**Q.1) Consider the following statements.**

1. Telangana is the first state to have eco-friendly bridges for the movement of tigers.
2. National Tiger Conservation Authority will be the nodal agency for recommending the size and location of eco-bridge.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

**Q.1) Solution (a)**

First of its kind, **Telangana State** will have eco-friendly bridges over a canal cutting across the tiger corridor linking the Tadoba-Andhari Tiger Reserve.

**Tiger corridor linking the Tadoba-Andhari Tiger Reserve (TATR)** in the Chandrapur district of Maharashtra with the forests in Telangana's Kumram Bheem Asifabad district.

The 'eco-bridges' will be constructed at key spots along the 72 km-long with the laying of fertile soil to grow grass and plants over the structure, so that fragmentation of the reserve forest is camouflaged.

**National Board of Wildlife** will be the nodal agency for recommending the size and location of eco-bridge.

**Do you know?**

**Why is eco-Bridge needed?**

- Maintain biodiversity conservation and are important for country's ecological security.
- Help in colonizing new area thus safeguard themselves from inbreeding.
- Reduce man-animal conflict.
- Fulfill the migratory need of animals.

**THINK!**

- Green corridor

**Q.2) Consider the following statements about elephant conservation.**

1. Under Wildlife (Protection) Act, 1972 Elephant is a Schedule I animal.

2. Asian elephants are listed as "endangered" in the IUCN Red List of threatened species.
3. Project Elephant is a Centrally Sponsored Scheme.

**Which of the above statements is/are *incorrect*?**

a) 2 only
b) 2 and 3 only
c) All the above
d) None

**Q.2) Solution (d)**

**Steps Taken for Elephant conservation**

Wildlife (Protection) Act, 1972: Under it, Elephant is a **Schedule I animal.**

**IUCN Status**: Asian elephants are listed **as "endangered"** in the IUCN Red List of threatened species.

**Project Elephant:** It was launched in the year 1992 as a Centrally Sponsored Scheme

**Objectives:**

- To protect elephants, their habitat & corridors
- To address issues of man-animal conflict
- Welfare of captive elephants
- Elephant reserves are established across states to achieve above objectives.

**Do you know?**

**Elephant corridors**

These are narrow strips of land that allow elephants to move from one habitat patch to another. There are 88 identified elephant corridors in India.

**THINK!**

- Monitoring of Illegal Killing Of Elephants (MIKE) Programme

**Q.3) Consider the following statements about Animal Welfare Board of India.**

1. The Animal Welfare Board of India is a statutory advisory body.
2. The Animal Welfare Board of India set up in 1962, in accordance with Wildlife (Protection) Act 1972.

3. Shrimati Rukminl Devi Arundale pioneered the setting up of the Board, with its Headquarters at Chennai.

**Which of the above statements is/are correct?**

a) 1 and 2 only
b) 1 and 3 only
c) 2 and 3 only
d) All the above

**Q.3) Solution (b)**

The Animal Welfare Board of India is a **statutory advisory body** on Animal Welfare Laws and promotes animal welfare in the country.

The Animal Welfare Board of India, the first of its kind to be established by any Government in the world, was set up in 1962, in accordance with Section 4 of **the Prevention of Cruelty to Animals Acts 1960.**

**Shrimati Rukminl Devi Arundale** pioneered the setting up of the Board, with its Headquarters at Chennai. She guided the activities of the Board for nearly twenty years till her demise in 1986.

**Do you know?**

**Functions of The Animal Welfare Board of India**

- To keep the law in force in India for the Prevention of Cruelty to Animals under constant study and to advise the government on the amendments to be undertaken in any such law from time to time.
- To advise the Central Government on the making of rules under the Act with a view to preventing unnecessary pain or suffering to animals generally, and more particularly when they are being transported from one place to another or When they are used as performing animals or when they are kept in captivity or confinement.

**THINK!**

- Central Zoo Authority.

**Q.4) Consider the following statements about Coalition Against Wildlife Trafficking.**

1. It works to end the illegal trade in wildlife and wildlife products.
2. It is an intergovernmental treaty under the aegis of UNEP.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

**Q.4) Solution (a)**

The Coalition Against Wildlife Trafficking (CAWT) aims to focus public and political attention and resources on **ending the illegal trade in wildlife and wildlife products.**

Initiated in 2005, CAWT is a **unique voluntary public-private coalition** of like-minded governments and organizations sharing a common purpose.

**Do you know?**

- The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, aquatic and avian migratory species throughout their range.
- **It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme,** concerned with the. Conservation of wildlife and habitats on a global scale.

