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Awakening Toppers

ENVIRONMENT

PYQs 2011-2023

Why PYQs

- Topics repeat
- Themes repeat
- Pattern analysis
- Application of content
- Revision

BIODIVERSITY

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Q. Consider the following statements:

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Statement-I

Marsupials are not naturally found in India.

Statement-II

Marsupials can thrive only in montane grasslands with no predators.

Which one of the following is correct in respect of the above statements?

a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

c) StatemenI I - is Correct but Statement-II is incorrect

d) Statement-II is incorrect but Statement-II is correct

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Marsupials

- A marsupial is **a mammal that belongs to the infraclass Metatheria, which is sometimes called Marsupialia**.
- There are more than 250 marsupial species.
- Marsupials are characterized by **premature birth and continued development of the newborn** while attached to the nipples on the mother's lower belly. (pouched mammals)
- Examples - Kangaroos, koalas, etc.
- Marsupials are **native to Australia.**
- The Americas also have a presence of marsupials, with **opossums being the only marsupial family found in North and South America.**
- **Marsupials are not naturally found in India**.

Egg Laying Mammals

- Only two kinds of egg-laying mammals are left on the planet today—the **duck-billed platypus and the echidna, or spiny anteater.**
- These "monotremes" once dominated Australia, until their pouch-bearing cousins, the marsupials, invaded the land down under 71 million to 54 million years ago and swept them away.

Q. Consider the following fauna:

1. Lion-tailed Macaque
2. Malabar Civet
3. Sambar Deer

How many of the above are generally nocturnal or most active after sunset?

a) Only one

b) Only two

c) All three

d) None

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- **Sambar Deer:** The elusive sambar deer are crepuscular or nocturnal animals as they are most active at dusk and at night.
- They are found in a broad range of forest habitats like **dry deciduous forests, rainforests and mixed forests.**
- These deer play an important role in the ecosystem they live in by **dispersing seeds** throughout their native range.
- Indian Leopard, Bengal Tiger, and Dhole are the predators that prey on them.
- It has been listed as a **vulnerable species** on the IUCN Red List
- WPA 1972 – Schedule III

Malabar Civet

- It is **endemic to India** and was first reported from Travancore, Kerala.
- It is **nocturnal in nature** and found exclusively in the Western Ghats.

Habitat

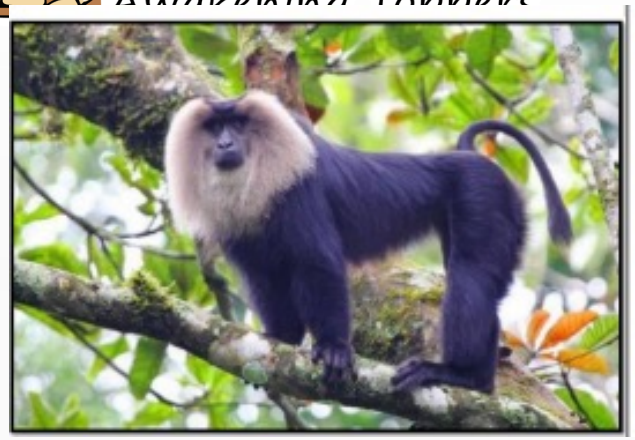
- Wooded plains and hill slopes of evergreen rainforests.
- Western Ghats.

Malabar Civet

Threats

- Deforestation and commercial plantations are major threats.
- Civetone is extracted from the scent gland of this animal and used in medicine, and as an aromatic.
- Wildlife Protection Act Status - Schedule I
- CITES - Appendix III
- Haven't been sighted since 1991.
- It is among the 15 most threatened mammals in the world today.

Lion-tailed Macaque



- It is also called as **Lion-tailed Macaque, Wanderoo, or Liontail Macaque.**
- **It is diurnal,** meaning it is active exclusively in daylight hours.
- This animal is **endemic to the Western Ghats of Karnataka, Kerala** and **Tamil Nadu.**
- The Lion-tailed macaques prefer to stay in the **higher canopy of tropical evergreen forests.**
- The main threat to this species **is habitat disintegration due to human activities.**
- They are listed as **endangered species** under IUCN list.
- **Schedule I** of the Wildlife Protection Act, 1972.
- **Appendix I** of CITES

Q. Invasive Species Specialist Group' (that develop Global Invasive Species Database) belongs to which one of the following organizations?

a) The International union for Conservation of Nature

b) The United Nations Environment Programme

c) The United Nations World Commission for Environment and Development

d) The world wide fund for Nature

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- The Invasive Species Specialist Group (ISSG) is a global network of scientific and policy experts on invasive species, organized under the auspices of the **Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN).**
- It **aims** to reduce threats to natural ecosystems and the native species they contain by increasing awareness of invasive alien species, and of ways to prevent, control or eradicate them.

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Q. Which one of the following makes a tool with a stick to scrape insects from a hole in a tree or a log of wood?

a) Fishing cat

b) Orangutan

c) Otter

d) Sloth bear

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Q. Consider the following statements regarding the Indian squirrels:

1. They build nests by making burrows in the ground.
2. They store their food materials like nuts and seeds in the ground.
3. They are omnivorous.

How many of the above statements are correct?

a) Only one

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Q. Which of the following organisms perform Waggle dance for others of their kin to indicate the direction and the distance to a source of their food?

a) Butterflies

b) Dragonflies

c) Honeybees

d) Wasps

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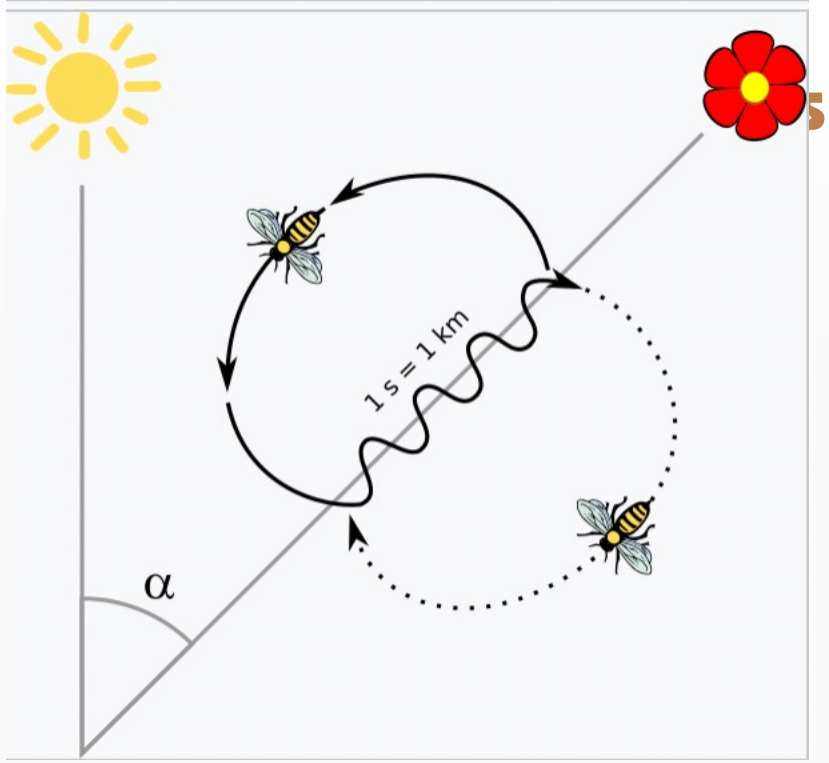
- **Waggle dance** is a term used in beekeeping and ethology for a **particular figure-eight dance of the honey bee.**
- By performing this dance, successful foragers can share information about the direction and distance to patches of flowers yielding nectar and pollen, to water sources, or to new nest-site locations with other members of the colony.



Q. Consider the following statements:

1. In India, the Biodiversity Management Committees are key to the realization of the objectives of the Nagoya Protocol.

2. Biodiversity Management Committees have important functions in determining access and benefit sharing, including the power to levy collection fees on the access of biological resources within its jurisdiction.

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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- **Biodiversity Management Committees (BMC)**
- As per the **Biological Diversity Act 2002**, BMCs are created for "promoting conservation, sustainable use and documentation of biological diversity" by local bodies across the country.
- It shall consist of a chair person and not more than six persons nominated by the local body, of whom not less than one third should be women and not less than 18% should belong to the Scheduled Castes/ Scheduled Tribes.
- The main function of the BMC is **to prepare People's Biodiversity Register in consultation with the local people.**
- The Registers entail a **complete documentation of biodiversity** in the area plants, food sources, wildlife, medicinal sources, etc.
- India's Biological Diversity Act (BDA) 2002, is in close synergy with the **Nagoya Protocol** and aims to implement provisions of the Convention on Biological Diversity (CBD).
- The Nagoya Protocol sought to ensure commercial and research utilisation of genetic resources led to sharing its benefits with the government and the community that conserved such resources.
- CBD has two subsidiary protocols, namely the **Cartagena Protocol** on biosafety and the **Nagoya Protocol** on access to genetic resources and fair and equitable benefit-sharing.

Q. How does National Biodiversity Authority (NBA) help in protecting the Indian Agriculture?

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1. NBA checks the biopiracy and protects the indigenous and traditional genetic resources.
2. NBA directly monitors and supervises the scientific research on genetic modification of crop plants.
3. Application for Intellectual Property Rights related to genetic/biological resources cannot be made without the approval of NBA.

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b) 2 and 3 only

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National Biodiversity Authority

- The National Biodiversity Authority (NBA) was established in 2003 **to implement India's Biological Diversity Act (2002).**
- The NBA is a **Statutory, Autonomous Body** and it performs the **facilitative, regulatory and advisory functions** for the Government of India on issues of conservation, sustainable use of biological resources and fair and equitable sharing of benefits arising out of the use of biological resources.
- Prior approval of NBA is necessary **before applying for any kind of IPRs in India** and outside based on any research or information on a biological resource obtained from India.

Bioprospecting and Biopiracy

- Bioprospecting is the search for and the commercialisation of new products that have been sourced from nature.
- Also known as biodiversity prospecting.
- While biopiracy is when researchers and scientists use sources from nature and traditional knowledge without permission and exploit the indigenous cultures they're getting their information from.
- Various international treaties have been negotiated to provide countries legal recourse in the event of biopiracy and to offer commercial actors legal certainty for investment.
- These include the UN Convention on Biological Diversity and the Nagoya Protocol.

Genetic Engineering Appraisal Committee

- The Genetic Engineering Appraisal Committee (GEAC) is a statutory body constituted under the 'Rules for the Manufacture, Use /Import /Export and Storage of Hazardous Microorganisms/Genetically Engineering Organisms or Cells, 1989' notified under the Environment (Protection) Act, 1986.
- It functions under the Ministry of Environment, Forests & Climate Change.
- The body regulates the use, manufacture, storage, import and export of hazardous microorganisms or genetically-engineered organisms and cells in India.

Q. The "Red Data Books" published by the International Union for Conservation of Nature and Natural Resource (IUCN) contain lists of

1. Endemic plant and animal species present in the biodiversity hotspots.
2. Threatened plant and animal species.
3. Protected sites for conservation of nature and natural resources in various countries.

Select the correct answer using the codes given below:

a) 1 and 3

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c) 2 and 3

d) 3 only

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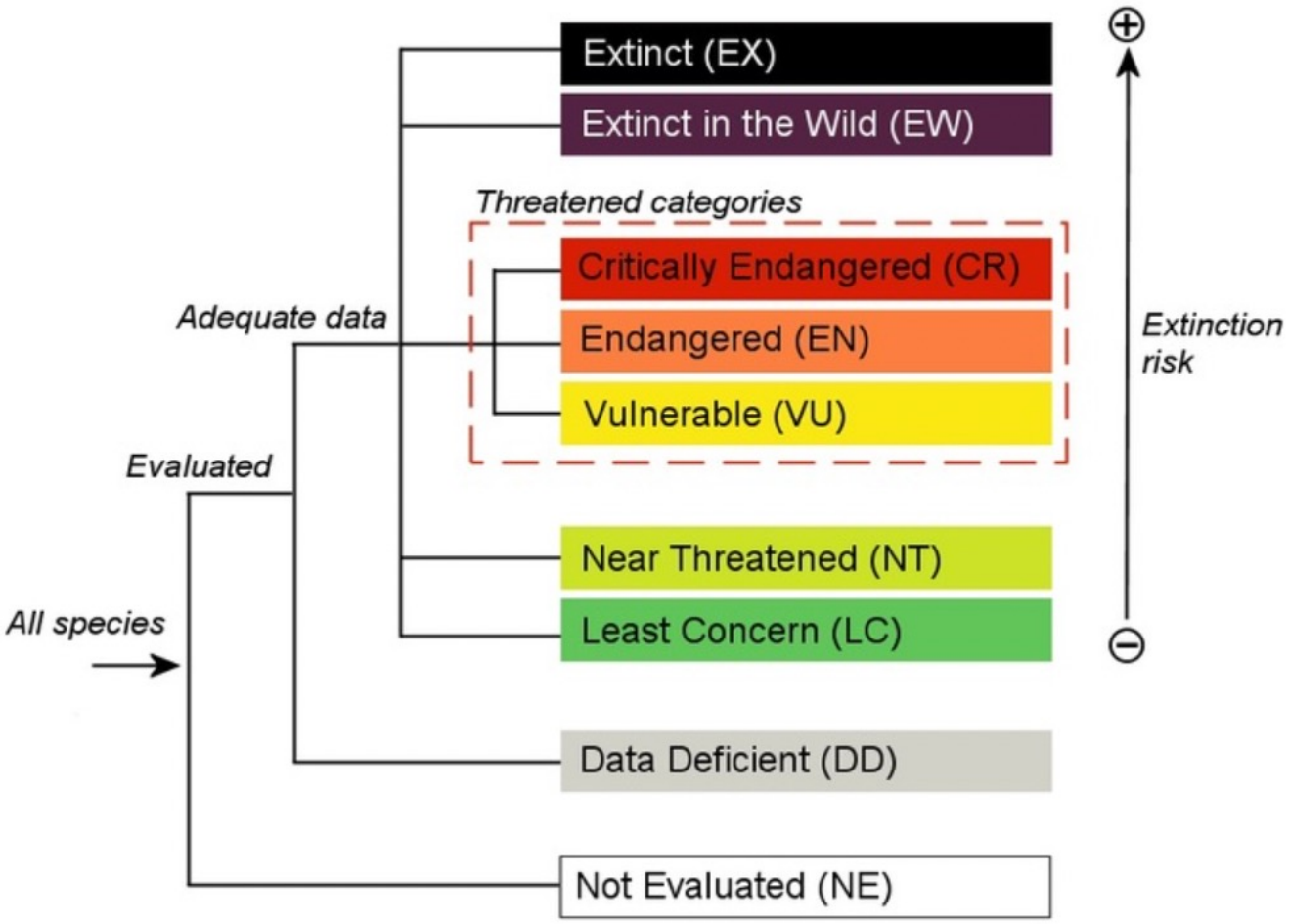

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Q.) With reference to the International Union for Conservation of Nature and Natural Resource (IUCN) and the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), which of the following statements is/are correct ?

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

Select the correct answer using the codes given below:

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CITES/ Washington Convention

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

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Appendix I

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

(Example: African rhinoceros - threatened with extinction)

Appendix II

Trade strictly controlled - 97% of all species

(Example: Orchidaceae - at risk of becoming threatened)

Appendix III

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

(Example: Chilenian toad)

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CoP 3	New Delhi	India	25 February – 8 March 1981
CoP 18	Geneva	Switzerland	17–28 August 2019
CoP 19	Panama City	Panama	14–25 November 2022

IUCN

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

Q. Consider the following statements:

1. Biodiversity is normally greater in the lower latitudes as compared to the higher latitudes.
2. Along the mountain gradients, biodiversity is normally greater in the lower altitudes as compared to the higher altitudes.

Which of the statements given above is/are correct?

a) 1 only

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d) Neither 1 nor 2

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- Species density is higher in the tropics (low latitude) than in temperate regions (high latitude) resulting in a **latitudinal biodiversity gradient (LBG).**
- **Elevational diversity gradient (EDG)** is an ecological pattern where biodiversity changes with elevation.
- The EDG states that species richness tends to increase as elevation increases, up to a certain point, creating a "**diversity bulge**" at middle elevations.
- **Humboldt's enigma** by Alexander von Humboldt's observations, it questions the conventional notion that tropical regions, fueled by ample sunlight, are the primary centres of biodiversity on Earth.
- It contends that despite receiving less sunlight and enduring colder temperatures, **mountain ecosystems defy this notion by showcasing exceptional biodiversity**, thereby challenging traditional ecological theories and prompting investigation into this anomaly.

Q. A sandy and saline area is the natural habitat of an Indian animal species. The animal has no predators in that area but its existence is threatened due to the destruction of its habitat. Which one of the following could be that animal?

a) Indian wild buffalo

b) Indian wild ass

c) Indian wild boar

d) Indian gazelle

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Indian Wild Ass

- The Indian Wild Ass also called Ghor Khar or Ghud Khur is found predominantly in the Little Rann of Kutch and its surrounding areas in Gujarat.
- Saline deserts (Rann), arid grasslands and shrub lands are its preferred environment.

Indian wild ass

Individual from Odu-location = near Ahmedabad aprox 100km near moti malvan Khari in the Little Rann of Kutch

Conservation status

Extinct | Threatened | Least Concern

EX EW CR EN VU NT LC

Near Threatened (IUCN 3.1)[1]

CITES Appendix I (CITES)[2]

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Indian Wild Ass

- Threats
  - Threats to Wild Ass in the Little Rann of Kutch stem from increasing human activities.
  - Land use patterns have changed since the Mega Narmada Dam Project which resulted in the Sardar Sarovar canals all around the protected area.
  - The International Boundary with Pakistan has been fenced thus restricting any possibility of Wild Ass movement beyond borders.
  - Increased agricultural practices have converted lands into irrigation fields, resulting in shrinking habitat for the existing Wild Ass population.
  - Prosopis juliflora invasion is an additional threat to the habitat.

Indian Wild Ass

- **Conservation Status**
  - In August 2015, the IUCN Red List has moved the Indian wild ass from the 'vulnerable' to 'endangered' category, indicating the need for heightened protection measures.
  - It has been classified as a 'nearly threatened' animal by IUCN in 2016.
  - It is protected under Schedule I of the Wildlife Protection Act 1972.
  - Included in Appendix I of the Convention on International Trade in Endangered Species (CITES), making international trade in this species illegal.

Indian Wild Ass

- **Indian Wild Ass Sanctuary** located in the Little Rann of Kutch is the **largest wildlife sanctuary** in India. (The Rann can be considered a large **ecotone**, a transitional area between **marine and terrestrial ecosystems.** During monsoon, the Rann gets inundated for a period of about one month. It is dotted with about 74 elevated plateaus or islands, locally called '**bets**'.)

Species	Habitat	IUCN Status
Indian wild buffalo	Wet grasslands, swamps, flood plains and densely vegetated river valleys	Endangered
Indian wild boar	Absent in extremely dry deserts and alpine zones.	Least Concern (Wild Boar)
Indian gazelle	Chinkara live in arid plains and hills, deserts, dry scrub and light forests.	Least Concern

Q. Which one of the following groups of animals belongs to the category of endangered species?

a) Great Indian Bustard, Musk Deer, Red Panda and Asiatic Wild Ass

b) Kashmir Stag, Cheetal, Blue Bull and Great Indian Bustard

c) Snow Leopard, Swamp Deer, Rhesus Monkey and Saras (Crane)

d) Lion-tailed Macaque, Blue Bull, Hanuman Langur and Cheetal

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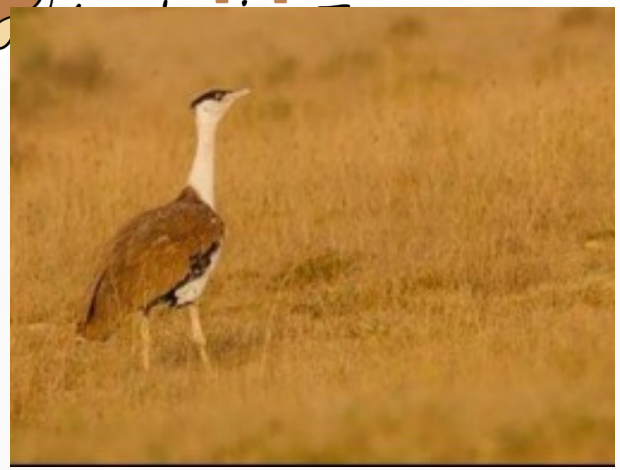
Great Indian Bustard



- The Great Indian Bustard is a **bustard found in India and the adjoining regions of Pakistan.**
- A large bird with a horizontal body and long bare legs, giving it an **ostrich like appearance**, this bird is among the **heaviest of the flying birds.**
- It is the **state bird of Rajasthan.**
- It is considered the **flagship grassland species,** representing the health of the grassland ecology.
- But with less than 200 GIBs remaining in the world, most of them found in **Rajasthan's 'Desert National Park'**, we are on the brink of forever losing a majestic bird species, which was once a **strong contender to be declared as India's National Bird**.

Great Indian Bustard

- **IUCN Red List -** Critically Endangered.
- **CITES -** Appendix I
- **Wildlife (Protection) Act 1972 -** Schedule I
- The **Great Indian Bustard, Asian Elephant and Bengal Florican** have been included in **Appendix I of the UN Convention on Migratory Species** at the 13th Convention on Migratory Species (CMS) in Gandhinagar (Gujarat) COP.

