Q1. D
Octopuses are well-known for their intelligence, problem-solving skills, and ability to navigate complex environments. In laboratory settings, they have been observed solving puzzles, opening jars, and navigating mazes, all of which indicate a high level of cognitive ability and learning.

Q2. A
Chimpanzees have been observed in the wild using certain plants with medicinal properties to treat their illnesses or discomfort. This behavior, known as zoopharmacognosy, involves selecting and using specific plant materials to combat parasitic infections or other ailments. For instance, chimpanzees have been known to swallow whole leaves of certain rough-leafed plants, which seem to help expel intestinal parasites.

Q3. A
The Serengeti is a famous protected area known for its vast and varied population of wildlife, including a large population of lions and other large mammals. It is located in northern Tanzania and extends to southwestern Kenya (where it's known as the Maasai Mara). The majority and the most well-known part of the Serengeti, however, is in Tanzania.

Q4. C
Satkosia Tiger Reserve is located in the state of Odisha, India. It spans along the magnificent gorge over the mighty river Mahanadi and is flanked by the majestic hills of the Eastern Ghats. It is known for its diverse landscapes, rich wildlife, and the meeting point of two distinct biogeographic regions, providing a unique ecosystem with a rich biodiversity. The area includes a dynamic mix of various habitats, making it an important region for conservation and ecological studies.

Q5. C
This event is known as the Great Oxidation Event (GOE) or Oxygen Catastrophe. Before this time, Earth's atmosphere and oceans were largely anoxic (lacking in oxygen), and life was primarily anaerobic (not requiring oxygen). However, the emergence and proliferation of photosynthetic cyanobacteria began producing significant amounts of oxygen as a byproduct. Over time, this oxygen accumulated in the atmosphere, fundamentally changing Earth's environment. For anaerobic organisms, which thrived in the absence of oxygen, the increase in atmospheric oxygen was toxic, leading to their mass extinction. Meanwhile, the oxygenation of Earth paved the way for the evolution of aerobic life forms that could utilize oxygen for respiration.

Q6. D
Sea Lettuce: Sea lettuce is a type of green algae found in marine environments and is a primary producer.
Seaweed: Seaweed refers to various types of algae, which are primary producers in aquatic environments.
Seagrass: Seagrass is a marine flowering plant and is a primary producer.
Sea Kelp: Sea kelp is a type of large brown algae found in marine environments and is also a primary producer.

Sea Urchins: Sea urchins are marine animals and not primary producers; they are generally herbivores or omnivores.

Q7. A
In terms of the number of recorded species, insects are by far the most diverse. This is followed by vascular plants, then fishes, and mammals have the fewest number of species among these groups.

Q8. B

- Leopard (Panthera pardus): Leopards are adaptable and widespread across various habitats in India, including both the Himalayas and the Western Ghats.
- Elephant (Elephas maximus indicus): Indian elephants are found in various habitats, including forested regions of both the Western Ghats and the Himalayan foothills.
- Indian Python (Python molurus): This large snake is widely distributed across India, including in the Western Ghats and parts of the Himalayan region.
- Western Tragopan: This pheasant is more localized to the Himalayas and not found in the Western Ghats.
- Lion-tailed Macaque (Macaca silenus): This primate is endemic to the Western Ghats and is not found in the Himalayan region.

Q9. D
The Deccan Peninsula is a large plateau that makes up the majority of southern India. It's bounded by the Eastern and Western Ghats and extends over a vast area. This region encompasses various types of habitats, including tropical forests, grasslands, and dry scrub areas.

Q10. D
Biodiversity hotspots are not designated by the IUCN and UNEP specifically. The concept of biodiversity hotspots was first put forth by Norman Myers in 1988 and further developed by Conservation International.
It must contain at least 1,500 species of vascular plants (it doesn't include mammals) as endemics, and it has to have lost at least 70% of its original habitat.