**THINK!**

- TRAFFIC

**Q.5) Consider the following statements.**

1. The Global Tiger Forum (GTF) is an intergovernmental and international body to save the tiger species in the wild.
2. Global Tiger Alliance is an alliance of governments, international agencies, civil society, and the private sector united to save wild tigers from extinction.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

**Q.5) Solution (c)**

**THE GLOBAL TIGER FORUM (GTF)**

**The Global Tiger Forum (GTF) is an intergovernmental and international body established with members from willing countries** to embark on a worldwide campaign, common approach, promotion of appropriate programmes and controls to save the remaining five sub-species of tigers in the wild distributed Over 14 tiger range countries of the world.

Formed in 1994 with its secretariat at New Delhi, GTF is the only inter-governmental & international body campaigning to save the TIGER worldwide. The General Assembly of GTF shall meet once in three years.

**Global Tiger Initiative**

An alliance of governments, international agencies, civil society, and the private sector united to save wild tigers from extinction.

**Do you know?**

- The Economic and Social Council of the United Nations (ECOSOC), established the **United Nations Forum on Forests (UNFF).** In October 2000, a subsidiary body with the main objective to promote "the management, conservation and sustainable development of all types of forests and to strengthen long term political commitment to this end" based on **the Rio Declaration, the Forest Principles, Chapter 11 of Agenda 21** and the outcome Of **Intergovernmental Panel on Forests (IPF)/intergovernmental Forum on Forests (IFF)** processes and other key milestones of international forest policy.

**THINK!**

- The International Tropical Timber Organization (ITTO).

**Q.6) Consider the following statements.**

1. Rajasthan is the first state to have India's first wildlife conservation reserve dedicated exclusively to the blackbuck.
2. Blackbucks are native to the Indian subcontinent that has been classified as endangered (IUCN) in 2017.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

**Q.6) Solution (d)**

**India's first wildlife conservation reserve** dedicated exclusively to the blackbuck has been approved by the state government in **the trans-Yamuna region of Allahabad** in Uttar Pradesh under Wildlife Protection Act, 1972. It is the "first ever conservation reserve" of any kind in U.P.

**They are native to the Indian subcontinent that has been classified as Least Concerned in 2017** (earlier status was near threatened by IUCN since 2003). They are now extinct in Bangladesh and Pakistan.

**Do you know?**

- Bishnoi community is known as protectors of Blackbuck.

**THINK!**

- Amrita Devi Bishnoi Wildlife Protection Award

**Q.7) Consider the following statements.**

1. Environmental Information System (ENVIS) is a centrally sponsored scheme, being implemented by MoEF&CC since 1982-83.
2. ENVIS Hubs and ENVIS Resource Partners (RPs) are part of its network.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) None

**Q.7) Solution (b)**

**Environmental Information System (ENVIS**)

It is a **central sector scheme** not sponsored, being implemented by MoEF&CC since 1982-83.

It is a decentralized network of centers of which some centers dealing with ''State of the Environment and Related Issues'' are hosted by State Government /UT Administrations, called ENVIS Hubs.

Some are hosted by environment-related governmental and non-governmental organizations/ institutes of professional excellence, with varied thematic mandates

pertaining to environment, called the ENVIS Resource Partners (RPs).

**Do you know?**

- **Green Skills:** Green skills are those skills needed to adapt products, services and processes to climate change and the related environmental requirements and regulations. They include the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society. (OECD definition)
- These skills are required in areas such as such as Renewable energy, Waste water treatment, Climate resilient cities, Green construction, Solid waste management etc.

**THINK!**

- Green Skill Development Programme (GSDP).

**Q.8) Which of the following statements are correct regarding 'Hope spots'?**

1. These are the regions of low biodiversity where species have been destroyed because of a natural calamity and can be restored by human intervention.
2. A hope spot is an area of an ocean that needs special protection because of its wildlife and significant underwater habitats.
3. India does not have any hope spots.

**Which of the above statements are NOT correct?**

a) 1 and 2
b) 2 only
c) 1 and 3
d) All of the above

**Q.8) Solution (c)**

Note: Incorrect options have been asked.

**Hope Spot**

A hope spot is an area of an ocean that needs special protection because of its wildlife and significant underwater habitats.

Andaman and Nicobar Islands and Lakshadweep islands have recently been named as the new "hope spots" by the International Union for Conservation of Nature (IUCN) and Mission Blue, an organization involved in the study of oceans.

The two group of islands, considered extremely rich in marine biodiversity, are the first places in India to have been added in the list of 50 global 'hope spots'. Earlier, 13 hope spots had been identified all around the world. The additional list of 31 new hope spots was released by IUCN and Mission Blue.