Red Panda

- The Red panda is listed as **Endangered** under IUCN as its population has declined up to 50%.
- Also known as the **lesser panda.**
- **State animal of Sikkim**
- The red panda is found in particularly in along the Myanmar-Yunnan border, India, Nepal , Bhutan and China. (**Native to the eastern Himalayas and southwestern China**)
- In India the red panda is found in the foothills of the Himalayas, particularly in the **wetter eastern sections of Sikkim, West Bengal and Arunachal Pradesh.**
- These are closely connected with **montane forests with thick bamboo forest.**

Red Panda

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- Scientists from the ZSI have concluded that India is home to both the (sub) species —
  - Himalayan red panda (*Ailurus fulgens*) and the
  - Chinese red panda (*Ailurus styani*) and
- the **Siang river in Arunachal Pradesh** splits the red panda into these two phylogenetic species.
- The red panda was considered a **monotypic species** till 2020 until the scientists studied its genetic make-up with respect to geographical distribution and described the occurrence of the two species.

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Red Panda

Threats

- The main problems faced by these species **are destruction of habitat, poaching, and disintegration.**
- These species are used for different uses including medicine, wild meat etc.
- In India it is found in 19 protected or otherwise managed areas.
- **Wildlife Protection Act Status:** Schedule I
- **CITES** – Appendix I

Himalayan / White-Bellied Musk Deer

Habitat

- Kashmir, Kumaon and Sikkim.

Threat

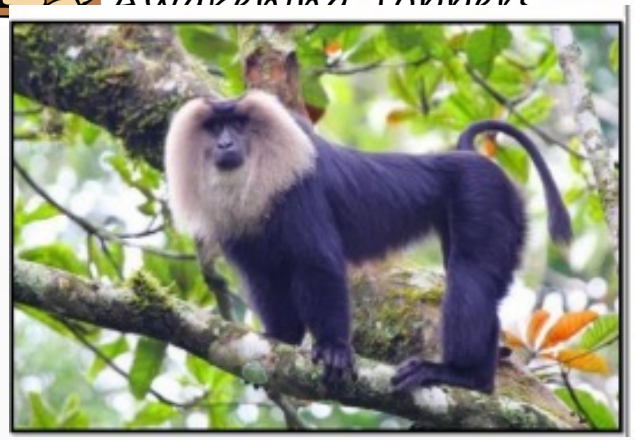
- Poaching & illegal trade for its musk.
- Only males produce the musk.

- **IUCN Status** - Endangered

Kashmir Stag/Hangul

- The Kashmir stag is the **state animal of Jammu and Kashmir.**
  - Ladakh administration declared black necked crane(NT) as its 'state bird' and snow leopard (VU) as its new 'state animal.'
- Today though, the viable population of hangul is limited to the **Dachigam Wildlife Sanctuary** near Srinagar, which is spread over 141 square kilometres.
- Very small fragmented groups have been seen in its adjoining protected areas which include **Overa-Aru Wildlife Sanctuary** in south Kashmir.
- It is placed under **Schedule I** of the Indian Wildlife (Protection) Act, 1972.
- IUCN Status – **Critically Endangered**

Lion-tailed Macaque



- It is also called as **Lion-tailed Macaque, Wanderoo, or Liontail Macaque.**
- This animal is **endemic to the Western Ghats of Karnataka, Kerala** and **Tamil Nadu.**
- The Lion-tailed macaques prefer to stay in the **higher canopy of tropical evergreen forests.**
- The main threat to this species **is habitat disintegration due to human activities.**
- They are listed as **endangered species** under IUCN list.
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Q. In which of the following States is lion-tailed macaque found in its natural habitat?

1. Tamil Nadu
2. Kerala
3. Karnataka
4. Andhra Pradesh

Select the correct answer using the codes given below:

a) 1, 2 and 3 only

b) 2 only

c) 1, 3 and 4 only

d) 1, 2, 3 and 4

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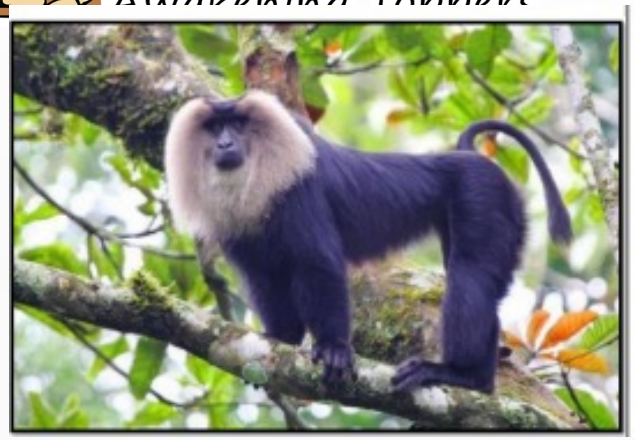
Lion-tailed Macaque



- It is also called as **Lion-tailed Macaque, Wanderoo, or Liontail Macaque.**
- This animal is **endemic to the Western Ghats of Karnataka, Kerala** and **Tamil Nadu.**
- The Lion-tailed macaques prefer to stay in the **higher canopy of tropical evergreen forests.**
- The main threat to this species **is habitat disintegration due to human activities.**
- They are listed as **endangered species** under IUCN list.
- **Schedule I** of the Wildlife Protection Act, 1972.
- **Appendix I** of CITES

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 3 and 4 only

d) 1 and 4 only

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Himalayan / White-Bellied Musk Deer

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- Found in Kashmir, Kumaon and Sikkim.
- Only males produce the musk.
- Threats include poaching & illegal trade for its musk.
- State animal of Uttarakhand.
- Endangered.
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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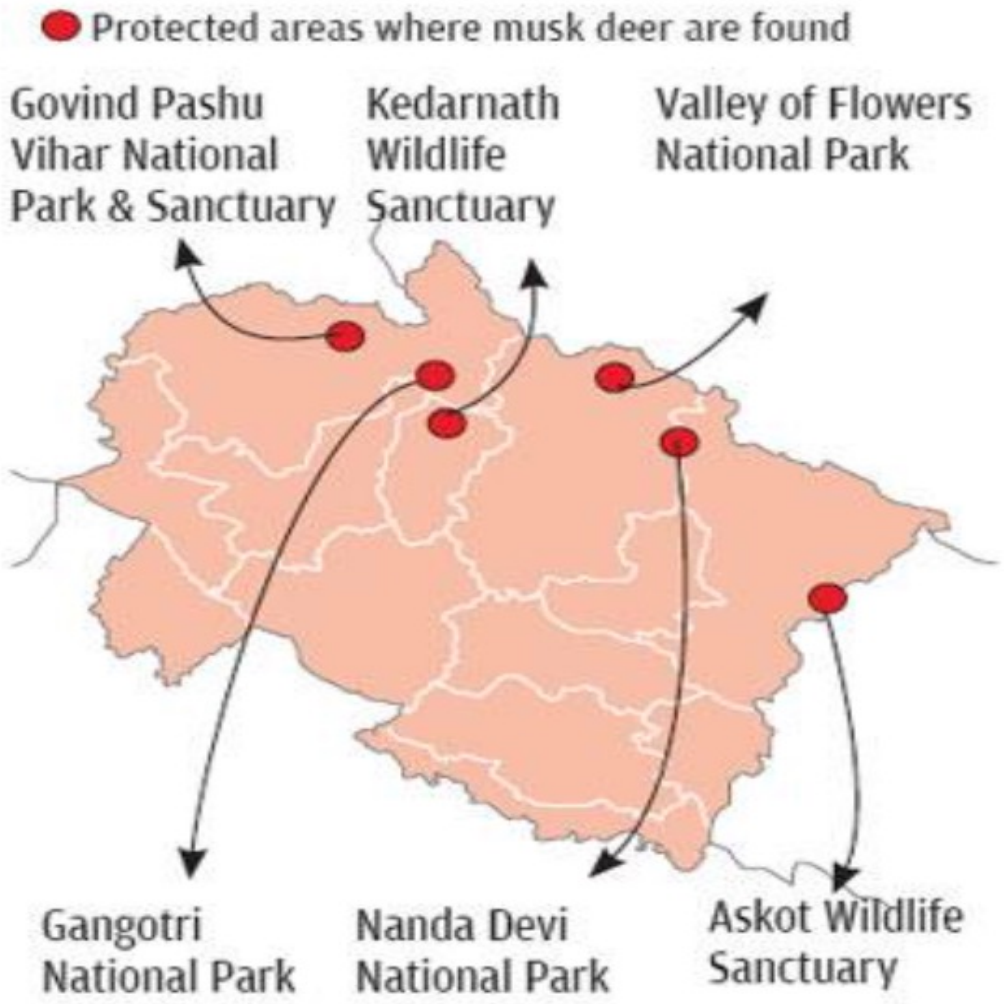
Fall from grace

Over 1,000 musk deer used to roam the areas a few decades ago



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Q. Which one of the following is not a site for in-situ method of conservation of flora?

a) Biosphere Reserve

b) Botanical Garden

c) National Park

d) Wildlife Sanctuary

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Biodiversity Conservation

IN-SITU

1. Protected Areas
   - National Parks
   - Sanctuaries
   - Biosphere Reserves
2. Sacred Forests and Lakes

EX-SITU

1. Seed Banks, Gene Banks
2. Long Term Captive Breeding
3. Animal Translocations
4. Tissue Culture Banks
5. Cryopreservation of Gametes and Embryos
6. Botanical Gardens
7. Zoological Gardens or Zoos.

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Q. Three of the following criteria have contributed to the recognition of Western Ghats-Sri Lanka and Indo-Burma regions as hotspots of biodiversity:

1. Species richness
2. Vegetation density
3. Endemism
4. Ethno-botanical importance
5. Threat perception
6. Adaptation of flora and fauna to warm and humid conditions

Which three of the above are correct criteria in this context?

a) 1 2 and 6
b) 2, 4 and 6
c) 1, 3 and 5
d) 3, 4 and 6

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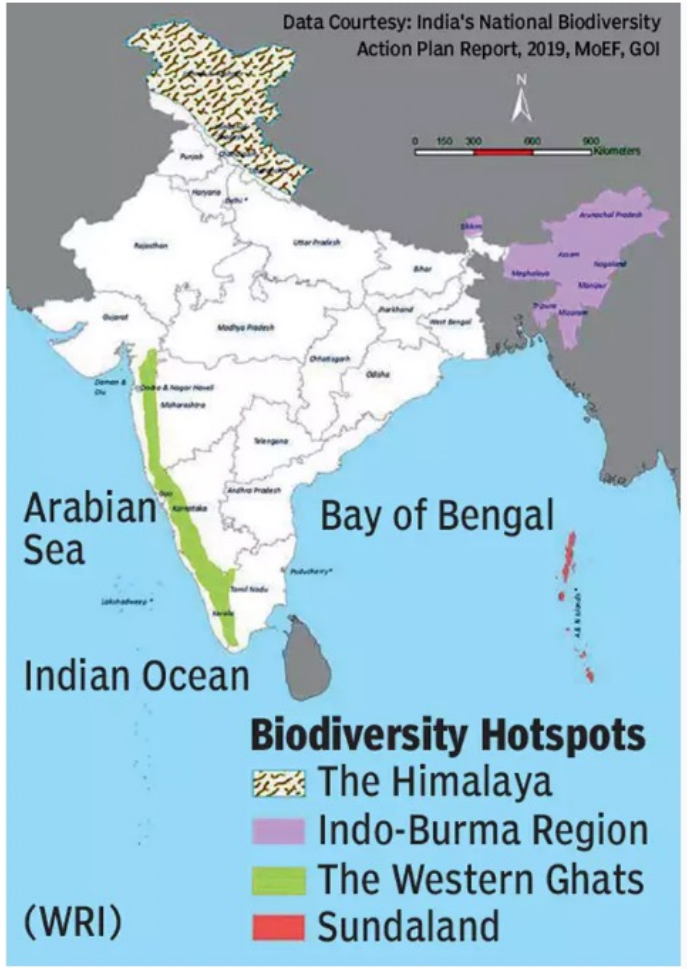
a) 1 2 and 6
b) 2, 4 and 6
c) **1, 3 and 5**
d) 3, 4 and 6

Biodiversity Hotspot

- To qualify as a biodiversity hotspot, a region **must meet two strict criteria:**
  - it must contain at least 1,500 species of vascular plants (more than 0.5% of the world's total) as endemics, and
  - it has to have lost at least 70% of its primary vegetation.
- Globally, 36 zones qualify under this definition

Biodiversity Hotspot - India



Biodiversity Hotspots - India

1. Himalaya: Includes the entire Indian Himalayan region [Jammu and Kashmir, Himachal Pradesh, Uttarakhand, northern part of West Bengal (Darjeeling), Sikkim, northern part of Assam and Arunachal Pradesh] and that falling in Pakistan, Tibet, Nepal, Bhutan, China and Myanmar.

2. Indo-Burma: Myanmar, Thailand, Vietnam, Laos, Cambodia and southern China; also included the entire northeastern India (Mizoram, Manipur, Nagaland, Meghalaya, and Tripura), and Andaman group of Islands, Bangladesh and Malaysia.

3. Sundaland: Indonesia, Malaysia, Singapore, Brunei and Philippines; also included Nicobar group of Islands.

4. Western Ghats and Sri Lanka: Includes the entire Western Ghats [Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat] and Sri Lanka.

Q. Government of India encourages the cultivation of 'sea buckthorn'. What is the importance of this plant/

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1. It helps in controlling soil erosion and in preventing desertification.
2. It is a rich source of biodiesel.
3. It has nutritional value and is well-adapted to live in cold areas of high altitudes.
4. Its timber is of great commercial value.

Which of the statements given above is/are correct?

a) 1 only

b) 2, 3 and 4 only

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Sea Buckthorn

- Produces an orange-yellow coloured edible berry.
- AKA Wonderberry, Lehberry, Ladakh gold.
- In India, it is found above the tree line in the Himalayan region, generally in dry areas such as the cold deserts of Ladakh and Spiti.
- In Himachal Pradesh, it is locally called chharma and grows in the wild in Lahaul and Spiti and parts of Kinnaur.
- A major part is covered by this plant in Himachal Pradesh, Ladakh, Uttarakhand, Sikkim and Arunachal Pradesh.

Sea Buckthorn

- Seabuckthorn is a soil-binding plant which prevents soil-erosion, checks siltation in rivers and helps preserve floral biodiversity.
- Its fruit and leaves are rich in vitamins, carotenoids and omega fatty acids and it can help troops in acclimatising to high-altitude.

Q. What is the difference between the antelopes Oryx and Chiru?

a) Oryx is adapted to live in hot and arid areas whereas Chiru is adapted to live in steppes and semi-desert areas of cold high mountains.

b) Oryx is poached for its antlers whereas Chiru is poached for its musk.

c) Oryx exists in western India only whereas Chiru exists in north-east India only.

d) None of the statements (a), (b) and (c) given above is correct.

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Oryx

- Oryx is a type of antelope.
- They are found in Arabian Peninsula and North and East Africa.
- The Arabian oryx was only saved from extinction through a captive-breeding program and reintroduction to the wild.
- North Africans are extinct in wild. East Africans are still present.
- All oryx species prefer near-desert conditions and can survive without water for long periods.

Arabian oryx

Male in Dubai Desert Conservation Reserve

Conservation status

Vulnerable (IUCN 3.1)[1]

CITES Appendix I (CITES)[1]

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Chiru

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- Chiru (or chiru goat) is also referred to as Tibetan antelope.
- It is a sociable, tiny, graceful antelope-like animal that lives on the Tibetan Plateau's high alpine steppes.
- They are mainly seen in the Ladakh region in India.
- The underfur of the Tibetan antelope, or "soft gold" as it's called by poachers, is the warmest and softest wool in the animal kingdom.
- Predominantly, this underfur is woven into a traditional shawl known as a *shahtoosh.*
- 'Near Threatened' in IUCN Red List.
- It has been enlisted in Schedule I of Wildlife Protection Act, 1972.
- To enhance its protection, its prime habitats have been declared as Wildlife Sanctuaries viz. Karakorma Wildlife Sanctuary and Changthang Cold Desert Wildlife Sanctuary.

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Q. Which of the following can be threats to the biodiversity of a geographical area?

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1. Global warming
2. Fragmentation of habitat
3. Invasion of alien species
4. Promotion of vegetarianism

Select the correct answer using the codes given below:

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THE FIVE THREATS TO BIODIVERSITY

Land and Sea use Change
(Including habitat loss and degradation)

Example:
Agricultural land use which is responsible for **80%** of the global deforestation

Pollution

Make the environment unsuitable for survival directly and indirectly

Species overexploitation

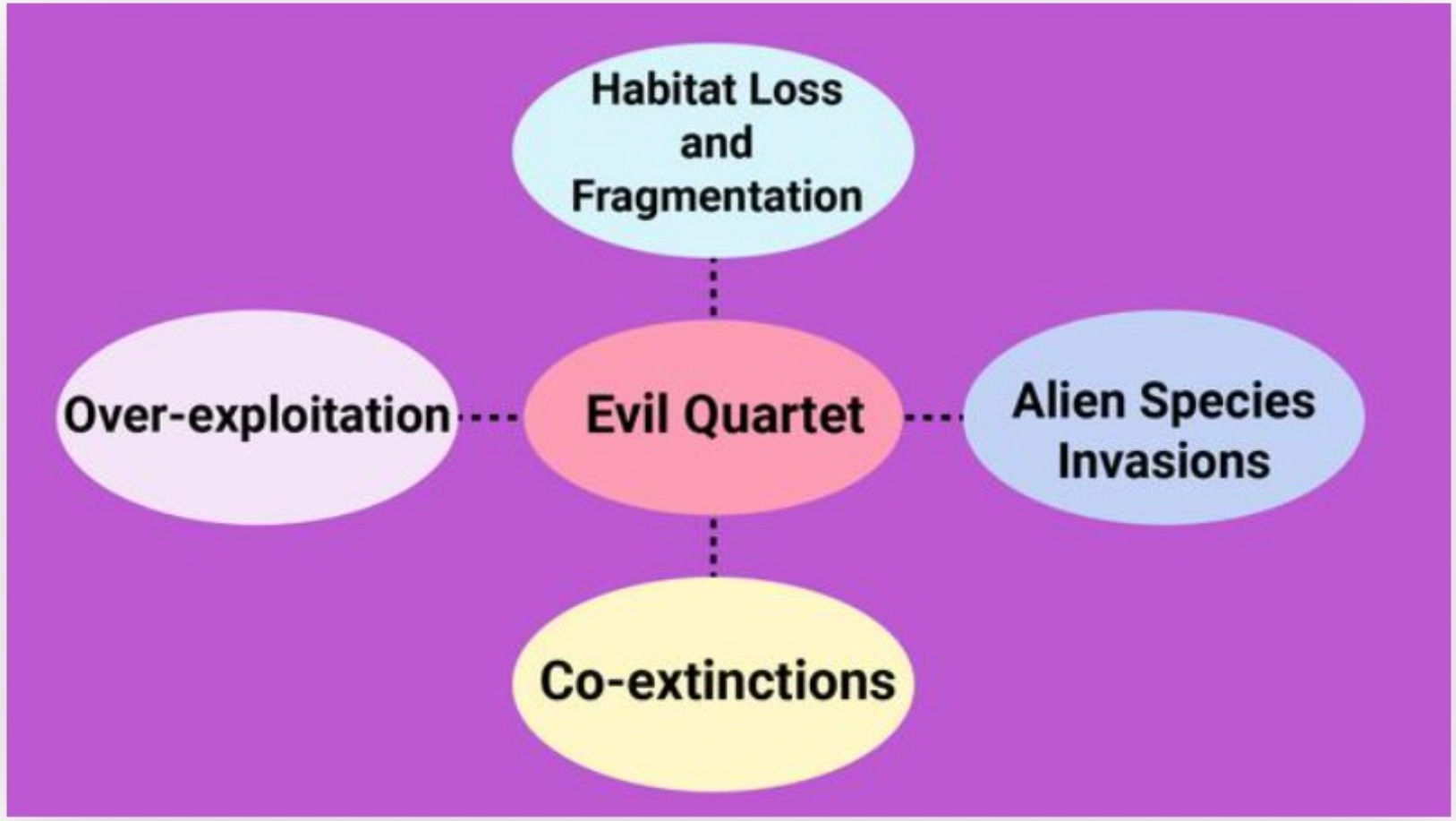
Example:
Overfishing which may decimate global fish populations by 2050

Climate Change

Forcing the animal to shift range or confounding the signals that trigger seasonal events and more

Invasive species and disease

Compete with native species for space, food and other resources; sometimes spread disease that native species have no immunity of


Habitat Loss and Fragmentation
Over-exploitation
Evil Quartet
Alien Species Invasions
Co-extinctions

Q. Consider the following:

1. Black-necked crane
2. Cheetah
3. Flying squirrel
4. Snow leopard

Which of the above are naturally found in India?

