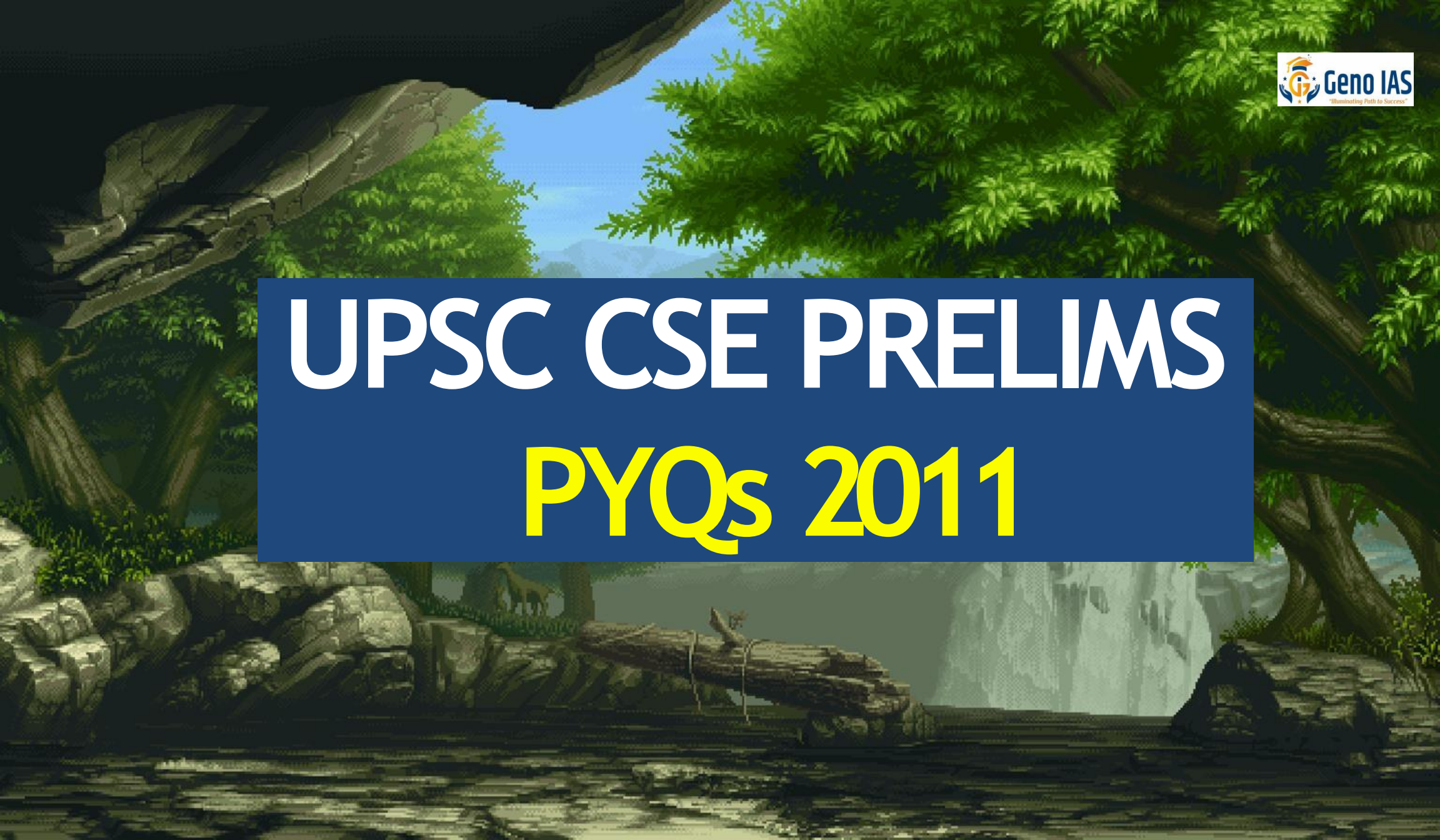
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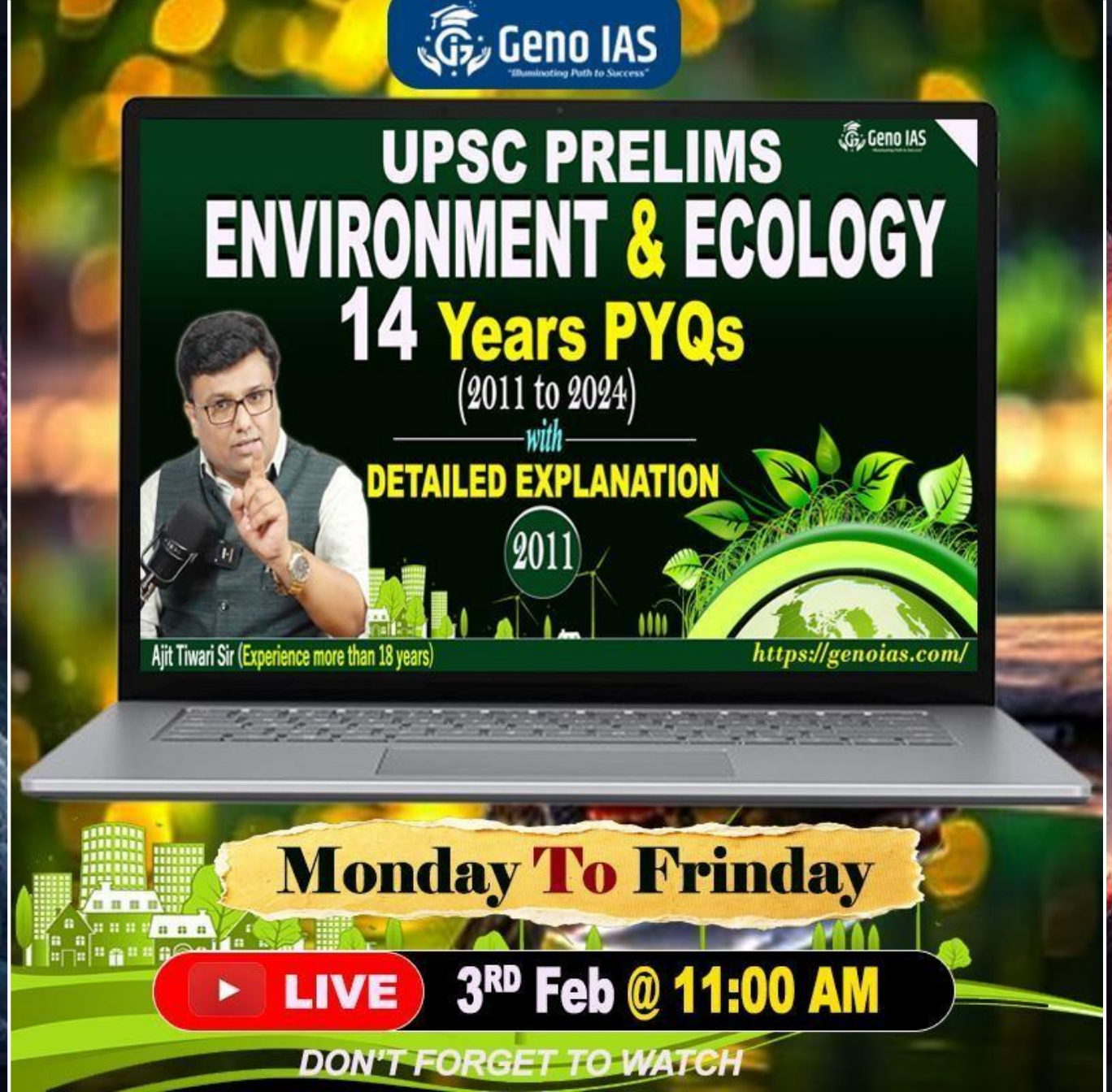

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LET'S REVISE


UPSC CSE PRELIMS
PYQs 2011

Q1. 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

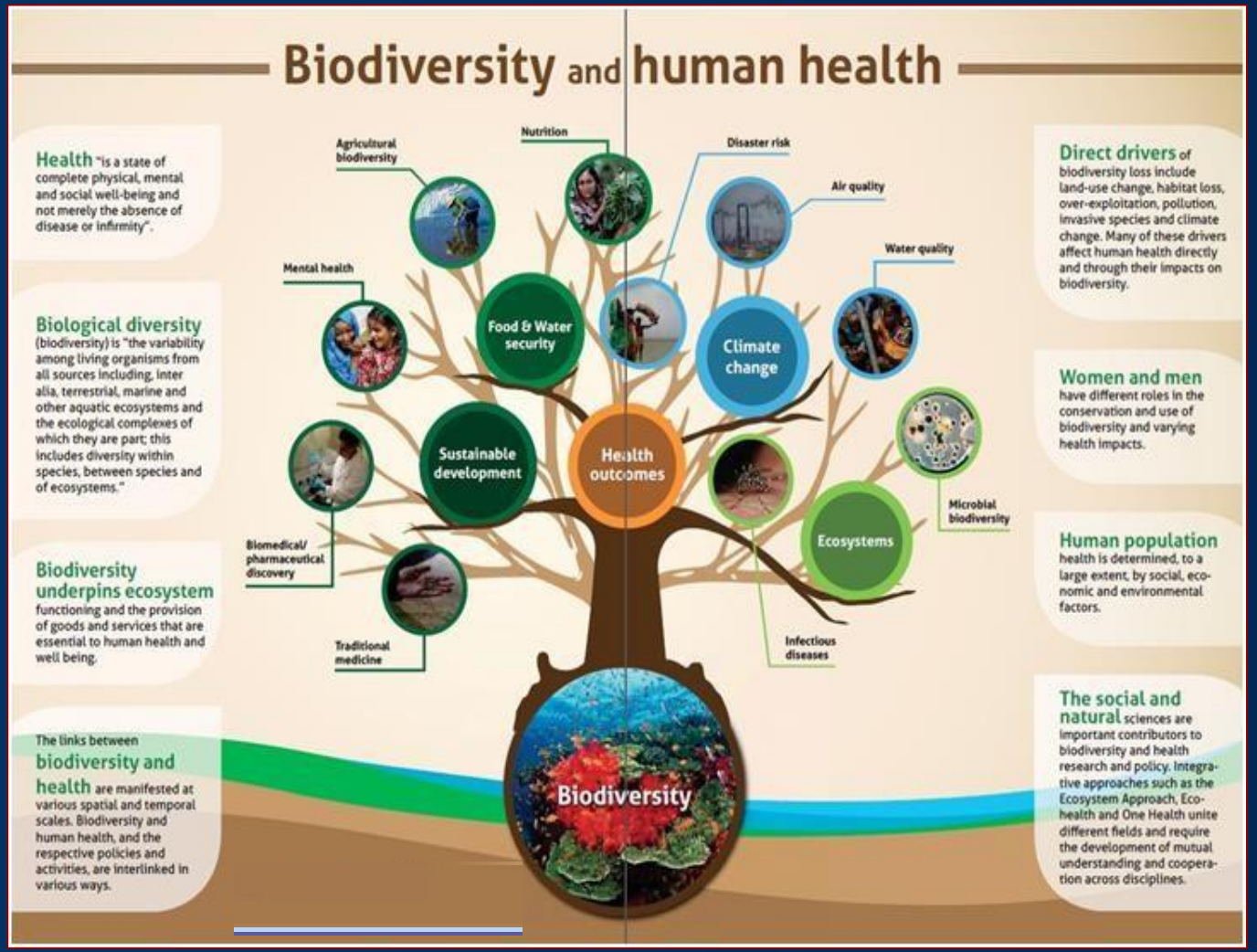
Select the correct answer using the codes given below:

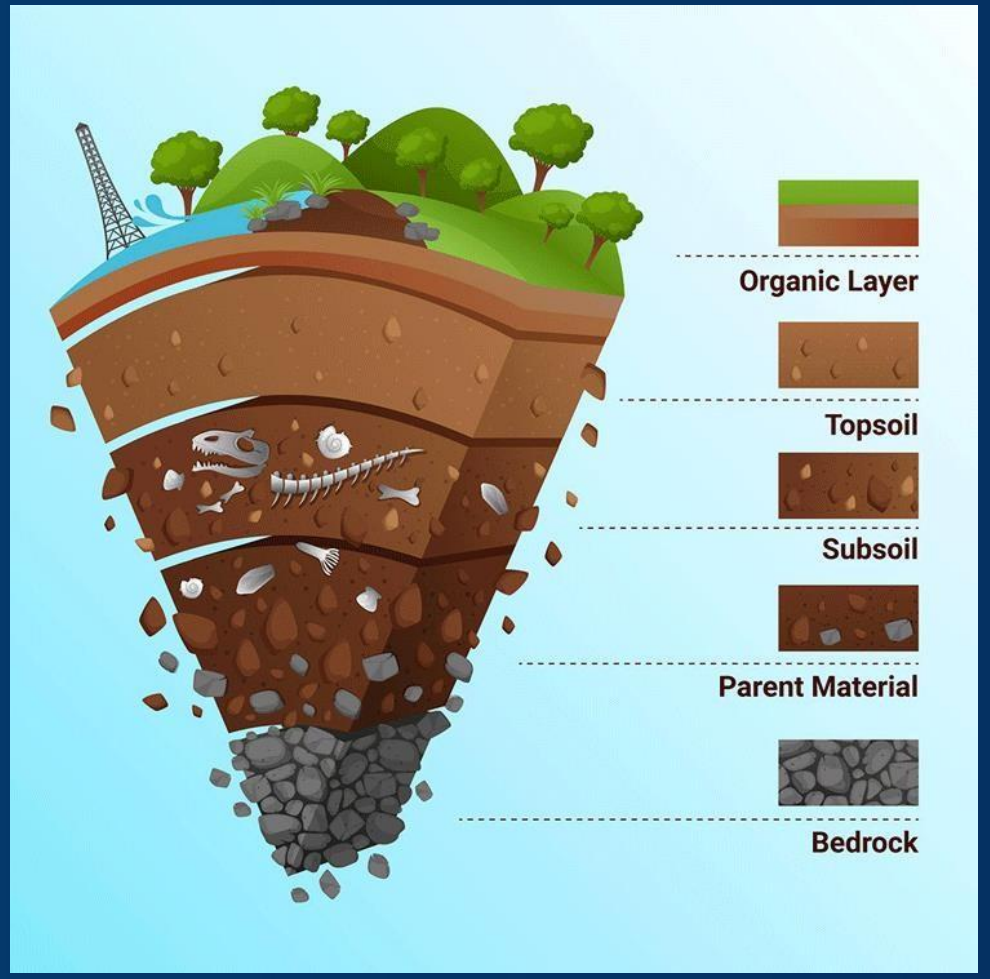
a) 1, 2 and 3 only
b) 2, 3 and 4 only
c) 1 and 4 only
d) 1, 2, 3 and 4

Zoop
Entomo
Myrmeco
Ornitho
Malaco
α. within ecosystem
β. between
γ. overall

1. Solution (d)

- Biodiversity helps in all of them including soil formation.





Protecting the Soil

Replant forests.

Reclaim mine land.

Hold soil in place at construction sites.