Q11. C
Wildlife (Protection) Amendment Act, 2022:
The number of schedules has been reduced to four (from six):

- Schedule I containing animal species enjoying the highest level of protection.
- Schedule II for animal species subject to a lesser degree of protection.
- Schedule III for protected plant species, and
- Schedule IV for scheduled specimens under CITES.

Q12. D
Nokrek National Park, located in the Garo Hills of Meghalaya, India, is known for its diverse range of flora and fauna. It is part of the Nokrek Biosphere Reserve and is recognized as an important habitat for the red panda, which is an endangered species. The park's unique

montane forest environment provides a suitable habitat for the red panda, among other rare and endemic wildlife.

Q13. A
Sri Venkateswara National Park is located in the Seshachalam Hills range of the Eastern Ghats in Andhra Pradesh.

Manas National Park: Manas National Park is located in Assam, India, and is contiguous with the Royal Manas National Park in Bhutan. The park is bounded by Manas river an important tributary of Brahmaputra River in the north.

Valmiki National Park is the only national park in Bihar. It's situated in the Himalayan Terai region and is bordered by the Gandak River. It is quite a distance from the main course of the Ganga River.

Q14. B
Nanda Devi is part of the UNESCO MAB programme.
Both Dibru-Saikhowa and Dehang-Dibang are not part of the UNESCO MAB programme.

Q15. A

Loss of Sea Ice and Ice-Albedo Feedback: Ice and snow have high albedo, meaning they reflect most of the solar energy back into space. When they melt, they reveal darker surfaces (like ocean water or land), which absorb more solar energy, leading to further warming and more ice melt. This is a well-documented and significant driver of Arctic amplification.

Accelerated Ozone Depletion at Arctic Compared to Rest of the Planet: The primary driver of warming in the Arctic is the greenhouse gas emissions and the associated feedback loops, including ice-albedo feedback, not specifically accelerated ozone depletion in the Arctic.

Q16. D

Lapse rate feedback does involve changes in the temperature gradient, or lapse rate, due to global warming.

Positive lapse rate feedback is related to the situation where the warming of the surface is more pronounced compared to the upper atmosphere, reducing the lapse rate and amplifying the greenhouse effect.

Negative lapse rate feedback is less commonly discussed but would involve a scenario where the upper atmosphere warms more than the lower atmosphere, increasing the lapse rate and potentially leading to less surface warming relative to the upper atmosphere.

Lapse rate feedback and water vapor feedback are interrelated, as changes in water vapor concentration can significantly affect the lapse rate and vice versa. They are not independent components but rather closely connected in the Earth's climate system.

Q17. B

The term "radiative forcing" is used by scientists to understand how various factors affect the Earth's climate system, particularly in the context of global warming. It is defined as the change in energy flux (incoming or outgoing) in the atmosphere attributable to a particular factor, such as changes in greenhouse gas concentrations, aerosols, or solar radiation.

Q18. D

- Chlorofluorocarbons (CFCs): CFCs are potent greenhouse gases, even though they are better known for their role in ozone depletion in the stratosphere.
- Hydrochlorofluorocarbons (HCFCs): HCFCs are greenhouse gases, albeit less potent and less long-lived than CFCs. They are used as transitional substitutes for CFCs.
- Hydrofluorocarbons (HFCs): HFCs are greenhouse gases used as replacements for CFCs and HCFCs in applications like refrigeration and air conditioning.
- Perfluorocarbons (PFCs): PFCs are synthetic greenhouse gases with a high global warming potential, used in various industrial applications.
- Sulfur hexafluoride (SF6): SF6 is a potent greenhouse gas used primarily in the electrical industry for insulation and to quench arcs.
- Nitrogen Trifluoride (NF3): NF3 is used in the semiconductor and certain other industries, and it's a potent greenhouse gas.
- Ozone (O3): While ozone in the stratosphere protects life on Earth by absorbing ultraviolet radiation, tropospheric ozone (near the Earth's surface) acts as a greenhouse gas and is a component of smog.