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

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Black Necked Crane

- The **black-necked crane** is a medium-sized crane in Asia that breeds on the **Tibetan Plateau and remote parts of India and Bhutan.**
- In India, **Eastern Ladakh** is the only known breeding ground of the Black-necked Crane outside of China.
- Owing to the special significance of the bird for the state, it has been declared as the **state bird of Ladakh.**

Black Necked Crane

Sleepy Classes
Awakening Toppers

- It is locally known as **Dhung Karma.**
- Also, it is the only **high-altitude crane** amongst the 15 species found in the world.
- These birds build their nests in vast open environments, making them vulnerable to a host of predators.
- The major reason behind their depleting population are **feral dogs that disrupt their breeding process by harming eggs and chicks.**
- The other big reason is **loss of habitat altogether**, credited to increased grazing that puts tremendous pressure on wetlands and leads to their degradation

Black-necked crane

Black-necked Crane in Ladakh

Conservation status

Near Threatened (IUCN 3.1)[1]

CITES Appendix I (CITES)[2]

Namdapha Flying Squirrel

- It is a unique (the only one in its genus) flying squirrel that is restricted to a **single valley in the Namdapha in Arunachal Pradesh.** (Spotted in 1981)
- *Biswamoyopterus biswasi (named after zoologist* Shyamrup Biswas)
- Arboreal
- Nocturnal

Namdapha Flying Squirrel

Sleepy Classes
Awakening Toppers

Habitat

- Tropical forests.
- Mesua Ferrea jungles
- Found only in Namdapha Tiger Reserve in Arunachal Pradesh.

Threats

- Hunted for food
- Wildlife Protection Act Status - Schedule II
- It is among the 25 “most wanted lost” species that are the focus of Global Wildlife Conservation’s “Search for Lost Species” initiative.

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Snow Leopard

- In India, their geographical range encompasses:
  - **Western Himalayas:** Jammu and Kashmir, Himachal Pradesh.
  - **Eastern Himalayas:** Uttarakhand and Sikkim and Arunachal Pradesh.
  - **J&K, Ladakh(State animal), HP (State animal), Uttarakhand, Sikkim, Arunachal Pradesh**

Snow Leopard

Sleepy Classes
Awakening Toppers

- IUCN Status – Vulnerable
- WPA, 1972 – Schedule I
- CITES – Appendix I
- CMS – Appendix I
- Hemis NP – Snow leopard capital of the world
- Kibber WS – Hotspot for snow leopards

Q. Consider the following fauna and India:

1. Gharial
2. Leatherback turtle
3. Swamp deer

Which of the above is/are endangered?

a) 1 and 2 only

b) 3 only

c) 1, 2 and 3

d) None

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Awakening Toppers

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Gharial

- The **Gharial** is one of the **three species of crocodilians only found in Indian subcontinent -** Mugger, Saltwater crocodiles and the Gharial.
- Gharials are **endemic to the Indian subcontinent.**
- Once found abundantly in all the major river systems of South Asia, the Gharial is **now extinct in Pakistan, Bangladesh, Burma and Bhutan.**
- Gharial is listed as '**Critically Endangered**' in the IUCN Red List of Endangered Species.

Gharial

Sleepy Classes
Awakening Toppers

- Population of Gharials are a **good indicator of clean river water.**
- In India small populations are present and increasing in the rivers of the **National Chambal Sanctuary, Katarniaghat Wildlife Sanctuary in UP(Girwa river), Sone River Sanctuary in MP** and the rainforest biome of Mahanadi **in Satkosia Gorge Sanctuary, Orissa, where they apparently do not breed.**
- NCS is located at **tri-junction of Rajasthan, Madhya Pradesh and Uttar Pradesh.**
- It is known for **critically endangered gharials**, the **red-crowned roof turtle**, and the **endangered Ganges river dolphin**.
- **Satkosia gorge of Mahanadi** which is the southernmost limit of gharials home range in India.
- Ghaghra, Gandak river, Ramganga river, etc.

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Gharial

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- In 1976, the population of **Gharial had plummeted to less than 200 individuals.**
- Getting alarmed, the Government of India subsequently accorded the highest level of protection to Gharial by bringing it under **Schedule I of the Wild Life Protection Act, 1972.**
- In 1976, **Project Crocodile** was initiated with support from the United Nations Development Programme and Food and Agriculture Organization.
- The project included an **intensive captive rearing and breeding programme intended** to restock depleted Gharial habitats.
- The **gharial reintroduction** in the **Beas Conservation Reserve is an ambitious programme of the Punjab government.**
- The reptiles were commonly sighted in the Beas River till the 1960s but later became extinct.

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Giant Leatherback Turtle

- **Galathea Bay** is an **iconic nesting site** in India of the **enigmatic Giant Leatherback**, the **world's largest marine turtle**—borne out by surveys done over three decades.
- The largest of the seven species of sea turtles on the planet and also the most long-ranging, Leatherbacks are **found in all oceans except the Arctic and the Antarctic.**
- Within the **Indian Ocean**, they nest only in **Indonesia, Sri Lanka and the Andaman and Nicobar Islands** and are also listed in **Schedule I of India's Wildlife Protection Act, 1972**, according it the highest legal protection.
- IUCN status - **Vulnerable**
- **CITES – Appendix I**

Swamp Deer

- The **barasingha** (*Rucervus duvaucelii*), also known as the swamp deer, is a deer species distributed in the **Indian subcontinent.**
- Populations in **northern and central India are fragmented,** and two isolated populations occur in southwestern Nepal.

Barasingha

male

adult female and yearling

Conservation status

Vulnerable (IUCN 3.1)[1]

CITES Appendix I (CITES)[1]

Swamp Deer

- There are three subspecies of swamp deer found in the Indian Subcontinent.
  - The western swamp deer (Rucervus duvaucelii) found in Nepal.
  - Southern swamp deer/Hard Ground Barasingha (Rucervus duvaucelii branderi) found in central and north India.
  - Eastern swamp deer (Rucervus duvaucelii ranjitsinhi) found in the Kaziranga (Assam) and Dudhwa National Parks (Uttar Pradesh).

Q. Consider the following:

1. Star tortoise
2. Monitor lizard
3. Pygmy hog
4. Spider monkey

Which of the above are naturally found in India?

a) 1, 2 and 3 only

b) 2 and 3 only

c) 1 and 4 only

d) 1, 2, 3 and 4

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Pygmy Hog

- Is the **world's smallest wild pig.**
- It is one of the **most useful indicators of the management status of grassland habitats.**
- The grasslands where the pygmy hog resides are crucial for the survival of other threatened species such as Indian Rhinoceros, Swamp Deer, Wild Buffalo, Hispid Hare, Bengal Florican and Swamp Francolin.

Habitat

- Relatively **undisturbed, tall 'terai' grasslands.**
- Assam is home to the **world's smallest and rarest wild suid** (pigs), the Pygmy Hog (*Porcula salvania*).

Pygmy hog

Conservation status

Endangered (IUCN 3.1)[2]

CITES Appendix I (CITES)[2]

Pygmy Hog

- Bullet-shaped, standing just 25 cm tall, they were once widely found in the wet grasslands of the Himalayan foothills stretching from **Uttar Pradesh to Assam, through Nepal terai and Bengal duars.**
- Today they are confined to a few pockets along **Assam's border with Bhutan and Arunachal Pradesh.**
- In fact, its only viable population exists in the **Manas Tiger Reserve.**
- **Wildlife Protection Act Status: Schedule I**
- **CITES Appendix I**

Indian Star Tortoise

- Indian star tortoises are found across the Indian subcontinent, more specifically, in the Central and Southern parts of India, in West Pakistan and in Sri Lanka.
- It is typically found in dry, open habitats such as scrub forests, grasslands, and rocky outcroppings.
- IUCN Red List: Vulnerable
- Wild Life Protection Act 1972: Schedule IV
- Schedule IV: This list is for species that are not endangered. It includes protected species but the penalty for any violation is less compared to the Schedules I and II.
- Convention on International Trade in Species (CITES): Appendix I

- India is home to **four Monitor lizards** – the Bengal Monitor (Varanus bengalensis), the Asian Water monitor (Varanus salvator), the Yellow monitor (Varanus flavescens) and the Desert monitor (Varanus griseus).
- These reptiles are mostly solitary and spend their days on the go, often venturing into urban areas for food and water.
- They are even known **to help regulate rodent and insect populations.**

Bengal monitor

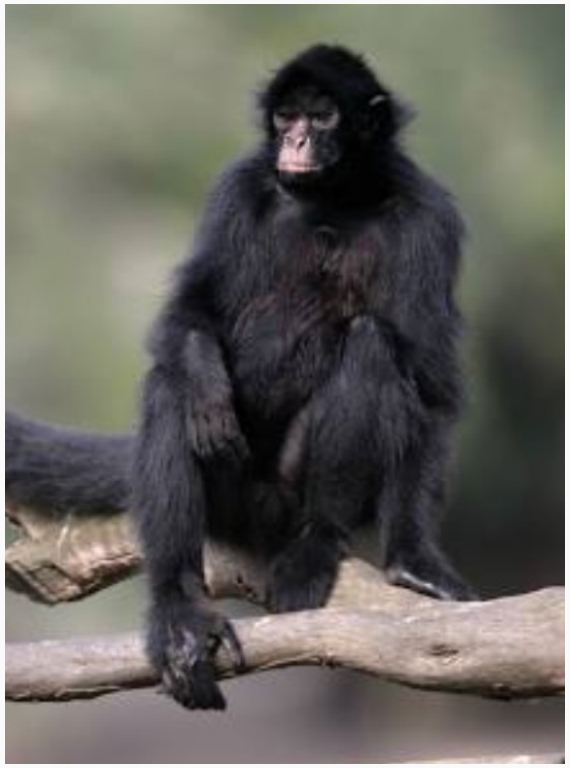
Bundala National Park

Conservation status

Near Threatened (IUCN 3.1)[1]

CITES Appendix I (CITES)[1]

- **Spider Monkeys** live in tropical climates, specifically the evergreen forests of **Central and South America.**
- They can also be found as far north as Mexico but not in India.



Q. With reference to "Gucchi" sometimes mentioned in the news, consider the following statements:

1. It is a fungus.
2. It grows in some Himalayan Forest areas.
3. It is commercially cultivated in the Himalayan foothills of north-eastern India.

Which of the statements given above is/are correct?

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

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Gucchi

- Found on the foothills of the Himalayas.
- One of the most sought-after edible mushrooms, guchhi is known for its spongy, honeycombed head and savoury flavour but all of that comes at a high price.
- It is known to be one of the most expensive mushrooms.
- The mushrooms cannot be cultivated commercially and grow in conifer forests across temperature regions, and the foothills in Himachal Pradesh, Uttaranchal, and Jammu and Kashmir.
- And it takes months for villagers to collect enough of these mushrooms, dry them and bring them to the market.

Q. Consider the following statements:

1. Some mushrooms have medicinal properties.
2. Some mushrooms have psychoactive properties
3. Some mushrooms have insecticidal properties
4. Some mushrooms have bioluminescent properties.

How many of the above statements are correct?

a) Only one

b) Only two

c) Only three

d) All four

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- Medicinal mushrooms such as shiitake, maitake, and reishi have been found to have antitumor and immunostimulant properties.
- Psilocybin is a hallucinogenic chemical in certain mushrooms known as magic mushrooms. Eating mushrooms that contain psilocybin can have a variety of effects, ranging from euphoria to hallucinations. Individuals use psilocybin as a recreational drug. It can provide feelings of euphoria and sensory distortion that are common to hallucinogenic drugs, such as LSD (lysergic acid diethylamide).
- Recently, an increasing number of mushrooms have been found to contain insecticidal compounds.
- Bioluminescence is the production and emission of light by living organisms. Panellus stipticus is one of the brightest-glowing bioluminescent mushrooms on Earth.
- A mushroom documentation project in the forests of Northeast India has revealed not only 600 varieties of fungi, but also led to a new discovery: a bioluminescent or light emitting variety of mushroom. The new species — named Roridomyces phyllostachydis — was first sighted on a wet August night near a stream in Meghalaya's Mawlynnong in East Khasi Hills district and later at Krang Shuri in West Jaintia Hills district

Sleepy Classes
Awakening Toppers

Q. Improper handling and storage of cereal grains and oilseeds result in the production of toxins known as aflatoxins which are not generally destroyed by normal cooking process. Aflatoxins are produced by

a) Bacteria

b) Protozoa

c) Moulds

d) Viruses

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Sleepy Classes
Awakening Toppers

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c) **Moulds**

d) Viruses

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- **Aflatoxins** are naturally occurring mycotoxins that are produced by many species of **Aspergillus,** a fungus.
- The term "mould" is a common name having no taxonomic significance.
- It is applied to a variety of fungi which grow as semi-microscopic organisms, and whose mycelium tends to form a loose meshwork rather than a dense tissue.

Sleepy Classes
Awakening Toppers

Q. Consider the following organisms:

1. Agaricus
2. Nostoc
3. Spirogyra

Which of the above is/are used as biofertilizers/biofertilizers?

a) 1 and 2

b) 2 only

c) 2 and 3

d) 3 only

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1. Agaricus
2. Nostoc
3. Spirogyra

Which of the above is/are used as biofertilizers/biofertilizers?

a) 1 and 2

b) 2 only

c) 2 and 3

d) 3 only

Agaricus

- **Agaricus is a genus of mushrooms** containing both edible and poisonous species, with possibly over 300 members worldwide.

Nostoc

- **Bioinoculants** are microbial preparations that enhance the uptake of nutrients by plants from the soil, increase the availability of the nutrients and stimulate plant growth. There are two types of organisms which are used as inoculants: symbiotic organisms (such as *Rhizobium, Synorhizobium, Bradyrhizobium, Nostoc, Anabaena,* etc.) and non-symbiotic organisms (such as Azotobacter, Azospirilum, Beijerinckia, etc.)

Spirogyra

- **Spirogyra is a genus of filamentous green algae** of the order Zygnematales, named for the helical or spiral arrangement of the chloroplasts that is diagnostic of the genus.
- Spirogyra chiefly occurs in ponds, pools, ditches and similar other places.

Q. Consider the following statements :

1. Animal Welfare Board of India is established under the Environment (Protection) Act, 1986.
2. National Tiger Conservation Authority is a statutory body.
3. National Ganga River Basin Authority is chaired by the Prime Minister.

Which of the statements given above is/are correct ?

a) 1 only

b) 2 and 3 only

c) 2 only

d) 1, 2 and 3

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Which of the statements given above is/are correct ?

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c) 2 only

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- Animal Welfare Board has been established under Prevention of Cruelty to Animals Acts 1960.
- National Tiger Conservation Authority (NTCA) is a statutory body under the Ministry of Environment, Forests and Climate Change.
- It was established in 2005 following the recommendations of the Tiger Task Force.
- It was constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it.
- Headed by Minister of Environment.

National Ganga Council

- Also known as 'National Council for Rejuvenation, Protection and Management of River Ganga'.
- It was formed under the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.
- This Order dissolved the National Ganga River Basin Authority and replaced it with the National Ganga Council.
- This Council has the overall responsibility of preventing pollution and rejuvenating the Ganga River Basin, including the River Ganga and its tributaries.
- Headed by PM.

Q. Which of the following are the key features of 'National Ganga River Basin Authority (NGRBA)'?

1. River basin is the unit of planning and management.
2. It spearheads the river conservation efforts at the national level.
3. One of the Chief Ministers of the States through which the Ganga flows becomes the Chairman of NGRBA on rotation basis.

Select the correct answer using the code given Below.

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

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Q. With reference to Bombay Natural History Society (BNHS), consider the following statements :

1. It is an autonomous organization under the Ministry of Environment and Forests.
2. It strives to conserve nature through action-based research, education and public awareness.
3. It organizes and conducts nature trails and camps for the general public.

Which of the statements given above is/are correct?

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3

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Bombay Natural History Society

- The Bombay Natural History Society (BNHS), founded on 15 September 1883, is one of the largest non-governmental organisations in India engaged
in conservation and biodiversity research.
- The BNHS logo is the great hornbill.

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

Great hornbill

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

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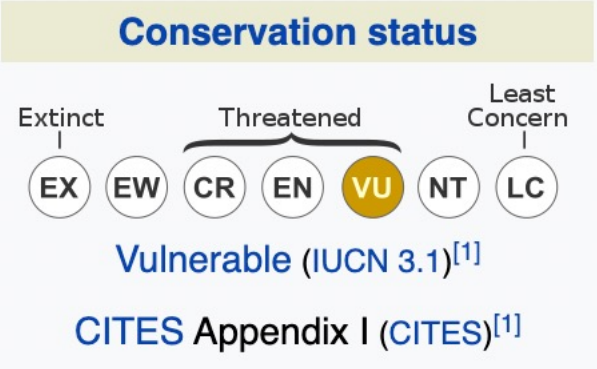

Initiatives

- Asian Waterbird census
- The Asian waterbird census is an annual exercise undertaken in India by Bombay Natural History Society in association with Wetlands International, in which enthusiastic birdwatchers count the birds by observing them near their respective breeding grounds.
- The exercise is a part of 'International waterbird census', an international exercise.
- It also aims to create awareness regarding bird species as well as health of the wetlands, which are facing severve threat amidst anthropogenic disturbance.
- It is conducted in the month of January every year.

Initiatives

- National Dragonfly festival
- The festival was started in 2018 in order to inform the public about integral role played by dragonflies in our environment.
- The Bombay Natural History Society has been organising the festival since then in association with WWF India, United Nations Development Programme, United Nations Environment Programme and National Biodiversity Board of India.
- The local events which are the part of this nationwide festival are also organised by WWF India in association with various state agencies.
- The "Thumbimahotsavam" is a state butterfly festival of Kerala which is organised as a part of National Dragonfly festival.

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Initiatives

- On August 18 every year, the World-Wide Fund for Nature (WWF-India) and the Bombay Natural History Society (BNHS) commemorates Dragonfly Day in New Delhi and its surrounding areas.
- Dragonflies
- It is an aerial predator insect most commonly found near freshwater habitats throughout most of the world.
- Their distinctive colors make them look beautiful. This makes Most species of dragonflies live in the tropics and particularly in the rainforests.

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Q. Other than poaching, what are the possible reasons for the decline in the population of Gangas River Dolphins ?

1. Construction of dams and barrages on rivers
2. Increase in the population of crocodiles in rivers.
3. Getting trapped in fishing nets accidentally
4. Use of synthetic fertilizers and other agricultural chemicals in crop-fields in the vicinity of rivers

Select the correct answer using the code given below.

a) 1 and 2 only

b) 2 and 3 only

c) 1, 3 and 4 only

d) 1, 2, 3 and 4

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Gangetic Dolphin (Susu)

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- The Ganges river dolphin can only live **in freshwater and is essentially blind**. (**Ultrasonic waves – echolocation -** emitting sounds and listening for the reflected echoes when it bounces off objects)
- Also known as **Susu** due to the noise the dolphin is said to make when it breathes.
- Tiger of the Ganges.
- It is a **reliable indicator** of the health of the entire river ecosystem.
- It was recognised as the **National Aquatic Animal** in 2009, by the Government of India.
- **Official animal** of the **Indian city of Guwahati.**
- **Habitat -** Ganges and Brahmaputra rivers and their tributaries in Bangladesh, India and Nepal.

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Gangetic Dolphin (Susu)

- It is among the **four freshwater dolphins** in the world- the other three are:
    - The 'Baiji' now likely extinct from the Yangtze River in China,
    - The 'Bhulan' of the Indus in Pakistan, and
    - The 'Boto' of the Amazon River in Latin America.
- These four species live only in rivers and lakes.

Gangetic Dolphin (Susu)

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- A stretch of the **Ganges River between Sultanganj and Kahlgaon in Bihar** has been declared a dolphin sanctuary and named **Vikramshila Gangetic Dolphin Sanctuary**, the first such protected area.
- On the occasion of the 74th Independence Day, 15 August 2020, the Indian Ministry of Environment, Forest and Climate Change announced '**Project Dolphin**' to boost conservation of both river and oceanic dolphins.
- Wildlife (Protection), Act 1972: **Schedule I.**
- IUCN: **Endangered.**
- CITES: **Appendix I**
- CMS: **Appendix II**
- **National Mission for Clean Ganga** celebrates 5th October as National Ganga River Dolphin Day.

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Q. The most important strategy for the conservation of biodiversity together with traditional human life is the establishment of

a) Biosphere reserves

b) Botanical gardens

c) National parks

d) Wildlife sanctuaries

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a) **Biosphere reserves**

b) Botanical gardens

c) National parks

d) Wildlife sanctuaries

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Biosphere Reserves

- There are 18 Biosphere Reserves in India. (categories roughly correspondingly to IUCN Category V Protected areas) to protect larger areas of natural habitat than a typical national park or animal sanctuary, and that often include one or more national parks or reserves, along with buffer zones that are open to some economic uses.
- Protection is granted not only to the flora and fauna of the protected region, but also to the human communities who inhabit these regions, and their ways of life.
- Biosphere Reserves are thus special environments for both people and nature and are living examples of how human beings and nature can co-exist while respecting each other's needs.

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

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

Which of the pairs given above are correctly matched?

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

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

Rusty-spotted cat

Conservation status

Near Threatened (IUCN 3.1)[2]

CITES Appendix I (CITES)[2]

Q. Which of the following is not a bird?

a) Golden Mahseer

b) Indian Nightjar

c) Spoonbill

d) White Ibis

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Q. With reference to Indian laws about wildlife protection, consider the following statements:

1. Wild animals are the sole property of the government.
2. When a wild animal is declared protected, such animal is entitled for equal protection whether it is found in protected areas or outside.
3. Apprehension of a protected wild animal becoming a danger to human life is sufficient ground for its capture or killing.