Recycling Process
Fabrication
Collection
Sorting
Shredding
Washing

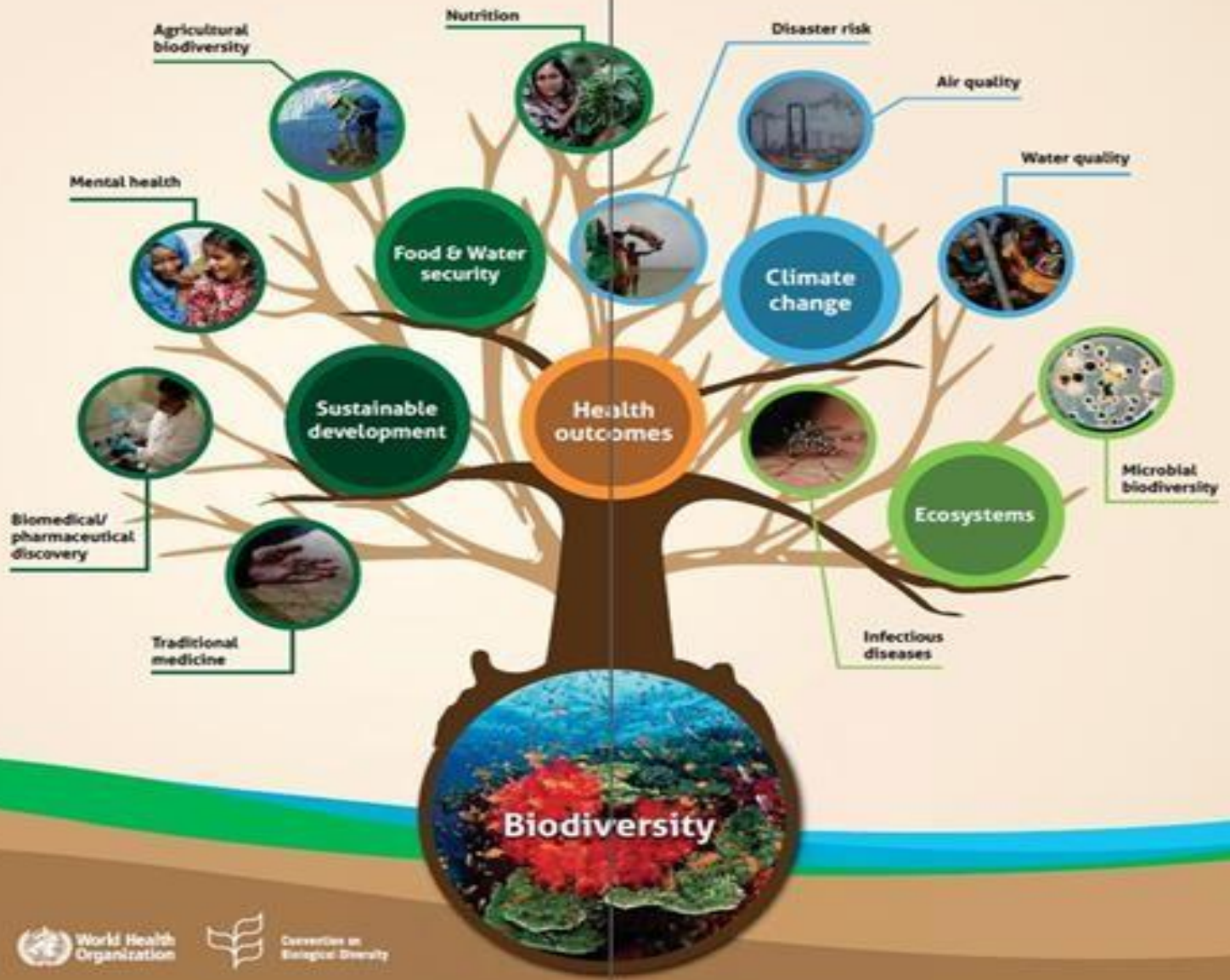
Biodiversity and human health

Health "is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

Biological diversity (biodiversity) is "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

Biodiversity underpins ecosystem functioning and the provision of goods and services that are essential to human health and well being.

The links between **biodiversity and health** are manifested at various spatial and temporal scales. Biodiversity and human health, and the respective policies and activities, are interlinked in various ways.



Direct drivers of biodiversity loss include land-use change, habitat loss, over-exploitation, pollution, invasive species and climate change. Many of these drivers affect human health directly and through their impacts on biodiversity.

Women and men have different roles in the conservation and use of biodiversity and varying health impacts.

Human population health is determined, to a large extent, by social, economic and environmental factors.

The social and natural sciences are important contributors to biodiversity and health research and policy. Integrative approaches such as the Ecosystem Approach, Ecohealth and One Health unite different fields and require the development of mutual understanding and cooperation across disciplines.

World Health Organization

Convention on Biological Diversity

KNOWLEDGE BASE / EXPECTED QUESTIONS

- Biodiversity can be defined as a community of all the living organisms on the earth and the diversity among them from all the ecosystems.
- Biodiversity is thus the variability between the species, within the species and between the ecosystem.
- The term biodiversity was coined by Walter G. Rosen in 1986.
- Edward Wilson is the Father of Biodiversity.E.O. Wilson, the former Harvard University biologist and Pulitzer Prize winner whose study of ants and human behavior made him one of the world's most influential scientists and prompted his calls for action to protect millions of species on the planet, has died. He was 92.

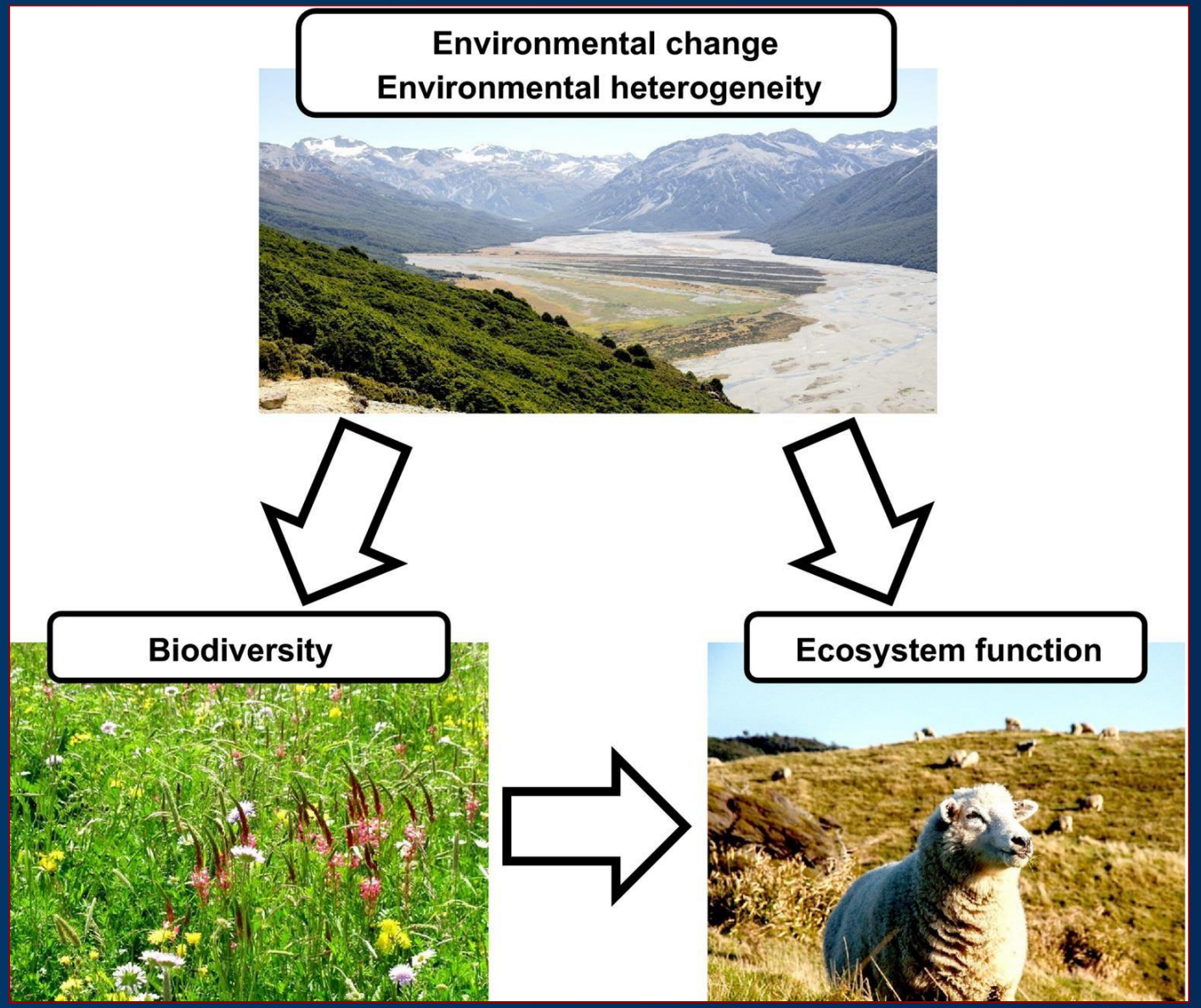
- Biodiversity holds ecological and economic significance.
- It provides us with nourishment, housing, fuel, clothing and several other resources.

ROLE OF BIODIVERSITY

- It also extracts monetary benefits through tourism.
- Biodiversity plays a major role in maintaining the ecological balance of the ecosystem.
- It refers to the number of different species belonging to a particular region.
- In biodiversity, each individual species has a major role to play in the ecosystem.

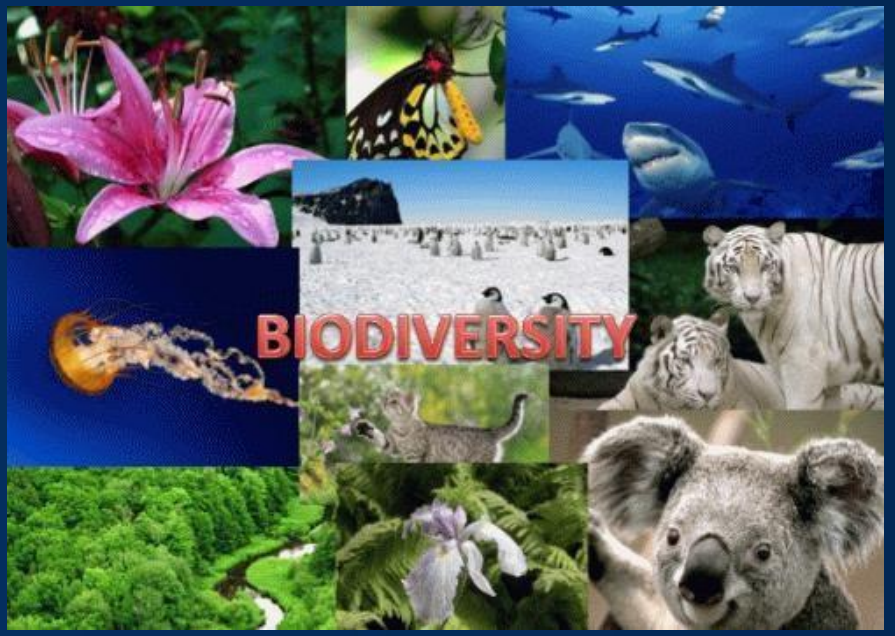
ECOLOGICAL ROLE OF BIODIVERSITY AND STABILITY OF ECOSYSTEM

- Apart from providing ecological balance to the environment, each individual species of biodiversity has a major function to play in the ecosystem.
- They play a major role in the production and decomposition of organic wastes, fixing atmospheric gases and regulation of water and nutrients throughout the ecosystem.
- The stability of the ecosystem increases with the diversity of the species.


Environmental change
Environmental heterogeneity
Biodiversity
Ecosystem function

ECONOMICAL ROLE OF BIODIVERSITY

- Biodiversity acts as a source of energy and has a major role in providing raw materials for industrial products such as oils, lubricants, perfumes, dyes, paper, waxes, rubber, etc.
- Importance of plant species for various medicinal uses has been known since ages.



Lubricants Oil

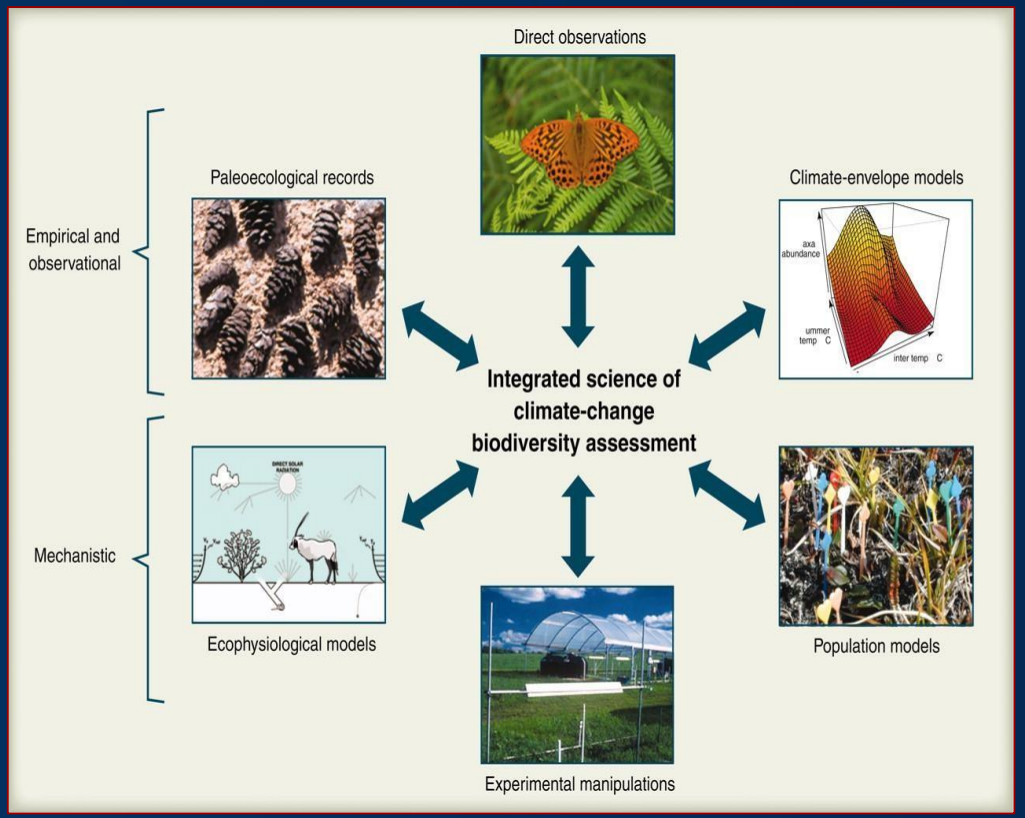
perfumes Oil

Dyes Oil

- According to reports, more than 70 % of the anti-cancer drugs are derived from plants in the tropical rainforests.

SCIENTIFIC ROLE OF BIODIVERSITY

- Each species of the ecosystem contributes to providing enough evidence as to how life evolved on this planet and the role of each species in maintaining the sustainability of the ecosystem.



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Q2. Which one of the following is not a site for in-situ method of conservation of flora?

