Daily Current Affairs Prelims Quiz 19-04-2023 (Online Prelims Test)

1) Consider the following statements with respect to Electromagnetic Ion Cyclotron (EMIC) waves

1. EMIC waves are a form of plasma waves.
2. These waves are sensible electromagnetic emissions observed in the Earth's magnetosphere.
3. These waves are used to precipitate the killer electrons which are hazardous to space-borne technology/instruments.

Which of the statement(s) given above is/are correct?

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

Answer : d

Scientists have identified Electromagnetic Ion Cyclotron (EMIC) waves, a form of plasma waves in the Indian Antarctic station, Maitri

Electromagnetic Ion Cyclotron (EMIC) waves

- It is a form of plasma waves.

Plasma Waves

- The waves that are emanate from the sun having Low-density, ionized gases are called as plasmas.
- Plasma is a good electrical conductor with properties that are strongly affected by electric and magnetic fields.
- Waves in plasmas are an interconnected set of particles and fields which propagate in a periodically repeating fashion.

EMIC waves

- EMIC waves play an important role in precipitation of killer electrons.
- **Killer Electrons** - Electrons having speed close to speed of light, which form the radiation belt of planet Earth.
- Killer electrons are hazardous to our space-borne technology/instruments.
- EMIC waves are sensible electromagnetic emissions observed in the Earth's magnetosphere (the cavity in which the Earth lies and stays protected from the wrath of the Sun).
- They can resonate with electrons with a wide energy range --- from 500 keV to hundreds of MeV.
- It make the electrons precipitate to high-latitude atmosphere.

- Short-period modulation of EMIC wave events is common and dependent on EMIC wave frequency.
- The short period decreases with an increase in the peak frequency of the EMIC wave, and stronger EMIC wave events were likely to have a higher peak frequency.
- It is important to improve the understanding of EMIC wave modulation and how they interact with energetic particles that impact satellites and their communication.

2) The term *Magnaporthe Oryzae* recently seen in news, is related to which of the following statements?

a. It is a shoot fly species that causes damage to the rice fields in Australia
b. It is a fungus originated in South America threatening food security to the wheat fields
c. It is a new species of endemic honeybee that has been discovered in the Western Ghats
d. It is a newly discovered drug to treat type 2 diabetes.

Answer : b

Magnaporthe oryzae, a fungus infects wild and cultivated grasses in South America are now spreading to Asia and Africa

Magnaporthe oryzae

- It is a fungus first reported in South America.
- The fungus is destroying South American wheat crops and it is spreading worldwide.
- The pathogen affects the crop in a disease known as 'wheat blast'.
- It infects wild and cultivated grasses, most notably rice and wheat.
- This fungus has the potential to affect not only wheat but also other major food crops.
- The pathogen is also resistant to fungicides.
- Rice blast fungus is a hemiobiotrophic pathogen meaning that initially, the fungus establishes a biotrophic relationship with its host (i.e., invades a few cells, steals nutrients, but does not kill host cells).
- Eventually, the fungus becomes necrotrophic, destroying plant tissue.
- Infection starts when three-celled conidia from the pathogen adhere to the host's surface.
- Initial attachment of conidia and other fungal structures is mediated by mucilage.
- Cell to cell movement is achieved through plasmodesmata.
- After colonization of the host and infection of aerial parts, lesions are formed and sporulation takes place.
- These are the source of primary inoculum that enables the disease to reinitiate.

3) Consider the following statements with respect to Fireflies

1. It glows to warn predators and use bioluminescence as a defence mechanism.
2. Fireflies are found in tropical climates only.

Which of the statement(s) given above is/are correct?

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

Answer : a

Synchronous lighting by mega congregation of fireflies recorded in forest range of Anamalai Tiger Reserve

Fireflies and Associated Bioluminescence

- The Lampyridae are a family of elateroid (large family of beetles) many of them are light-emitting.
- They get the names *firefly* and *lightning bug* because of the flashes of light they naturally produce.
- This phenomenon is called bioluminescence, and the bioluminescent organs in fireflies are found on the underside of the abdomen.
- These insects live in a variety of warm environments, as well as in more temperate regions.
- Fireflies live in moisture and often in humid regions of every continent except Antarctica.
- In drier areas, they are found around wet or damp areas that retain moisture.
- Firefly larvae start emerging in the wet, evergreen forests after the first summer rain.
- Fireflies live as larvae for a year before they pupate and become the adult.
- Firefly larvae glow to warn predators and use bioluminescence as a defence mechanism.
- The larvae depend on moisture to prevent them from desiccating.
- Firefly larvae eat snails, worms, and slugs, which they inject with a numbing chemical to disable.
- Adults eat other fireflies, nectar, or pollen, although some don't eat at all.

4) Wellington Reef, sometimes seen in the news recently, is located in?

a. Papua New Guinea

b. Ecuador

c. Australia

d. New Zealand

Answer : b

Scientists discovered new coral reef in the Galapagos reef where Wellington reef is believed to be the one which survived El Nino weather in 1982

Wellington Reef

- It is found off the coast of Darwin Island in the far north of the Galápagos archipelago, Ecuador.
- It was thought to be among the few structural shallow coral reefs in the islands to have survived the destruction wreaked by an El Niño event in 1982-83.
- The deep-water coral communities were in the depths of the Galápagos marine reserve.
- These newly discovered reefs are potentially of global significance, a 'canary in the mine' for other reefs global sites.
- It can be used to monitor over time to see how pristine habitats evolve with our current climate crisis.
- It could also help understand the role of MPAs in the carbon cycle and fisheries.

Cocos Island

- The Cocos Islands are an Australian external territory in the Indian Ocean.
- It is located midway between Australia and Sri Lanka and relatively close to the Indonesian island of Sumatra.
- The isolated territory is made up of two coral atolls.
- The southern territory comprising 26 islets and the northern containing only North Keeling Island.
- The territory's administrative headquarters are on West Island in the southern atoll.

5) Consider the following statements with respect to Great Pacific Garbage Patch

1. It is the largest accumulation of ocean plastic located between Hawaii and California.
2. The Patch spans waters from the West Coast of North America to Japan.

Which of the statement(s) given above is/are correct?

a. 1 only

b. 2 only

c. Both 1 and 2

d. Neither 1 nor 2

Answer : c

A recent study shows that the Great Pacific Garbage Patch contains high number of plastic trash

Great Pacific Garbage Patch

- The Great Pacific Garbage Patch (GPGP) is the largest of the five offshore plastic accumulation zones in the world's oceans.
- It is located halfway between Hawaii and California.

- Marine debris is litter that ends up in oceans, seas, and other large bodies of water.
- The Great Pacific Garbage Patch, also known as the Pacific trash vortex, spans waters from the West Coast of North America to Japan.
- The patch is actually comprised of the Western Garbage Patch, located near Japan, and the Eastern Garbage Patch, located between the U.S. states of Hawai'i and California.
- These areas of spinning debris are linked together by the North Pacific Subtropical Convergence Zone, located a few hundred kilometers north of Hawai'i.
- This convergence zone is where warm water from the South Pacific meets up with cooler water from the Arctic.
- The zone acts like a highway that moves debris from one patch to another.
- The entire Great Pacific Garbage Patch is bounded by the North Pacific Subtropical Gyre.
- **Gyres** - There are some water currents in the oceans that, driven by winds and the Coriolis force, form loops.
- The *North Pacific Subtropical Gyre* (NPSG) is located just north of the equator in the Pacific Ocean.