuels are produced directly from food crops by abstracting the oils for use in biodiesel or producing bioethanol through fermentation.
- Crops such as wheat and sugar are the most widely used feedstock for bioethanol while oil seed rape has proved a very effective crop for use in biodiesel.
- Second Generation biofuels are produced from non-food crops such as wood, organic waste, food crop waste and specific biomass crops.
- Cellulosic ethanol technology fits in here, as do non-food crop technologies such as jatropha-based biofuels.
- Third Generation of biofuels is based on improvements in the production of biomass.
  - ✓ It takes advantage of specially engineered energy crops such as algae as its energy source.
  - ✓ The algae are cultured to act as a low-cost, high-energy and entirely renewable feedstock.
- Fourth Generation Biofuels are aimed at not only producing sustainable energy but also a way of capturing and storing
  CO_2.

96. **India hosted a two-day summit on Green Hydrogen initiatives involving the BRICS nations. Consider the following statements with respect to Green Hydrogen.**

1. **Hydrogen when produced from biomass is known as Green Hydrogen.**
2. **Green Hydrogen can be used to replace the industrial hydrogen that gets made every year from natural gas.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: B

Explanation

- Green hydrogen is a clean burning fuel that eliminates emissions by using renewable energy to electrolyse water, separating the hydrogen atom within it from its molecular twin oxygen.
- While blue hydrogen is created from fossil sources, where the carbon emissions are captured and stored, green hydrogen is made from non-fossil sources.
- Green hydrogen energy is vital for India to meet its Nationally Determined Contributions and ensure regional and national energy security, access and availability.
- Hydrogen can act as an energy storage option, which would be essential to meet intermittencies (of renewable energy) in the future.

97. Which one of the following statements correctly defines The Zero waste International Alliance?

A. An international organization promoting alternatives to landfill and incineration.

B. An alliance of nations striving to minimize their plastic waste disposal in the ocean.

C. A group of individuals promoting minimalist living and less consumerism.

D. An alliance of technology based multinational companies undertaking recycling of e-waste.

Answer: A

Explanation

Zero Waste International Alliance (ZWIA)

✓ It is a group of environmental professionals dedicated to working towards a world without waste through public education and practical application of Zero Waste principles.

✓ By disseminating knowledge and providing support to its members ZWIA is promoting the implementation of Zero Waste Principles in various aspects.

- This alliance has been established to promote positive alternatives to landfill and incineration and to raise community awareness of the social and economic benefits to be gained when waste is regarded as a resource base upon which can be built both employment and business opportunity.

98. Several countries, including the UK and France, have enacted laws promising to achieve a net-zero emission scenario by the middle of the century. Consider the following statements with respect to the same.

1. **Net-zero, which is also referred to as carbon-neutrality, means that a country would bring down its emissions to zero.**
2. **No country in Asia has negative emissions.**
3. **The European Union has launched a campaign called "Fit for 55", to cut emissions by 55 per cent below 1990 levels by 2030.**

Which of the above statements is/are incorrect?