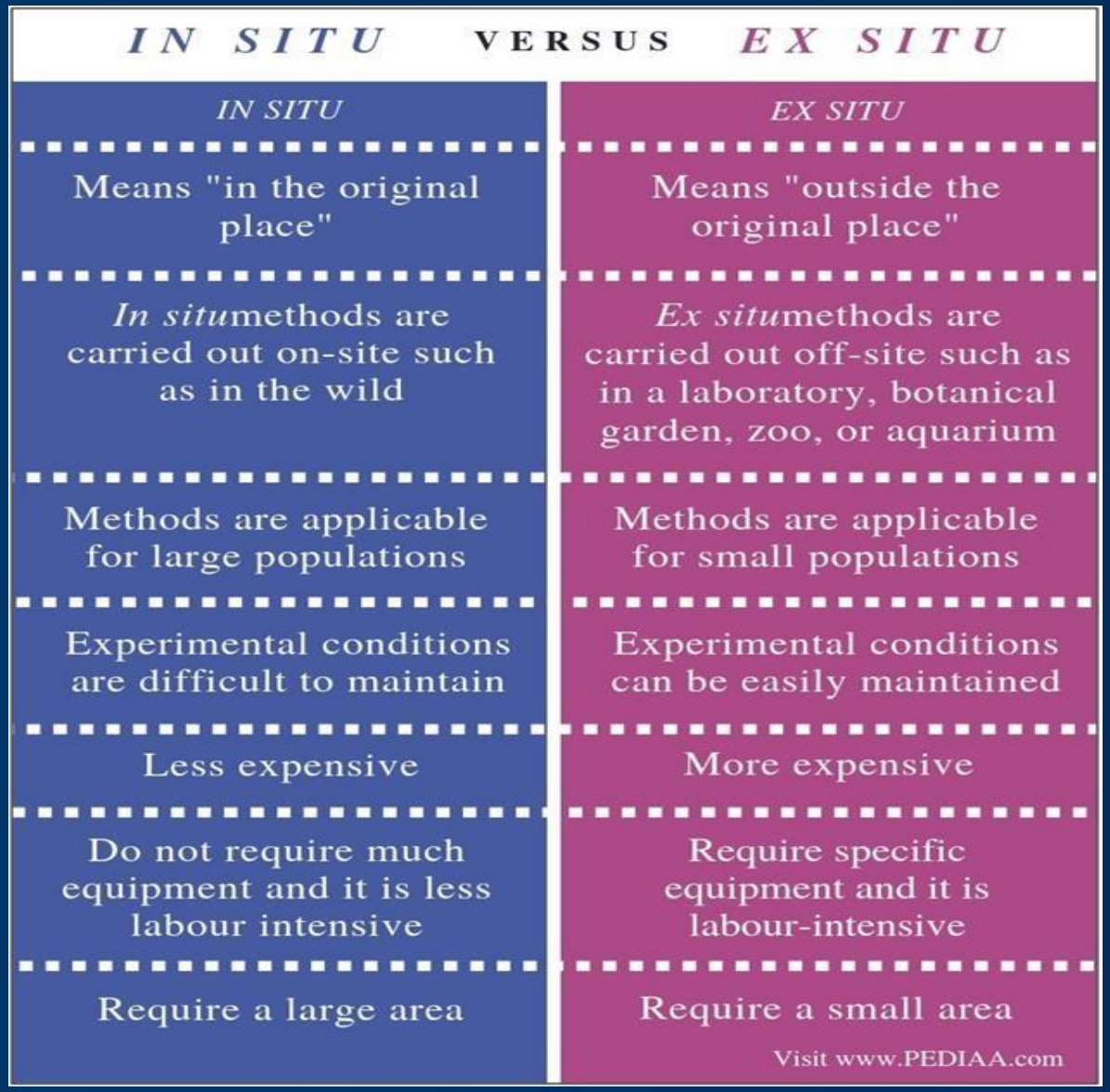
a) Biosphere Reserve In
b) Botanical Garden
c) National Park In
d) Wildlife Sanctuary In

On site → In situ

Off-site → Ex-situ

Cryopreservation
-173°C

Botanical gardens
Zoological parks
Gene banks
Seed banks
DNA ↑


IN SITU VERSUS EX SITU
IN SITU
EX SITU
Means "in the original place"
Means "outside the original place"
In situmethods are carried out on-site such as in the wild
Ex situmethods are carried out off-site such as in a laboratory, botanical garden, zoo, or aquarium
Methods are applicable for large populations
Methods are applicable for small populations
Experimental conditions are difficult to maintain
Experimental conditions can be easily maintained
Less expensive
More expensive
Do not require much equipment and it is less labour intensive
Require specific equipment and it is labour-intensive
Require a large area
Require a small area
Visit www.PEDIAA.com

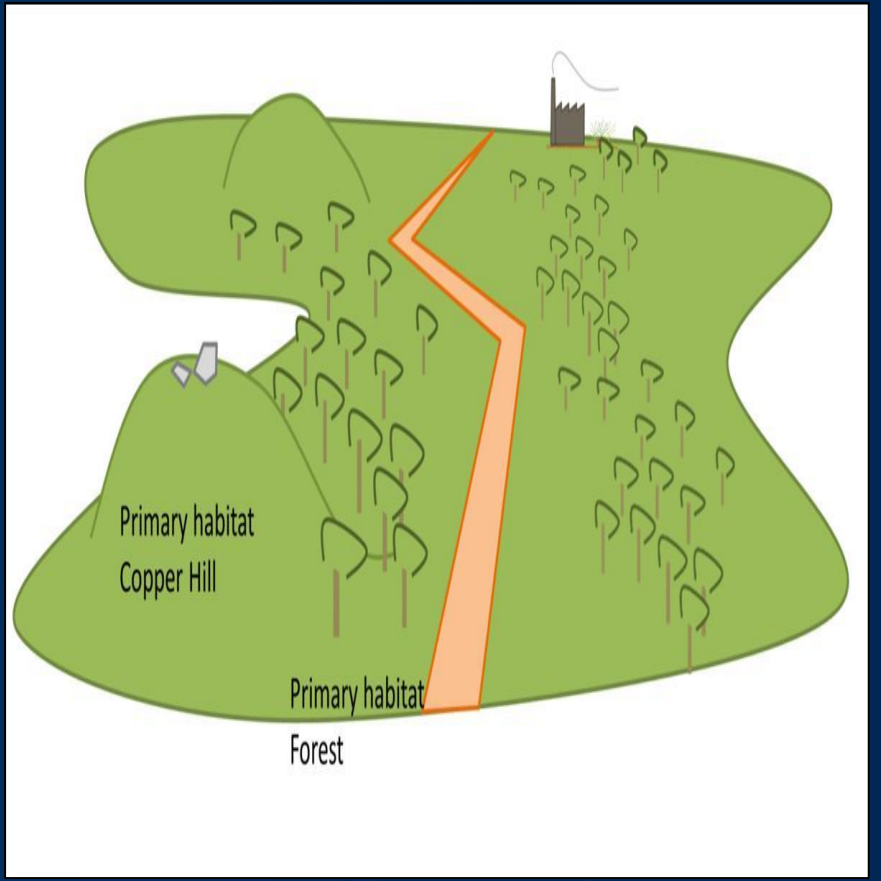
2. Solution (b)

Explanation:

- Biodiversity possesses a rich and diverse fauna and flora and is unique in having immense natural beauty in its different ecosystem.
- The maintenance of species and ecosystems is a keystone to sustainable development.
- Therefore, the protection and efficient management of wild species and their environment is the prime objective of conservation.

IN SITU CONSERVATION

- In situ Conservation is one of the methods of the conservation of genetic resources in natural populations of plant or animal species.
- In other words, it is a set of conservation techniques involving the designation, management and monitoring of biodiversity in the same area where it is encountered.



Ex situ Conservation:

Arboreta → Ex-situ

- Ex situ Conservation is one of the methods of the conservation of living organisms outside their natural habitat through genetic conservation.
- It includes both captive propagation of species and their eventual release into natural or restored ecosystems.
- This involves conservation of genetic resources, as well as wild and cultivated species, and draws on a diverse body of techniques and facilities. Some of these include:
- Gene banks, e.g. seed banks, sperm and ova banks, field banks.

In situ Conservation	Ex situ Conservation
It means conservation of biodiversity on site.	It means conservation of biodiversity from their site of occurrence.
Protected areas are the sanctuaries and national parks.	Artificial conditions are created to make their habitat almost like a natural habitat.
It aims to enable biodiversity to maintain itself within the context of the ecosystem.	It involves the maintenance of genetic variation (Genetic Conservation) away from its original location.
Establish a protected area network, with appropriate management practices, corridors to link fragments and restore degraded habitats within and outside.	Established botanical and zoological gardens, conservation stands; banks of germplasm, pollen, seed, seedling, tissue culture, gene and DNA etc.

It involves in the reduction of biotic pressure rehabilitation	It identifies and rehabilitates threatened species; launched augmentation, reintroduction or introduction programmes.
It helps in the multiplication of the species through the process of evolution and adaptation.	This method will enhance the probability of reproductive success for endangered species.
It maintained ecological integrity.	It creates artificial natural habitat for endangered species and also protects the species from external threats like predation and poaching.
It provides greater mobility to the animal species because of the large habitat area.	It provides less mobility to the organism because of its small habitat area.
Example- National parks, biosphere reserves, parks, sanctuaries.	Example- Zoo, aquarium, seed banks

Q3. 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.

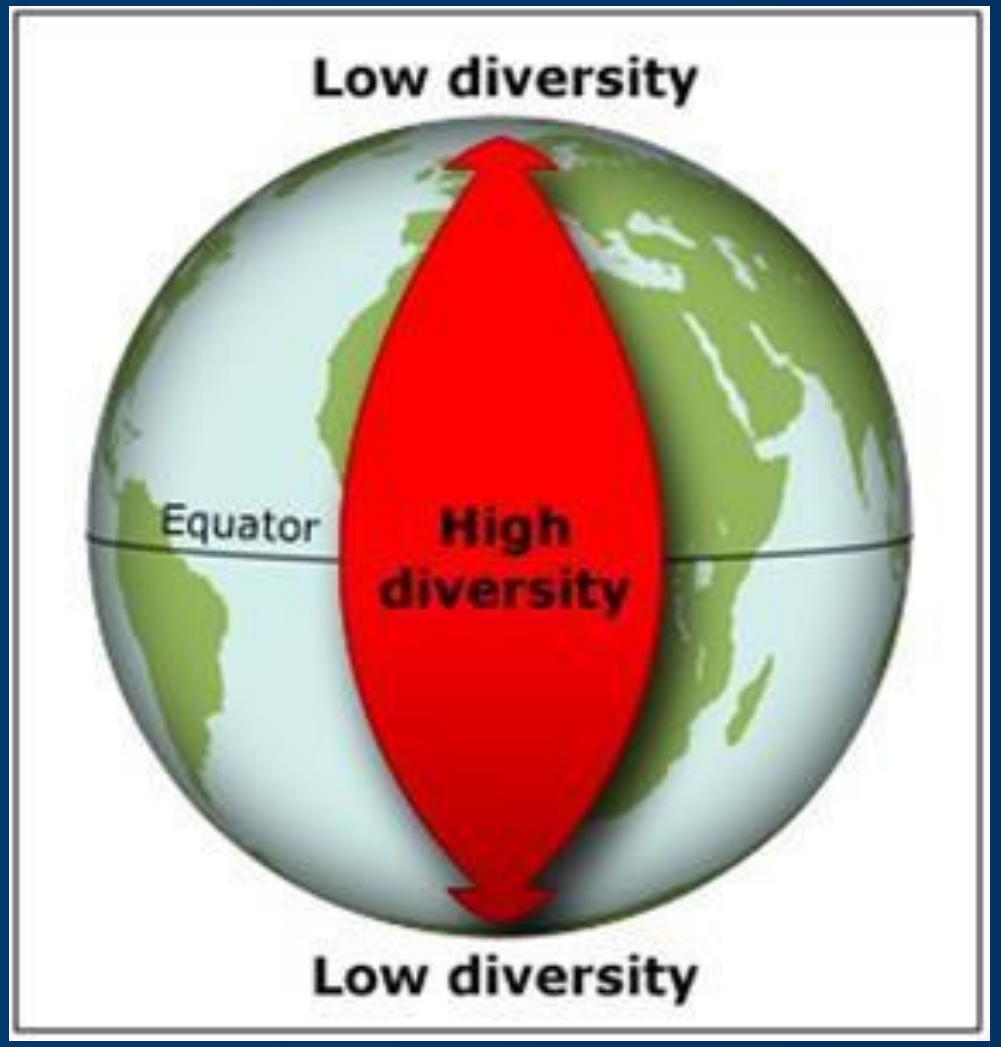
Which of the statements given above is/are correct?