Which of the statements given above is/are correct?

a) 1 and 2

b) 2 only

c) 1 and 3

d) 3 only

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Statement 1 is correct: The Wild Life (Protection) Act, 1972 mentions that every wild animal, other than vermin, which is hunted **shall be the property of the State Government**, and, where such animal is hunted in a sanctuary or National Park declared by the Central Government, such animal or any animal **article shall be the property of the Central Government.**

Statement 2 is correct: The law governing the subject of wildlife, the Wildlife (Protection) Act, 1972, **does not discriminate between animals found in protected areas and outside.**

Statement 3 is not correct: Only if the **wild animal becomes a danger to human life or is diseased or disabled** beyond recovery can it be allowed to be captured or killed by the competent authority, the Chief Wildlife Warden of the State.

Mere apprehension or fear that a wild animal could endanger human life is not a ground for capture or killing.

Q. Certain species of which one of the following organisms are well known as cultivators of fungi?

a) Ant

b) Cockroach

c) Crab

d) Spider

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- The ant–fungus mutualism is a symbiosis seen between certain ant and fungal species, in which ants actively cultivate fungus much like humans farm crops as a food source.
- Leafcutter ants use leaves as their fertilizer to grow their crop: fungus.
- They cultivate their fungal gardens by providing them with freshly cut leaves, protecting them from pests and molds, and clearing them of decayed material and garbage.
- In return, the fungus acts as a food source for the ants' larvae.

Q. Consider the following pairs:

1.Nokrek Bio-sphere Reserve : Garo Hills

2.Logtak (Loktak) Lake : Barail Range

3.Namdapha National Park : Dafla Hills

Which of the above pairs is/are correctly matched?

a) 1 only

b) 2 and 3 only

c) 1, 2 and 3

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- Nokrek is the highest peak in Garo Hills.
- The Barail Range is a tertiary mountain range in Northeast India with an area of approximately 80,000 ha between Brahmaputra and Barak basins stretching from Nagaland & Manipur to the east and Assam & Meghalaya to the west.
- Daphla (or Dafla) Hills is a tract of hilly country on the border of western Arunachal and Assam occupied by an independent tribe called Daphla.
- Namdapha National Park is located between the Dapha bum range of the Mishmi Hills and the Patkai range with a wide elevation range between 200 and 4,571 m. It is crossed from east to west by the Noa Dihing River that originates at the Chaukan Pass on the Indo-Myanmar border.

Q. Consider the following pairs

1. Dampa Tiger Reserve : Mizoram
2. Gumti Wildlife Sanctuary : Sikkim
3. Saramati Peak : Nagaland

Which of the above pairs is /are correctly matched?

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Gumti Wildlife Sanctuary is in Tripura.

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

a) Bhitarkanika National Park

b) Keibul Lamjao National Park

c) Keoladeo Ghana National Park

d) Sultanpur National Park

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c) Keoladeo Ghana National Park

d) Sultanpur National Park

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

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

Q. In a particular region in India, the local people train the roots of living tree into robust bridges across the streams. As the time passes these bridges become stronger. These unique 'Living Root Bridges' are found in

a) Meghalaya

b) Himachal Pradesh

c) Jharkhand

d) Tamil Nadu

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- The living root bridges of **Cherrapunji, Laitkynsew, and Nongriat in Meghalaya** is a form of tree shaping, which creates these **suspension bridges.**
- The useful lifespan of the bridges, once complete, is thought to be 500–600 years.
- They are **naturally self-renewing and self-strengthening** as the component roots grow thicker.
-

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

a) Saltwater crocodile

b) Olive ridley turtle

c) Gangetic dolphin

d) Gharial

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Gangetic Dolphin (Susu)

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

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

a) Food Safety and Standards Act, 2006

b) Geographical Indications of Goods (Registration and Protection) Act, 1999

c) Environment (Protection) Act, 1986

d) Wildlife (Protection) Act, 1972

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

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

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

Select the correct answer using the code given below:

a) 1 only

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d) 1, 2 and 3

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

- The British biologist **Norman Myers** coined the term "biodiversity hotspot" in 1988 .

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

a) Sand deserts of northwest India

b) Higher Himalayas of Jammu and Kashmir

c) Salt marshes of western Gujarat

d) Western Ghats

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

Great hornbill

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

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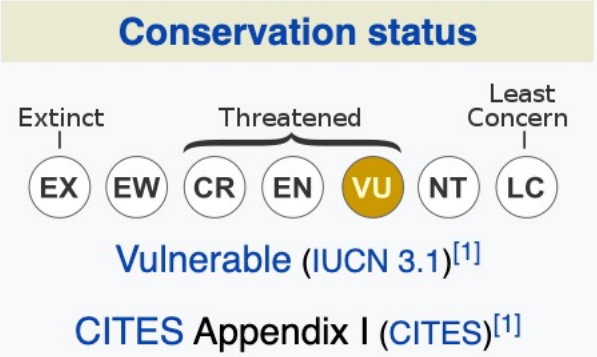

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Q).What is/are unique about 'Kharai camel', a breed found in India?

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

Select the correct answer using the code given below

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

d) 1, 2 and 3

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

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Awakening Toppers

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

Select the correct answer using the code given below

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

Sleepy Classes
Awakening Toppers

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

- UCN Red List: Endangered.
- CITES: Appendix II
- Wildlife (Protection) Act 1972: Schedule II

- Sandalwood Spike Disease is an infectious disease which is caused by phytoplasma.
- Phytoplasmas are bacterial parasites of plant tissues which are transmitted by insect vectors and involved in plant-to-plant transmission.
- There is no cure as of now for the infection.

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

a) constitutional reforms

b) Ganga Action Plan

c) linking of rivers

d) protection of Western Ghats

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Awakening Toppers

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

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b) Ganga Action Plan

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

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

a) Bhitarkanika Mangroves

b) Chambal River

c) Pullicat Lake

d) Deepor Beel

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c) Pullicat Lake

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Gharial

Sleepy Classes
Awakening Toppers

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

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

a) Captive breeding of Wild Fauna

b) Maintenance of Tiger Reserves

c) Indigenous Satellite Navigation System

d) Security of National Highways

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a) Captive breeding of Wild Fauna

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d) Security of National Highways

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

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

a) It enjoys the same level of protection as the tiger.

b) It no longer exists in the wild, a few individuals are under captive protection; and not it is impossible to prevent its extinction.

c) It is endemic to a particular region of India.

d) Both (b) and (c) stated above are correct in this context.

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WPA 1972

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

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Vermin

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

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

a) a license is required to cultivate that plant.

b) Such a plant cannot be cultivated under any circumstances.

c) It is a Genetically Modified crop plant.

d) Such a plant is invasive and harmful to the ecosystem.

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d) Such a plant is invasive and harmful to the ecosystem.

- There are six schedules under the Wildlife Protection Act, 1972.
- The specified endemic plants in Schedule VI are prohibited from cultivation and planting.
- It further states that "Cultivation of specified plants without license prohibited. –

  (1) no person shall cultivate a specified plant except under, and in accordance with a license granted by the Chief Wildlife Warden or any other officer authorized by the State Government in this behalf;

  2) Every license granted under this section shall specify the area in which and the conditions, if any, subject to which the licensee shall cultivate a specified plant."
- Placement in Schedule VI provides for regulation in cultivation of a specified plant and restricts its possession, sale and transportation.
- Both cultivation and trade of specified plants can only be carried out with prior permission of competent authority.

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Gharial

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- The National Chambal Sanctuary is located along river Chambal on the tri-junction of Rajasthan, Madhya Pradesh and Uttar Pradesh.
- It is known for critically endangered gharials, the red-crowned roof turtle, and the endangered Ganges river dolphin.
- Critically endangered.
- Schedule I of the Wild Life (Protection) Act, 1972.
- Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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

Sleepy Classes
Awakening Toppers

Indian Wild Ass

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

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Wild Water Buffalo

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

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

Sleepy Classes
Awakening Toppers

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

Which of the above statements is/are correct?

a) 1 only

b) 2 only

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

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

Sleepy Classes
Awakening Toppers

Q. Consider the following kinds of organisms:

1. Bat
2. Bee
3. Bird

Which of the above is/are pollinating agent/agents?

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

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

Pollination

- Pollination is the process of reproduction in plants.
- It is the transfer of pollen from a male part of a plant to a female part of a plant.

Sleepy Classes
akening Toppers

POLLINATION

- **Self-Pollination** (Autogamy)
- **Cross-Pollination** (Xenogamy or Allogamy)
  - **Abiotic Agencies**
    1. Anemophily (Wind)
    2. Hydrophily (Water)
  - **Biotic Agencies**
    - Cantharophily (Beetle)
    - Phalaenophily (Moths)
    - Mellitophily (Bees)
    - Psychophily (Butterflies)
    - Malacophily (Snails)
    - Ornithophily (Birds)
    - Chieropterophily (Bats)
    - Myrmecophily (Ants)

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

Sleepy Classes
Awakening Toppers

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

Select the correct using the code given below:

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Statement 1 and 3 are correct

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

Statement 2 is *not correct*

Q. Biodiversity forms the basis for human existence in the following ways:

1. Soil formation
2. Prevention of soil erosion
3. Recycling of waste
4. Pollination of crops

Select the correct answer using the codes given below:

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

Sleepy Classes
Awakening Toppers

a) Its extract is widely used in cosmetics.

b) It tends to reduce the biodiversity in the area in which it grows.

c) Its extract is used in the synthesis of pesticides.

d) None of these

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Sleepy Classes
Awakening Toppers

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c) Its extract is used in the synthesis of pesticides.

d) None of these

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

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

Sleepy Classes
Awakening Toppers

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

a) Arunachal Pradesh

b) Manipur

c) Meghalaya

d) Nagaland

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

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

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

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

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

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Awakening Toppers

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

Sleepy Classes
Awakening Toppers

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only
b) 2 only
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Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

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

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

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

Sleepy Classes
Awakening Toppers

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

Q. Recently there was a proposal to translocate some of the lions from their natural habitat in Gujarat to which one of the following sites ?

a) Corbett National Park
b) Kuno Palpur Wildlife Sanctuary
c) Mudumalai Wildlife Sanctuary
d) Sariska National Park

Sleepy Classes
Awakening Toppers

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c) Mudumalai Wildlife Sanctuary

d) Sariska National Park

Sleepy Classes
Awakening Toppers

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

a) Neyyar, Peppara and Shendurney Wildlife Sanctuaries; and Kalakad Mundanthurai Tiger Reserve.

b) Mudumalai, Sathyamangalam and Wayanand Wildlife Sanctuaries; and Silent Valley National Park.

c) Kaundinya, Gundla Brahmeswaram and Papikonda Wildlife Sanctuaries; and Mukurthi National Park.

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

Sleepy Classes
Awakening Toppers

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

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the codes given below:

a) 1 and 2

b) 2 only

c) 1 and 3

d) 3 only

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

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

Select the correct answer using the codes given below:

a) 1 and 2

b) 2 only

c) 1 and 3

d) 3 only

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DUGONG

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

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Q. Consider the following animals:

1. Sea cow
2. Sea horse
3. Sea lion

Which of the above is/are mammal/mammals?

a) 1 only

b) 1 and 3 only

c) 2 and 3 only

d) 1, 2 and 3

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Sea Cow

- Sea Cow (*Hydrodamalis gigas*), also called Steller's sea cow, very large aquatic mammal.

Sea Horse

- Sea horse is a vertebrate fish

Sea Lion

- It is warm blooded, gives birth to live young, has hair, and the female produces milk.
- All these are characteristics of mammals.

Q. Consider the following:

1.Bats

2.Bears

3.Rodents

The phenomenon of hibernation can be observed in which of the above kinds of animals?

a) 1 and 2 only

b) 2 only

c) 1, 2 and 3

d) Hibernation cannot be observed in any of the above

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Q. Among the following organisms, which one does not belong to the class of other three?

a) Crab

b) Mite

c) Scorpion

d) Spider

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- **Arachnids and crustaceans** are two groups of arthropods that are invertebrates.
- Arachnids are **terrestrial animals** whereas crustaceans are **aquatic animals.**
- Both arachnids and crustaceans have a **segmented body with jointed appendages.**
- The main difference between arachnids and crustaceans is the type of habitat they live.
- Mite, Scorpion and mite are Arachnids, while Crab is a Crustacean.

Sleepy Classes
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Q.) Consider the following statements:

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

Which of the statements given above are correct?

a) 1 and 3 only

b) 2, 3 and 4 only

c) 2 and 4 only

d) 1, 2, 3 and 4

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

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

a) Khangchendzonga National Park

b) Nandadevi National Park

c) Neora Valley National Park

d) Namdapha National Park

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

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- The **Nanda Devi National Park or Nanda Devi Biosphere Reserve,** established in 1982 is **a national park situated around the peak of Nanda Devi (7816 m) in Chamoli Garhwal district of Uttarakhand, in northern India**. The entire park lies at an elevation of more than 3,500 m (11,500 ft) above mean sea level.

- **Neora NP in WB** sustains a unique ecosystem where tropical, sub-tropical, sub-temperate, and temperate vegetative system still harbours a wealth of flora and fauna.

Q. From the ecological point of view, which one of the following assumes importance in being a good link between the Eastern Ghats and the Western Ghats?

a) Sathyamangalam Tiger Reserve
b) Nallamala Forest
c) Nagarhole National Park
d) Seshachalam Biosphere Reserve

Sleepy Classes
Awakening Toppers

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Sleepy Classes
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Q.) Which one of the following National Parks lies completely in the temperate alpine?

a) Manas National Park

b) Namdahpa National Park

c) Neora Valley National Park

d) Valley of Flowers National Park

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

a) Manas National Park

b) Namdahpa National Park

c) Neora Valley National Park

d) Valley of Flowers National Park

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

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

a) 1 and 2 only

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c) 1 and 3 only

d) 1, 2 and 3

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Sleepy Classes
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- Desert National Park is a national park situated in the Indian state of Rajasthan, near the towns **of Jaisalmer and Barmer.**
- This is one of the largest national parks, covering an area of 3162 km^2.
- The Desert National Park is an excellent example of the ecosystem of the Thar Desert.
- The Thar desert is the most thickly populated desert in the world with an average density of 83 persons/km^2
- However, the human population within the DNP is low (4-5 persons per km^2).
- There are 73 villages and also settlements or Dhanis existing within the Park.

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

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Q. Consider the following pairs about parks and rivers passing through them:

1. Corbett National Park: Ganga
2. Kaziranga National Park: Manas
3. Silent Valley National Park: Kaveri

Which of the above pairs is/are correctly matched?

a) 1 and 2

b) 3 only

c) 1 and 3

d) None

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d) None

1.Corbett National Park : Ganga	River Ramganga (West) and River Kosi
2.Kaziranga National Park : Manas	Brahmaputra, Diphlu, Mora Diphlu and Mora Dhansiri
3.Silent Valley National Park : Kaveri	Bharathapuzha ,River Kunthi

Q.) Among the following Tiger Reserves:

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

a) Corbett

b) Ranthambore

c) Nagarjunsagar-Srisailam

d) Sunderbans

Sleepy Classes
Awakening Toppers

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

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

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

Which of the statements given above is/are correct?

a) 1 and 2 only

b) 2 and 4 only

c) 3 only

d) 1, 3 and 4 only

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

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

a) Birds

b) Primates

c) Reptiles

d) Amphibians

Sleepy Classes
Awakening Toppers

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

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

a) Kanha National Park

b) Manas National Park

c) Mudumalai Wildlife Sanctuary

d) Tal Chhapar Wildlife Sanctuary

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

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

a) Congress grass

b) Elephant grass

c) Lemongrass

d) Nut grass

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

Q.) Consider the following animals:

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

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

a) 1 and 2

b) 2 only

c) 3 only

d) 1 and 3

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

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

a) Catfish

b) Octopus

c) Oyster

d) Pelican

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b) Octopus

c) **Oyster**

d) Pelican

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- **Filter Feeder** is an animal (such as a clam or baleen whale) that obtains its food by filtering organic matter or minute organisms from a current of water that passes through some part of its system.
- This means they feed by pumping water through their gills, trapping particles of food as well as nutrients, suspended sediments and chemical contaminants.
- **Oysters** are natural filter feeders.
- Some animals that use this method of feeding are **clams, krill, sponges, baleen whales, and many fish (including some sharks).**
- Some birds, such as **flamingos and certain species of duck**, are also filter feeders

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

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

Which of the statements given above are correct?

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

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

Q.) Consider the following statements:

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

Which of the statements given above are correct?

a) 1, 2, 4 and 5

b) 3, 4 and 5

c) 1, 3 and 4

d) 1, 2, 3 and 5

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- Moringa oleifera is a plant that is often called the drumstick tree, the miracle tree, the ben oil tree, or the horseradish tree.
- Moringa has been used for centuries due to its **medicinal properties and health benefits.**
- It also has **antifungal, antiviral, antidepressant, and anti-inflammatory properties.**
- It can be evergreen or semi-deciduous.
- Because of which is extensively being grown in semiarid regions in India.
- **Tamarind Tree is** a leguminous tree bearing edible fruit that is indigenous to tropical Africa. It is native to Africa or Indian-sub continent and grown in Southeast Asia and Africa as well. Hence, statement 2 is not correct. Most of the tamarind is collected as minor forest produce. Hence, statement 3 is correct. India is one of the largest exporters of **both Tamarind and Seed of Moringa.**

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

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Q. Consider the following statements:

Statement-I:

The soil in tropical rainforests is rich in nutrients.

Statement-II:

The high temperature and moisture of tropical rain forests cause dead organic matter in the soil to decompose quickly.

Which one of the following is correct in respect of the above statements?

a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

c) Statement-I is correct but Statement-II is incorrect

d) Statement-I is incorrect but Statement-II is correct

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d) **Statement-I is incorrect but Statement-II is correct**

TROPICAL RAIN FORESTS -

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- Tropical rainforest soils are often deep but not particularly fertile.
- This is partly due to the fact that huge amounts of some mineral nutrients are tied up inside the vegetation rather than being free in the soil at any given time.
- Over two-thirds of the world's rainforests, and three-fourths of the Amazonian rainforest can be considered "wet-deserts" in that they grow on red and yellow clay-like laterite soils which are acidic and low in nutrients. - largely devoid of minerals like phosphorus, potassium, calcium, and magnesium, which come from "rock" sources, but are rich with aluminium oxide and iron oxide.

Q. Which of the following is/are unique characteristic/characteristics of equatorial forests?

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1. Presence of tall, closely set trees with crowns forming a continuous canopy
2. Coexistence of a large number of species
3. Presence of numerous varieties of epiphytes

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

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

a) North Coastal Andhra Pradesh

b) South-West Bengal

c) Southern Saurashtra

d) Andaman and Nicobar Islands

Sleepy Classes
Awakening Toppers

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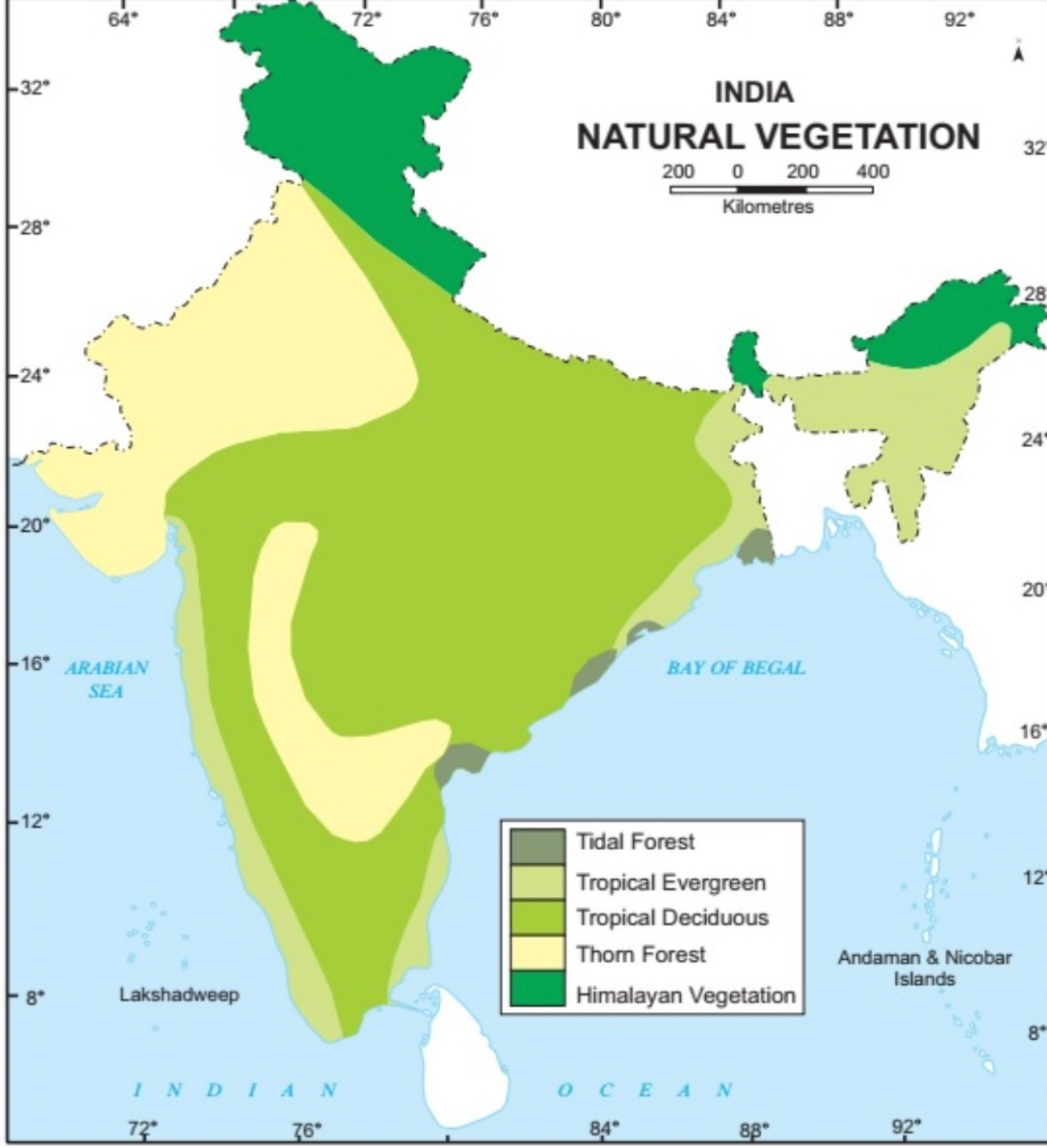
Tropical evergreen forests of India are found in the Andaman and Nicobar Islands, the Western Ghats, which fringe the Arabian Sea, the coastline of peninsular India, and the greater Assam region in the north-east.

