

Q.1)

Exp) Option c is the correct answer.

Integrated Development of Wildlife Habitats' (IDWH) is an on-going Centrally Sponsored Scheme which has been made operational by adding more components and activities to the erstwhile Centrally Sponsored Scheme - "Assistance for the Development of National Parks and Sanctuaries" during the 11th Plan Period.

**Statement 1 is correct:** Integrated Development of Wildlife Habitats (IDWH) is a **Centrally Sponsored Scheme** where government provides **financial and technical assistance** to State/UT governments for wildlife conservation.

**Statement 2 is correct:** The Scheme has following components:

- Support to Protected Areas like National Parks and Wildlife Sanctuaries.
- **Protection of Wildlife Outside Protected Areas.**
- Recovery Programme for saving Critically Endangered Species and Habitats.

**Statement 3 is correct:** The third component of the IDWH scheme is aimed at the **recovery of critically endangered species and habitats**, which are identified by the International Union for Conservation of Nature (IUCN) or the Wildlife Institute of India (WII). The scheme supports the preparation and implementation of species recovery plans, habitat restoration, captive breeding, reintroduction, and monitoring of such species. Some of the species covered under this component are **Snow Leopard, Malabar Civet, Great Indian Bustard, Dugong, Gangetic Dolphin, and Nilgiri Tahr.**

Q.2)

Exp) Option d is the correct answer.

Seaweeds are species of marine algae and plants that grow in the marine and shallow coastal waters and on rocky shores. They have many applications in various fields, such as:

**Option 1 is correct:** Seaweeds are used as **additives or coatings for textiles** to impart antimicrobial, antioxidant, and UV-protective properties. Seaweed fibres are an eco-friendly alternative to traditional textiles like cotton and polyester, which are environmentally damaging and unsustainable.

**Option 2 is correct:** Seaweeds are used as **feedstocks for bio-fuel production**, such as ethanol, methane, and hydrogen, by using different methods of fermentation, digestion, and gasification.

**Option 3 is correct:** Seaweeds are used as soil **conditioners to improve the physical, chemical, and biological properties** of the soil, such as water retention, nutrient availability, and microbial activity.

**Option 4 is correct:** Seaweeds are used as **bio-remediators to remove excess nutrients, heavy metals, and organic contaminants** from the water, thereby reducing coastal pollution and eutrophication.

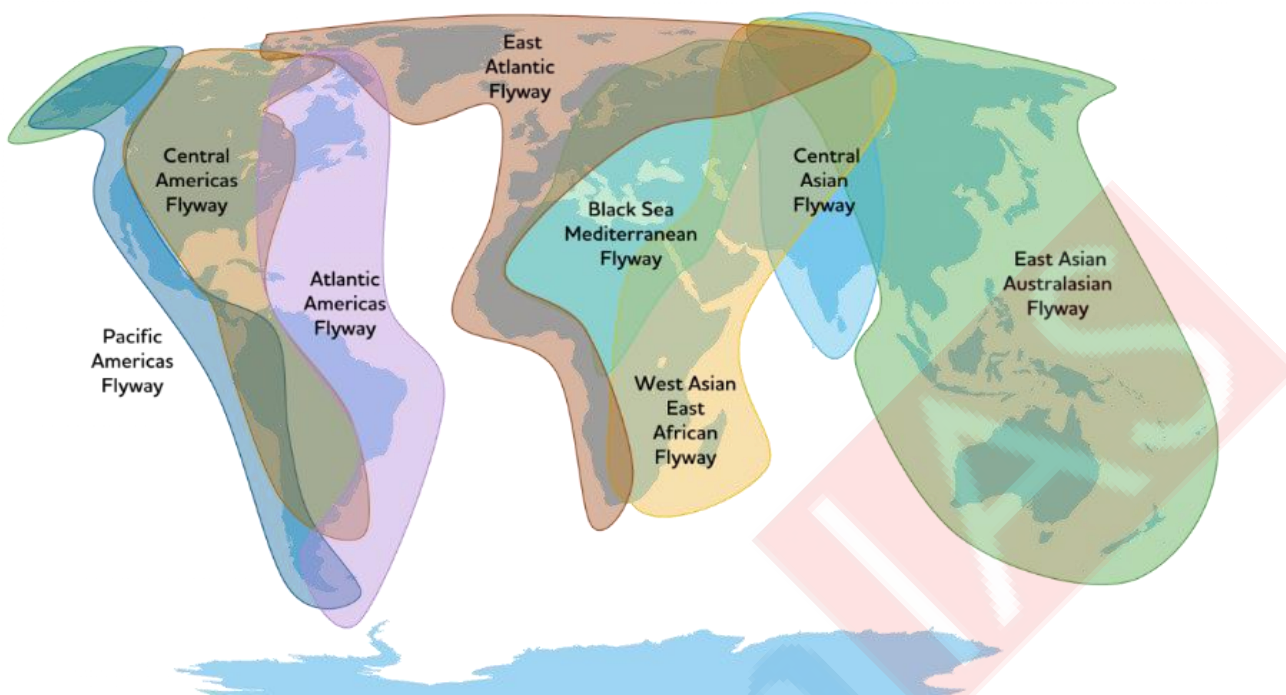
**Option 5 is correct:** Seaweeds are used as **nutritional supplements, functional foods, or nutraceuticals**, as they are rich in vitamins, minerals, and fibre and have anti-inflammatory and anti-microbial properties.