Q19. A
Agriculture and animal rearing, particularly enteric fermentation in livestock (like cattle, sheep, and goats), manure management, and rice paddies, are significant sources of methane emissions.

Q20. A
The ozone layer filters out most, but not all, of the sun's harmful ultraviolet (UV) radiation. Specifically, it absorbs a large part of the UV-B and all of UV-C rays from the sun, while allowing most of the UV-A and other forms of radiation to pass through. Some UV-B radiation, which is harmful to living organisms, does reach the Earth's surface.

Q21. D
HFCs have high green warming potential but they are not ozone depleting. Kigali agreement is result of an amendment to Montreal protocol. India has both signed and ratified the agreement.

Q22. A
The UNEP Emissions Gap Report (EGR) series tracks our progress in limiting global warming well below 2°C and pursuing 1.5°C in line with the Paris Agreement.
Adaptation gap report looks at progress in planning, financing and implementing adaptation actions.

Q23. D
The Bonn Challenge is a global goal to bring 150 million hectares of degraded and deforested landscapes into restoration by 2020 and 350 million hectares by 2030. Launched by the Government of Germany and IUCN in 2011.

Q24. A
Conocarpus trees seen in an invasive mangrove species banned by few state governments in India. Recently, Gujarat government has banned the planting of these ornamental trees “in forest or non-forest areas.

Q25. A
The "Kunming-Montreal" part of the name itself refers to two different locations associated with the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD). The COP15 of the CBD, where the KMGBF was adopted, took place in Montreal, Canada, not Glasgow, Scotland. Glasgow was the host city for COP26 of the United Nations Framework Convention on Climate Change (UNFCCC), not the CBD.

The Aichi Biodiversity Targets were the previous set of global biodiversity targets under the CBD for the period of 2011-2020. The Kunming-Montreal Global Biodiversity Framework was adopted as a successor to the Aichi targets, establishing a new set of goals and targets for the post-2020 period. It is not declared under the Aichi targets but rather builds upon the lessons learned from them and aims to address the urgent need to halt biodiversity loss and protect ecosystems.
Like many international agreements and frameworks, the goals and targets set out in the KMGBF are non-binding.

Q26. D
India does have a significant portion of the world's wild tiger population, but it's closer to 75% or slightly more, not as high as 95%.

In 2022, the maximum number of tigers, 785, were reported to be in Madhya Pradesh, followed by Karnataka (563), Uttarakhand (560), and Maharashtra (444). Nearly a quarter of the tigers were reportedly outside protected areas.

The reserves with the maximum number of tigers were at the Corbett National Park in Uttarakhand, which reported 260 animals, followed by Bandipur (150), and Nagarhole (141), both in Karnataka.

Q27. A
The COP 19, 2013 established the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts (Loss and Damage Mechanism), to address loss and damage associated with impacts of climate change, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects.

Q28. B

The global decrease in biodiversity due to natural climatic variations is not an indicator of Anthropocene epoch which aims to highlight human being impact on nature. All other options are correct.

Q29. D
The Bengal Tiger, African Lion, and Jaguar are all part of the Panthera genus, which is within the Felidae family. They share several characteristics, including the ability to roar due to specific adaptations in their throat and larynx.

The Cheetah, however, while also a big cat and a member of the Felidae family, belongs to a different genus, Acinonyx. Cheetahs are unique for their incredible speed and specialized hunting adaptations. They do not have the same anatomical structure that allows the other big cats to roar. Therefore, the Cheetah does not belong to the same taxonomic rank (genus) as the other three.

Q30. A
During the summit, the first global stocktake (GST) concluded. According to the UNFCCC, the GST "enables countries and other stakeholders to see where they are collectively making progress towards meeting the goals of the Paris Agreement – and where they are not".

Countries' decision at COP28 to transition away from fossil fuels was coupled with an ambition to triple renewable energy capacity by 2030.