The states where these forests are predominantly identified are :

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



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

Mangrove Cover Assessment 2021 (in sq km)

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

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Q. With reference to 'Forest Carbon Partnership Facility', which of the following statements is/are correct?

1. It is global partnership of governments, businesses, civil society and indigenous peoples
2. It provides financial aid to universities, individual scientists and institutions involved in scientific forestry research to develop eco-friendly and climate adaptation technologies for sustainable forest management
3. It assists the countries in their 'REDD+ (Reducing Emission from Deforestation and Forest Degradation+)' efforts by providing them with financial and technical assistance.

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

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Q. The "Miyawaki method" is well known for the:

a) Promotion of commercial farming in arid and semi-arid areas

b) Development of gardens genetically modified flora using genetically modified flora

c) Creation of mini forests in urban areas

d) Harvesting wind energy on coastal areas and on sea surfaces

Q. The "Miyawaki method" is well known for the:

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c) **Creation of mini forests in urban areas**

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Miyawaki Method

- A technique pioneered by Japanese botanist Akira Miyawaki, that helps build dense, native forests in a short time.
- Method: This method includes planting trees (only native species) as close as possible in the same area which not only saves space, but the planted saplings also support each other in growth and block sunlight reaching the ground, thereby preventing the growth of weed.

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 and 3 only

b) 2 and 3 only

c) 2 only

d) 1, 2 and 3

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

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

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

Select the correct answer using the codes given below:

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- More nitrogen in the soil leads to less need for nitrogen-fixing bacteria.
- Excessive/ inappropriate use of nitrogenous fertilizers increases the acidity of soil (due to the release of H ions) and leaching of nitrate to the groundwater.
- As the ammonium-N in fertilizers undergoes nitrification (conversion of ammonium to nitrate in soils by bacteria), hydrogen (H^+) is released, which can increase acidity.
- As the percentage of ammonium increases in a given fertilizer the acidifying potential will also be increased, thus reducing pH.
- Excessive fertilizer applications can lead to high concentrations of nutrients in the soil and the nutrients not taken up by plants are prone to leaching.

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Q. Which of the following adds / add nitrogen to the soil?

1. Excretion of urea by animals
2. Burning of coal by man
3. Death of vegetation

Select the correct answer using the codes given below.

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Q. Which of the following are nitrogen-fixing plants?

1. Alfalfa
2. Amarnath
3. Chickpea
4. Clover
5. Purslane (Kulfa)

Spinach Select the correct answer using the code given below:

a) 1, 3 and 4 only

b) 1, 3, 5 and 6 only

c) 2, 4, 5 and 6 only

d) 1, 2, 4, 5 and 6

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Alfalfa, also called lucerne, is a perennial flowering plant in the legume family Fabaceae. It is cultivated as an important forage crop in many countries around the world. Symbiotic N2 fixation by alfalfa provides substantial amounts of nitrogen (N) to livestock operations, subsequent crops, and soil organic matter. Hence option 1 is correct.

Amarnath: Amaranthus is a cosmopolitan genus of annual or short-lived perennial plants collectively known as amaranths. **Hence option 2 is not correct.**

Chickpea: The chickpea or chick pea is an annual legume of the family Fabaceae. **Hence option 3 is correct.**

Clover: Nitrogen is "fixed" in clovers through a symbiotic relationship with Rhizobium bacteria that infects the plant's roots. **Hence option 4 is correct.**

Purslane: Purslane is a green, leafy vegetable that can be eaten raw or cooked. It is known scientifically as Portulaca oleracea, and is also called pigweed, little hogweed, fat weed and pusley. This succulent plant contains about 93% water. It has red stems and small, green leaves. **Hence option 5 is not correct.**

Spinach: Spinach is a leafy green flowering plant native to central and western Asia. It is of the order Caryophyllales, family Amaranthaceae. **Hence option 6 is not correct.**

Q. Mycorrhizal biotechnology has been used in rehabilitating degraded sites because mycorrhiza enables the plants to

1. resist drought and increase absorptive area
2. tolerate extremes of PH
3. Resist disease infestation

Select the correct answer using the codes given below:

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

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- **Mycorrhizal plants** have tolerance to adverse soil, PH, high temp., drought and toxic heavy metals.
- The most important role of Mycorrhizal fungi is to **absorb nutrients and water from soil and transfer them to their hosts.**
- Mycorrhizae helps plants withstand root diseases, the **oxalic acid production** by mycorrhizal fungi contributes to disease suppression.

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Q. With reference to the food chains in ecosystems, which of the following kinds of organism is/are known as decomposer organism/organisms?

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1. Virus
2. Fungi
3. Bacteria

Select the correct answer using the codes given below:

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- When plants drop leaves or die, they contribute to detritus.
- Detritus consists of dead leaves and other plant remains that accumulate on the ground or at the bottom of a body of water.
- Detritus may also include animal feces and other organic debris.
- Heterotrophic organisms called detritivores feed on detritus.
- Earthworms, millipedes, and woodlice are detritivores that consume rotting leaves and other dead plant materials in or on soil.
- Dung beetles consume feces.
- In aquatic ecosystems, detritivores include "bottom feeders" such as sea cucumbers and catfish.

DECOMPOSERS

- Saprotrophs (Gr: sapros - rotten; trophos - feeder) are also called decomposers or reducers.
- They break down the complex organic compounds of dead matter (of plants and animals).
- They mainly consist of bacteria and Fungi.
- Decomposers do not ingest their food.
- Instead they secrete digestive enzymes into the dead and decaying plant and animal remains to digest the organic material.
- Enzymes act upon the complex organic compounds of the dead matter.
- Decomposers absorb a part of the decomposition products for their own nourishment.
- The remaining substances are added as minerals to the substratum (mineralisation).
- Released minerals are reused (utilised) as nutrients by the plants (producers).

Q.) Which of the following are detritivores?

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

Select the correct answer using the code given below:

a) 1, 2 and 4 only

b) 2, 3, 4 and 5 only

c) 1, 3 and 5 only

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

Q. In the grasslands, trees do not replace the grasses as a part of an ecological succession because of

a) insects and fungi

b) limited sunlight and paucity of nutrients

c) water limits and fire

d) None of the above

Sleepy Classes
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- Ecological succession typically begins when the existing biological community has been cleared away by human activity or natural disturbance such as a fire or severe storm.
- The population of trees that once lived in this area can't grow back because the fire has changed the ground composition. Without tree roots to act as anchors, rain washes away the soil and the ground becomes rocky and barren. This rocky ground, however, proves ideal to lichens, the pioneer population.
- Mosses and herbs are well suited to living in the shallow soil environment created by the lichen, and they replace the lichen as the dominant population.
- Grasses intercept most of the rainwater before it reaches the roots of the shrubs. Because the grasses limit the supply of water to the shrub seedlings, they maintain the integrity of the ecosystem as a grass ecosystem.

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

Which of the following are such conditions?

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

Select the correct answer using the code given below:

a) 1 and 2

b) 4 and 5

c) 2, 3 and 4

d) 1, 3 and 5

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

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Q. Which one of the following is the correct sequence of ecosystems in the order of decreasing productivity?

a) Oceans, lakes, grasslands, mangroves

b) Mangroves, oceans, grasslands, lakes

c) Mangroves, grasslands, lakes, oceans

d) Oceans, mangroves, lakes, grasslands

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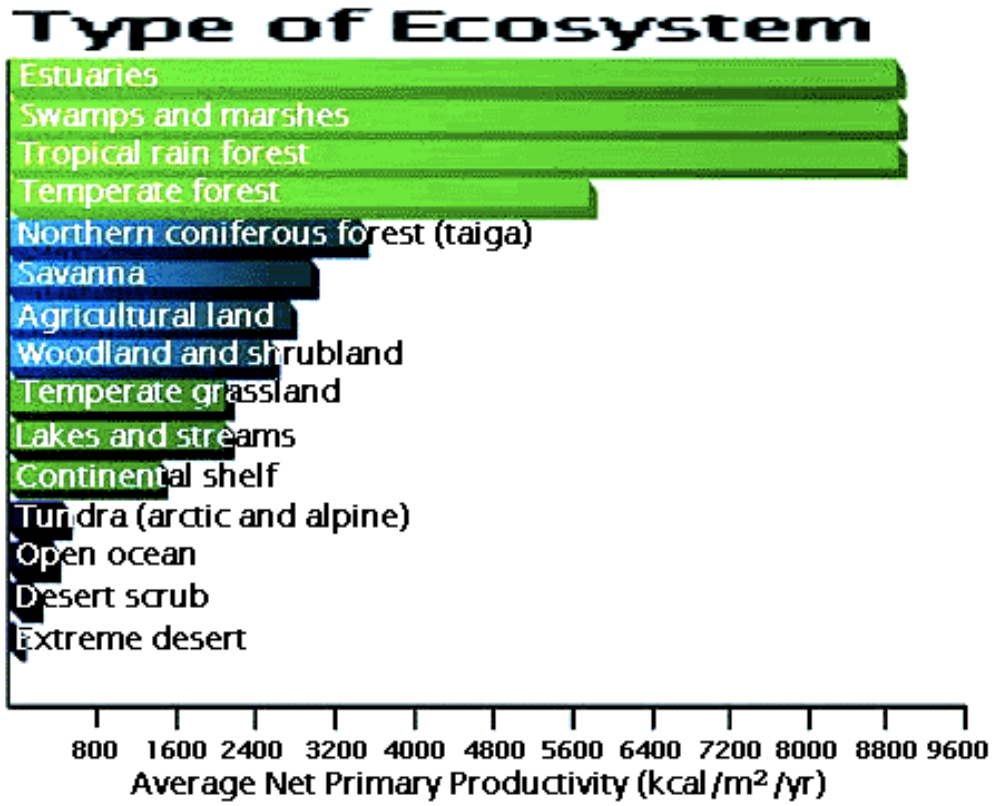
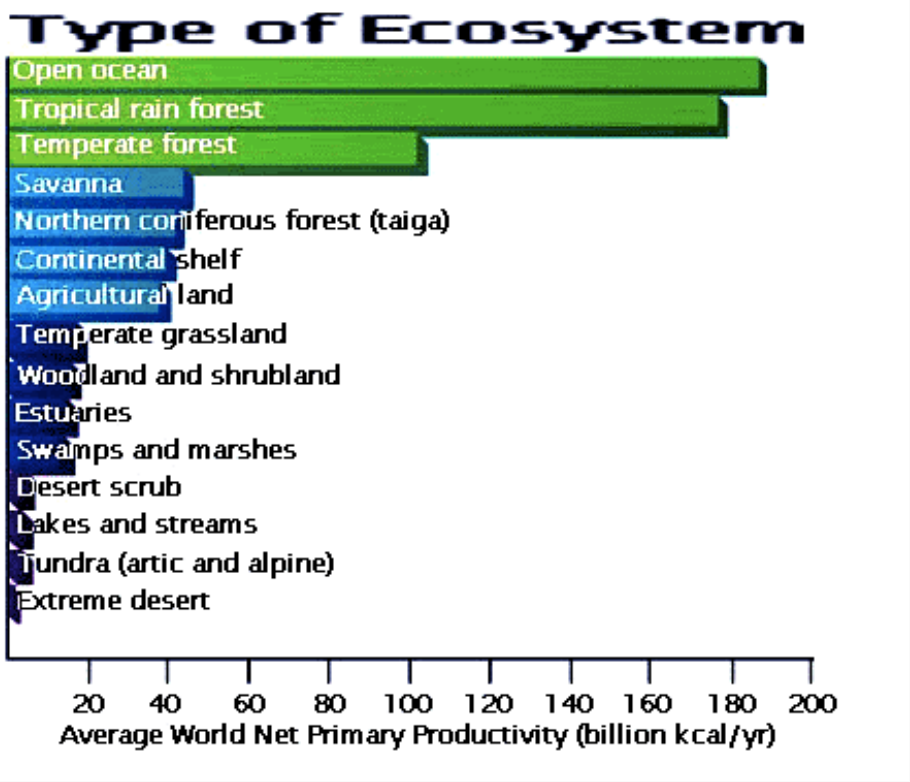
PRODUCTIVITY IN DIFFERENT ECOSYSTEMS





Q. With reference to food chains in ecosystems, consider the following statements:

1. A food chains illustrates the order in which a chain of organisms feed upon each other
2. Food chains are found within the populations of a species.
3. A food chain illustrates the numbers of each organism which are eaten by others.

Which of the statements given above is/are correct?

a) 1 only

b) 1 and 2 only

c) 1, 2 and 3

d) None

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d) None

- **A food chain is the sequence of who eats whom in a biological community (an ecosystem) to obtain nutrition.**

TYPES OF FOOD CHAIN

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Grazing food chain

- In a grazing food-chain, the first level starts with **plants as producers** and ends with **carnivores as consumers** at last level, with the herbivores being at the intermediate level.
- In a **terrestrial ecosystem**, the grass is eaten by a caterpillar, which is eaten by lizard and lizard is eaten by a snake.
- In **Aquatic ecosystem,** phytoplankton (primary producers) are eaten by zooplanktons which are eaten by fishes and fishes are eaten by pelicans.
- In an **aquatic ecosystem**, the grazing food chain is the major conduit for energy flow.
- As against this, in a **terrestrial ecosystem**, a much larger fraction of energy flows through the detritus food chain than through the grazing food chain.

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TYPES OF FOOD CHAIN

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Detritus food chain

- This type of food chain goes from **dead organic matter to organisms** feeding on detritus (detrivores) and their predators.
- Such ecosystems are thus less dependent on direct solar energy.
- These depend chiefly on the influx of organic matter produced in another system.

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Q. Which one of the following terms describes not only the physical space occupied by an organism, but also its functional role in the community of organisms?

a) Ecotone

b) Ecological niche

c) Habitat

d) Home range

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a) Ecotone

b) **Ecological niche**

c) Habitat

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- The ecological niche is the ecological role and space that an organism fills in an ecosystem.
- The ecological niche involves both the place where an organism lives and the roles that an organism does in its habitat.
- For example, the ecological niche of a sunflower growing in the backyard includes absorbing light, water and nutrients (for photosynthesis), providing shelter and food for other organisms (e.g. bees, ants, etc.), and giving off oxygen into the atmosphere.

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Q. With reference to 'Eco-Sensitive Zones', which of the following statements is/are correct ?

1. Eco-Sensitive Zones are the areas that are declared under the Wildlife (Protection) Act, 1972.
2. The purpose of the declaration of Eco-Sensitive Zones is to prohibit all kinds of human activities in those zones except agriculture.

Select the correct answer using the code given below.

a) 1 only

b) 2 only

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d) Neither 1 nor 2

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- Declared under Environment (Protection) Act, 1986. Activities prohibited are generally specific to each zone and notified separately.

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Q. With reference to Neem tree, consider the following statements :

1. Neem oil can be used as a pesticide to control the proliferation of some species of insects and mites.
2. Neem seeds are used in the manufacture of biofuels and hospital detergents.
3. Neem oil has applications in pharmaceutical industry.

Which of the statements given above is/are correct ?

a) 1 and 2 only

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Q. With reference to a conservation organization called 'Wetlands International', which of the following statements is/are correct?

1. It is an intergovernmental organization formed by the countries which are signatories to Ramsar Convention.
2. It works at the field level to develop and mobilize knowledge, and use practical experience to advocate for better policies.

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c) Both 1 and 2

d) Neither 1 nor 2

- Wetlands International is the **only global non-governmental organisation (NGO) dedicated to wetlands.**

Q. Consider the following pairs:

Wetlands Confluence of rivers

1. Harike Wetlands : Confluence of Beas and Satluj/Sutlej
2. Keoladeo Ghana National Park : Confluence of Banas and Chambal
3. Kolleru Lake : Confluence of Musi and Krishna

Which of the above pairs is/are correctly matched?

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Keoladeo Ghana National Park is formed by inundation of Gambira and Banganga rivers.

Kolleru Lake is confluence of Godavari and Krishna.

Q. Consider the following pairs:

Wetland/Lake:	Location
1. Hokera Wetland	Punjab
2. Renuka Wetland	Himachal Pradesh
3. Rudrasagar Lake	Tripura
4. Sasthamkotta	Tamil Nadu

How many pairs given above are correctly matched?

a) Only one pair

b) Only two pairs

c) Only three pairs

d) All four pairs

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- **Hokera Wetland** is located in Jammu and Kashmir, not Punjab. Hokera wetland is about 10 km from Srinagar. It is a natural perennial wetland contiguous to the Jhelum basin.
- **Renuka Wetland** is the largest natural lake in Himachal Pradesh..
- It is a natural wetland with freshwater springs and inland subterranean karst formations, fed by a small stream flowing from the lower Himalayan out to the Giri river.
- **Rudrasagar Lake**, also known as Rudijala, is a lake located in Melaghar, Tripura.
- The lake is designated as a Ramsar site. A lowland sedimentation reservoir in the northeast hills, fed by three perennial streams discharging to the River Gomti.
- **Sasthamkotta** is located in the Kollam district of Kerala, not Tamil Nadu. It is the largest freshwater lake in Kerala and has always been a centre of tourist activity.

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

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c) 3 only

d) 1, 2 and 3

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

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

Q. "If rainforests and tropical forests are the lungs of the Earth, then surely wetlands function as its kidneys." Which one of the following functions of wetlands best reflects the above statement?

a) The water cycle in wetlands involves surface runoff, subsoil percolation and evaporation.

b) Algae form the nutrient base upon which fish, crustaceans, molluscs, birds, reptiles and mammals thrive.

c) Wetlands play a vital role in maintaining sedimentation balance and soil stabilization.

d) Aquatic plants absorb heavy metals and excess nutrients.

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- Tropical rainforests are often called the “lungs of the planet” because they generally draw in carbon dioxide and breathe out oxygen. Natural wetlands have often been referred to as "earth's kidneys" because of their high and long-term capacity to filter pollutants from the water that flows through them.
- Aquatic plants can uptake large amounts of metals from water and/or sediment through active and passive absorption, with this absorption capacity of metals through different organs such as roots, stems, and leaves, making these plants suitable for heavy metal alterations in the aquatic environment.