While about 12 percent of the land around the world is now under some form of protection (as national parks etc.), less than six percent of the ocean is protected in any way. Hope Spots allow us to plan for the future and look beyond current marine protected areas (MPAs), which are like national parks on land where exploitative uses like fishing and deep sea mining are restricted. Hope Spots are often areas that need new protection, but they can also be existing MPAs where more action is needed. They can be large, they can be small, but they all provide hope due to:

- A special abundance or diversity of species, unusual or representative species, habitats or ecosystems
- Particular populations of rare, threatened or endemic species
- A site with potential to reverse damage from negative human impacts
- The presence of natural processes such as major migration corridors or spawning grounds
- Significant historical, cultural or spiritual values
- Particular economic importance to the community

**THINK!**

- Mission Blue

**Q.9) Consider the following statements:**

1. Rock Nitrogen is the nitrogen trapped in the Rocks.
2. Rock nitrogen is available to the plants due to weathering of the rocks.

**Which of the above statements are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.9) Solution (c)**

**Rock Nitrogen**

- Prevailing science has indicated that all of the nitrogen on Earth available to plants comes from the atmosphere BUT, more than a quarter comes from Earth's bedrock
- Nitrogen weathering is a globally significant source of nutrition to soils and ecosystems worldwide

**Weathering**

- Ecosystems need nitrogen and other nutrients to absorb carbon dioxide pollution, and there is a limited amount of it available from plants and soils.
- If a large amount of nitrogen comes from rocks, it helps explain how natural ecosystems like boreal forests are capable of taking up high levels of carbon dioxide.
- But not just any rock can leach nitrogen. Rock nitrogen availability is determined by weathering, which can be physical, such as through tectonic movement, or chemical, such as when minerals react with rainwater.
- Large areas of Africa are devoid of nitrogen-rich bedrock while northern latitudes have some of the highest levels of rock nitrogen weathering
- Mountainous regions like the Himalayas and Andes are estimated to be significant sources of rock nitrogen weathering, similar to those regions' importance to global weathering rates and climate.
- Grasslands, tundra, deserts and woodlands also experience sizable rates of rock nitrogen weathering.

https://www.pressreader.com/india/the-hindu/20180408/282265256001513

**Q.10) Recently President of India has planted a Baobab tree in Rashtrapati Bhawan. Which of the following statements regarding Baobab are correct?**

1. It is native to Australia and has high medicinal and nutrition value.
2. In India, it is found in small pockets at Gujarat, Maharashtra and Jharkhand.
3. Baobab has high levels of vitamin C, potassium, phosphorous and antioxidants.

**Select the code from following:**

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

**Q.10) Solution (b)**

**Baobab Tree**

- The Baobab, known in India as kalpavriksha or a wish-fulling tree, is a rare sight.
- Across the country, not more than 200 are found say conservationists; mostly in isolated pockets of Gujarat, Maharashtra and a few in Jharkhand.
- The Baobab has high medicinal and nutritional value, much like the Neem tree.
- The Baobab is native to Africa and of the nine species of genus Adansonia in the world, Madagascar is home to six species, while two are native to mainland Africa and the Arabian Peninsula, and one is native to Australia.
- People in many African countries use the Baobab to treat malaria and infertility.
- Baobab powder is very popular in European market ; it used to make porridge and smoothies.
- Baobab has high levels of vitamin C, potassium, phosphorous and antioxidants.
- It lives for 2000 years

https://www.ndtv.com/india-news/this-tree-lives-for-2000-years-president-kovind-plants-a-baobab-sapling-at-rashtrapati-bhavan-garden-1832277

**Q.11) A recent study shows that flowering plants have evolved to produce a 'Blue Halo' from there petals. Which of the following statements is correct regarding the Blue Halo?**

a) It is invisible to humans but lure pollinating bees
b) It repels the harmful insects by triggering their panic centers.
c) It helps in repelling the harmful UV radiations coming from the sun.
d) None of the above

**Q.11) Solution (a)**

**Blue Halo**

- Hundreds of flower species have evolved the ability to project ethereal halos of blue light invisible to humans in order to lure pollinating bees.
- In laboratory experiments, bumblebees were drawn to synthetic flowers designed to generate the same kind of ultraviolent rings.
- The effect occurs in the ultraviolent part of the optical spectrum that we cannot see, but bees can.

- Previous studies have shown that bees in search of nectar-giving plants are attracted to odours, but take most of their cues from colours and petal shapes. Bees are especially sensitive to the band of colours on the light spectrum where blue graduates into ultraviolent.