Q.4)

Exp) Option b is the correct answer

Flyway is a geographical region within which a single or a group of migratory species completes its annual cycle – breeding, moulting, staging and non-breeding.

**Statement 1 is incorrect:** Central Asian Flyway extends from the northernmost breeding grounds in the Russian Federation (Siberia) to the southernmost non-breeding (wintering) grounds in West and South Asia, the Maldives and British Indian Ocean Territory. **New Zealand is part of the East Asian – Australasian Flyway (EAAF).**



**Statement 2 is correct: Black necked crane and Spot-billed Pelican are migratory waterbirds** that travel on the CAF. The black necked crane breeds in the high-altitude wetlands of China, India, and Bhutan, and winters in lower altitudes of China and India. Both species are vulnerable to habitat loss and degradation.

Q.8)

Exp) Option a is the correct answer.

**Hibernation is a state of dormancy that certain animals enter to conserve energy during periods of environmental stress, such as winter cold or food scarcity.** During hibernation, the animal's metabolic rate decreases significantly, its body temperature drops, and it enters a prolonged period of inactivity. Hibernation allows animals to survive harsh conditions by reducing their energy expenditure until more favorable conditions return. **Many mammals, such as bears, hedgehogs, and certain rodents, undergo hibernation, while other animals, like reptiles and amphibians, may enter similar states known as brumation or aestivation, depending on the environmental conditions they face.**

**Option 1 is incorrect. Reindeer do not hibernate during winter.** Instead, they are migratory animals that adapt to cold conditions by growing thick fur and finding food sources beneath the snow. They are active throughout the winter, migrating over long distances in search of food.

**Option 2 is correct. Marmots are known for their hibernation habits.** They hibernate during winter, entering a state of deep torpor to conserve energy. Marmots typically retreat to underground burrows before the onset of winter, where they remain inactive until warmer temperatures return in spring.

**Option 3 is incorrect. Raccoons do not typically hibernate during winter. While they may become less active in colder weather, raccoons remain active throughout the year,** foraging for food and adapting their behavior to the seasonal changes.

**Option 4 is incorrect. Penguins do not hibernate. Instead, they have adaptations to survive in cold environments such as Antarctica by relying on their thick layer of insulating feathers and their ability to store energy in the form of fat.** Penguins remain active throughout the year, hunting for food in the icy waters of the Southern Ocean.

**Option 5 is correct. Hedgehogs hibernate during winter.** They enter a state of torpor to conserve energy and survive harsh winter conditions. Hedgehogs typically build nests or find sheltered locations such as piles of leaves or log piles where they hibernate until warmer temperatures return in spring

Q.10)

**Exp) Option b is the correct answer.**

India has nine species of vultures in the wild. However, there has been a constant decline in their population pushing them to the brink of extinction. Vulture Safe Zones (VSZs) are regions in India that have been identified as potential safe zones for vultures in the wild.

**Statement 1 is incorrect. The Bombay Natural History Society (BNHS) is establishing Vulture Safe Zones (VSZs) in India.** The BNHS is working with the UK Government's Darwin Initiative to protect vultures in Gujarat.