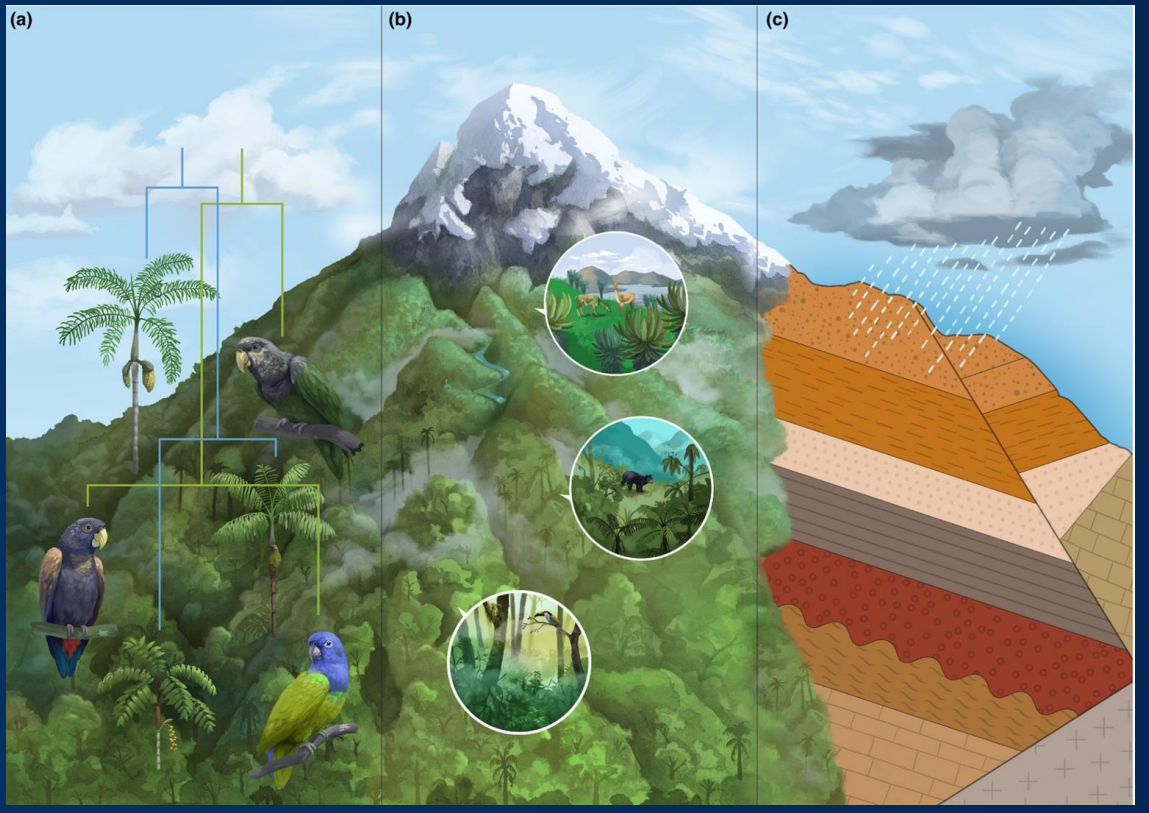
a) 1 only

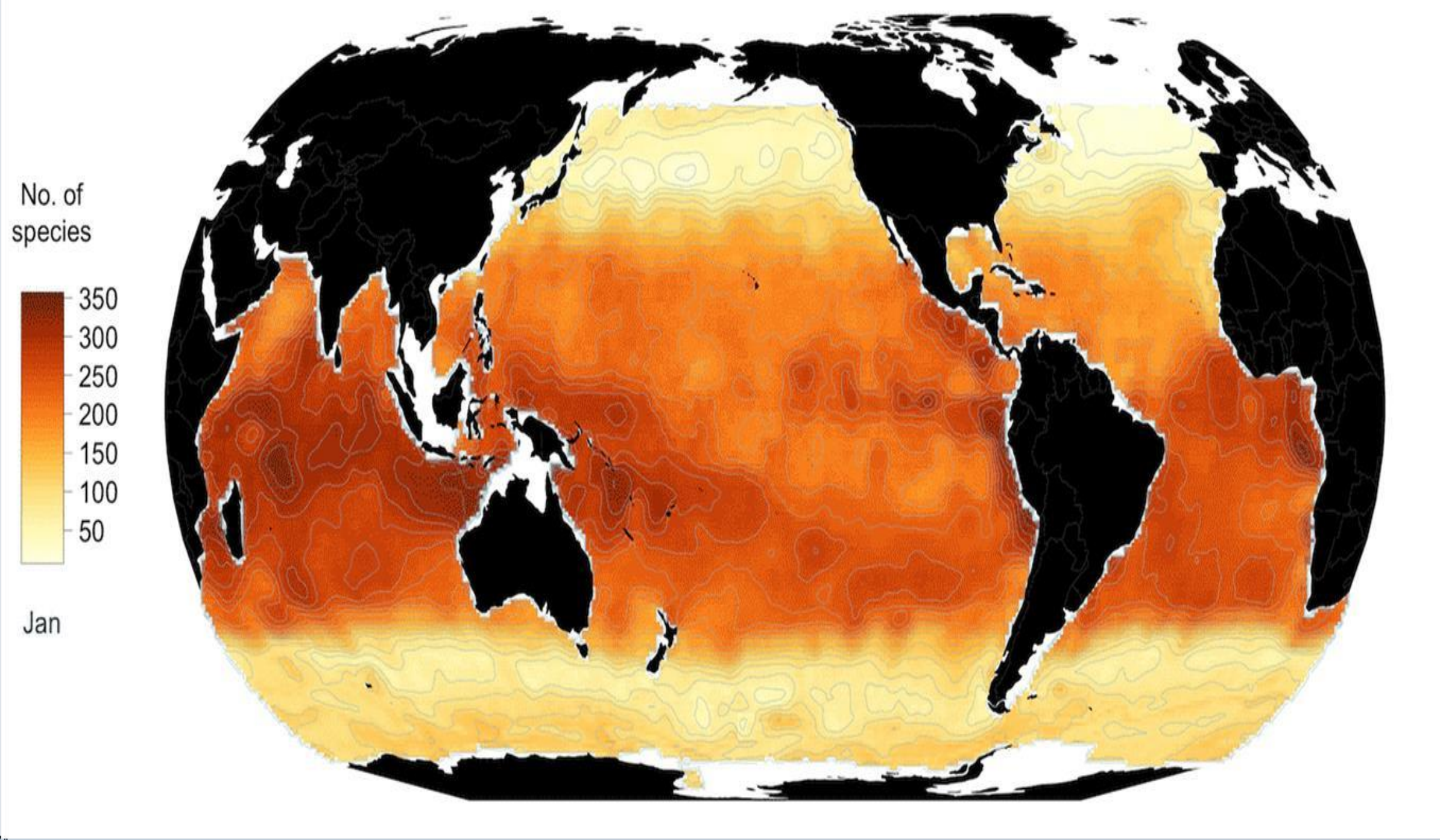
b) 2 only

c) Both 1 and 2

d) Neither 1 nor 2


Low diversity
Equator
High diversity
Low diversity


(a)
(b)
(c)


No. of species
350
300
250
200
150
100
50
Jan

3. Solution (c)

Explanation:

- The lower altitudes along the mountain gradients represent life similar to the tropical rain forests while higher altitudes of temperate forests of pine.

Knowledge base:

- The diversity of plants and animals is not uniform throughout the world but shows a rather uneven distribution.
- For many groups of animals or plants, there are interesting patterns in diversity, the most well- known being the latitudinal gradient in diversity.

BIODIVERSITY LATITUDINAL GRADIENTS

- In general, species diversity decreases as we move away from the equator towards the poles.
- With very few exceptions, tropics (latitudinal range of 23.5° N to 23.5° S) harbour more species than temperate or polar areas.
- Colombia located near the equator has nearly 1,400 species of birds while New York at 41° N has 105 species and Greenland at 71° N only 56 species.
- India, with much of its land area in the tropical latitudes, has more than 1,200 species of birds.

- A forest in a tropical region like Ecuador has up to 10 times as many species of vascular plants as a forest of equal area in a temperate region like the Midwest of the USA.
- The largely tropical Amazonian rain forest in South America has the greatest biodiversity on earth - it is home to more than 40,000 species of plants, 3,000 of fishes, 1,300 of birds, 427 of mammals, 427 of amphibians, 378 of reptiles and of more than 1,25,000 invertebrates.
- Scientists estimate that in these rain forests there might be at least two million insect species waiting to be discovered and named.

Q4. Three of the following criteria have contributed to the recognition of Western Ghats-Sri Lanka and Indo-Burma regions as hotspots of biodiversity:

Norman Myers 1988

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

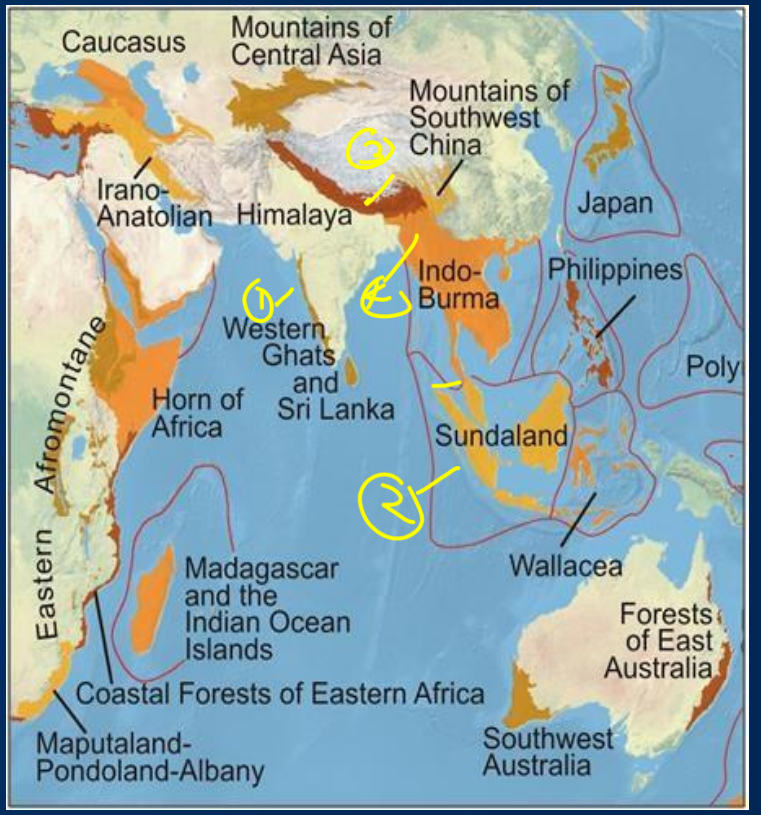
Which three of the above are correct criteria in this context?

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

4. Solution (C) 1 , 3 & 5

Biodiversity Hotspot:Biodiversity Hotspot:

- A biodiversity hotspot is an area with unusual concentration of species, many of which are endemic.
- It is marked by serious threats to its biodiversity by humans.
- The concept was given in 1988 by Norman Myers.



Criteria for determining hotspots:/ EXPECTED QUESTIONS

- According to Conservation International, a region must fulfil the following two criteria to qualify as a hotspot:
- The region should have at least 1500 species of vascular plants i.e., it should have a high degree of endemism.
- It should contain 70% of its original habitat.

Following the criteria must for an area to be declared as Biodiversity Hotspot, there are major four biodiversity hotspots in India:

- The Himalayas
- Indo-Burma Region
- The Western Ghats
- Sundaland

North East
Nicobar Island

Q5. Two important rivers -one with its source in Jharkhand (and known by a different name in Odisha), and another, with its source in Odisha -merge at a place only a short distance from the coast of Bay of Bengal before flowing into the sea. This is an important site of wildlife and biodiversity and a protected area. Which one of the following could be this?

a) Bhitarkanika

b) Chandipur-on-sea

c) Gopalpur-on-sea

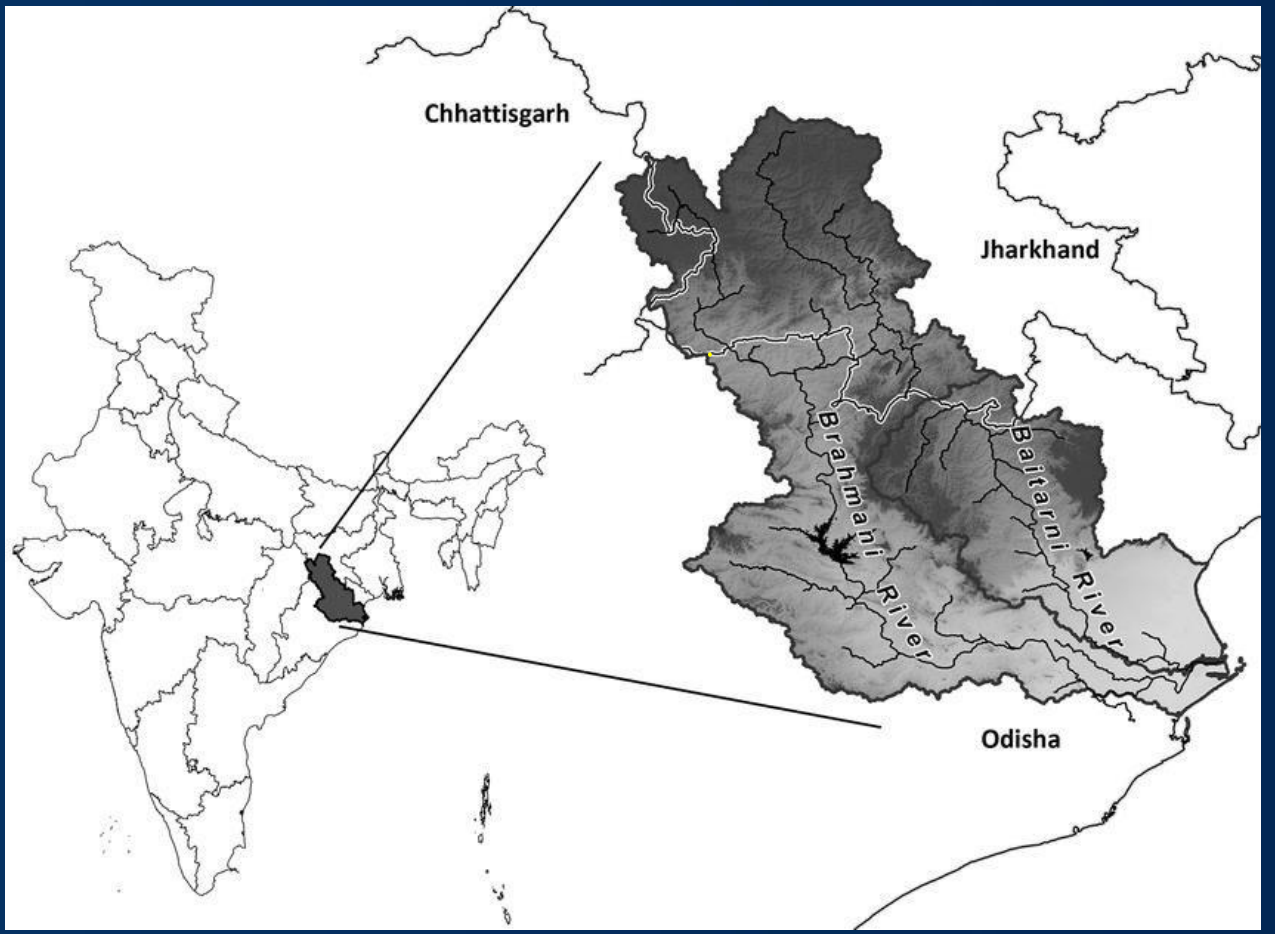
d) Simlipal

NP - Ramsar Site W.L.S

Sunderban

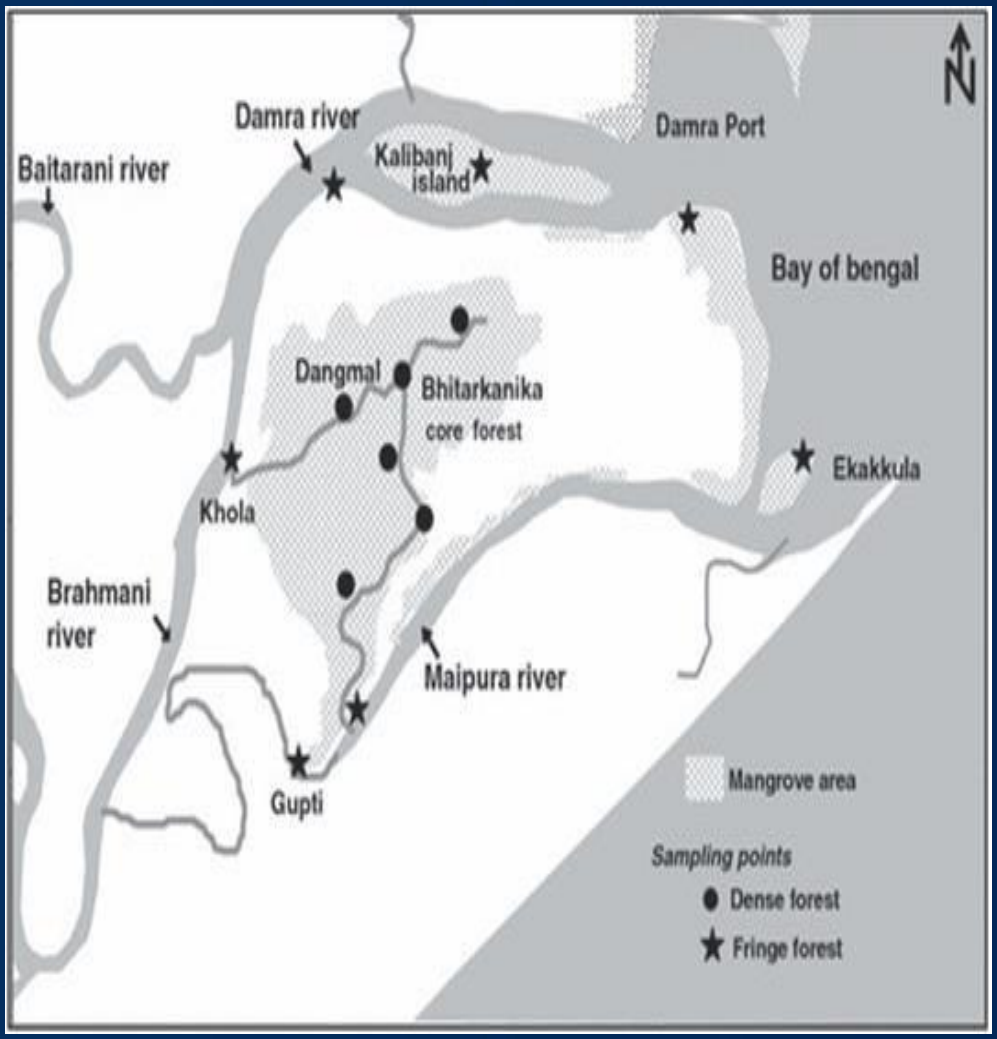
Bhitarkanika

Brahmani River


Chhattisgarh
Jharkhand
Brahmani River
Baitarni River
Odisha

5. Solution (a)

- Bhitarkanika is a national park located in Kendrapara district of Odisha in eastern India.
- It has been designated as a National Park since 1998.
- It is also a Ramsar site.
- The national park is surrounded by the Bhitarkanika Wildlife Sanctuary.