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

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

Select the correct answer using the code given below:

a) 1 only

b) 2 and 3 only

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

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

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

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

Select the correct answer using the code given below

a) 1 and 2 only

b) 3 only

c) 2 and 3 only

d) 1, 2 and 3

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

Sleepy Classes
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Q. In the context of ecosystem productivity, marine upwelling zones are important as they increase the marine productivity by bringing the

1. Decomposer microorganism to the surface.
2. Nutrients to the surface.
3. Bottom-dwelling organisms to the surface.

Which of the statements given above is/are correct?

a) 1 and 2

b) 2 only

c) 2 and 3

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

a) Measuring oxygen levels in blood

b) Computing oxygen levels in forest ecosystems

c) Pollution assay in aquatic ecosystems

d) Assessing oxygen levels in high altitude regions

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a) Measuring oxygen levels in blood

b) Computing oxygen levels in forest ecosystems

c) **Pollution assay in aquatic ecosystems**

d) Assessing oxygen levels in high altitude regions

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

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

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

Select the correct answer using the code given below:

a) 2 and 3 only

b) 2 only

c) 3 only

d) 1, 2 and 3

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

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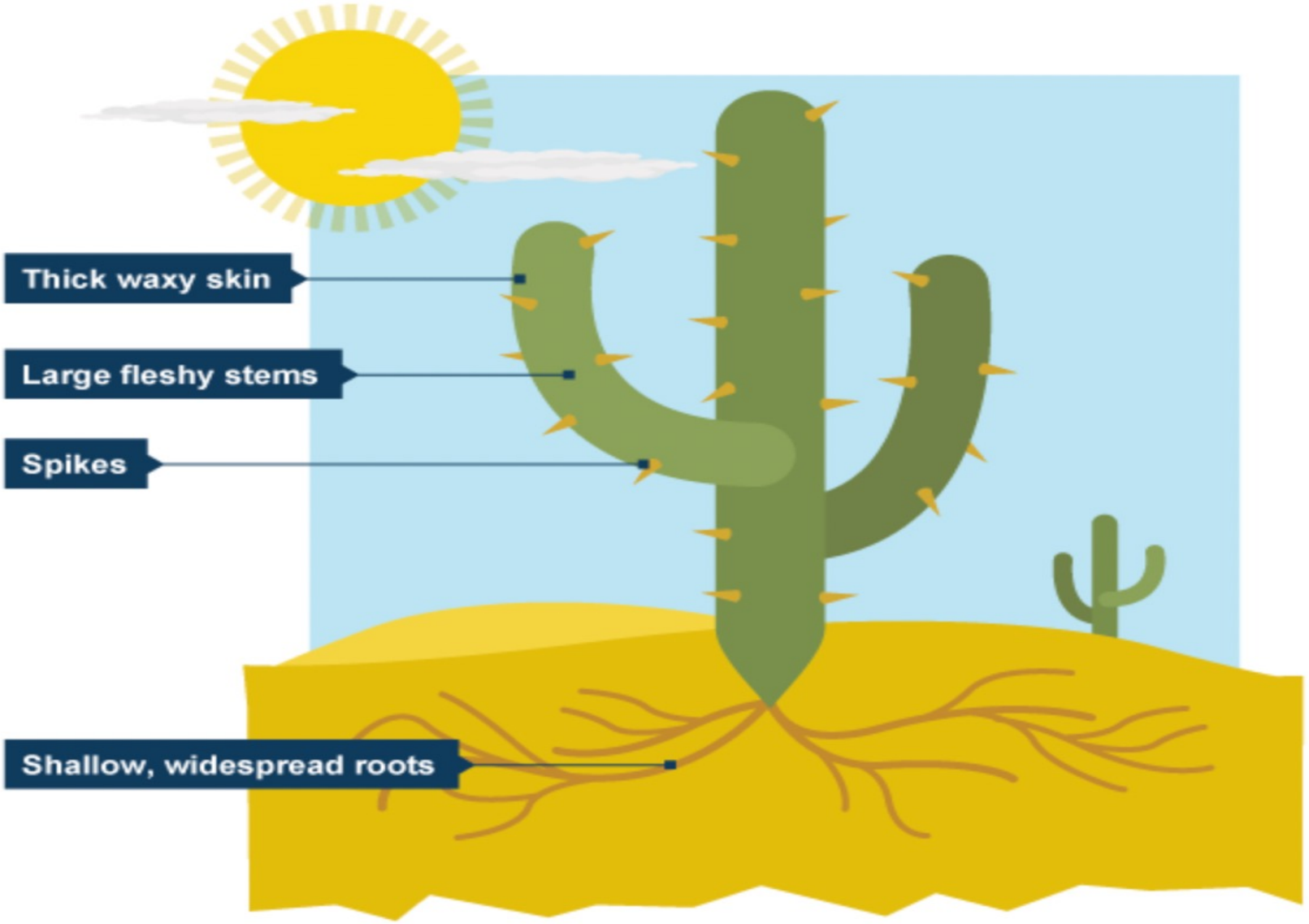
Thick waxy skin
Large fleshy stems
Spikes
Shallow, widespread roots

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

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

Sleepy Classes
Awakening Toppers

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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

Sleepy Classes
Awakening Toppers

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 and 2 only

b) 2 and 3 only

c) 3 only

d) 1, 2 and 3

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

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Q.) Consider the following states:

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

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

Which one of the following is the correct ascending order?

a) 2-3-1-4

b) 2-3-4-1

c) 3-2-4-1

d) 3-2-1-4

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c) **3-2-4-1**

d) 3-2-1-4

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

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

a) 1 and 4 only

b) 2 only

c) 2 and 3

d) 1, 3 and 4

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

Q. Lichens, which are capable of initiating ecological succession even on a bare rock, are actually a symbiotic association of

a) algae and bacteria

b) algae and fungi

c) bacteria and fungi

d) fungi and mosses

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

- Lichens are **mutualistic associations** of a fungus and an alga or cyanobacterium.
- They are **sensitive to sulphur dioxide in the air** which rapidly accumulates in their tissues.
- Lichens are commonly used as **air quality indicators** since some species are more pollution tolerant than others.
- The most sensitive lichens are shrubby and leafy whereas the most tolerant lichens are crustose.

Q. If you walk through countryside, you are likely to see some birds stalking alongside the cattle to seize the insects, disturbed by their movement through grasses, Which of the following is/are such bird/birds?

1. Painted Stork
2. Common Myna
3. Black-necked Crane

Select the correct answer using the code given below.

a) 1 and 2

b) 2 only

c) 2 and 3

d) 3 only

Sleepy Classes
Awakening Toppers

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- The common myna (Acridotheres tristis), also called the Indian myna, is a highly **commensal passerine** that lives in close association with humans, being most successful in disturbed habitats.
- It is an **opportunistic feeder** on inspects, disturbed by grazing cattle.

Q.) Consider the following kinds of organisms:

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

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

a) 1 and 2

b) 2 and 3

c) 3 and 4

d) 1 and 4

Sleepy Classes
Awakening Toppers

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

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

Sleepy Classes
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Q. Which one of the following is the process involved in photosynthesis?

a) Potential energy is released to form free energy

b) Free energy is converted into potential energy and stored

c) Food is oxidized to release carbon dioxide and water

d) Oxygen is taken, and carbon dioxide and water vapour are given out

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Q. Which one of the following is the correct sequence of a food chain?

a) Diatoms-Crustaceans-Herrings

b) Crustaceans-Diatoms-Herrings

c) Diatoms-Herrings-Crustaceans

d) Crustaceans-Herrings-Diatoms

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b) Crustaceans-Diatoms-Herrings

c) Diatoms-Herrings-Crustaceans

d) Crustaceans-Herrings-Diatoms

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

a) Carbon cycle

b) Nitrogen cycle

c) Phosphorus cycle

d) Sulphur cycle

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

Sleepy Classes
Awakening Toppers

Q. Which of the following adds/add carbon dioxide to the carbon cycle on the planet Earth?

Sleepy Classes
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1. Volcanic action
2. Respiration
3. Photosynthesis
4. Decay of organic matter

Select the correct answer using the code given below.

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

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

1. Cnidarians
2. Fungi
3. Protozoa

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

Q. Which of the following have coral reefs?

1. Andaman and Nicobar Islands
2. Gulf of Kutch
3. Gulf of Mannar
4. Sunderbans

Select the correct answer using the code given below.

a) 1, 2 and 3 only
b) 2 and 4 only
c) 1 and 3 only
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Sleepy Classes
Awakening Toppers

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d) 1, 2, 3 and 4

- Major reef formations in Indian seas occur in the **Gulf of Mannar, Palk Bay , Gulf of Kutch, the Andaman and Nicobar Islands and the Lakshadweep.**

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Q."Biorock technology" is talked about in which one of the following situations?

a) Restoration of damaged coral reefs

b) Development of building materials using plant residues

c) Identification of areas for exploration/extraction of shale gas

d) Providing salt licks for wild animals in forests/protected areas

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BIOROCK TECHNOLOGY

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- The Zoological Survey of India (ZSI), with help from Gujarat's forest department, is attempting for the first time a process to restore coral reefs using biorock or mineral accretion technology.
- It is a method that applies safe, low voltage electrical currents through seawater, causing dissolved minerals to crystallize on structures, growing into a white limestone (CaCo3) similar to that which naturally makes up coral reefs and tropical white sand beaches.
- Biorock, also known as Seacrete or Seament, refers to the substance formed by electro-accumulation of minerals dissolved in seawater.
- A biorock structure was installed one nautical mile off the Mithapur coast in the Gulf of Kachchh on 19th January, 2020.
- The scientists have used solar panels for power in this case.

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Q. Consider the following international agreements:

Sleepy Classes
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1. The International Treaty on Plant Genetic Resources for Food and Agriculture
2. The United Nations Convention to Combat Desertification
3. The World Heritage Convention

Which of the above has/have a bearing on biodiversity?

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

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Sleepy Classes
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Q. On the planet earth, most of the freshwater exists as ice caps and glaciers. Out of the remaining freshwater, the largest proportion

a) is bound in atmosphere as moisture and clouds

b) is found in freshwater lakes and rivers

c) exists as groundwater

d) exists as soil moisture

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d) exists as soil moisture

Percentage of fresh water resources

- Ice Caps and Glaciers- 2.05%,
- Groundwater- 0.68%,
- Lakes- 0.01,
- Soil Moisture- 0.005,
- Atmosphere- 0.001%,
- Streams and rivers 0.0001%,
- Biosphere - 0.00004%

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 and 3 only

c) 2 only

d) 1 and 3 only

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Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 and 3 only

c) 2 only

d) 1 and 3 only

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

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- To effectively regulate the groundwater extraction, the Centre, following the NGT's directions, has divided areas with declining water tables in three categories:

  1. Overexploited – Areas in which groundwater extraction rate is more than the groundwater recharge rate

  2. Critical – Areas where groundwater extraction rate is 90-100% of the recharge

  3. Semi-critical – Areas with an extraction rate of 70-100% of groundwater recharge

- These categories are together called the OCS areas.
- Of the 6,584 groundwater units in India, 1,034 are 'overexploited'; 253 are 'critical'; and 681 are 'semi-critical' – making up 1,968 OCS units in all.
- Around 80,000 industrial units run in these OCS areas.
- Most of them are in the Delhi-NCR region.

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

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Q. Which one of the following has been constituted under the Environment (Protection) Act, of 1986?

a) Central Water Commission
b) Central Ground Water Board
c) Central Ground Water Authority
d) National Water Development Agency

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CLIMATE CHANGE

Q. Among the following crops, which one is the most important anthropogenic source of both methane and nitrous oxide?

a) Cotton

b) Rice

c) Sugarcane

d) Wheat

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- Paddy fields are anthropogenic sources of atmospheric nitrous oxide (N_2O) and methane (CH_4), which have been reckoned as 273 and 80-83 times more powerful than CO_2 in driving temperature increase in 20 years.
- Paddies are a potential source of anthropogenic nitrous oxide (N_2O) emissions.
- In paddies, both the soil and the rice plants emit N_2O into the atmosphere.
- The rice plant in the paddy is considered to act as a channel between the soil and the atmosphere for N_2O emission.

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Q. Consider the following activities:

1. Spreading finely ground basalt rock on farmlands Extensively
2. Increasing the alkalinity of oceans by adding lime,
3. Capturing carbon dioxide released by various industries and pumping it into abandoned subterranean mines in the form of carbonated

How many of the above activities are often considered and discussed for carbon capture and sequestration?

a) Only One

b) Only Two

c) All Three

d) None

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

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a) Increased plant growth due to increased concentration of carbon dioxide in the atmosphere

b) Increased temperature of Earth due to increased concentration of carbon dioxide in the atmosphere

c) Increased acidity of oceans as a result of increased concentration of carbon dioxide in the atmosphere

d) Adaptation of all living beings on Earth to the climate change brought about by the increased concentration of carbon dioxide in the atmosphere

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

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

d) 1, 2 and 3

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d) 1, 2 and 3

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- Carbon sequestration is **the process of capturing and storing atmospheric carbon dioxide**.
- It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change.
- Geological sequestration involves the storage of CO_2 underground in depleted oil and gas reservoirs, saline formations or deep, unminable coal beds.

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Q. Consider the following statements:

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Statement – I

Carbon markets are likely to be one of the most widespread tools in the fight against climate change.

Statement – II

Carbon markets transfer resources from the private sector to the state.

Which one of the following is correct in respect of the Above statements?

a) Both Statement—I and Statement-II are correct and Statement-II is the correct explanation for Statement—I

b) Both Statement—I and Statement—II are correct and Statement—II is not the correct explanation for Statement—I

c) Statement—I is correct but Statement II is incorrect

d) Statement—I is incorrect but Statement—II is correct

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Q. Regarding "carbon credits", which one of the following statements is not correct?

a) The carbon credit system was ratified in conjunction with the Kyoto Protocol

b) Carbon credits are awarded to countries or groups that have reduced greenhouse gases below their emission quota

c) The goal of the carbon credit system is to limit the increase of carbon dioxide emission

d) Carbon credits are traded at a price fixed from time to time of the United Nation Environment Programme

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Carbon Credits

- It is a credit for greenhouse emissions reduced or removed from the atmosphere by an emission reduction project.
- A carbon market turns emission reductions and removals into tradeable assets, thus creating incentives to reduce emissions or improve energy efficiency.
- Carbon trading started formally in 1997 under the United Nations Kyoto Protocol on climate change.

Carbon Credits

- The Kyoto Protocol provides for three mechanisms that enable countries, or operators in developed countries, to acquire greenhouse gas reduction credits:
  - Under Joint Implementation (JI), a developed country with relatively high costs of domestic greenhouse reduction would set up a project in another developed country.
  - Under the Clean Development Mechanism (CDM), a developed country can "sponsor" a greenhouse gas reduction project in a developing country where the cost of greenhouse gas reduction project activities is usually much lower, but the atmospheric effect is globally equivalent.
  - Under International Emissions Trading (IET), countries can trade in the international carbon credit market to cover their shortfall in Assigned Amount Units (AAUs). Countries with surplus units can sell them to countries that are exceeding their emission targets under Annex B of the Kyoto Protocol.

Q. The scientific view is that the increase in global temperature should not exceed 2 °C above pre-industrial level. If the global temperature increases beyond 3°C above the pre-industrial level, what can be its possible impact/impacts on the world?

1. Terrestrial biosphere tends toward a net carbon source
2. Widespread coral mortality will occur.
3. All the global wetlands will permanently disappear.
4. Cultivation of cereals will not be possible anywhere in the world.

Select the correct answer using the code given below.

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

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Q. Human activities in the recent past have caused the increased concentration of carbon dioxide in the atmosphere, but a lot of it does not remain in the lower atmosphere because of

1. Its escape into the outer stratosphere.
2. The photosynthesis by phytoplankton in the oceans.
3. The trapping of air in the polar ice caps.

Which of the statements given above is/are correct?

a) 1 and 2

b) 2 only

c) 2 and 3

d) 3 only

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Q. The increasing amount of carbon dioxide in the air is slowly raising the temperature of the atmosphere, because it absorbs

a) The water vapour of the air and retains its heat.

b) The ultraviolet part of the solar radiation.

c) All the solar radiations.

d) The infrared part of the solar radiation.

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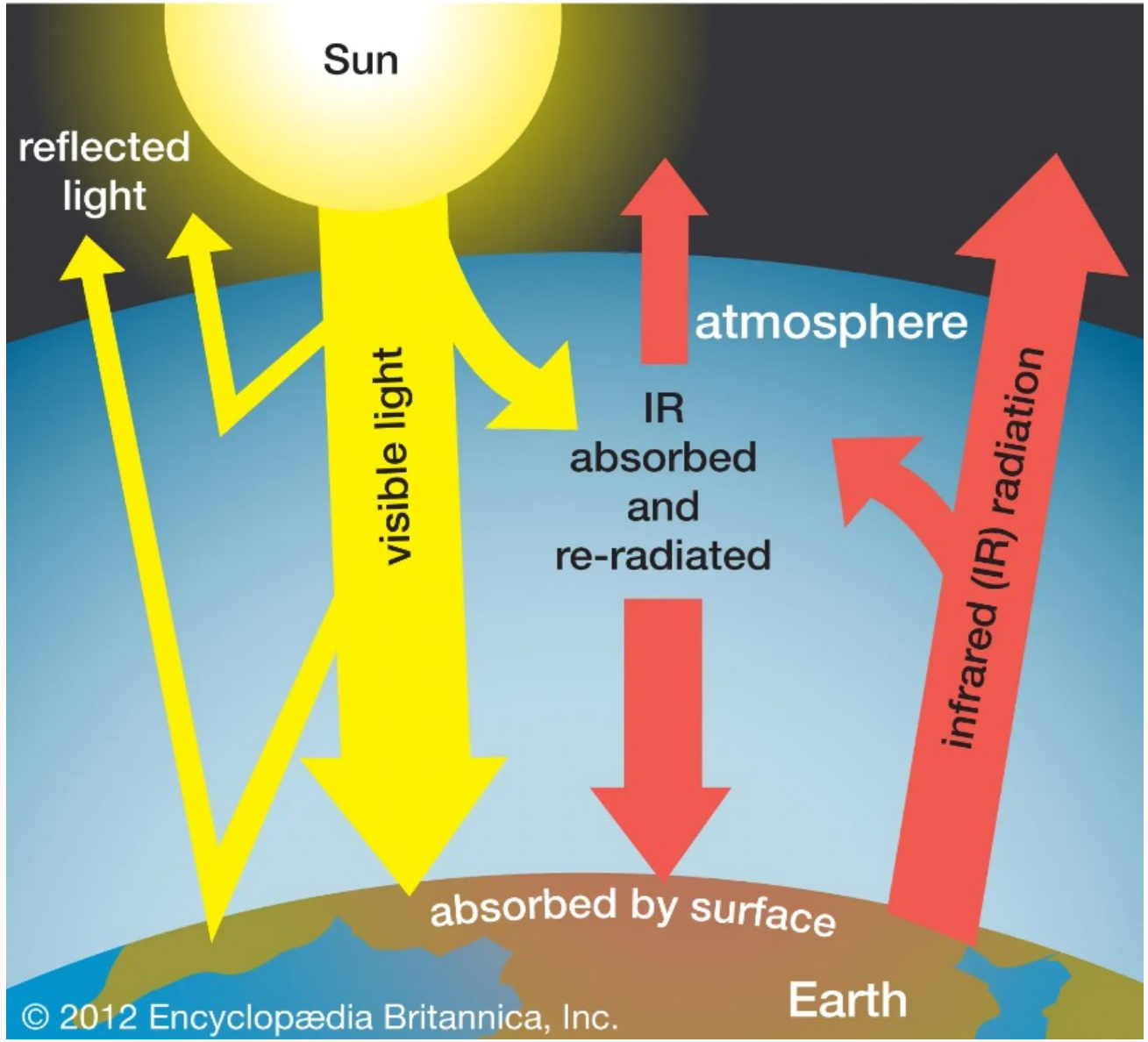

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Q. What would happen if phytoplankton of an ocean is completely destroyed for some reason?

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1. The ocean as a carbon sink would be adversely affected.
2. The food chains in the ocean would be adversely affected.
3. The density of ocean water would drastically decrease.

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c) 3 only
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Q.) Which one of the following is associated with the issue of control and phasing out of the use of ozone-depleting substances?

a) Bretton Woods Conference

b) Montreal Protocol

c) Kyoto Protocol

d) Nagoya Protocol

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

Q. Consider the following statements:

Chlorofluorocarbons, known as ozone-depleting substances, are used

1. In the production of plastic foams.
2. In the production of tubeless tyres.
3. In cleaning certain electronic components.
4. As pressurizing agents in aerosol cans.

Which of the statements given above is/are correct?

a) 1, 2 and 3 only

b) 4 only

c) 1, 3 and 4 only

d) 1, 2, 3 and 4

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c) 1, 3 and 4 only

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Q. Consider the following:

1. Aerosols
2. Foam agents
3. Fire retardants
4. Lubricants

In the making of how many of the above are hydrofluorocarbons used?

a) Only one

b) Only two

c) Only three

d) All four

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

a) It is the United Nations Conference on Sustainable Development.

b) It is a Ministerial Meeting of the World Trade Organization.

c) It is a Conference of the Inter Government Panel on Climate Change.

d) It is a Conference of the Member Countries of the Convention on Biological Diversity.

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

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

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

Select the correct answer using the codes given below:

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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

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

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

Select the correct answer using the code given below:

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3

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a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3

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

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

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

a) pledges made by the European countries to rehabilitate refugees from the war-affected Middle East.

b) plan of action outlined by the countries of the world to combat climate change.

c) capital contributed by the member countries in the establishment of Asian Infrastructure Investment Bank.

d) plan of action outlined by the countries of the world regarding Sustainable Development Goals.

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

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

- An economy-wide emissions intensity target of 33%–35% below 2005 levels;
- A electric power capacity target of 40% installed capacity from non-fossil-based energy resources by 2030, to be achieve with internationally support); and
- A carbon sink expansion target of creating an additional (cumulative) carbon sink of 2.5–3 $GtCO_2e$ through additional forest and tree cover by 2030.

Q).Consider the following pairs:

Terms sometimes seen in the news : Their origin

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

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

a) 1 and 2 only

b) 2 and 3 only

c) 3 only

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

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

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

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

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

Select the correct answer using the code given below:

a) 1, 2 and 4

b) 1, 3 and 5

c) 3 and 4

d) 2 and 5

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

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

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

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

Select the correct answer using the code given below

a) 1 only

b) 2 and 3 only

c) 3 only

d) 1, 2 and 3

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

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

Select the correct answer using the code given below

a) 1 only

b) 2 and 3 only

c) 3 only

d) 1, 2 and 3

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

Sleepy Classes
Awakening Toppers

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

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

Select the correct answer using the code given below:

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

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

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

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

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 3 only

c) 2 and 3 only

d) 1, 2 and 3

Sleepy Classes
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- REDD+ is a framework created by the UNFCCC Conference of the Parties to guide activities in the forest sector that reduces emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries.
- It is estimated that globally, deforestation and forest degradation account for around 11 percent of CO_2 emissions. Halting deforestation is a cost-effective action that has a clear impact in reducing global GHG emissions.
- It aims at the implementation of activities by national governments to reduce human pressure on forests that result in greenhouse gas emissions at the national level, but as an interim measure also recognizes subnational implementation.
- The implementation of REDD+ activities is voluntary and depends on the national circumstances, capacities and capabilities of each developing country and the level of support received.