**Statement 2 is correct.** The VSZs aims to raise awareness against **Non-steroidal Anti-inflammatory Drugs (NSAIDs) toxic to the vultures. It also aims to ban other NSAIDs like ketoprofen and aceclofenac** in veterinary use as they too are found to be toxic to vultures.

**Statement 3 is correct.** Various places in India have been identified as possible Vulture Safe Zones (VSZs) for vultures in the wild, each comprising approximately 30,000 square kilometers **surrounding Majuli Island in Assam, Terai region in Uttar Pradesh, and Bundelkhand region in Madhya Pradesh.**

Knowledge Base:

**About Bombay Natural History Society (BNHS):**

- 1) It is one of the oldest and premier organizations in India dedicated to the study and conservation of nature, including birds.
- 2) It was founded in 1883 and has a long history of contributing to ornithological research and conservation efforts.

Q.12)

**Exp) Option b is the correct answer.**

**Statement 1 is correct:** NGT deals with civil cases under the following laws

- 1) The Water (Prevention and Control of Pollution) Act, 1974;
- 2) The Water (Prevention and Control of Pollution) Cess Act, 1977;
- 3) The Forest (Conservation) Act, 1980;
- 4) The Air (Prevention and Control of Pollution) Act, 1981;
- 5) The Environment (Protection) Act, 1986;
- 6) The Public Liability Insurance Act, 1991;
- 7) The **Biological Diversity Act, 2002.**

**Statement 2 is correct:** The Biological Diversity Act, 2002 provide for the conservation of biological diversity, sustainable use of its components, and **fair and equitable sharing of the benefits arising out of the use of biological resources** and knowledge associated with it.

The Biological Diversity Act, 2002 has made it mandatory for every local self-governing institution in rural and urban areas to constitute a **Biodiversity Management Committee (BMC)** within their area of jurisdiction.

**Statement 3 is incorrect:** The **Biodiversity Management Committee must prepare a Peoples' Biodiversity Register (PBR) in consultation with local people. It is not prepared by the National Biodiversity Authority (NBA).**

A PBR comprehensively documents traditional knowledge of local biological resources. The BMC is the custodian of these resources, and any industry that extracts biological resources from these areas has to share part of its revenue with the local community.

Q.16)

Exp) Option c is the correct answer.

**Environmental Impact Assessment (EIA)** in India, mandated by the **Environment Protection Act, 1986**, evaluates **potential environmental impacts** of projects, considering socio-economic factors. The **Ministry of Environment, Forest, and Climate Change (MoEFCC)** is responsible for overseeing the EIA process.

**Statement 1 is correct-** Highway projects deemed of **strategic and defense significance**, particularly those situated **within 100 kilometers of the Line of Control** and other critical locations, are **exempted** from the requirement of **obtaining environmental clearance before construction**. This exemption is based on the understanding that such projects, integral to defense and strategic interests in border states, are often sensitive and necessitate prioritized execution due to strategic, defense, and security considerations.

**Statement 2 is correct-** Thermal power plants with a capacity of up to 15 MW, utilizing biomass or non-hazardous municipal solid waste, and employing auxiliary fuel like coal, lignite, or petroleum products up to 15%, are exempted from the need for environmental clearance before construction, provided that the fuel combination adheres to eco-friendly standards.

**Statement 3 is correct-** Ports and harbors dedicated to fish handling, with lower pollution potential in comparison to others and serving small-scale fishermen, are granted an exemption from the requirement of obtaining environmental clearance.

**Statement 4 is correct-** Toll plazas requiring additional width for the installation of toll collection booths to accommodate a high volume of vehicles are exempt from the necessity of obtaining environmental clearance.

**Statement 5 is incorrect-** The construction of new airports necessitates mandatory environmental clearance. However, according to the Environmental Impact Amendment, only projects involving the expansion and modernization of existing airports without an increase in the current area are exempted from the mandatory environmental clearance requirement.

Q.18)

Exp) Option b is the correct answer.

The Cheetah Reintroduction Project in India began on September 17, 2022. The project's goal is to restore the population of cheetahs, which were declared extinct in India in 1952. The project involves moving cheetahs from South Africa and Namibia to Kuno National Park in Madhya Pradesh.