- Gahirmatha Beach and Marine Sanctuary lies to the east, and separates the swamp region covered with canopy of mangroves from the Bay of Bengal.
- Bhitarkanika has one of the largest populations of endangered saltwater crocodile in India and is globally unique in that, 10% of the adults exceed 6 m length.
- Nearly 1671 saltwater crocodiles inhabit the rivers and creeks.

- The sanctuary is the second largest mangrove ecosystem in India.
- The national park and wildlife sanctuary is inundated by a number of rivers - Brahmani, Baitarani, Dhamra, Pathsala and others.
- The park is home to the saltwater crocodile, white crocodile, Indian python, black ibis, wild pigs, rhesus monkeys, chitals, darters, cobra, water monitor lizard. Olive ridley sea-turtles nest on Gahirmatha and other nearby beaches.
- Mammals including monkeys, jackals, common langur, otter, sambar deer, jungle cat, fox, Mongoose, wolf, fishing cats, hyena, were also present, according to the survey data.

Monkeys

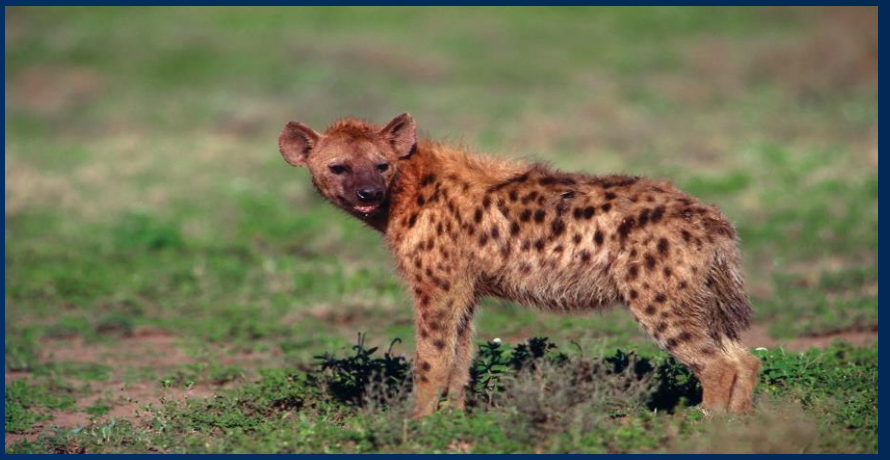
Common Langur

Jackals

Fox

Wolf

Hyena



Mongoose

Fishing Cats

Saltwater Crocodile

White Crocodile

Black Ibis

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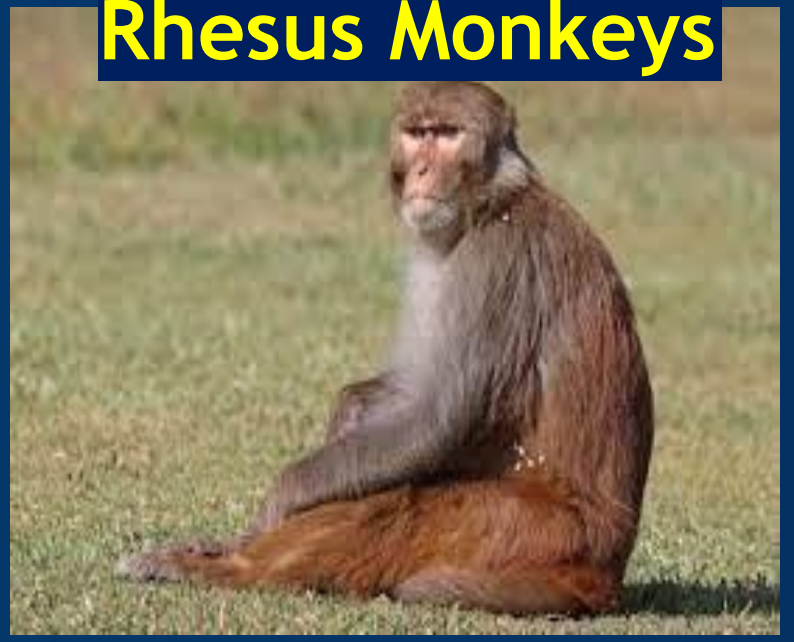
Indian Pthon

Wild Pigs

Rhesus Monkeys



Darters

Chitals

Cobra


Gahirmatha

Q6. 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

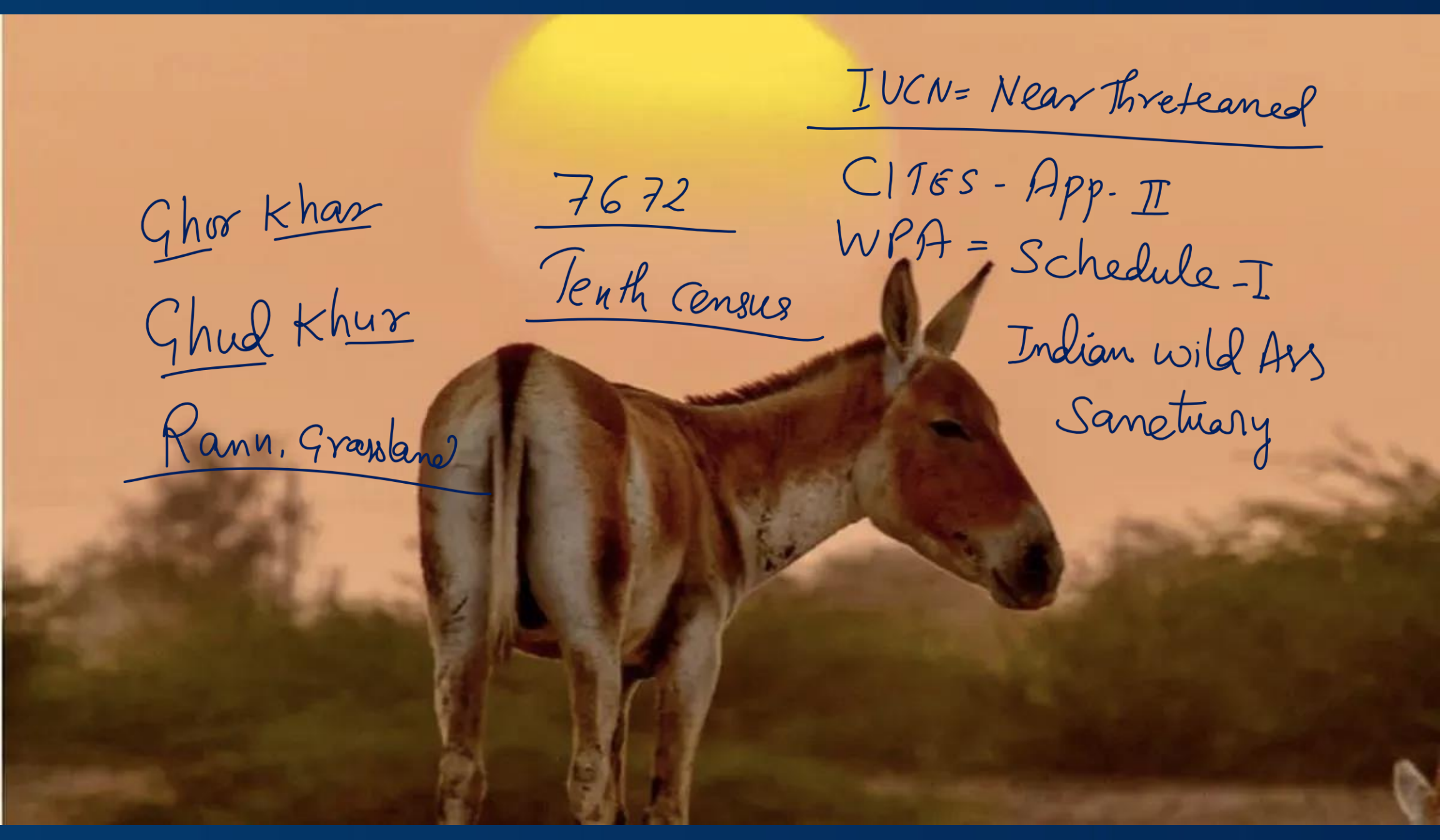
c) Indian wild boar

d) Indian gazelle

CITES.

IVCN.

WPA.

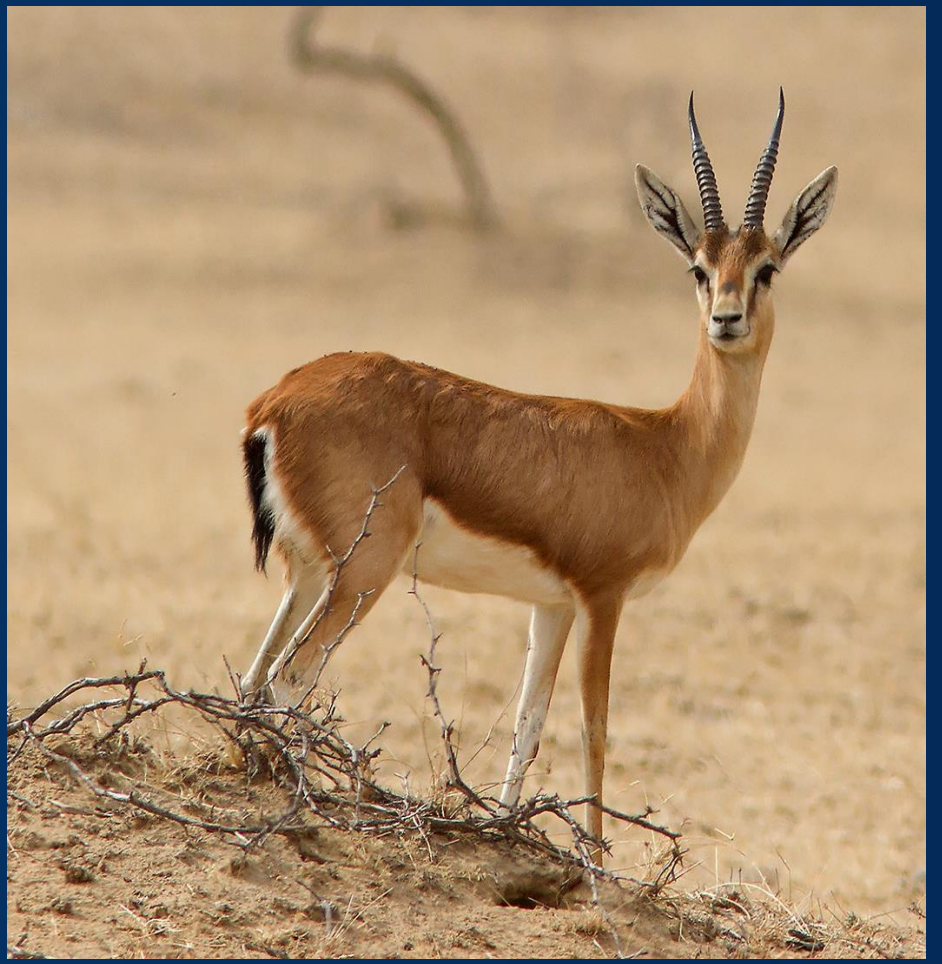

Ghor khar
Ghud khur
Rann, Grassland
7672
Tenth census
IUCN = Near Threteaned
CITES - App. II
WPA = Schedule - I
Indian wild Ass
Sanctuary

Indian Wild Buffalo

Indian Wild ass

Indian Wild Boar

Indian Gazelle



6. Solution (b) EXPECTED QUESTIONS

- 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.
- It Was also found in southern Pakistan, Afghanistan, and south-eastern Iran.
- Saline deserts (Rann), arid grasslands and shrublands are its preferred environment.
- The coat of the animal is usually sandy and may vary from reddish grey, fawn, to pale chestnut.

Overview:

- The population of wild asses in Gujarat has been estimated at 7,672, as per the 10th Wild Ass Population Estimation (WAPE) conducted by the Gujarat government earlier this year.

About Indian Wild Ass:

- It is a sub-species of Asian Wild Ass (Equus hemionus).
- It is locally called as khur in Gujarat region.
- It possesses remarkable characteristics, such as its ability to survive in the extreme conditions of Gujarat's Wild Ass Sanctuary.
- The primary food source for these animals is the grass that grows on the islands in the desert.

- **Appearance:** It is characterized by distinctive white markings on the anterior part of the rump and on the posterior part of the shoulder and a stripe down the back that is bordered by white.
- **Distribution:** The khur was formerly widespread in the arid zone of northwestern India and Pakistan, westwards through much of central Asia. It is now limited to the Little Rann of Kutch in Gujarat.
- **Habitat:** Desert and grassland ecosystems.

Conservation Status:

- **IUCN:** Near threatened.
- **CITES:** Appendix II
- **Wildlife Protection Act (1972):** Schedule-I
- **Ecological Significance:** It is helpful in seed dispersal in the area which helps in promoting vegetation growth and diversity. Besides, it is helpful in habitat creation for other species as it clears pathways by consuming grasses.
- **Threats:** Increased human presence, both for salt farming and agriculture, extensive cattle grazing, poses a major threat to the delicate ecosystem and its wildlife.

- Irrigation canals that bring water to the southern rim of the Little Rann can also add salinity to the soil.
- Indian Wild Ass Sanctuary located in the Little Rann of Kutch is the largest wildlife sanctuary in India.

- It possesses an erect, dark mane which runs from the back of the head and along the neck followed by a dark brown stripes running along the back, to the root of the tail.
- It feeds on grass, leaves and fruits of plant, crop and saline vegetation.
- Wild asses graze between dawn and dusk.
- The animal feeds on grass, leaves and fruits of plant, crop, Prosopis pods, and saline vegetation.
- They live either solitarily, or in small groups of twos and threes while family herds remain large.