**Process**

- Many flowers lack the genetic and biochemical capability to manipulate pigment chemistry into the blue-to-ultraviolent spectrum.
- So arranging the molecules in petals so that reflected sunlight will produce a blue halo emerged as an alternative evolutionary strategy to attract pollinators.
- Remarkably, otherwise divergent species wound up with the same lure.
- Findings suggest the petal ridges that produce 'blue halos' evolved many times across different flower lineages, all converging on this optical signal for pollinators.

**Think**

- Pollination
- Key stone species

**Q.12) Amidst huge protest from the environmentalists, Ministry of Environment and Forest has given clearance to Athirapally project. In which state is it located?**

a) Tamil Nadu
b) Karnataka
c) Kerala
d) Andhra Pradesh

**Q.12) Solution (c)**

**Athirapally Project**

**Location:** Athirapally waterfalls, Chalakudy river, Kerala

Capacity: 163 MW

The dam is proposed on the Chalakudy River which is 5$^{th}$ largest river in Kerala with 144 kms length. The Chalakudy River is a tributary of the Periyar River and originates in the Anamalai region of Tamil Nadu. The famous Athirapally and Vazhachal waterfalls are situated on this

river. Athirapally waterfall is situated at 1000ft MSL and falling from a height of 80 fts. It is largest waterfall in the state.

**In news:**

The Union Ministry of Environment and Forest has sanctioned clearance for this proposed project on July 19, 2007 but environmentalist are against this project because it will result in enormous destruction of the riparian ecosystem.

**Facts:**

The proposed dam will affect 138.6 hector of forestland and livelihood of tribal families depending on the forest and river.

Also a stretch of 28.5 hectares of riparian forest falls under the submergence area while it will reduce or dry up the water-flow of Athirapally waterfall which harnesses ecology and tourism in this area.

EIA and Public hearing was not done before implementation of this program.

The Western Ghats Ecology Expert Panel (WGEEP),led by Mr. Gadgil, constituted by Union Ministry of Environment and Forests to suggest conservation measures for Western Ghats has rejected this proposal.

**Q.13) Which of the following species are known as the 'Panda of the sea'?**

a) King Penguin
b) Walrus
c) Vaquita porpoise
d) Indian Dugong

**Q.13) Solution (c)**

**Vaquita Porpoise**

With an estimated 30 or fewer individuals remaining, vaquita porpoise — the world's most endangered marine mammal — may go extinct by 2018 if no action is taken to save them, a new study warns.

**Highlights**

- Known as the 'panda of the sea' because of its distinctive markings, the vaquita is endemic to the Upper Gulf of California.
- Unsustainable fishing practices and illegal wildlife trade driven by demand for the swim bladder, has caused the vaquita population to plummet.
- Listed as the most endangered cetacean in the world these mammals are often accidentally killed in gillnets also.

**Q.14) Consider the following statements regarding 'Chinnar Wildlife Sanctuary'?**

1. CWS the only rehabilitation centre for star tortoises in the country.
2. CWS is the only place in Kerala where star tortoises are known to occur in the wild
3. Pet trade and poaching has made Star Tortoise critically endangered.

**Select the code from following:**

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

**Q.14) Solution (a)**

**Chinnar Wildlife Sanctuary (CWS)**

- CWS the only rehabilitation centre for star tortoises in the country.
- CWS is the only place in Kerala where star tortoises are known to occur in the wild
- Chinnar Wildlife Sanctuary (CWS) is located in the Idukki district of Kerala
- The conservation status of Star Tortoise is Vulnerable.

http://www.thehindu.com/sci-tech/energy-and-environment/chinnar-wildlife-sanctuary-hitches-wagon-to-star-tortoises/article18410581.ece

**Q.15) Which among the following are species endemic to the Western Ghats?**

1. Malabar large-spotted civet
2. Lion-tailed macaque
3. Brown palm civet
4. Nilgiri tahr

**Choose the correct answer using the codes below:**

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

**Q.15) Solution (d)**

Among the species endemic to the Western Ghats are the Malabar large-spotted civet, lion-tailed macaque, brown palm civet and Nilgiri tahr. Hence option (d) is the answer.

**Do you know?**

Recognised as one of the world's eight "hottest hotspots" of biological diversity, the Western Ghats is older than the Himalayan mountain range.

The forests are home to more than over a thousand species, including 300 species of globally threatened flora and fauna. The major vegetation types are tropical evergreen forests, moist deciduous forests, dry deciduous forests, scrub jungles, sholas, peat bogs and swamps.