**Option a is incorrect.** The Wildlife Trust of India (WTI) is a non-profit organization that works to protect India's wildlife. It was not the nodal authority responsible for the cheetah reintroduction program. Discussions to bring the cheetah back to India were initiated in 2009 by the Wildlife Trust of India.

**Option b is correct.** The **National Tiger Conservation Authority (NTCA) in India is the nodal authority responsible for the cheetah reintroduction program.** They oversee and coordinate efforts related to the reintroduction of cheetahs in the country.

**Option c is incorrect.** National Board for Wildlife (NBWL) is not the nodal authority responsible for the cheetah reintroduction program. It is the apex body for wildlife conservation in India. The Prime Minister chairs the NBWL, which has 30 members. The NBWL advises the government on wildlife conservation and promotes the development of wildlife and forests.

**Option d is incorrect.** The Wildlife Institute of India (WII) is not the nodal authority responsible for the cheetah reintroduction program. WII is involved in the Action Plan for Introduction of Cheetah in India.

Q.19)

Exp) Option d is the correct answer.

**The Wetlands (Conservation and Management) Rules of 2017** is a legal framework in India aimed at preserving and managing wetland ecosystems. Enacted under the provisions of the **Environment (Protection) Act, 1986**, these rules provide guidelines for the identification, conservation, and sustainable management of wetlands across the country.

The rules define a **wetland as an area of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary. It encompasses a range of water bodies with static or flowing water, fresh, brackish, or salt, including areas of marine water with depths not exceeding six meters at low tide.** Hence, water bodies with flowing water and areas with marine water are included in the definition of wetlands.

The rules **explicitly exclude** certain areas from the definition of wetlands, such as **river channels, paddy fields, man-made water bodies constructed for drinking purposes, and structures specifically constructed for aquaculture, salt production, recreation, and irrigation purposes**

Q.23)

Exp) Option d is the correct answer.

**Winter adaptations in plants:**

**Option 1 is correct. Dormancy:** Many plants go into a dormant or **metabolically inactive state in order to store energy and withstand the harsh winter conditions.** It is a **type of adaptation technique used by plants to conserve resources** and survive extreme winter weather. For instance, the seeds remain dormant until they are exposed to light. The seed is changed by exposure to light, enabling it to germinate in the absence of light. **The phytochrome is in the Pr (inactive form) in the dark, which prevents seed germination. It requires light at the soil's surface in order to germinate.**

**Option 2 is correct. Anti-freeze:** Plants have the **ability to produce antifreeze and to transfer water from their cells to their roots.** The **leftover sap acts as an antifreeze.** Cold-hardy plants **produce a particular kind of protein known as Antifreeze Proteins (AFPs) in response to freezing stress.** This protein **reduces the cytosol's freezing temperature, prevents the growth of ice crystals in the apoplast, and reduces the effects of freezing.** For example, **plants that can withstand freezing temperatures produce a lot of glycerol, or antifreeze, into their cells in order to prevent the water from freezing.**

**Winter adaptations in animals:**

**Option 3 is correct. Migration:** A group of **animals migrating from one place to another, usually to alter their living conditions or habitats, is known as migration.** **Due to the high energy required for travel and the constant struggle with native species for resources like food and shelter, migration puts a great deal of stress on animals.** One example of a winter adaption is the October migration of the Indian Grey Hornbill to southern India.

**Option 4 is correct. Hibernation:** The second strategy of the animals for enduring cold weather is hibernation. An **animal experiences this physical state when its metabolism slows down to preserve energy during a season when there is little food or water and low temperatures.** A drop in body temperature and a decrease in respiration, or breathing, are signs of this slower bodily function. **Animals that hibernate during extreme cold weather conditions include the Himalayan Black Bear, which hibernates from November to March.**

Q.26)

Exp) Option a is the correct answer.

Recently, Vanadium, an essential raw material in various industries, has been discovered in sediment samples taken from the Gulf of Khambhat. At Gulf of Khambhat, it has been found in a mineral called **titanomagnetite, which is formed when molten lava cools rapidly**. This discovery particularly may give new impetus to steel and battery manufacturing capacity in India.