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"Illuminating Path to Success"

Q7. The Himalayan Range is Very rich in species diversity. Which one among the following is the most appropriate reason for this phenomenon?

a) It has a high rainfall that supports luxuriant vegetative growth

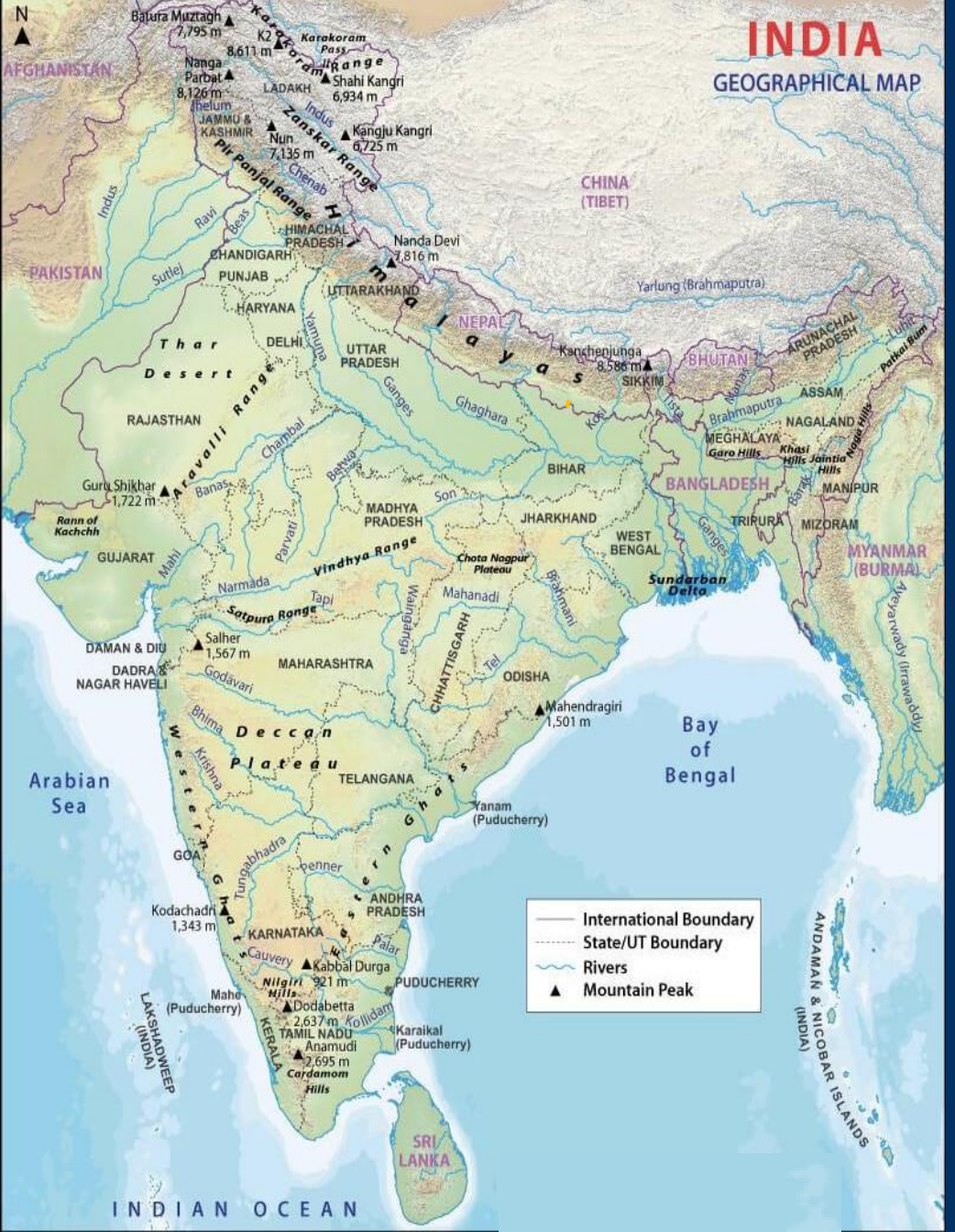
b) It is a confluence of different biogeographical zones

c) Exotic and invasive species have not been introduced in this region

d) It has less human interference

7. Solution (b)

- Himalayan Range represents a conference of different biogeographical zones because the geographical variations in this range are vertically oriented from the base to top.
- These forms represent all forms of flora and fauna lives found inhabited in tropical forests to temperate forests and even beyond tree line.



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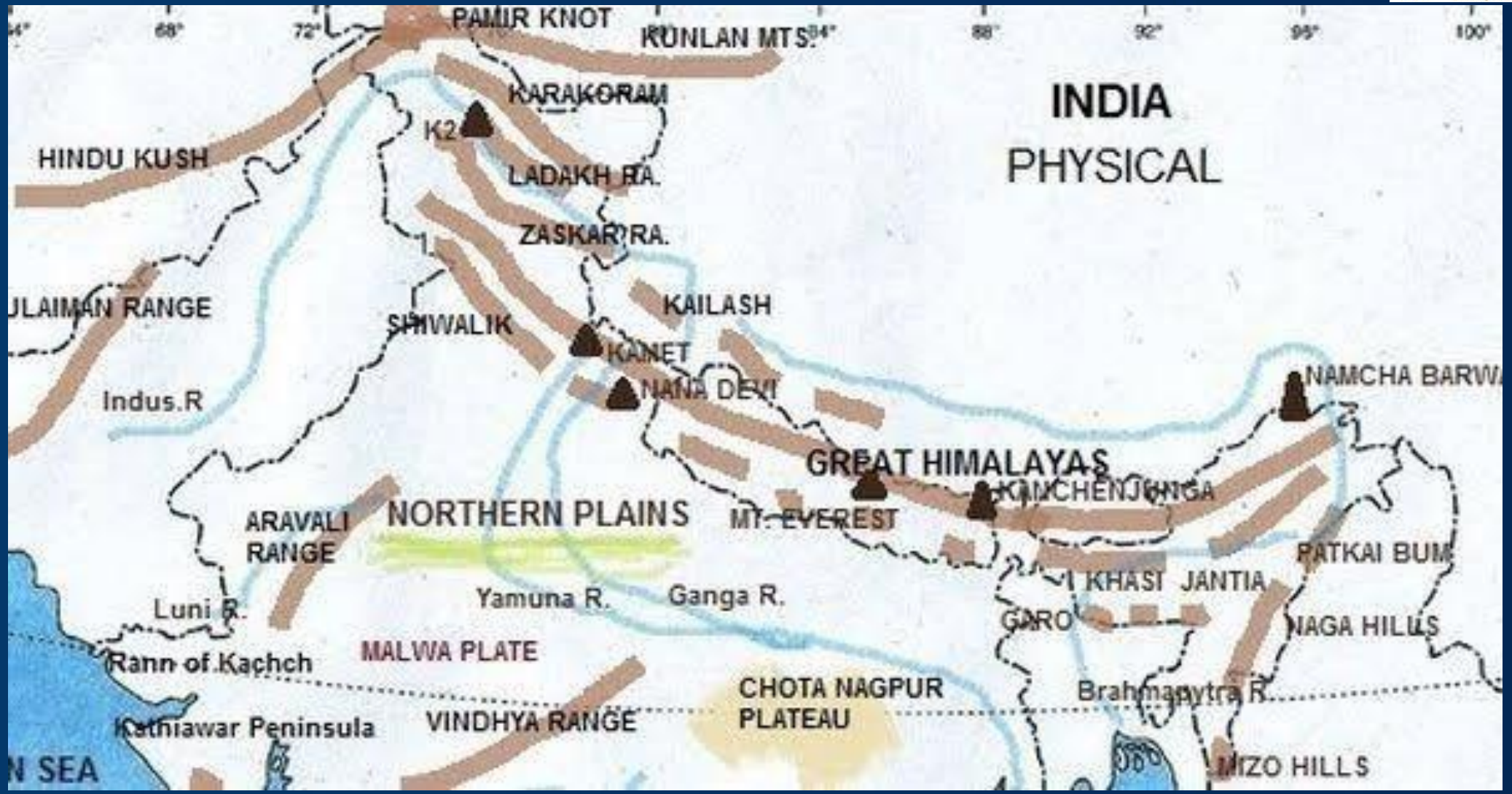
"Illuminating Path to Success"

Mount Everest
HINDU KUSH
KARAKORAM
KUNLUN MOUNTAINS
AFGHANISTAN
CHINA
PLATEAU OF TIBET
PAKISTAN
KAILAS RANGE
LADAKH RANGE
ZASKAR MOUNTAINS
PIR PANJAL RANGE
Srinagar
Shimla
Chandigarh
Dehra Dun
NEW DELHI
PLAIN OF THE INDUS
GREAT INDIAN DESERT
Indira Gandhi Canal
BHIWANI BAGAR
ROHILKHAND PLAINS
RAJASTHAN BAGAR
ARAVALLI RANGE
MEWAR
Jaipur
Lucknow
AVADH PLAINS
PLAIN OF THE GANGA
Patna
Gangtok
BHUTAN
Itanagar
Dispur
Shillong
Kohima
Imphal
BANGLADESH
Agartala
Aizawl
Tropic of Cancer
MYANMAR
BUNDELKHAND
VINDHYAN SCARP LANDS
HAZARIBAG PLATEAU
RAJMAHAL HILLS
MALWA PLATEAU
BHANDER PLATEAU
KAIMUR RANGE
BAGHELKHAND
CHOTA NAGPUR
Ranchi
Gandhinagar
Bhopal
RANN OF KACHCHH
KACHCHH PENINSULA
LITTLE RANN
KATHIAWAR PENINSULA
GIR RANGE
I N D I A
VINDHYA RANGE
SATPURA RANGE
MAHADEO HILLS
Kolkata
SUNDARBANS
Mouths of the Ganga
New Moore I. (INDIA)
Raipur
Daman (D&D)
Diu (D&D)
Silvassa
Gulf of Khambhat
AJANTA RANGE
Bhubaneshwar
DANDAKARANYA
BASTAR PLATEAU
Mahendragiri 1501
L. Chilika
ARABIAN SEA
Mumbai
BALAGHAT RANGE
HARISCHANDRA RANGE
Mahabaleshwar 1438
BAY OF BENGAL
Hyderabad
DECCAN PLATEAU
TELANGANA PLATEAU
NORTHERN CIRCARS
EASTERN GHATS
WESTERN GHATS
KONKAN
Panaji
L. Kolleru
COROMANDEL COAST
MALABAR COAST
Bengaluru
Chennai
Puducherry
SHEVAROY HILLS
NILGIRI HILLS
PALGHAT GAP
ANAMALAI HILLS
CARDAMOM HILLS
Palk Strait
Gulf of Mannar
SRI LANKA
Thiruvananthapuram
Cape Comorin
INDIAN OCEAN
Lakshadweep Sea
Lakshadweep (INDIA)
Bitra
Chettlatt
Kiltan
Amindivi
Perumalpar
Agatti
Kadamatt
Kavaratti
Andrott
Cardamom
Suheli
Kalpeni
Nine Degree Channel
Minicoy
Eight Degree Channel
Mouths of the Irrawaddy
Preparis I. (MYANMAR)
Coco I. (MYANMAR)
Coco Channel
Narcondam I. (INDIA)
North Andaman
Barren I. (INDIA)
Middle Andaman
South Andaman
Port Blair
Little Andaman
Ten Degree Channel
Andaman Sea
Car Nicobar
Tarasa
Camorta I.
Katchall
Little Nicobar
Great Nicobar
Indira Point
Andaman and Nicobar Is (INDIA)
ALTITUDE IN METRES
6000
3000
2400
1800
1200
600
300
150
0
DEPTH IN METRES
200
1000
72°E
76°E
80°E
84°E
88°E
92°E

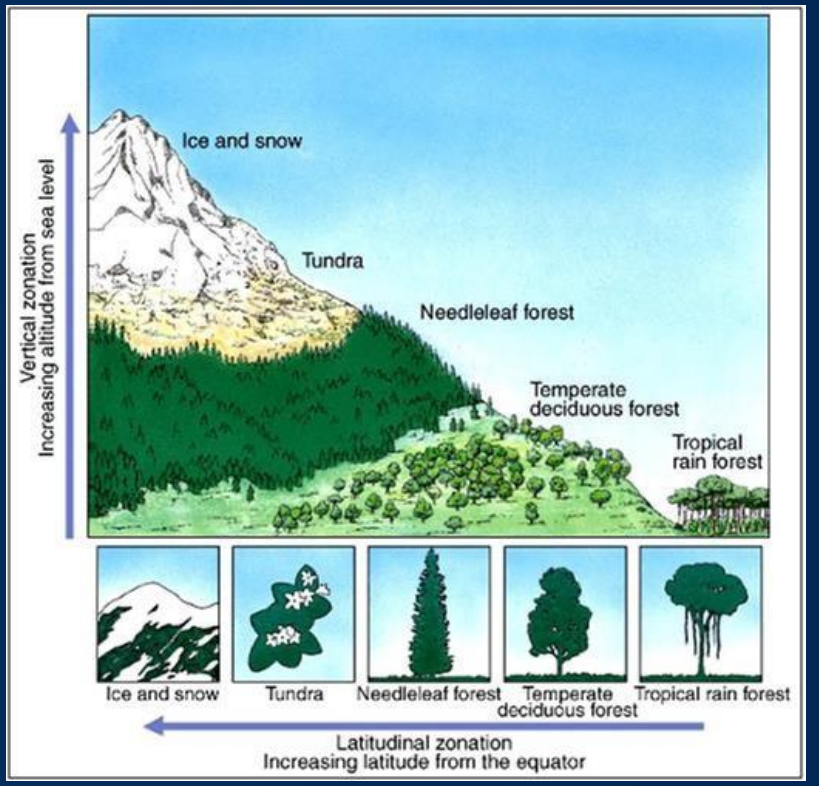
KNOWLEDGE BASE: HIMALAYAN REGION

- The Indian Himalayan region includes Uttarakhand, Himachal Pradesh, Jammu and Kashmir, Ladakh, West Bengal, Assam, Meghalaya, Manipur, Mizoram, Sikkim, Nagaland, Tripura and Arunachal Pradesh.
- The Indian Himalayas are divided into two biogeographic zones- the Trans-Himalaya and the Himalaya, based on physiographic, climatic and eco-biological attributes


INDIA
PHYSICAL
PAMIR KNOT
KUNLAN MTS.
KARAKORAM
K2
HINDU KUSH
LADAKH RA.
ZASKAR RA.
ULAIMAN RANGE
SHIWALIK
KAILASH
KAMET
NANDA DEVI
Indus.R
NAMCHA BARWA
GREAT HIMALAYAS
KANCHENJUNGA
ARAVALI RANGE
NORTHERN PLAINS
MT. EVEREST
PATKAI BUM
KHASI JANTIA
Yamuna R.
Ganga R.
Luni R.
GARO
NAGA HILLS
MALWA PLATE
Rann of Kachch
CHOTA NAGPUR PLATEAU
Brahmaputra R.
Kathiawar Peninsula
VINDHYA RANGE
MIZO HILLS
N SEA

SPECIES RICHNESS OF HIMALAYA

- The entire region, spread over 3.95 lakh sq. km. is home to 280 species of mammals, 940 species of birds, 316 species of fishes, 200 species of reptiles and 80 species of amphibians.
- This put together accounts for 27.6% of the total vertebrate diversity of the country.
- The ZSI publication lists 133 vertebrate species of the region cited as threatened in the IUCN Red List.



- This includes 43 species of mammals like the critically endangered Pygmy Hog, the Namdapha flying squirrel and the endangered Snow leopard, the Red Panda and the Kashmir Gray Langur.
- Fifty-two species of birds are also in the threatened category like the critically endangered White-Bellied Heron and Siberian crane and vulnerable species like the Black Necked crane and the Indian Spotted Eagle, among others.
- Some of the rare high-altitude butterflies found in the Himalayas are Parnassius stoliczkanus (Ladakh banded Apollo) and Parnassius epaphus (Red Apollo), listed under Schedule I and Schedule II of the Wildlife Protection Act, 1972, respectively.

Q8. In the Union Budget 2011-12, a full exemption from the basic customs duty was extended to the bio-based asphalt (bioasphalt). 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 bioasphalt for surfacing of the roads.