Sleepy Classes
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Q.) What is 'Greenhouse Gas Protocol'?

a) It is an international accounting tool for government and business leaders to understand, quantify and manage greenhouse gas emissions.

b) It is an initiative of the United Nations to offer financial incentives to developing countries to reduce greenhouse gas emissions and to adopt ecofriendly technologies.

c) It is an intergovernmental agreement ratified by all the member countries of the United Nations to reduce greenhouse gas emissions to specified levels by the year 2022.

d) It is one of the multilateral REDD+ initiatives hosted by the World Bank.

Sleepy Classes
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- The Paris Agreement commits countries to reduce greenhouse gas emissions to keep the global temperature rise below 1.5 degrees Celsius, in order to avoid the worst impacts of climate change.
- The GHG Protocol arose out of the need to help countries and companies account for, report, and mitigate emissions, based on a report that identified an action agenda to address climate change that included the need for standardized measurement of GHG emissions.

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

Sleepy Classes
Awakening Toppers

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

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 3 only

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

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

Q.)Consider the following statements:

1. Climate and Clean Air Coalition (CCAC) to Reduce Short Lived Climate Pollutants is a unique initiative of G2O group of countries.
2. The CCAC focuses on methane, black carbon and hydrofluorocarbons.

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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Awakening Toppers

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

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

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

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

Sleepy Classes
Awakening Toppers

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

a) The Earth Summit on Sustainable Development 2002, Johannesburg

b) The United Nations Conference on Sustainable Development 2012, Rio de Janeiro

c) The United Nations Framework Convention on Climate change 2015, Paris

d) The World Sustainable Development Summit 2016, New Delhi.

Sleepy Classes
Awakening Toppers

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Awakening Toppers

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b) **The United Nations Conference on Sustainable Development 2012, Rio de Janeiro**

c) The United Nations Framework Convention on Climate change 2015, Paris

d) The World Sustainable Development Summit 2016, New Delhi.

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

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

a) The Intergovernmental Panel on Climate Change

b) The UNEP Secretariat

c) The UNFCCC Secretariat

d) The World Meteorological Organization

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Sleepy Classes
Awakening Toppers

a) The Intergovernmental Panel on Climate Change

b) The UNEP Secretariat

c) **The UNFCCC Secretariat**

d) The World Meteorological Organization

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

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

a) Creating the artificial rains in some regions.

b) Reducing the frequency and intensity of tropical cyclones.

c) Reducing the adverse effects of solar wind on the Earth.

d) Reducing the global warming.

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d) Reducing the global warming.

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

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

Sleepy Classes
Awakening Toppers

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

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

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

Sleepy Classes
Awakening Toppers

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

a) long-term damage done by a tonne of CO_2 emissions in a given year.

b) requirement of fossil fuels for a country to provide goods and services to its citizens, based on the burning of those fuels.

c) efforts put in by a climate refugee to adapt to live in a new place.

d) contribution of an individual person to the carbon footprint on the planet Earth.

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

Sleepy Classes
Awakening Toppers

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

a) assessing the carbon footprint of building operations around the world

b) enabling commercial farming entities around the world to enter carbon emission trading

c) enabling governments to assess the overall carbon footprint caused by their countries

d) assessing the overall carbon foot-print caused by the use of fossil fuels by the world in a unit time

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Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

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

Which of the statements given above are correct?

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

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

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

Q. With reference to 'Global Environment Facility', which of the following statements is/are correct?

a) It serves as financial mechanism for 'Convention on Biological Diversity' and 'United Nations Framework Convention on Climate Change'.

b) It undertakes scientific research on environmental issues at global level.

c) It is an agency under OECD to facilitate the transfer of technology and funds to underdeveloped countries with specific aim to protect their environment.

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Global Environment Facility

- 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.
- The GEF is the largest multilateral trust fund focused on enabling developing countries to invest in nature and supports the implementation of major international environmental conventions including on biodiversity, climate change, chemicals, and desertification.
- It brings together 184 member governments in addition to civil society, international organizations, and private sector partners.
- The financial contributions to the GEF are replenished every four years.
- The Fund is currently in its 7th replenishment cycle, GEF-7: 2018 – 2022
- Through its Small Grants Programme, the GEF has provided support to more than 25,000 civil society and community initiatives in 135 countries.

Global Environment Facility

- An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, persistent organic pollutants (POPs), mercury, sustainable forest management, food security, and sustainable cities.
- The GEF also serves as a financial mechanism for the following conventions:
  - Convention on Biological Diversity (CBD)
  - United Nations Framework Convention on Climate Change (UNFCCC)
  - United Nations Convention to Combat Desertification (UNCCD)
  - Stockholm Convention on Persistent Organic Pollutants
  - Minamata Convention on Mercury
- The GEF, although not linked formally to the Montreal Protocol on Substances that Deplete the Ozone Layer (MP), supports implementation of the Protocol in countries with economies in transition

Sleepy Classes
Awakening Toppers

Q. The scientific view is that the increase in global temperature should not exceed 20C above pre-industrial level. If the global temperature increases beyond 30C above the pre-industrial level, what can be its possible impact/impacts on the world?

1. Terrestrial biosphere tends toward a net carbon source.
2. Widespread coral mortality will occur.
3. All the global wetlands will permanently disappear.
4. Cultivation of cereals will not be possible anywhere in the world.

Select the correct answer using the code given below:

a) 1 only

b) 1 and 2 only

c) 2, 3 and 4 only

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Q. "Climate Action Tracker, which monitors the emission reduction pledges of different countries is a:

a) Database created by coalition of research organisations

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c) Committee under "United Nations Framework Convention on Climate Change"

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- The Climate Action Tracker is an independent scientific analysis that tracks government climate action and measures it against the globally agreed Paris Agreement aim of "holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C." A collaboration of two organisations, Climate Analytics and New Climate Institute, the CAT has been providing this independent analysis to policymakers since 2009. CAT quantifies and evaluates climate change mitigation targets, policies and action. It also aggregates country action to the global level, determining likely temperature increases during the 21st century using the MAGICC climate model. CAT further develops sectoral analysis to illustrate required pathways for meeting the global temperature goals.
- CAT tracks 39 countries and the EU covering around 85% of global emissions.
- CAT covers all the biggest emitters and a representative sample of smaller emitters covering about 85% of global emissions and approximately 70% of global population.

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Q. Consider the following statements:

1. "The Climate Group" is an international non-profit organization that drives climate action by building large networks and runs them.
2. The International Energy Agency in partnership with the Climate Group launched a global initiative "EP100".
3. EP100 brings together leading companies committed to driving innovation in energy efficiency and increasing competitiveness while delivering on emission reduction goals.
4. Some Indian companies are members of EP100.
5. The International Energy Agency is the Secretariat to the "Under2 Coalition".

Which of the statements given above are correct?

a) 1, 2, 4 and 5

b) 1, 3 and 4 only

c) 2, 3 and 5 only

d) 1, 2, 3, 4 and 5

Q. Consider the following statements:

Sleepy Classes
Awakening Toppers

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Statement 1 is correct: The Climate Group is a non - profit organisation that works with business and government leaders around the world to address climate change. The group has programmes focusing on renewable energy and reducing greenhouse gas emissions.

Statement 2 is not correct and Statement 3 is correct: EP100 is a global initiative led by the international non - profit Climate Group, bringing together over 120 energy smart businesses committed to measuring and reporting on energy efficiency improvements. The Climate Group's global EP100 initiative, delivered in partnership with the Alliance to Save Energy, brings together leading companies improving their energy productivity; using less energy to achieve higher economic output.

Statement 4 is correct: Mahindra & Mahindra Ltd., the world's largest manufacturer of tractors, has signed up to EP100. The Indian-based company has committed to doubling their energy productivity by 2030, a core requirement for any business signing on to the campaign. Recently, Dalmia Cement and JSW Cement – two leading Indian cement companies - committed to the Climate Group's flagship business initiatives RE100, EV100 and EP100. Dalmia Cement committed to EV100, while they are already members of RE100 and EP100. JSW Cement, committed to all the three campaigns in one go.

Statement 5 is not correct: It is the largest global network of state and regional governments committed to reducing emissions in line with the Paris Agreement.

Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

Q. Consider the following statements regarding 'Earth Hour'

Sleepy Classes
Awakening Toppers

1. It is an initiative of UNEP and UNESCO.
2. It is a movement in which the participants switch off the lights for one hour on a certain day every year.
3. It is a movement to raise the awareness about the climate change and the need to save the planet.

Which of the statements given above is / are correct?

a) 1 and 3 only
b) 2 only
c) 2 and 3 only
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POLLUTION

Sleepy Classes
Awakening Toppers

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Q.) Consider the following statements:

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 and 3 only

c) 3 only

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Sleepy Classes
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Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

Q. With reference to coal-based thermal power plants in India, consider the following statements:

1. None of them uses seawater
2. None of them is set up in water-stressed district.
3. None of them is privately owned

How many of the above statements are correct?

a) Only one

b) Only two

c) All three

d) None

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

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Q. Consider the following statements regarding mercury pollution:

Sleepy Classes
Awakening Toppers

1. Gold mining activity is a source of mercury pollution in the world.
2. Coal-based thermal power-plants cause mercury pollution.
3. Three is no known safe level of exposure to mercury

How many of the above statements are correct?

a) Only one

b) None

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Q. Consider the following:

1. Carbon dioxide
2. Oxides of Nitrogen
3. Oxides of Sulphur

Which of the above is/are the emission/emissions from coal combustion at thermal power plants?

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

Coal-based Thermal Power Plants

- Coal-based Thermal Power Plants (TPPs) are responsible for a disproportionately higher share of emissions than the industrial sector (60 per cent of PM, 45 per cent of SO2, 30 per cent of NO2 and 80 per cent of mercury (Hg)) .
- The emissions include a myriad of toxic air pollutants and carbon dioxide (CO_2), which is the most important human-produced climate-altering greenhouse gas.
- The CPCB has categorized TPP as highly polluting activities.

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

a) 1, 2 and 3 only

b) 2, 3 and 4 only

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Sleepy Classes
Awakening Toppers

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- Launched by the Environment Ministry in April 2015.
- Initiative under 'Swachh Bharat'.
- It helps the common man to judge the air quality within his vicinity.
- There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe.
- Pollutants considered - It considers eight pollutants (PM10, PM2.5, NO_2, SO_2, CO, O_3, NH_3, and Pb).

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- The government is executing a nation-wide programme of ambient air quality monitoring known as NAMP.
- The network consists of 703 manual operating stations covering 307 cities/towns in 28 states and 8 Union Territories of the country.
- Under NAMP, four air pollutants viz. SO2, NO2, suspended particulate matter (PM10), and fine particulate matter (PM2.5) have been identified for regular monitoring at all the locations.

Sleepy Classes
Awakening Toppers

- In addition, there are 134 real-time Continuous Ambient Air Quality Monitoring stations (CAAQMS) in 71 cities across 17 states, monitoring 08 pollutants viz.
- PM10, PM2.5, SO_2, NO_x, ammonia (NH_3), CO, ozone (O_3), and benzene.

Q. There is a concern over the increase in harmful algal blooms in the seawaters of India. What could be the causative factors for this phenomenon?

Sleepy Classes
Awakening Toppers

1. Discharge of nutrients from the estuaries.
2. Run-off from the land during the monsoon.
3. Upwelling in the seas.

Select the correct answer from the codes given below:

a) 1 only
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Q. In the Union Budget 2011-12, a full exemption from the basic customs duty was extended to the bio-based asphalt (bioashphalt). What is the importance of this material?

1. Unlike traditional asphalt, bio-asphalt is not based on fossil fuels.
2. Bioasphalt can be made from non-renewable resources.
3. Bioasphalt can be made from organic waste materials.
4. It is eco-friendly to use biosphalt for surfacing of the roads.

Which of the statements given above are correct?

a) 1, 2 and 3 only

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Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Select the correct answer using the code given below:

(a) 1 only

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

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Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

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

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

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

Sleepy Classes
Awakening Toppers

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

a) The Bio -medical Waste (Management and Handling) Rules, 1998

b) The Recycled Plastic (Manufacturing and Usage) Rules, 1999

c) The e -Waste (Management and Handling) Rules, 2011

d) The Food Safety and Standard Regulations, 2011

Sleepy Classes
Awakening Toppers

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Sleepy Classes
Awakening Toppers

- EPR is a policy approach under which producers are given a significant responsibility – **financial and/or physical –** for the treatment or disposal of post-consumer products.
- Assigning such responsibility could in principle provide incentives to prevent wastes at the source, promote product design for the environment and support the achievement of public recycling and materials management goals.

Q. Lead, ingested or inhaled, is a health hazard. After the addition of lead to petrol has been banned, what still are the sources of lead poisoning?

Sleepy Classes
Awakening Toppers

1. Smelting units
2. Pens and pencils
3. Paints
4. Hair oils and cosmetics

Select the correct answer using the codes given below:

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

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Q. Which of the following can be found as pollutants in the drinking water in some parts of India?

Sleepy Classes
Awakening Toppers

1. Arsenic
2. Sorbitol
3. Fluoride
4. Formaldehyde
5. Uranium

Select the correct answer using the codes given below

a) 1 and 3 only

b) 2, 4 and 5 only

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ARSENIC POLLUTION

Sleepy Classes
Awakening Toppers

- Contamination of ground water by arsenic leads to accumulation of arsenic in the body parts like blood, nails and hairs causing skin lesions, rough skin, dry and thickening of skin and ultimately skin cancer. (Black Foot Disease)
- Arsenic is highly toxic in its organic form and presence of high levels of arsenic in groundwater renders it toxic.
- Long-term exposure to arsenic from drinking-water and food can cause cancer and skin lesions.
- It has also been associated with developmental effects, cardiovascular disease, neurotoxicity and diabetes.
- The government of India had kept the maximum arsenic level in water at 50 μg/L while WHO has kept it at 10 μg/L.
- However, in India, the permissible limit in drinking water has recently been revised from .05 mg per litre to .01 mg per litre.

FLUOROSIS

Sleepy Classes
Awakening Toppers

- Ingestion of excess fluoride, most commonly in drinking-water, can cause fluorosis which affects the teeth and bones.
- Moderate amounts lead to dental effects, but long-term ingestion of large amounts can lead to potentially severe skeletal problems.
- Paradoxically, low levels of fluoride intake help to prevent dental caries.

URANIUM CONTAMINATION

Sleepy Classes
Awakening Toppers

- The primary source of uranium is geogenic i.e., main source of uranium is granite, which is common in the Himalayan range.
- Over the years, uranium may have slowly leached into the water.
- However, anthropogenic factors such as overexploitation of groundwater for agricultural irrigation and nitrate pollution due to overuse of nitrogenous fertilizers may have further enhanced uranium mobilization.

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Q. Photochemical smog is a resultant of the reaction among

a) NO_2, O_3 and peroxyacetyl nitrate in the presence of sunlight

b) CO, O_2 and peroxyacetyl nitrate in the presence of sunlight

c) CO, CO_2 and NO_2 at low temperature

d) high concentration of NO_2, O_3 and CO in the evening

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Awakening Toppers

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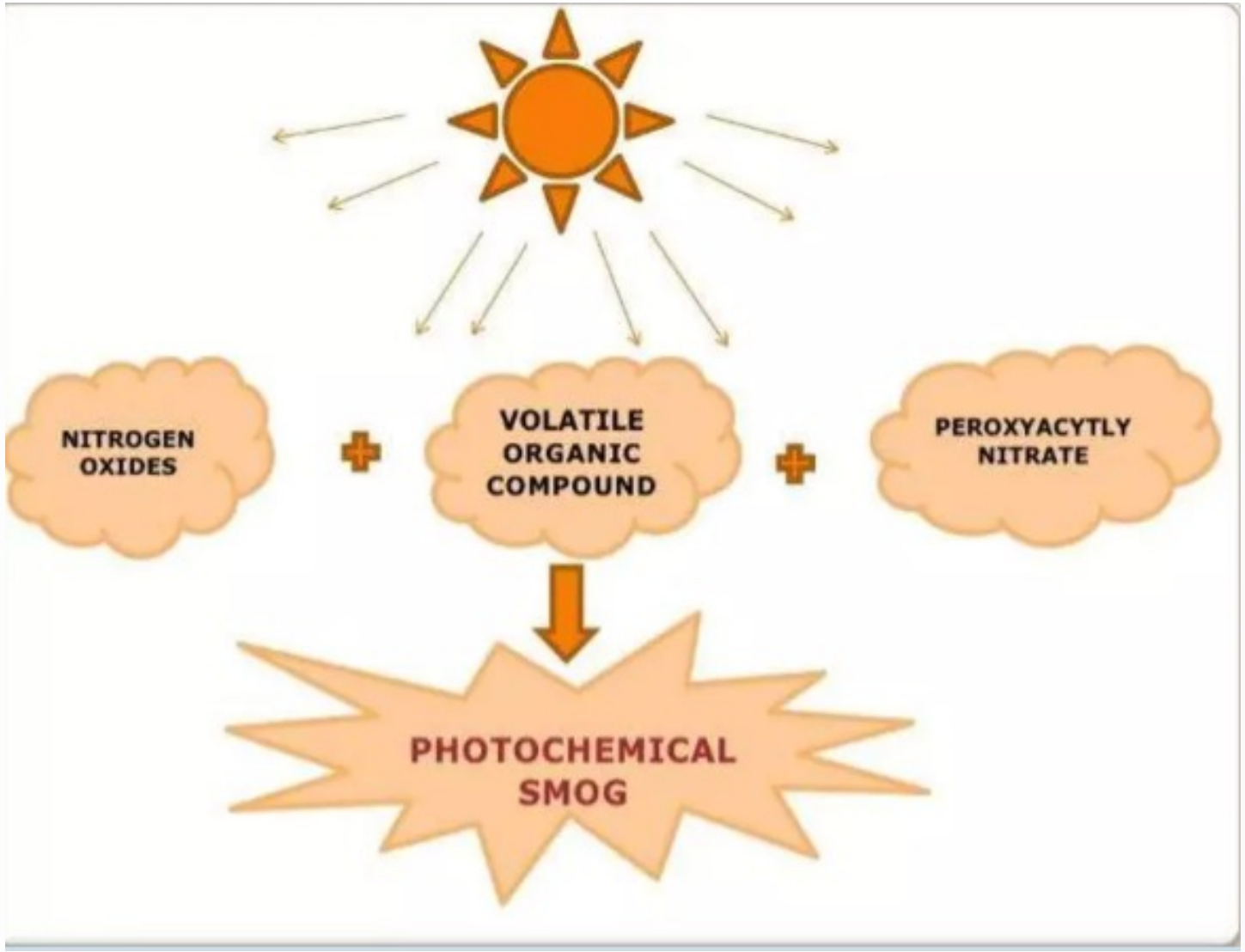

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
Awakening Toppers

a) Waste generator has to segregate waste five categories.

b) The Rules are applicable to notified urban local bodies, notified towns and all industrial townships only.

c) The Rules provide for exact and elaborate criteria for the identification of sites for landfills and waste processing facilities.

d) It is mandatory the part of waste generator that the waste generated in one district cannot be moved to another district.

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

Q. Which of the following are some important pollutants released by steel industry in India ?

1. Oxides of sulphur
2. Oxide of nitrogen
3. Carbon monoxide
4. Carbon dioxide

Select the correct answer using the code given below

a) 1, 3 and 4 only

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Sleepy Classes
Awakening Toppers

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Q. There is some concern regarding the nanoparticles of some chemical elements that are used by the industry in the manufacture of various products. Why?

1. They can accumulate in the environment and contaminate water and soil.
2. They can enter the food chains.
3. They can trigger the production of free radicals.

Select the correct answer using the code given below

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

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- Many of the nano particles are very stable and hence have a tendency for accumulation.
- They can easily enter food chains because of their very small size and stay in it because of their stable nature.
- They have the ability to generate free radicals and cause oxidative stress in cells.

Sleepy Classes
Awakening Toppers

Q. Brominated flame retardants are used in many household products like mattresses and upholstery. Why is there some concern about their use?

1. They are highly resistant to degradation in the environment.
2. They are able to accumulate in humans and animals.

Select the correct answer using the code given below.

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

a) Extraction of rare earth elements

b) Natural gas extraction technologies

c) Hydrogen fuel-based automobiles

d) Waste-to-energy technologies

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

a) Extraction of rare earth elements

b) Natural gas extraction technologies

c) Hydrogen fuel-based automobiles

d) Waste-to-energy technologies

- Pyrolysis is a common technique used to convert plastic waste into energy, in the form of solid, liquid and gaseous fuels.
- Pyrolysis is the thermal degradation of plastic waste at different temperatures (300–900°C), in the absence of oxygen, to produced liquid oil
- Plasma Gasification: Plasma gasification is an extreme thermal process using plasma which converts organic matter into a syngas (synthesis gas - a mixture of carbon monoxide (CO) and hydrogen (H_2) which is primarily made up of hydrogen and carbon monoxide.
- These technologies are sometimes are known as Advanced Thermal Technologies or Alternative Conversion Technologies.