**Option a is correct: Titanomagnetite** is a mineral that is rich in **vanadium**. In fact, it is one of the primary sources of vanadium in the Earth's crust. Vanadium is a valuable element that is used in a variety of applications, including steel production, batteries, and catalysts.

**Option b is incorrect: Aluminium is primarily extracted from the mineral ore bauxite**, which is a sedimentary rock composed of various aluminium hydroxide minerals.

**Option c is incorrect: Thortveitite** is the primary mineral ore of **scandium**. It is a rare, silicate mineral that contains up to 45% scandium oxide.

**Option d is incorrect: Bastnäsite, Monazite and Xenotime** are some of the minerals from which Europium is derived.

Q.29)

Exp) Option c is correct

**Statement 1 is correct. Nilambur** located in **Malappuram District of Kerala** is famous for **teak**. Its teak is known internationally for its superior quality and elegant appearance. Recently, Nilambur teak has been added to the list of the **Geographical Indication (GI) tag**. Historically, it was the British who identified the superior quality of teak from Nilambur plantations and forests. Later, the region became the major supplier of quality teak in the world.

**Statement 2 is correct. Marayoor** located in the **Idukki District of Kerala** is a famous place for cultivation of **sandalwood**. As per the head of The Department of Wood Science of Kerala Agricultural University (KAU), the **Marayoor sandal division** in Idukki district is the only compact tract of sandal forests in the country or, perhaps, the whole world having mature trees. Therefore, it has taken the initiative for securing forest certification and registration of Geographical Indication for Marayoor sandal.

**Statement 3 is correct. Kandhamal**, in Kandhamal District of Orissa is known **for cultivation of Organic Haladi** which has also received **GI tag**. Tribals grow the herbs **without applying fertiliser** or pesticide. The aromatic value and golden yellow colour of 'Kandhamal Haladi' make it different from the rest. Its cultivation starts in the summer months of April and May and it is harvested during the months from December to February

Q.31)

Exp) Option a is the correct answer.

The National Gene Bank (NGB) was established in 1996 to preserve the seeds of Plant Genetic Resources for future generations in the form of seeds, genomic resources, pollen etc.

**Statement 1 is incorrect.** The primary goal is conservation, **not genetic modification**. National Gene Banks aim to preserve the genetic diversity of species to maintain their natural traits and characteristics.

**Statement 2 is incorrect.** The National Gene Bank for Plants in India is at the National Bureau of Plant Genetic Resources (NBPGR). The NBPGR, located in New Delhi, **is an organization under the Indian Council of Agricultural Research (ICAR)**. It serves as the primary institute for the conservation and management of plant genetic resources in the country.

**Statement 3 is correct.** National Gene Bank has been protecting 4.52 lakh accessions (samples or varieties of plant genetic material) of **which 2.7 lakh are the Indian germplasm while the rest have been imported from other countries**

Q.33)

**Exp) Option c is correct.**

A number of animals and plants have been listed as 'possibly extinct' in the latest edition of the International Union for the Conservation of Nature (IUCN)'s Red List of Threatened Species.

The factors like competition, predation, natural selection and human induced factors like hunting, habitat degradation are some of the important reasons that have led to these extinction.

**Statement 1,2,3 and 4 is correct.** Among mammals, the **cheetah** (*Acionyx jubatus*) and the **Sumatran rhinoceros** (*Dicerorhinus sumatrensis*) are considered **extinct in India**. The **pink-headed duck** (*Rhodonessa caryophyllaceai*) is feared extinct since 1950 and the **Himalayan quail** (*Ophrysia supercilios*) was last reported in 1876.

The latest edition of the Red List was released at the recently-concluded World Conservation Congress organised by the IUCN at Marseille, France.

Fish that have been declared as possibly extinct include the **Deolali minnow**, the **Deccan barb** and the **Nilgiri mystus**, all of which are found in the Deccan.

Birds include the Pink-headed duck, which has been feared to be extinct since the 1950s, the Siberian crane, that once famously drew crowds to Keoladeo National Park as well as the Buffy fish-owl or Malay owl.

**Statement 5 is incorrect.** **Himalayan Trillium** is a common herb of the Himalayas. It is often locally called as Nagchatri. It is **found in temperate** and sub-alpine zones of the Himalayas at an altitude from 2,400-4,000 meters above sea level. Its IUCN status is **endangered**.