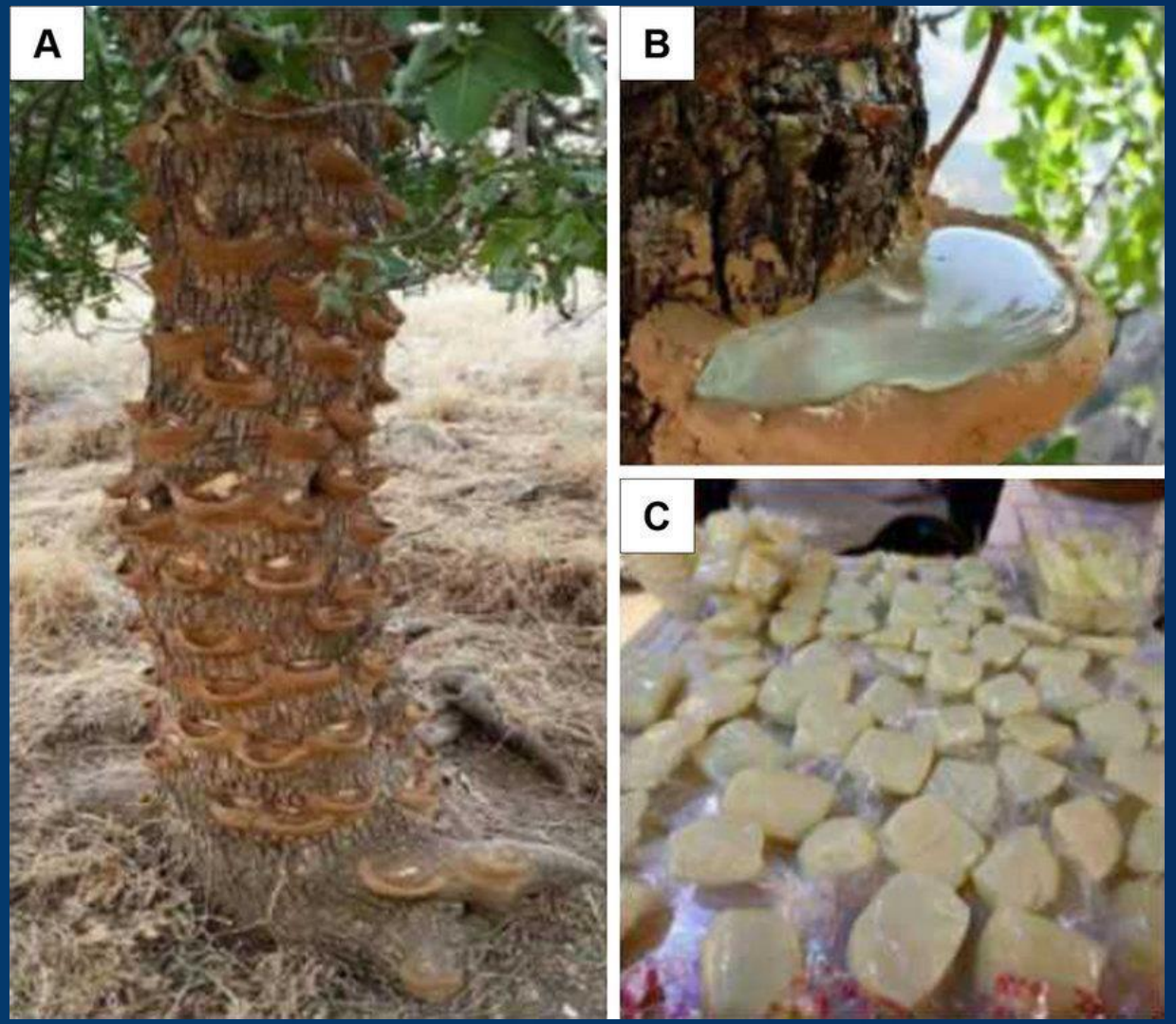
Which of the statements given above are correct?

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

8. Solution (b) 1,3 & 4

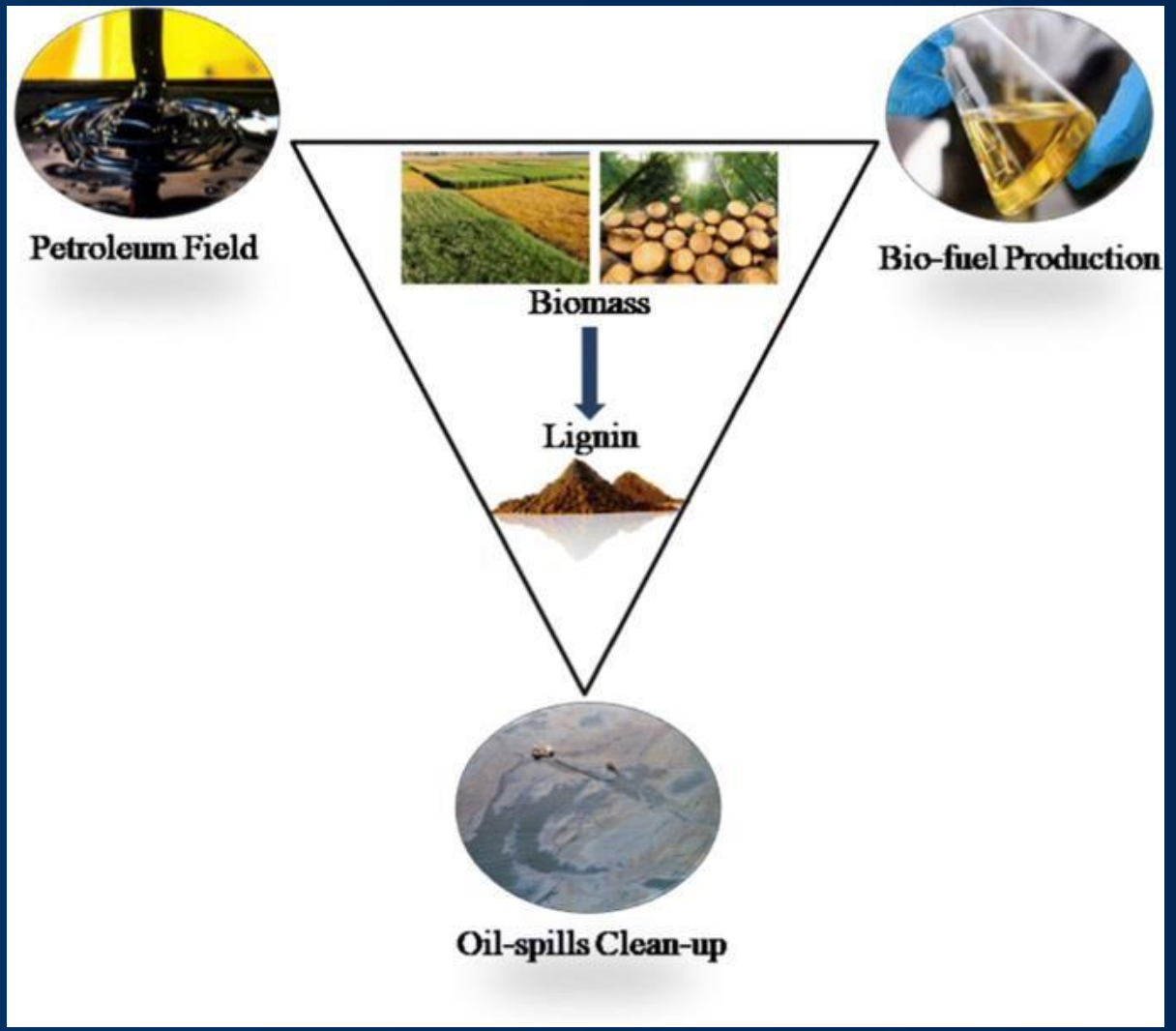
- Bitumen, also known as Asphalt, is produced from petroleum and is a black viscous mixture of hydrocarbons, used basically for road surfacing and roofing.
- Bioasphalt is an asphalt alternative made from non-petroleum based renewable resources.
- These sources include sugar, molasses and rice, corn and potato starches, natural tree and gum resins, natural latex rubber and vegetable oils, lignin, cellulose, palm oil waste, coconut waste, peanut oil waste, canola oil waste, dried sewerage effluent and so on.

Gum Resins Tree

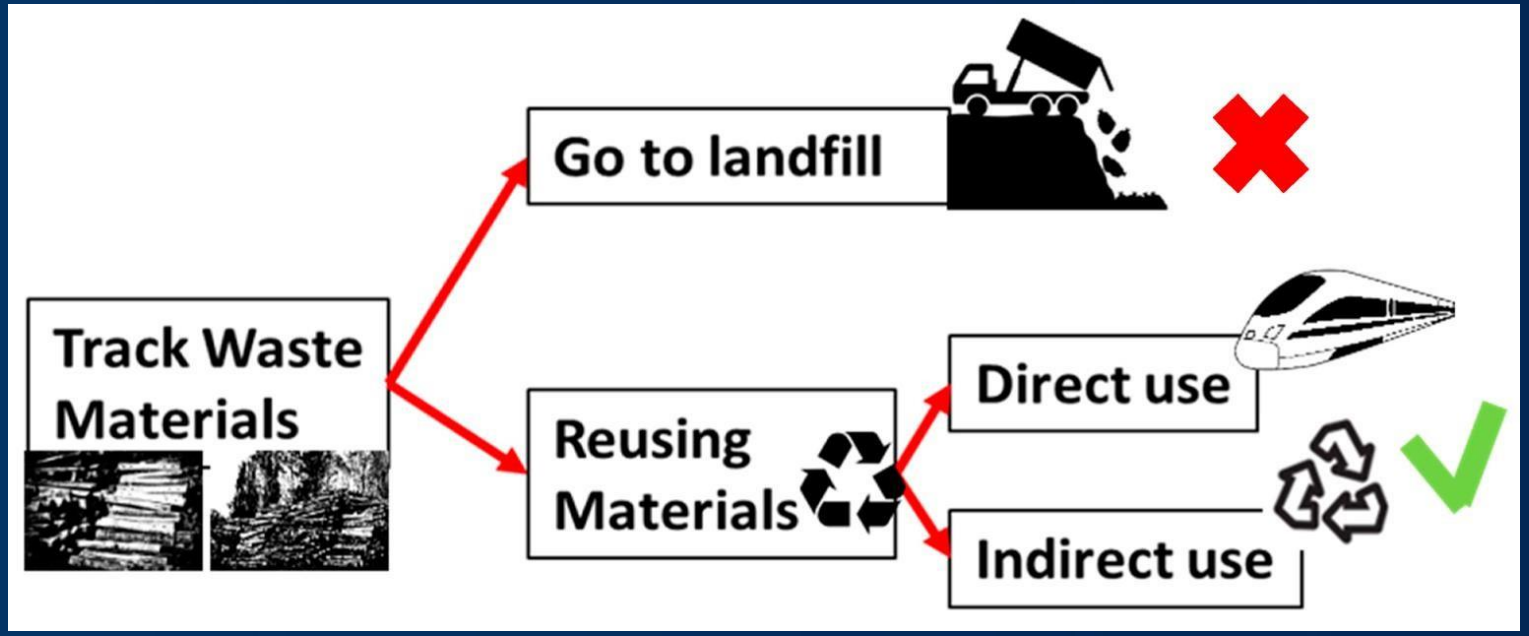


Natural Latex Rubber Tree

Vegetable Oils Tree

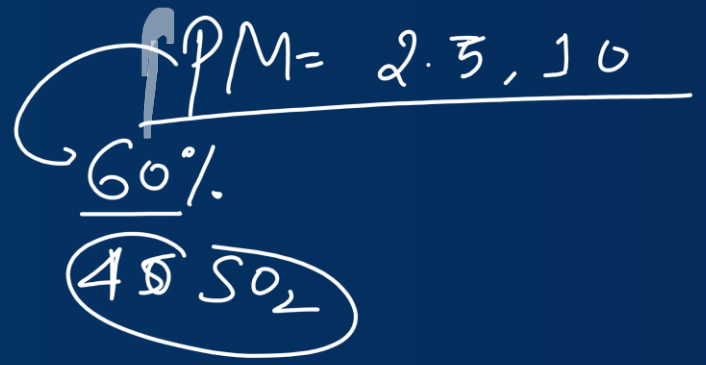


- Bitumen can also be made from waste vacuum tower bottoms produced in the process of cleaning used motor oils, which are normally burned or dumped into landfills.
- Non-petroleum based bitumen binders can be colored, which can reduce the temperatures of road surfaces and reduce the Urban heat islands.



Q9. Consider the following:

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



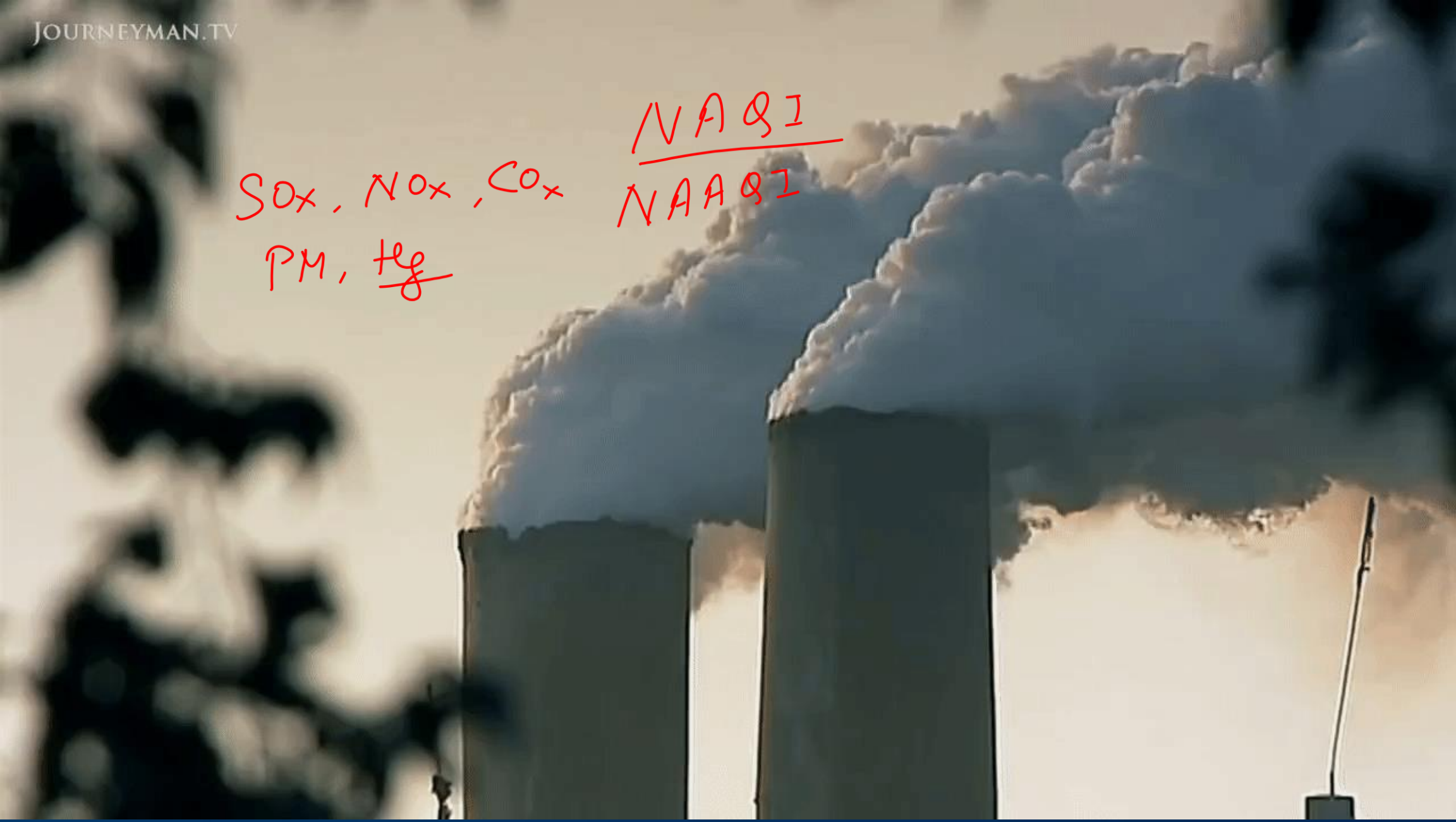
Which of the above is/are the emission/ emissions from coal combustion at thermal power plants?