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

a) They are considered harmful to marine ecosystems.

b) They are considered to cause skin cancer in children.

c) They are small enough to be absorbed by crop plants in irrigated fields.

d) They are often found to be used as food adulterants.

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

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

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

Which of the statements given above is/are correct?

a) 1 only

b) 2 and 3 only

c) 4 only

d) 1, 2, 3 and 4

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c) 4 only

d) 1, 2, 3 and 4

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

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Q.) Consider the following:

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

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

a) 1 and 2 only

b) 2, 3 and 4 only

c) 1 and 4 only

d) 1, 2, 3 and 4

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

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

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

Select the correct answer using the code given below:

a) 1, 2 and 3 only

b) 2 and 4 only

c) 1, 3 and 4 only

d) 1, 2, 3, 4 and 5

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

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

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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

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

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

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

Select the correct answer using the code given below:

a) 1, 2 and 3 only

b) 2, 3 and 4 only

c) 4 and 5 only

d) 1 and 5 only

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

- Production of cold asphalt mix does not require high investment in equipment, which makes it economical.
- It is also suitable for use in remote areas.
- Cold asphalt mixes can be used both for initial construction (100% virgin mixes) and for recycling of asphalt pavements.
- Hot mix asphalt technology is major CO2 emitter.
- Geotextiles are mostly used in road construction, especially to fill gaps between the roads to improve soil structure. Geotextile makes poor soil more beneficial for use and then easy to build in difficult places also. It helps to prevent the erosion of soil but allows the water to drain off.
- Portland cement that binds concrete together is energy intensive and emits enormous amounts of carbon dioxide (CO_2) as well as numerous other pollutants.

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

Sleepy Classes
Awakening Toppers

Q. Due to improper / indiscriminate disposal of old and used computers or their parts, which of the following are released into the environment as e-waste?

1. Beryllium
2. Cadmium
3. Chromium
4. Heptachlor
5. Mercury
6. Lead
7. Plutonium

Select the correct answer using the codes given below.

a) 1, 3, 4, 6 and 7 only
b) 1, 2, 3, 5 and 6 only
c) 2, 4, 5 and 7 only
d) 1, 2, 3, 4, 5, 6 and 7

Sleepy Classes
Awakening Toppers

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c) 1 and 3 only

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

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

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

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

Which of the statements given above are correct?

a) 1 and 2 only

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

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

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

Select the correct answer using the code given below:

a) 1, 2, 3 and 5 only

b) 1, 2 and 4 only

c) 3, 4 and 5 only

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- Magnetite is a mineral and one of the main iron ores, with the chemical formula $Fe^{2+}Fe^{3+}{}_2O_4$.
- It is one of the oxides of iron, and is ferrimagnetic; it is attracted to a magnet and can be magnetized to become a permanent magnet itself.
- It is the most magnetic of all the naturally occurring minerals on Earth.
- Magnetite can have potentially large impacts on the brain due to its unique combination of redox activity, surface charge and strongly magnetic behaviour.
- Airborne magnetite pollution particles < ~200 nm in size can access the brain directly via the olfactory and/or trigeminal nerves, bypassing the blood -brain barrier.

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

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Q. Acid rain is caused by the pollution of environment by

a) carbon dioxide and nitrogen

b) carbon monoxide and carbon dioxide

c) ozone and carbon dioxide

d) nitrous oxide and sulphur dioxide

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Q. Consider the following:

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2. Nitrogen oxide
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4. Sulphur dioxide

Excess of which of the above in the environment is/are cause(s) of acid rain?

a) 1, 2 and 3

b) 2 and 4 only

c) 4 only

d) 1, 3 and 4

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- Acid rain results when sulfur 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.

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AGRICULTURE

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Q. With reference to the role of biofilters in Recirculating Aquaculture System, consider the following statements

1. Biofilters provide waste treatment by removing uneaten fish feed.
2. Biofilters convert ammonia present in fish waste to nitrate
3. Biofilters increase phosphorus as nutrient for fish in water.

How many of the statements given above are correct?

a) Only one

b) Only two

c) All three

d) None

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Q. In India, cluster bean (Guar) is traditionally used as a vegetable or animal feed, but recently the cultivation of this has assumed significance. Which one of the following statements is correct in this context?

a) The oil extracted from seeds is used in the manufacture of biodegradable plastics

b) The gum made from its seeds is used in the extraction of shale gas

c) The leaf extract of this plant has the properties of anti-histamines

d) It is a source of high quality biodiesel

Sleepy Classes
Awakening Toppers

Q. In India, cluster bean (Guar) is traditionally used as a vegetable or animal feed, but recently the cultivation of this has assumed significance. Which one of the following statements is correct in this context?

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- Clusterbean commonly known as **guar**, has come to be recognized as one of the most important **commercial crop of arid and semi-arid region.**
- It is a **drought-hardy leguminous crop** because of its deep tap rooting system and has a high capacity to recover from water stress.

Q. Salinization occurs when the irrigation water accumulated in the soil evaporates, leaving behind salts and minerals. What are the effects of salinization on irrigated land?

a) It greatly increases the crop production

b) It makes some soils impermeable

c) It raises the water table

d) It fills the air spaces in the soil with water

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Q. Biomass gasification is considered to be one of the sustainable solutions to the power crisis in India. In this context, which of the following statements is/are correct?

1. Coconut shells, groundnut shells and rice husk can be used in biomass gasification.
2. The combustible gases generated consist of hydrogen and carbon dioxide only.
3. The combustible gases generated from biomass gasification can be used for direct heat generation but not in internal combustion engines.

Select the correct answer using the codes given below:

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Q. Consider the following agricultural practices:

1. Contour bunding
2. Relay cropping
3. Zero tillage

In the context of global climate change, which of the above helps/help in carbon sequestration/storage in the soil?

a) 1 and 2 only

b) 3 only

c) 1, 2 and 3

d) None of them

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Q. Contour bunding is a method of soil conservation used in

a) desert margins, liable to strong wind action

b) low flat plains, close to stream courses, liable to flooding

c) scrublands, liable to spread of weed growth

d) None of the above

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- Contour bunding (or contour bundling), involves the placement of lines of stones along the natural rises of a landscape.
- It helps to capture and hold rainfall before it can become runoff.
- It also inhibits wind erosion by keeping the soil heavy and moist.

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Q. In India, the problem of soil erosion is associated with which of the following?

1.Terrace cultivation

2.Deforestation

3.Tropical climate

Select the correct answer using the code given below.

a) 1 and 2 only

b) 2 only

c) 1 and 3 only

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Q. With reference to the usefulness of the by- products of sugar industry, which of the following statements is/are correct?

1. Bagasse can be used as biomass fuel for the generation of energy.
2. Molasses can be used as one of the feedstocks for the production of synthetic chemical fertilizers.
3. Molasses can be used for the production of ethanol.

Select the correct answer using the codes given below:

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

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Option 1

- When burned by a sugar mill, bagasse, the fibrous material leftover after juice is extracted from sugarcane, usually produces enough electricity to power all of the mill's operations and then some.

Option 2

- Molasses fertilizer is an organic fertilizer.

Option 3

- Sugarcane ethanol is an alcohol-based fuel produced by the fermentation of sugarcane juice and molasses. Sugarcane ethanol has emerged as a leading renewable fuel for the transportation sector.

Q. What are the significances of a practical approach to sugarcane production known as 'Sustainable Sugarcane Initiative' ?

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1. Seed cost is very low in this compared to the conventional method of cultivation.
2. Drip irrigation can be practiced very effectively in this.
3. There is no application of chemical/inorganic fertilizers at all in this.
4. The scope for intercropping is more in this compared to the conventional method of cultivation

Select the correct answer using the code given below

a) 1 and 3 only

b) 1, 2 and 4 only

c) 2, 3 and 4 only

d) 1, 2, 3 and 4

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- **The SSI method encourages application of organic manure as it enhances the macro and micro nutrient content in the soil in an eco friendly way and helps in optimum utilization of some of the chemical fertilizers.**

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

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

Select the correct answer using the code given below

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3

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Select the correct answer using the code given below

a) 1 and 3 only

b) 2 only

c) 2 and 3 only

d) 1, 2 and 3

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Statement 1 is incorrect

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

Statement 2 is correct

- GIAHS aims to identify and safeguard eco-friendly traditional farm practices and their associated landscapes, agricultural biodiversity and knowledge systems of the local communities.

Statement 3 is also incorrect

- There is no such provision.

Q. With reference to micro-irrigation, which of the following statements is/are correct?

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1. Fertilizer/nutrient loss can be reduced.
2. It is the only means of irrigation in dry land farming.
3. In some areas of farming, receding of ground water table can be checked.

Select the correct answer using the codes given below:

a) 1 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Sleepy Classes
Awakening Toppers

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 3 only

c) 1 and 3 only

d) 1, 2 and 3

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- **No-till farming (also called zero tillage or direct drilling) is a way of growing crops or pasture from year to year without disturbing the soil through tillage.**
- **No-till is an agricultural technique which increases the amount of water that infiltrates into the soil and increases organic matter retention and cycling of nutrients in the soil.**

Sleepy Classes
Awakening Toppers

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

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

Select the correct answer using the code given below:

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

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

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- Conservation Agriculture is a set of soil management practices that minimize the disruption of the soil's structure, composition and natural biodiversity. Despite high variability in the types of crops grown and specific management regimes, all forms of conservation agriculture share three core principles. These include:
  - maintenance of permanent or semi -permanent soil cover (using either a previous crop residue or specifically growing a cover crop for this purpose) ; minimum soil disturbance through tillage (just enough to get the seed into the ground) ; regular crop rotations to help combat the various biotic constraints.

Sleepy Classes
Awakening Toppers

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

Sleepy Classes
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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 only

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- Excessive instream sand and gravel mining causes the degradation of rivers. Instream mining lowers the stream bottom, which may lead to bank erosion.
- Depletion of sand in the streambed and along coastal areas causes the deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets. It may also lead to saline -water intrusion from the nearby sea. 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.
- Excessive instream sand mining is a threat to bridges, river banks and nearby structures. Sand mining also affects the adjoining groundwater system and the uses that local people make of the river.
- Sand aquifer helps in recharging the water table and sand mining causes sinking of water tables in the nearby areas, , drops leaving the drinking water wells on the embankments of these rivers dry. Turbidity increases at the mining site.

Sleepy Classes
Awakening Toppers

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

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

Which of the statements given above is/are correct?

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

Sleepy Classes
Awakening Toppers

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Sleepy Classes
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- Organic matter affects both the chemical and physical properties of the soil and its overall health.
- Properties influenced by organic matter include: soil structure; moisture holding capacity; diversity and activity of soil organisms, both those that are beneficial and harmful to crop production; and nutrient availability.
- Increased levels of organic matter and associated soil fauna lead to greater pore space with the immediate result that water infiltrates more readily and can be held in the soil.
- The improved pore space is a consequence of the bioturbating activities of earthworms and other macro - organisms and channels left in the soil by decayed plant roots.

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- Sulphur is one of three nutrients that are cycled between the soil, plant matter and the atmosphere. The sulfur cycle describes the movement of sulfur through the atmosphere, mineral and organic forms, and through living things. Although sulfur is primarily found in sedimentary rocks, it is particularly important to living things because it is a component of many proteins. Sulfur is released by weathering of rocks and minerals. Water, temperature and chemical reactions break down minerals releasing their component elements. Once sulfur is exposed to the air, it combines with oxygen, and becomes sulfate (SO4). Plants and microbes take up sulfate and convert it into organic compounds. As animals consume plants, the sulfur is moved through the food chain and released when organisms and plants die and decompose

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

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

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a) pesticides in agriculture

b) preservatives in processed foods

c) fruit-ripening agents

d) moisturizing agents in cosmetics

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- **Carbofuran, phorate, methyl parathion, monocrotophos, methyl demethon, prophenophos and triazophos are pesticides used in agriculture.**

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

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

Select the correct answer using the code given below:

a) 1, 2 and 3 only

b) 1, 2 and 4 only

c) 1,3 and 4 only

d) 2, 3 and 4 only

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c) 1,3 and 4 only

d) 2, 3 and 4 only

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

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- The pH of the irrigation water is of great importance, as it affects many chemical reactions. In fertigation, the reasons for adjusting the pH to an optimal range are:
  - To allow optimal uptake of nutrients, especially micronutrients;
  - To keep the irrigation system free from clogging. Alkalinity of a fertigation system can be controlled by adding Acid. The injection of acid to the irrigation water should be, as much as possible, uniform and continuous, throughout the entire duration of the irrigation.
- Drip fertigation increases water and nitrogen use efficiency. Drip fertigation reduced dissolved inorganic and organic N leaching by 90%.

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- Soluble fertilizers like urea, potash and a wide variety of fertilizer mixtures available in the market could be well mixed with irrigation water, filtered and then passed through the irrigation unit.
- Rock Phosphate and some other mineral fertilizers containing phosphorus are insoluble in water as well as in citric acid. They are suitable in strongly acid soils or organic soils. These fertilizers are given in green manured fields. The phosphorus is very slowly released by microbes at action and remains in soil for long time. Hence option (c) is the correct answer.

Sleepy Classes
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Q.) What is/are the advantage/ advantages of zero tillage in agriculture?

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 3 only

d) 1, 2 and 3

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Sleepy Classes
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- **Statement 1 is correct:** Zero -till farming is a way of growing wheat crops without tillage or disturbing the soil in harvested fields. Happy Seeder is one of the unique techniques which is used for sowing seed without any burning of Crop residue.
- **Statement 2 is correct:** Direct seeded rice (DSR) has received much attention because of its low - input demand. It involves sowing pre -germinated seed into a puddled soil surface (wet seeding), standing water (water seeding) or dry seeding into a prepared seedbed (dry seeding).
- **Statement 3 is correct:** Adopting no -tillage in agro - ecosystems has been widely recommended as a means of enhancing carbon (C) sequestration in soils.

Sleepy Classes
Awakening Toppers

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

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

Select the correct answer using the code given below:

a) 1, 2 and 3 only

b) 3 only

c) 4 only

d) 1, 2, 3 and 4

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d) 1, 2, 3 and 4

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

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

Sleepy Classes
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Q.) What is the use of biochar in farming?

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

Which of the statements given above is/are correct?

a) 1 and 2 only

b) 2 only

c) 1 and 3 only

d) 1, 2 and 3

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- Statement 1 is correct: As the use of soilless, hydroponic growing methods becomes more prevalent among crop producers, researchers are looking for new materials that can help growers save money, produce healthy plants, and contribute to sustainable practices. biochar, a charcoal-like material produced by heating biomass in the absence of oxygen, can help "close the loop" when used as a substrate for soilless, hydroponic tomato production. "This method could provide growers with a costeffective and environmentally responsible green-waste disposal method, and supplement substrate, fertilizer, and energy requirements.
- Statement 2 is correct: Biochar has the potential to boost the natural ability of legumes to fix nitrogen to the soil. Adding biochar to soil not only provides a way to sequester carbon, but also has many soil health benefits

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which will help farmers adapt to climate change and increase productivity. In addition to supporting the life of nitrogen - fixing microorganisms, biochar can also decrease soil N_2O emission, and increase nitrogen use efficiency and nitrogen retention in the soil.

- Statement 3 is correct: Because of its porous nature, biochar can improve your soil's water retention and water holding capacity – defined as the amount of water that a soil can hold for its crops – so that your plants will have more water available to them for a longer period of time.

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

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

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Select the correct answer using the code given below:

a) 1 and 3

b) 1, 2 and 4

c) 4 only

d) 2 and 3

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a) 1 and 3

b) 1, 2 and 4

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- Permaculture is, amongst others, an approach to land management that adopts arrangements observed in flourishing natural ecosystems. It includes a set of design principles derived using whole systems thinking. It uses these principles in fields such as regenerative agriculture, rewilding, and community resilience.
- Permaculture discourages monoculture and serves to open up the possibility of growing a wide range of food grains, fruits and vegetables and thereby expanding the food basket; thus permaculture also contributes to community health. Hence, statement 1 is correct.
- Application of permaculture methods and introducing permaculture techniques like swales, natural mulching, rainfall harvesting, legume cultivation, have a clear role in improving soil properties, increasing soil organic matter content and reducing soil salinity. Hence, statement 2 is correct.

- Due to its focus on water conservation and region specific crops, it is very much suitable for arid and semi arid regions. Hence, statement 3 is not correct.
- Mulch is a material placed on the soil surface to maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions. Mulching can help to improve crop yield and optimise water use which is an essential component of permaculture. Hence, statement 4 is correct.

Sleepy Classes
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Q. "System of Rice Intensification" of cultivation, in which alternate wetting and drying of rice fields is practised, results in :

1. Reduced seed requirement
2. Reduced methane production
3. Reduced electricity consumption

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 1 and 3 only

d) 1, 2 and 3

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Sleepy Classes
Awakening Toppers

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- System of Rice Intensification (SRI) was first developed in Madagascar in the 1980s and since then several countries in the world have been practicing it, including India. It promises to save 15 to 20% ground water, improves rice productivity.
- **Option 1 is correct:** Under SRI 2kg seed is required to grow a nursery for one acre against 5kg seed required in the traditional method.
- **Option 2 is correct:** SRI is a holistic approach to sustainable rice cultivation. By minimizing water use and alternating wet and dry conditions, it minimizes methane production.
- **Option 3 is correct:** With less consumption of water, adoption of SRI saves total energy inputs. A study found in Vietnam has also proved that applying SRI methods can save around 23% of energy inputs, while increasing energy outputs by 11%.

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Q. Consider the following statements:

Statement-l:

According to the United Nations' World Water Development Report, 2022,' India extracts more than a quarter of the world's groundwater withdrawal each year

Statement-II:

India needs to extract more than a quarter of the world's groundwater each year to satisfy the drinking water and sanitation needs of almost 18% of the world's population living in its territory

Which one of the following is correct in respect of the above statements?

a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

b) Both Statement-I and Statement-1I are correct and Statement-II is not the correct explanation for Statement-I

c) Statement-I is correct but Statement-II is incorrect

d) Statement-I is incorrect but Statement-II is correct

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MISC.

Q. With reference to two non-conventional energy sources called 'coal bed methane' and 'shale gas', consider the following 'statements:

1. Coal bed methane is the pure methane gas extracted from coal seams, while shale gas is a mixture of propane and butane only that can be extracted from fine-grained sedimentary rocks.
2. In India abundant coal bed methane sources exist, but so far no shale gas sources have been found.

Which of the statements given above is/are correct?

a) 1 only

b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2

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Awakening Toppers

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Shale gas resources exist in India.

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Q. With reference to technologies for solar power production, consider the following statements:

1. 'Photovoltaics' is a technology that generates electricity by direct conversion of light into electricity, while 'Solar Thermal' is a technology that utilizes the Sun's rays to generate heat which is further used in electricity generation process.
2. Photovoltaics generates Alternating Current (AC), while Solar Thermal generates Direct Current (DC).
3. India has manufacturing base for Solar Thermal technology, but not for Photovoltaics.

Which of the statements given above is / are correct?

a) 1 only
b) 2 and 3 only
c) 1, 2 and 3
d) None

Sleepy Classes
Awakening Toppers

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c) 1, 2 and 3
d) None

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- Solar energy can be converted directly into **electrical energy (direct current, DC)** by photovoltaic (PV) cells commonly called solar cells.

Q. Consider the following statements:

1. The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015.
2. The Alliance includes all the member countries of the United Nations.

Which of the statements given above is/are correct?

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

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Sleepy Classes
Awakening Toppers

Q. ‘Net metering’ is sometimes seen in the news in the context of promoting the

a) production and use of solar energy by the households/consumers

b) use of piped natural gas in the kitchens of households

c) installation of CNG kits in motor-cars

d) installation of water meters in urban households

Sleepy Classes
Awakening Toppers

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Sleepy Classes
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Q. On which of the following can you find the Bureau of Energy Efficiency Star Label?

1. Ceiling fans
2. Electric geysers
3. Tubular fluorescent lamps

Select the correct answer using the code given below.

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

Sleepy Classes
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Q. Consider the following heavy industries:

1. Fertilizer plants
2. oil refineries
3. Steel plants

Green hydrogen is expected to play a significant role in decarbonizing how many of the above industries?

a) Only one

b) Only two

c) All three

d) None

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1. It can be used directly as a fuel for internal combustion.
2. It can be blended with natural gas and used as fuel for heat or power generation.
3. It can be used in the hydrogen fuel cell to run vehicles.

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

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

Select the correct answer using the code given below:

a) 1, 2, 5 and 6 only

b) 1, 3, 4 and 6 only

c) 2, 3, 4 and 5 only

d) 1, 2, 3, 4, 5 and 6

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

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

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

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

Select the correct answer using the code given below:

a) 1 and 2 only

b) 2 and 3 only

c) 3 only

d) 1, 2 and 3

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Statement 1 is incorrect

- Production of algal biofuel is possible both in seas and on continents. They can grow on marginal or non-crop land and also on brackish or polluted water. Land based systems are more developed then sea based systems.

Statements 2 and 3 are correct

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