A. A. 1 only

B. 2 and 3 only

C. 1 and 2 only

D. 3 only

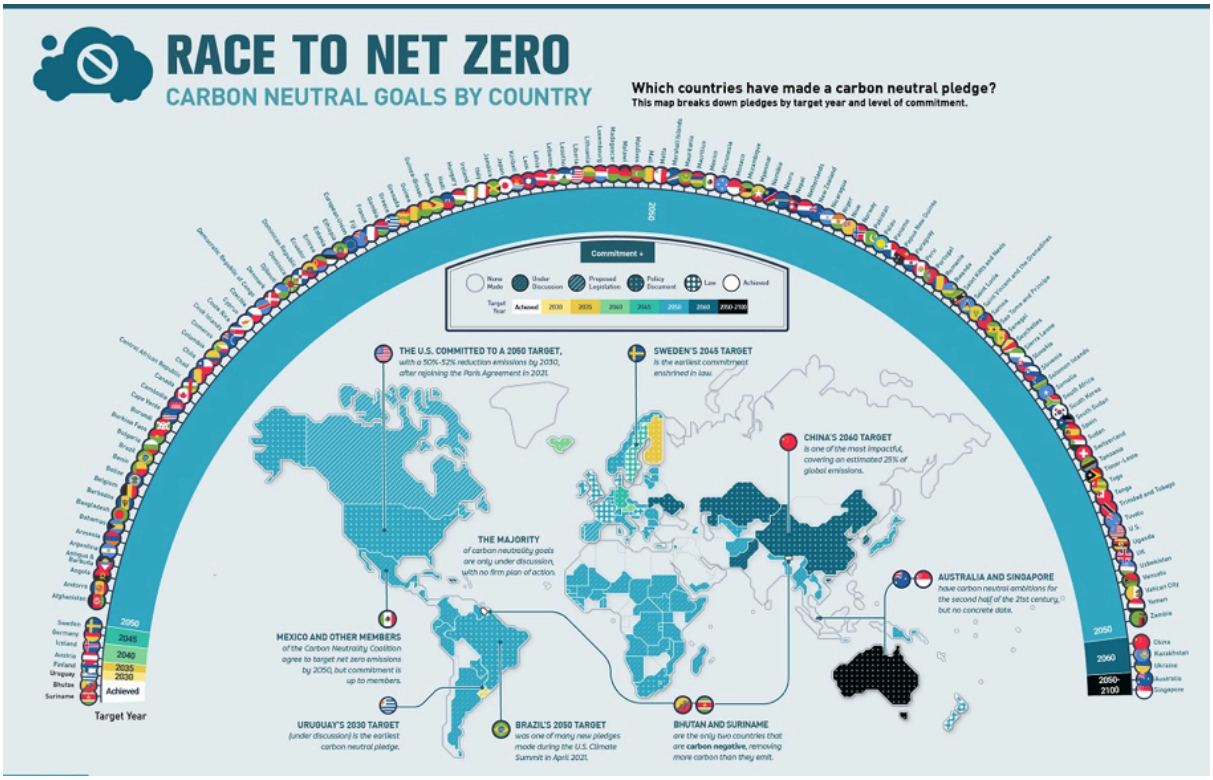
Answer: C

Explanation

- Net-zero, which is also referred to as carbon-neutrality, does not mean that a country would bring down its emissions to zero.
- That would be gross-zero, which means reaching a state where there are no emissions at all, a scenario hard to comprehend.
- Therefore, net-zero is a state in which a country's emissions are compensated by absorption and removal of greenhouse gases from the atmosphere.
- It is even possible for a country to have negative emissions, if the absorption and removal exceed the actual emissions. Bhutan has negative emissions, because it absorbs more than it emits.

Initiatives

- In 2019, the New Zealand government passed the Zero Carbon Act, which committed the country to zero carbon emissions by 2050 or sooner, as part of the country's attempts to meet its Paris climate accord commitments.
- In the same year, the UK's parliament passed legislation requiring the government to reduce the UK's net emissions of greenhouse gases by 100 per cent relative to 1990 levels by the year 2050.
- The European Union too, has a similar plan, called "Fit for 55", the European Commission has asked all of its 27 member countries to cut emissions by 55 per cent below 1990 levels by 2030.
- Last year, China also announced that it would become net-zero by the year 2060 and that it would not allow its emissions to peak beyond what they are in 2030.



99. Consider the following statements with respect to Hydrochlorofluorocarbons.

1. **India has successfully achieved the complete phase out of hydrochlorofluorocarbon (HCFC)-141 b.**
2. **It is a chemical used by foam manufacturing enterprises.**

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. None of the above

Answer: C

Explanation

- HCFC-141b is not produced in the country and all the domestic requirements are met through imports. With the notification of prohibiting the import of HCFC-141 b, the country has completely phased out the important ozone depleting chemical.
- Simultaneously, the use of HCFC-141 b by foam manufacturing industry has also been closed as on 1st January, 2020 under the Ozone Depleting Substances (Regulation and Control) Amendment Rules, 2014.
- The phase out of HCFC-141b from the country has twin environmental benefits viz.

✓Assisting the healing of the stratospheric ozone layer, and

✓Towards the climate change mitigation due to transitioning of foam manufacturing enterprises at this scale under HPMP to low global warming potential alternative technologies

- Nearly, 50 % of the consumption of ozone depleting chemicals in the country was attributable to HCFC-141 b in the foam sector.
- The Ministry adopted a structured approach to engage with foam manufacturing enterprises for providing technical and financial assistance in order to transition to non-ODS and low GWP technologies under HCFC Phase out Management Plan (HPMP).
- Around 175 foam manufacturing enterprises have been covered under HPMP out of which, 163 enterprises are covered under stage II of HPMP.

100.Consider the following statements:

1. **The Biological Diversity Act (BDA) 2002 is in line with the United Nations Convention on Biological Diversity (CBD).**
2. **To obtain biological resources, foreign nationals require the approval of the ministry of environment.**
3. **There is a provision of separate biodiversity board for union territories under the Biological Diversity Act.**

Which of the above statements is/are correct?

A. 1 and 2 only

B. 1 only

C. 2 and 3 only

D. 2 only

Answer: B

Explanation

- All foreign nationals require approval from NBA for obtaining Biological Resources from India.
- There is no provision for a Biodiversity Board for a Union Territory because Union Territories have been placed under National Biodiversity Authority.
- The Biological Diversity Act 2002 was born out of India's attempt to realize the objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992 which recognizes the sovereign rights of states to use their own Biological Resources.
- An Act to provide for the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.
- Powers and Functions of National biodiversity act (NBA)

- ✓ All foreign nationals require approval from NBA for obtaining Biological Resources from India.
- ✓ All Indian individuals/entities are required to seek NBA approval before transferring knowledge/research and material to foreigners.
- ✓ Prior approval of NBA before applying for any kind of IPR based on research conducted on biological material and or associated knowledge obtained from India.

The Biodiversity Act 2002 mandates each state to notify its State Biodiversity Board.