**THINK!**

- Neelakurinji

**Q.16) Which of the following substances are Ozone depleting substances?**

1. Methyl Chloroform
2. Hydrochlorofluorocarbons
3. Methyl Bromide
4. Methyl Iodide

**Select the correct answer using the codes:**

a) 1, 2 and 3 only
b) 1, 2 and 4 only
c) 1 and 3 only
d) All of the above

**Q.16) Solution (a)**

Methyl Iodide is a naturally occurring substance, however it does not has ozone-depleting properties. Methyl iodide was tested as a possible replacement for methyl bromide as a soil fumigant due to the scheduled removal of methyl bromide from the market. Methyl iodide is a better methylating agent than methyl bromide; it is rapidly destroyed by UV light and therefore unlikely to be involved in stratospheric ozone depletion. The United States Environment Protection Agency has designated the compound a non-ozone layer depleter.

**THINK!**

- Ozone related conventions and protocols

**Q.17) Consider the following statements regarding Earth Hour:**

1. It is a worldwide movement organized by UNEP and UNESCO.
2. The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their essential lights for 2 hours.
3. It is held annually to raise awareness about the climate change and the need to save the planet.

**Choose the correct codes:**

a) 1 and 3
b) 2 and 3

c) 2 only
d) 3 only

**Q.17) Solution (d)**

Earth hour is a worldwide movement for the planet organized by the **World Wide Fund for Nature**. The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their essential lights for One hour, from 8:30 to 9:30 pm, towards the end of March, as a symbol for their commitment to the planet.

It was famously started as a lights-off event in Sydney, Australia, in 2007. Since then, it has grown to engage more than 7000 cities and towns worldwide.

Today, Earth Hour engages a massive mainstream community on a broad range of environmental issues. It is held annually to raise awareness about the climate change and the need to save the planet. The One Hour event continues to remain the key driver of the now larger movements.

**Q.18) Which of the following defines the term Putrescibility correctly:**

a) It is the process of decomposition of inorganic matter in water by microorganisms using oxygen
b) It is the process of decomposition of organic matter in water by microorganisms using oxygen
c) It is the process of decomposition of inorganic matter in air by microorganisms using oxygen
d) It is the process of decomposition of organic matter in air by microorganisms using oxygen.

**Q.18) Solution (b)**

**Putrescibility:** It is the process of decomposition of organic matter in water by microorganisms using oxygen.

**Do you know?**

Putrescible waste is "solid waste that contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to cause obnoxious odors and to be capable of attracting or providing food for birds or animals.

Basically, putrescibles are the bits of garbage that decompose and get stinky. This can include food waste, used diapers, and pet waste.

**Q.19) Consider the below statements about Marine Ecosystem:**

1. They serve as the sink of a large quantity of runoff and wastes from land.
2. Marine water has a high salt content and rich in nitrates and phosphates as compared to freshwater.
3. Marine ecosystem provide good habitat for phytoplankton, zooplankton, aquatic plants and fishes.

**Which of the statements given above is/are correct?**

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

**Q.19) Solution (a)**

**Marine Ecosystem**

- Oceans occupy 70 per cent of earth's surface, offering habitat to numerous plants (mainly algae), animals like zoo plankton, shrimps, oysters, fishes, reptiles, birds and mammals. They serve as the sink of a large quantity of runoff and wastes from land.
- Marine water has a high salt content (about 3.5% by weight) and poor fertility due to lack of nitrates and phosphates as compared to freshwater.
- Marine life is abundant near the shore and in the continental shelf. The species include commercial fishes, large sea mammals like whales and seals.

**Freshwater Ecosystem**

- Freshwater bodies (ponds, lakes, rivers, springs) are rich in nutrients (nitrates, phosphates) and provide good habitat for phytoplankton, zooplankton, aquatic plants and fishes.

**Q.20) Troides minos is the largest butterfly in India. What is the name of the largest butterfly in the world?**

a) Queen Alexandra's birdwing

b) Large Blue
c) Lesser Monarch
d) Giant Galapago

**Q.20) Solution (a)**

Queen Alexandra's birdwing, is the largest butterfly in the world, with females reaching wingspans slightly in excess of 25 cm (9.8 inches).

This birdwing is restricted to the forests of the Oro Province in eastern Papua New Guinea.

The species is endangered, and is one of only three insects (the other two being butterflies as well) to be listed on Appendix I of CITES, making international trade illegal.

**Do you know?**

- The Queen Alexandra's birdwing was discovered by English naturalist and wildlife collector Albert Stewart Meek in 1906.
- Male Queen Alexandra's birdwings are smaller than the females, but have much brighter colors. Their wings are a shimmering emerald green-blue color, with black stripes and veins.
- Female Queen Alexandra's birdwings are larger than the males. Their wings are brown, and marked with rows of white spots and triangles.