The COP28 Presidency also introduced ALTÉRRA, an investment initiative with an ambitious goal to globally mobilise an unprecedented sum of $250 billion by 2030.

One key issue of contention was fossil-fuel subsidies. While developed countries advocated for phasing them out, developing countries, including India, refused over a phase-out's implications on economic growth and development. Such a phase-out also has social implications: several communities rely on fossil fuels (coal, in India's case) for gainful employment.

Q31. D
Rising temperatures cause permafrost (permanently frozen ground) to thaw, releasing methane and CO2, potent greenhouse gases that further accelerate global warming. It can also destabilize of infrastructure in Arctic regions due to ground subsidence and release ancient viruses and bacteria that have been dormant for thousands of years.

Q32. A
Silent Valley National Park, Kerala is nestled in the Nilgiri Hills, the park is drained by the Kunthi River and features tropical evergreen rainforest. Lion-Tailed Macaque can be spotted in the Park.

Q33. B
All are Birds. Malabar Parakeet is endemic to the Western Ghats. Ashambu laughingthrush or Travancore laughingthrush is found in the Western Ghats in southern Kerala and

southern Tamil Nadu. White-bellied blue robin or white-bellied sholakili is endemic to the Shola forests of the higher hills of southern India

Q34. D
Nagarjunsagar-Srisailam a tiger reserve located in Andhra Pradesh is the largest tiger reserve of India but not a national park till now.

Q35. B
Tardigrade is known for extraordinary survival skills which includes withstanding temperatures as low as -272°C and as high as 150°C, being exposed to the vacuum of outer space, being blasted with 500 times the dose of X-rays that would kill a human. In response to adverse conditions, it can enter a state of cryptobiosis, where their metabolic activities nearly stop. It may have survived last 5 major extinction events.

Q36. A
The International Treaty on Plant Genetic Resources for Food and Agriculture was adopted by the Thirty-First Session of the Conference of the Food and Agriculture Organization of the United Nations on 3 November 2001.
The Treaty aims at:

- recognizing the enormous contribution of farmers to the diversity of crops that feed the world;
- establishing a global system to provide farmers, plant breeders and scientists with access to plant genetic materials;
- ensuring that recipients share benefits they derive from the use of these genetic materials.

However, 3rd statement is not correct.

Q37. A
The Kigali Amendment to the Montreal Protocol is an international agreement to gradually reduce the consumption and production of hydrofluorocarbons. It is a legally binding agreement designed to create rights and obligations in international law.

Q38. C
Polar stratospheric clouds (PSCs) contribute to Ozone depletion by

- They remove nitrogen compounds that moderate the destructive impact of chlorine.
- They provide a surface which converts benign forms of chlorine into reactive, ozone-destroying forms.

Q39. A
.Central Zoo Authority, National Board for Wildlife, Wildlife crime control bureau, National tiger conservation Authority are established under Wildlife Protection Act, 1972.

Genetic Engineering Appraisal Committee and National Ganga Council are established under Environment Protection Act, 1986.

Q40. A

The formation of the ozone layer begins with the photodissociation of oxygen molecules (O_2) into individual oxygen atoms by UV-C radiation. These oxygen atoms then combine with O_2 molecules to form ozone (O_3).

Meanwhile, ozone molecules can absorb UV-B radiation, which leads to their dissociation back into O_2 and a free oxygen atom, a process that can also result in the reformation of ozone. This cycle of formation and destruction creates a concentration of ozone high enough to significantly reduce the amount of UV radiation that reaches the Earth's surface.

Thus it's accurate to argue that the dynamic equilibrium of ozone formation and destruction in the stratosphere is foundational to the creation and sustenance of the ozone layer, which in turn provides protection from harmful UV rays. Therefore, Statement II does inherently contribute to explaining why the ozone layer exists and how it functions to protect life on Earth from UV radiation.

Q41. D
Climate sensitivity is typically defined as the global temperature rise following a doubling of CO_2 concentration in the atmosphere compared to pre-industrial levels.