a) 1 only

b) 2 and 3 only

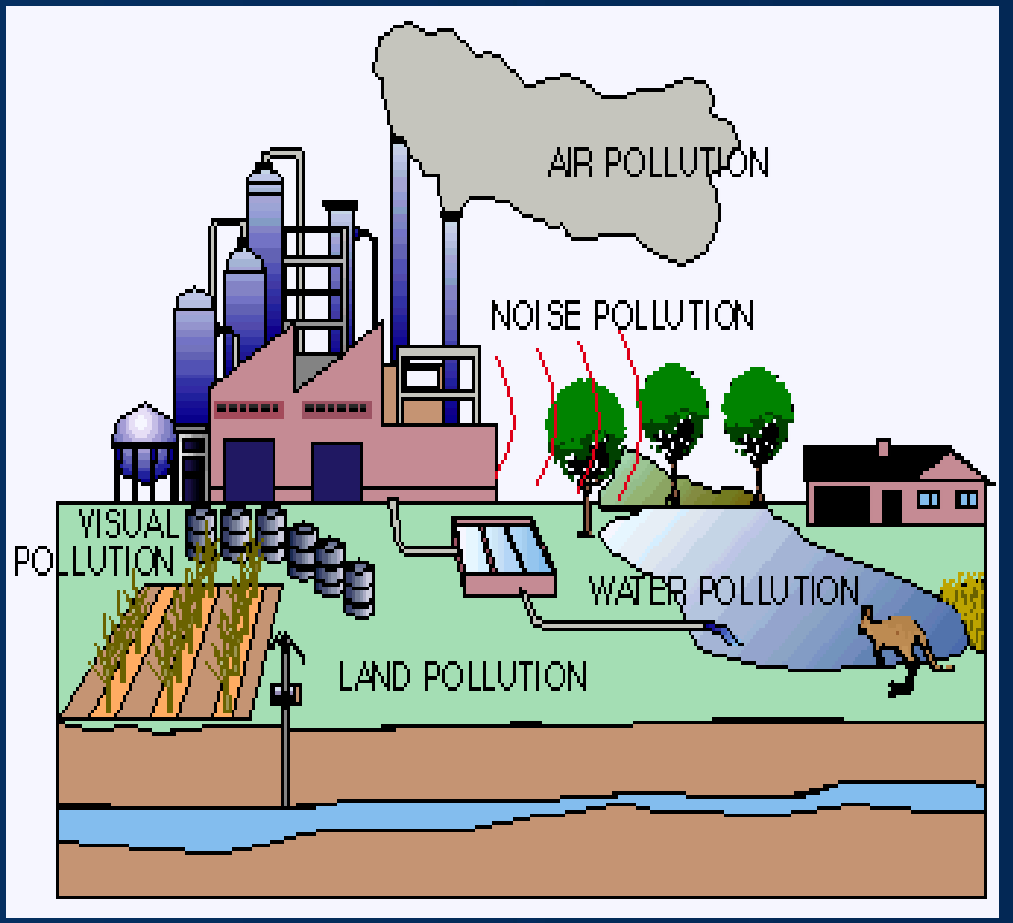
c) 1 and 3 only

d) 1, 2 and 3


JOURNEYMAN.TV
SOx, NOx, COx
PM, Hg
NAQI
NAAQI

9. Solution (d)

- Coal based thermal power plants account for over 60% of the total PM emissions from all industry, as well as 45% of the SO2, 30% of oxides of nitrogen (NOx) and over 80% of the mercury emissions.

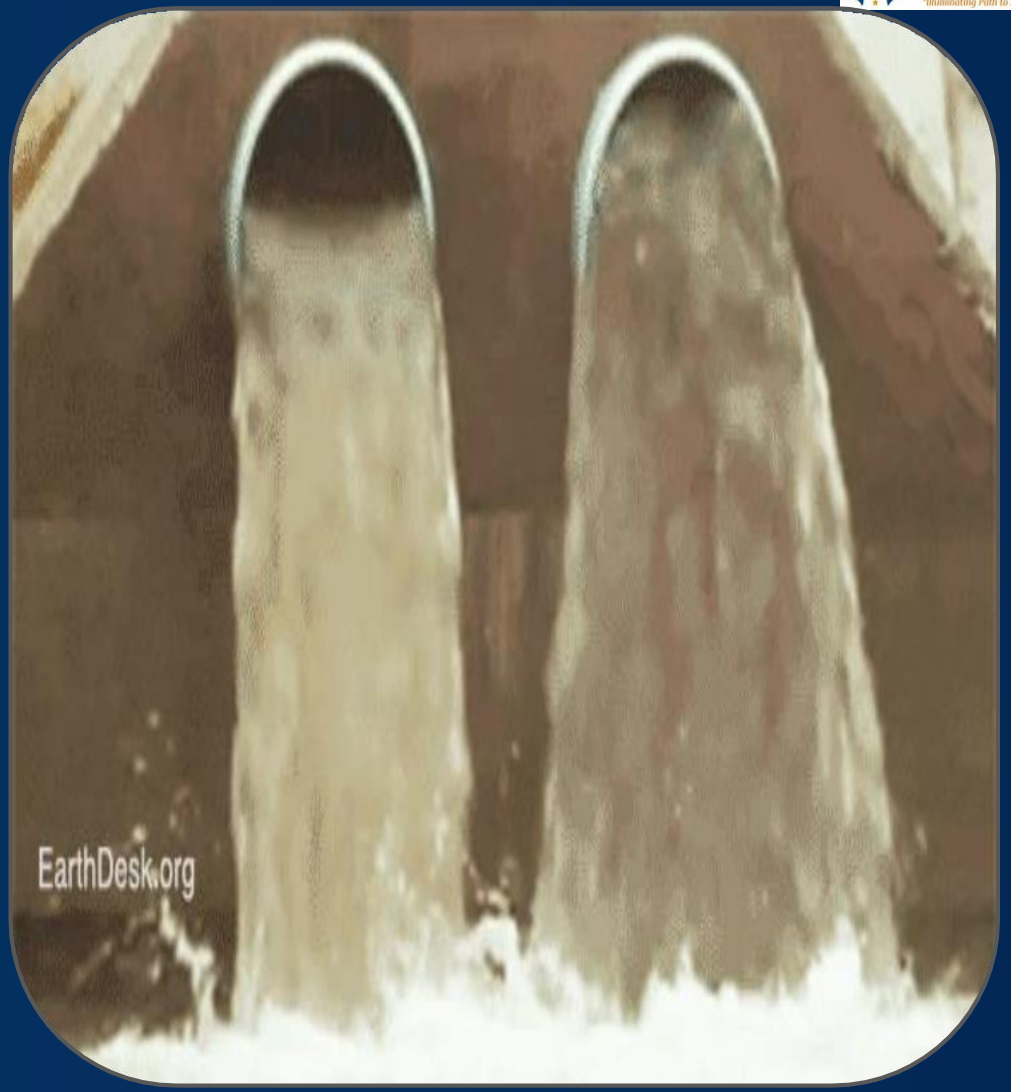


Pollution due to thermal power plants:-

- Largest emitter of mercury: Typical power plant emits 90 % of its mercury into the air and 10 percent on land.

AIR POLLUTION

- **From point source:** Particulates matter, Gaseous emission - Sulphur dioxide, oxides of nitrogen, carbon monoxide, carbon dioxide, Hydrocarbon.
- **From non-point source:** Transportation of coal, Loading/unloading of fuel, Coal storage yard, Fly ash handling & Transportation, Coal storage yard
- **Water pollution:** Plant Effluent, Coal Handling Plant Dust Suppression, Ash handling, Effluent from oil handling and transformer areas, Power House and Turbine Area Effluent.


EarthDesk.org

- **Land Degradation:** Untreated air and water pollutants from coal power plants affect the water and the flora and fauna of adjoining areas making them unfit for living or livelihood activities
- **Noise Pollution:** Regular exposure to such high noise levels emanating from power plants from the usage of equipment like boilers, turbines and crushers, affects people working in the plants.
- India’s coal use represents just over 54% of the present energy mix, and the fuel will continue to retain a high share of the overall generation.

Q10. 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 by the United Nations Environment Programme

10. Solution (d)

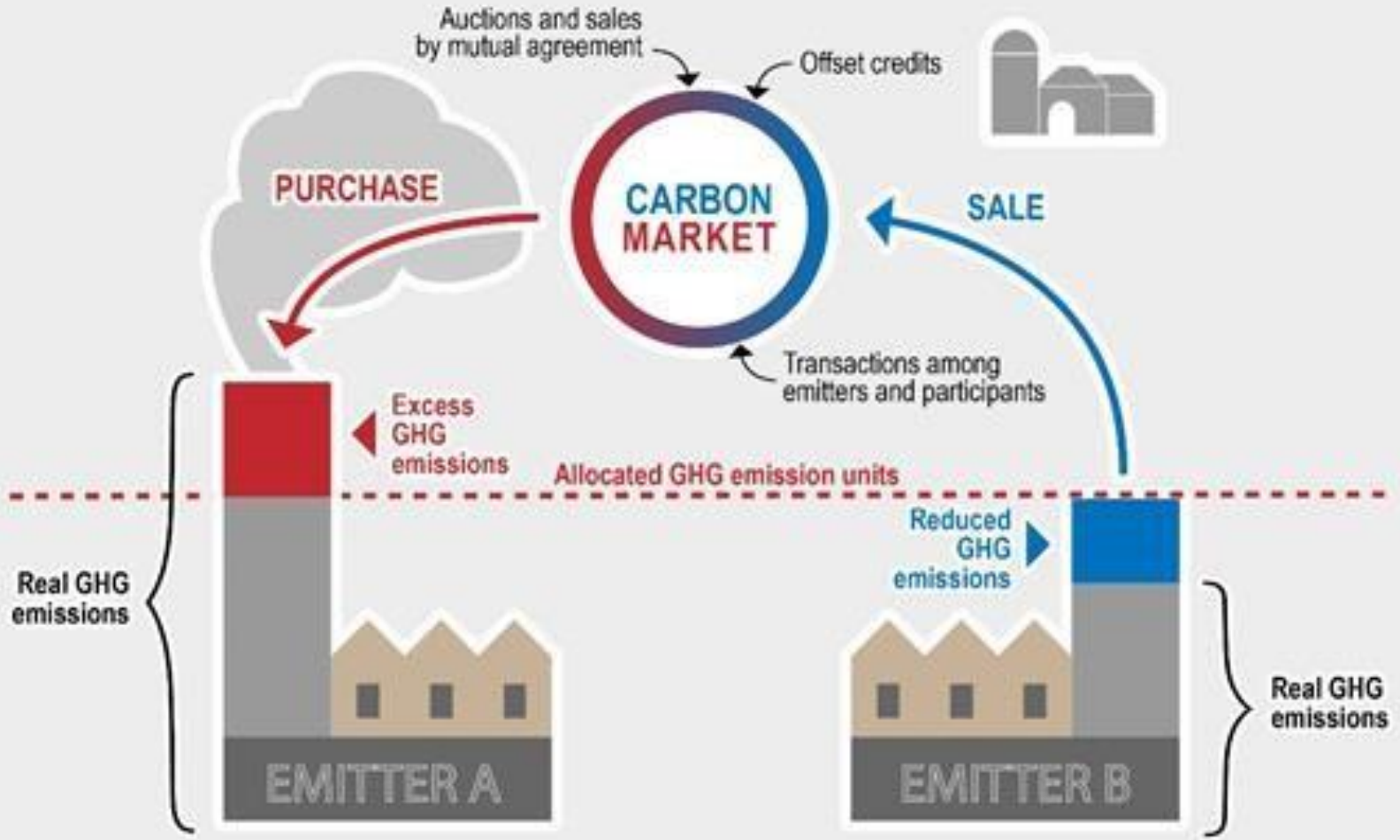
Mon - Fri → @ 11AM
PYQs

Explanation:

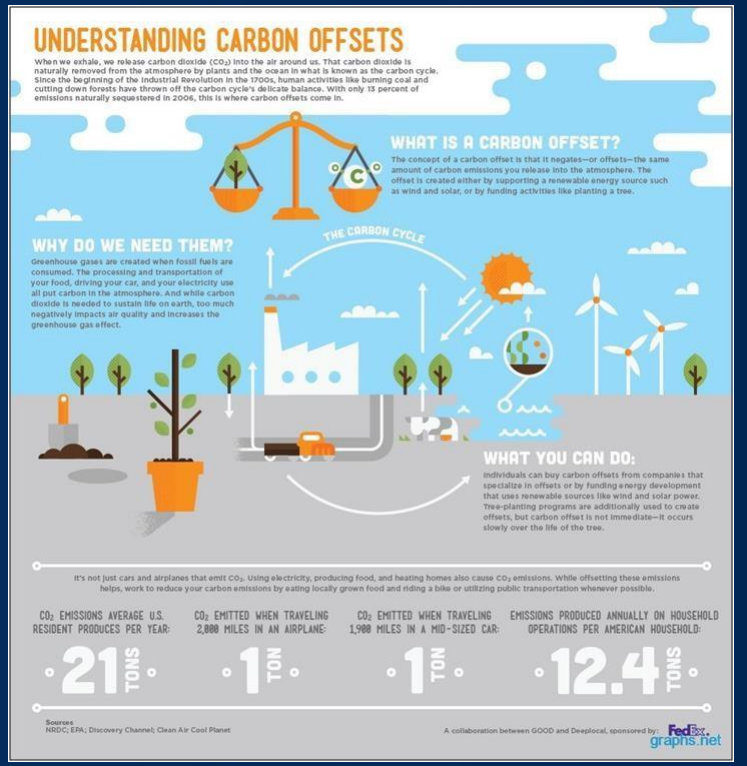
- There is considerable flexibility in the Carbon Credit system. Infact this forms the very basis of the Carbon Credit exchange system.
- Hence, it cannot be true that the Carbon credits are traded at a fixed price in absence of any flexibility.

CARBON CREDIT SYSTEM

- A carbon credit also called a carbon offset, is a financial instrument that represents a tonne of CO_2 (carbon dioxide) or CO_2 (carbon dioxide equivalent gases) removed or reduced from the atmosphere from an emission reduction project, that can be used, by governments, industry or private individuals to offset damaging effects of carbon emissions.
- Carbon credits or carbon offsets can be acquired through afforestation, renewable energy, CO_2 sequestration, methane capture, buying from an exchange (carbon credits trading) etc.
- Carbon trading is the name given to the exchange of emission permits.


Auctions and sales by mutual agreement
Offset credits
PURCHASE
CARBON MARKET
SALE
Transactions among emitters and participants
Excess GHG emissions
Allocated GHG emission units
Reduced GHG emissions
Real GHG emissions
Real GHG emissions
EMITTER A
EMITTER B

- This exchange may take place
- within the economy or may take the form of international transaction.
- Under Carbon Credits Trading mechanism countries that emit more carbon than the quota allotted to them buy carbon credits from those that emit less.
- In Carbon trading, one credit gives the country or a company the right to emit one tonne of CO_2.



TYPES OF CARBON TRADING

- A developing nation such as India, turns out to be a seller of such credits, which eventually provides them with monetary gains.
- Types of Carbon trading
- Emission trading and
- Offset trading.

EMISSION TRADING

- Emissions trading allows countries to sell unused emission units to countries that have exceeded their targets. Carbon is tracked and traded like any other commodity in a “carbon market.”
  - Other trading units in the carbon market:
  - A removal unit (RMU) by reforestation.
  - An emission reduction unit (ERU) generated by a joint implementation project.
  - A certified emission reduction (CER) generated from a clean development mechanism project activity.

OFFSET TRADING

- Another variant of carbon credit is to be earned by a country by investing some amount of money in such projects, known as carbon projects, which will emit a lesser amount of greenhouse gas in the atmosphere.
- For example, suppose a thermal plant of 800 megawatt capacity emits 400 carbon-equivalent in the atmosphere.
- Now a country builds up an 800 megawatt wind energy plant which does not generate any amount of emission as an alternative to the thermal plant.
- Then by investing in this project the country will earn 400 carbon-equivalent.
- Offset Trading is a variant of Emission Trading or Carbon Trading.

Thank You

FOR ANY ASSISTANCE

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