**Q.21) The kurinji flower, that blooms every 12 years in the Western Ghats and the Nilgiris are called…**

a) Hardy flowering plants
b) Half-hardy flowering plants
c) Gregarious flowering plants
d) Non-gregarious flowering plants

**Q.21) Solution (c)**

Neela Kurinji or Strobilanthes kunthianus is a shrub predominantly found in the Shola forests of Western Ghats and Nilgiri Hills of South India. It flowers once in 12 years and dies immediately after producing seeds. Such plants are called gregarious flowering plants.

**Do you know?**

**Neela Kurinji in Western Ghats bloom once in twelve years, why?**

Flowering is influenced by the surroundings, temperature, time of exposure to sunlight, humidity and favourable circumstances for pollination, seed formation and seed dispersal.

Under these favourable conditions, the receptors such as phytochromes present in the leaves will send the signals to rush more nutrients, carbohydrates, sugars, water and florigens such as Gibberellins (plant hormones) to the meristems to produce floral buds. These floral buds bloom on receiving more sugars and water. But this blooming will take place only when the inhibitors concentration falls below certain critical levels.

In Kurinji plants this happens regularly after a gap of twelve years. The period between each flowering season is called the Oscillatory period. This is under the control of an endogenous oscillator.

In plants like Neela Kurinji, Bamboo etc, the plants take several years to gather resources and prepare them selves for flowering.

By this time the inhibitor levels in Kurinji must have fallen below the critical levels making it suitable for both flowering and seed formation. Hence mass pollination takes place and seed formation occurs. Once the seeds are shed the plants will die.

Hence it is the inbuilt oscillatory mechanism which is responsible for the mass flowering in Neela Kurinji which in turn is controlled by the inhibitors present in the plant itself.

**Q.22) Consider the following statements about International Rice Research Institute (IRRI)**

1. It aims to reduce poverty and hunger
2. Indian Council of Agricultural Research (ICAR) is IRRI's nodal agency in India
3. Global Rice Science Partnership (GRiSP) is being led in Asia by the International Rice Research Institute (IRRI)

**Select the correct fees**

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) All of the above

**Q.22) Solution (d)**

India began its partnership with IRRI through the Indian Council of Agricultural Research (ICAR) in 1967 when Indian scientists from ICAR's two main rice research centers—the Central Rice Research Institute (CRRI) in Cuttack and the Directorate of Rice Research (DRR)

in Hyderabad—began regularly visiting IRRI. Indian Council of Agricultural Research (ICAR) is IRRI's nodal agency in India.

It aims to reduce poverty and hunger, improve the health of rice farmers and consumers, and ensure environmental sustainability of rice farming.

It is headquartered in Los Baños, Laguna in the Philippines and offices in seventeen countries

India is setting up a regional centre of the IRRI in Varanasi

**CGIAR (formerly the Consultative Group for International Agricultural Research)**

- It is a global partnership that unites organizations engaged in research for a food-secured future.
- CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring sustainable management of natural resources.

**Global Rice Science Partnership (GRiSP)**

- Also known as the CGIAR Research Program on Rice, is an initiative of the CGIAR to bring together research and development partners from around the world to undertake and deliver rice research.
- Launched in November 2010, GRiSP aims to "aims to dramatically improve the ability of rice farmers to feed growing populations in some of the world's poorest nations".
- GRiSP is being led in Asia by the International Rice Research Institute (IRRI), in Africa by the Africa Rice Center (AfricaRice), and in Latin America by the International Center for Tropical Agriculture (CIAT).

**Think**

- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

**Source:** **http://www.thehindu.com/news/national/narendra-modi-visits-rice-research-institute-meets-indian-scientists/article20378607.ece**

**Q.23) Consider the following statements about 'Konyaks'**

1. They have the largest population among the Nagas
2. They have now adopted Buddhism
3. They were known for the tradition of headhunting

**Select the correct statements**

a) 1 and
b) 2 and 3
c) 1 and 3
d) All of the above

**Q.23) Solution (c)**

The Konyaks are a Naga people. They are easily distinguishable from other Naga tribes by their pierced ears; and tattoos which they have all over their faces, hands, chests, arms, and calves.

The Konyaks have the largest population among the Nagas. They are found in Tirap, Longding, and Changlang districts of Arunachal Pradesh; Sibsagar District of Assam; and also in Myanmmar. They are known in Arunachal Pradesh as the Wanchos-- 'Wancho' is a synonymous term for 'Konyak'. Ethnically, culturally, and linguistically the Noctes of the same neighbouring state of Arunachal Pradesh, are also closely related to the Konyaks.

The Konyak language belongs to the Northern Naga sub branch of the Sal subfamily of Sino-Tibetan.