Q.34)

**Exp) Option d is correct.**

**Statement 1 is incorrect.** Union Ministry of Environment, Forests and Climate Change in June 2020 issued an advisory to streamline and formalize the process of importing live exotic animals. The advisory has **defined exotic animals** as those that are mentioned under the **Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**. They are not defined **under the schedules of the Wild Life (Protection) Act, 1972**.

**Statement 2 is incorrect: Import of exotic live species to India is allowed through an application for grant of a license.** The correct procedure of documentation and declaration to be followed under relevant rules and permission is obtained from the Chief Wildlife Warden and Director General of Foreign Trade.

Knowledge Base: Exotic live species are animal/ plant species that have been moved from their original range of distribution to another location where they are alien and not naturally found.

Q.35)

**Exp) Option a is the correct answer**

The sandalwood tree, *Santalum album*, is a small evergreen tree from southern India and Southeast Asia. It's precious for its sweet-smelling heartwood, which makes sandalwood oil.

**Statement 1 is incorrect: The Sandalwood tree is a partial-root parasite.** When sandal tree seedlings start growing, they connect to the roots of shrubs and later to nearby trees. **The sandal tree makes its food but relies on the host, like other partial parasites, for water and nutrients.**

**Statement 2 is correct: Santalol is the main part of sandalwood oil, and it makes the oil smell sweet and woody.** About 90% of the oil is made up of santalol. People use Santalol in traditional medicine for different health issues. It's believed to help with inflammation, bacteria, and fungi.

**Statement 3 is incorrect: Sandal trees are not native to South America.** They are native to tropical and subtropical regions of Asia and Australia.

Q.39)

Exp) Option c is the correct answer

The **cheetah** is a big cat known for its incredible speed and unique adaptations. Cheetahs are the fastest land animals, who use their speed to chase down and catch prey, mainly small to medium-sized prey like gazelles.

**Cheetah**

**Statement 1 is correct.** The gestation period for cheetahs is approximately **90 to 95 days**. After this period, female cheetahs give birth to a litter of cubs.

**Statement 2 is correct.** Cheetahs are primarily found in open grasslands and savannas, where their incredible speed is advantageous for hunting prey. They are also found in some arid environments.

**Statement 3 is incorrect.** Cheetahs are generally **more solitary animals compared to other big cats**. Males, especially, tend to be territorial and often live alone or in small, transient groups.

**Statement 4 is correct.** Cheetahs are listed as **vulnerable** on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. They face various threats, including habitat loss, human-wildlife conflict, and a reduced prey base. The subspecies of cheetah in Iran and northwest Africa are listed as Critically Endangered. The Cheetah is also assessed as Critically Endangered in the region of North and West Africa.

Q.46)

Exp) Option a is the correct answer.

**Statement 1 is incorrect.** In India, the **Marine Protected Areas are notified** under the provisions of the **Wildlife (Protection) Act of 1972 and not under Environment Protection Act of 1986**. This Act of 1972 provides legal protection for many marine animals.

**Statement 2 is correct.** **Marine Protected Areas** have been given **special protections** for natural or historic marine resources **by local, state, territorial, native, regional, or national authorities**. Human activity and resource exploitation are strictly regulated in Marine Protected Areas (MPAs).

**Statement 3 is incorrect.** A **defined region set aside to be managed for the long-term conservation of marine resources, ecosystem services, or cultural heritage is referred to as a marine protected area (MPA)**. In addition to helping in the preservation of important habitats and representative samples of marine life, **marine protected areas can also help restore ocean productivity and prevent further deterioration**.



Q.50)

Exp) Option d is the correct answer.

**Option d is correct:** Biodiversity cold spots are areas of the world that have **relatively low levels of biological diversity and they are also experiencing a high rate of habitat loss**. These areas are often characterized by harsh environmental conditions, such as high altitudes, deserts, or cold climates. Although a Biodiversity Coldspot is low in species richness, it is also important to conserve, as it may be home to rare flora and fauna. Biodiversity cold spots are important because they represent a unique and irreplaceable part of the world's natural heritage.

However, biodiversity cold spots are also some of the most vulnerable ecosystems on Earth. These areas are often under threat from human activities, such as deforestation, agriculture, and mining.