Q42. D
Nationally Determined Contribution (NDC) of Idnia
(a) To reduce emissions Intensity of its GDP by 45% by 2030, from 2005 level.
(b) To achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.
(c) To create an additional carbon sink of 2.5 to 3 billion tonnes of CO_2.

To produce 5 MMT of green hydrogen by 2030 is an objective under National Green Hydrogen mission but not a target under NDC.

Q43. B
Land degradation and desertification can contribute to climate change by reducing the land's ability to sequester carbon dioxide. Vegetation plays a crucial role in capturing CO_2 from the atmosphere, and its loss due to degradation and desertification diminishes this carbon sink capability, thus contributing to increased atmospheric CO_2 levels.

Climate change can contribute to land degradation and desertification through increased temperatures, altered precipitation patterns, and increased frequency and intensity of extreme weather events such as droughts and floods. These changes can exacerbate soil erosion, reduce soil fertility, and diminish water availability, leading to further degradation and desertification.

While both statements are correct, Statement II is not the correct explanation for Statement I. They describe a bidirectional relationship where each can contribute to the other, rather than a unidirectional causal relationship.

Q44. B
Different types of biodiversity include:

- **Genetic diversity:** A single species might show high diversity at the genetic level over its distributional range. The genetic variation shown by the medicinal plant Rauwolfia vomitoria growing in different Himalayan ranges might be in terms of the potency and concentration of the active chemical (reserpine) that the plant produces. India has more than 50,000 genetically different strains of rice, and 1,000 varieties of mango.
- **Species diversity:** The diversity at the species level. For example, the Western Ghats have greater amphibian species diversity than the Eastern Ghats.
- **Ecological diversity:** At the ecosystem level, India, for instance, with its deserts, rain forests, mangroves, coral reefs, wetlands, estuaries, and alpine meadows has a greater ecosystem diversity than a Scandinavian country like Norway.

Q45. C
Cartagena protocol is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms

Nagoya protocol is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms.

Both are under CBD.

Q46. B
Natural heritage sites

- Great Himalayan National Park Conservation Area
- Kaziranga National Park
- Keoladeo National Park
- Manas Wildlife Sanctuary
- Nanda Devi and Valley of Flowers National Parks
- Sundarbans National Park
- Western Ghats

Mixed Heritage Site

- Khangchendzonga National Park

Q47. C
Irrawaddy dolphins in their natural habitat in India can be seen in Chilika lake.

Q48. A
Nilgiri Biosphere Reserve: Intersection of Tamil Nadu, Karnataka, and Kerala
National Parks: Bandipur, Mudumalai, Nagarhole, Silent Valley, Wayanad

Q49. A
Both are correct and Statement II is correct explanation of Statement I.

Q50. C
Hemis National Park: Eastern Ladakh
Known for High-altitude terrain, including valleys, mountains, and alpine Forests and Arctic desert climate.
There is limited vegetation due to high altitude; primarily alpine trees and herbs. Snow leopard can be spotted here.
It's the largest national park in South Asia and is particularly significant for its snow leopard populations.

Here is the list of **Top-10 Biggest National Parks** in India:

S. No.	Name	Area (in sq.km)	State	Year of establishment
1.	Hemis National Park	4,400	Ladakh	1981
2.	Desert National Park	3,162	Rajasthan	1981
3.	Gangotri National Park	2,390	Uttarakhand	1989
4.	Namdapha National Park	1.,985.2	Arunachal Pradesh	1983
5.	Khangchendzonga National Park	1,784	Sikkim	1977
6.	Guru Ghasidas (Sanjay) National Park	1,440.7	Chhattisgarh	1981
7.	Sundarban National Park	1,330.1	West Bengal	1984
8.	Indravati National Park	1,258.4	Chhattisgarh	1975
9.	Papikonda National Park	1,031	Andhra Pradesh	2008
10.	Kanha National Park	940	Madhya Pradesh	1955