The Konyaks were the last among the Naga tribes to accept Christianity. In the past, they were infamous for marauding nearby villages of other tribes, often resulting in killings and decapitations of the heads of opposing warriors. The decapitated heads were taken as trophies and usually hung in the 'Baan' (a communal house). The number of hunted heads indicated the power of a warrior. The headhunting expeditions were often driven by, and founded on certain beliefs, code of honour; and, principles of loyalty and sacrifice.

**Source:** http://www.thehindu.com/news/cities/kozhikode/chronicling-the-konyaks/article19978027.ece

**Q.24) Consider the following statements about 'Gene Silencing'**

1. It aims to reduce or eliminate the production of a protein from its corresponding gene
2. It involves disabling the function of mRNA by preventing it from being translated into a protein
3. It can be used to treat Huntington's disease (HD) by targeting the mutant huntingtin protein

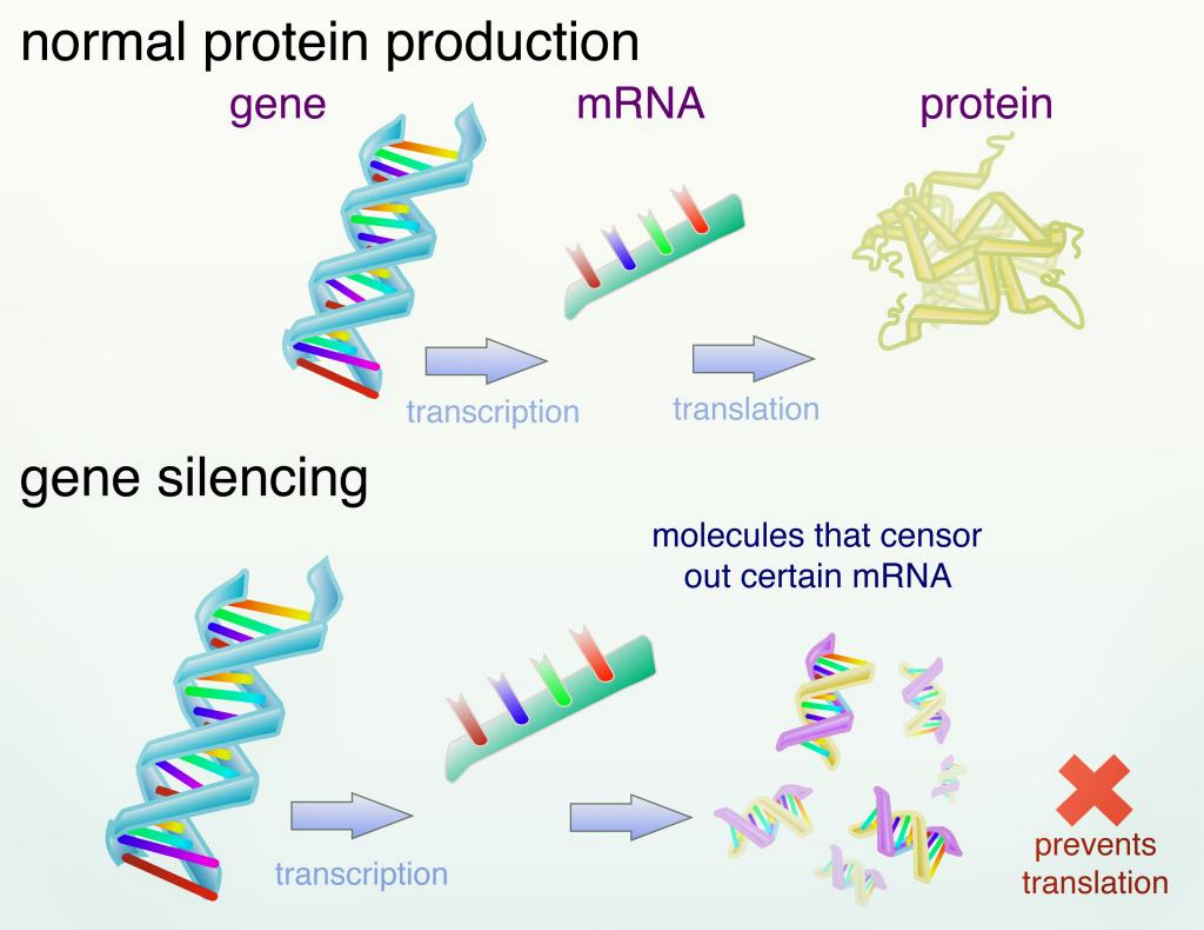
**Select the correct statements**

a) 1 Only
b) 1 and 3
c) 1 and 2
d) All of the above

**Q.24) Solution (d)**

As the name implies, gene silencing is a technique that aims to reduce or eliminate the production of a protein from its corresponding gene. Genes are sections of DNA that contain the instructions for making proteins. Proteins are essential molecules that perform an array of functions including signaling between cells, speeding up biochemical reactions, and providing structural support for the cell. Each gene is responsible for producing a corresponding protein in a two-step process. First, a copy of the information encoded in a gene is made in the form of messenger RNA (mRNA), a process known as transcription. This occurs in the nucleus of the cell, the cellular structure where all of the cell's genetic material is contained. The mRNA subsequently travels out of the nucleus, and the genetic information it carries is used to produce a specific protein, a process known as translation.

Instead of directly editing DNA or inhibiting the transcription process, the key idea behind gene silencing is intervening in gene expression prior to translation. By designing a molecule that can specifically identify and breakdown the mRNA carrying instructions for making a certain protein, scientists have been able to effectively decrease levels of that protein. Imagine the gene silencing molecule as a censor and mRNA as messages from genes that are broadcast into proteins: the molecule will censor out a specified mRNA message, preventing the corresponding protein from being broadcast into the cell, and thus silencing the gene that is providing these instructions. The ability to significantly lower the levels of a specific protein opens up many possibilities in scientific research and drug development, since proteins are critically involved in the proper function and structure of cells.




There are various gene silencing methods currently employed in research and being developed as potential disease therapeutics. Nearly all of them involve disabling the function of mRNA by preventing it from being translated into a protein.

Huntington's disease (HD) results from a mutation in the huntingtin gene that causes an excess of CAG repeats. The gene then forms a mutated huntingtin protein with polyglutamine repeats near the amino terminus. This disease is incurable and known to cause motor, cognitive, and behavioral deficits. Researchers have been looking to gene silencing as a potential therapeutic for HD.

Gene silencing can be used to treat HD by targeting the mutant huntingtin protein.

Gene silencing is often considered the same as gene knockdown. When genes are silenced, their expression is reduced. In contrast, when genes are knocked out, they are completely erased from the organism's genome and, thus, have no expression. Gene silencing is considered a gene knockdown mechanism since the methods used to silence genes, such as RNAi, CRISPR, or siRNA, generally reduce the expression of a gene by at least 70% but do not completely eliminate it. Methods using gene silencing are often considered better than gene knockouts since they allow researchers to study essential genes that are required for the animal models to survive and cannot be removed. In addition, they provide a more

complete view on the development of diseases since diseases are generally associated with genes that have a reduced expression.

**Source:** http://www.thehindu.com/sci-tech/agriculture/icrisat-researchers-make-peanuts-free-of-aflatoxin/article20048362.ece

**Q.25) Consider the following statements about 'International Indian Ocean Expedition' (IIOE-2)**

1. It is organised by the Indian-Ocean Rim Association
2. It focuses on oceanographic as well as atmospheric research

**Select the correct statements**

a) 1 Only
b) 2 Only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.25) Solution (b)**

The Second International Indian Ocean Expedition (IIOE-2) is a major global scientific program which will engage the international scientific community in collaborative oceanographic and atmospheric research from coastal environments to the deep sea over the period 2015-2020, revealing new information on the Indian Ocean (i.e. its currents, its influence upon the climate, its marine ecosystems) which is fundamental for future sustainable development and expansion of the Indian Ocean's blue economy.

IIOE-2, as the ongoing commemorative expedition is known, is organised by the Intergovernmental Oceanographic Commission (IOC) under the UN.

IIOE-1 was a watershed event for ocean research in India - it triggered the formation of several ocean-based research institutions in India like the NIO, NIOT, INCOIS and NCAOR & ocean studies departments in various universities. The event was among the factors instrumental in rechristening the Indian Naval Physical Laboratory in 1968 to NPOL as we are known today.

INS Sagardhwani was part of it.

**Source:** http://www.thehindu.com/news/cities/Kochi/sagardhwani-retraces-historic-indian-ocean-expedition-routes/article20790777.ece

**Q.26) 'Aditya - L1 Mission' is mean to observe**

1. Photosphere
2. Chromosphere
3. Corona

**Select the correct statements**

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

**Q.26) Solution (d)**

Aditya-1 was meant to observe only the solar corona. The outer layers of the Sun, extending to thousands of km above the disc (photosphere) is termed as the corona. It has a temperature of more than a million degree Kelvin which is much higher than the solar disc temperature of around 6000K. How the corona gets heated to such high temperatures is still an unanswered question in solar physics.

Aditya-L1 with additional experiments can now provide observations of Sun's Photosphere (soft and hard X-ray), Chromosphere (UV) and corona (Visible and NIR).

**Source:** https://www.isro.gov.in/aditya-l1-first-indian-mission-to-study-sun