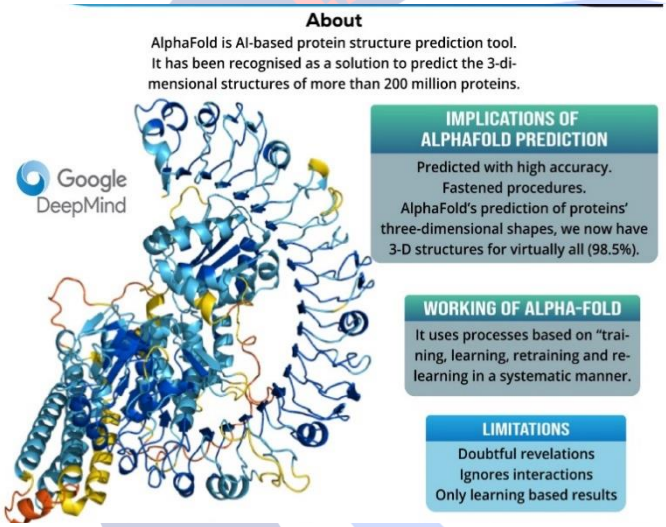
Prelims EDGE – 10/10/2024

NOBEL PRIZE IN CHEMISTRY

Context: The 2024 Nobel Prize in Chemistry is awarded to David Baker, Demis Hassabis, and John M. Jumper for their groundbreaking contributions to protein science.



- One-half of the prize is given to David Baker 'for computational protein design' and the other half jointly to Demis Hassabis and John M. Jumper 'for protein structure prediction.'
- David Baker has achieved the extraordinary feat of designing entirely new proteins. Demis Hassabis and John Jumper developed an artificial intelligence (AI) model to address a 50-year-old challenge- predicting the complex 3-D structures of proteins.
- Hassabis and Jumper AI-based model in 2020 named **AlphaFold2**. This can predict the structure of nearly all 200 million proteins identified to date.
- AlphaFold2 has been used extensively by millions of scientists around the globe to address issues like antibiotic resistance and plastic degradation.

Source : Nobel Prize in Chemistry awarded to David Baker, Demis Hassabis and John Jumper for decoding protein design and structures (The Hindu)

NON-BANKING FINANCIAL INSTITUTIONS

Context: RBI is concerned about rapid expansive tactics of NBFCs to capture the market.

About NBFCs

- An NBFC is a company registered under the Companies Act, 1956 or Companies Act, 2013, involved in various financial activities like lending, investing in securities, leasing, insurance.
- They offer various banking services but do not have a banking license.

Key Features:

- NBFCs provide diverse financial services like personal loans, home loans, vehicle loans, gold loans, microfinance, insurance, and investment management.
- They can accept public deposits for a **minimum of 12 months and a maximum of 60 months.**
- However, NBFCs cannot accept **demand deposits.**
- They do not form part of the **payment and settlement system and cannot issue cheques drawn on itself.**
- The company should have a minimum net owned fund of at least Rs. 10 crores to be eligible for NBFC registration.
- The RBI has been given the powers under the RBI Act 1934 to register, lay down policy, issue directions, inspect, regulate, supervise and exercise surveillance over NBFCs that meet the **50-50 criteria of principal business**.
- RBI considers a company's principal business to be financial in nature if more than **50% of its total assets and gross income come from financial activities.**
- This definition ensures that only companies primarily involved in financial operations are registered as NBFCs and fall under RBI's regulatory oversight.

Source : RBI's Das warns of action on NBFCs 'growing aggressively at any cost' (The Hindu)

CARBON BORDER ADJUSTMENT MECHANISM

Context: EU's CABM is bringing serious challenges to Indian exports to European Countries.

- CBAM is part of the **"Fit for 55 in 2030 package"**, which is the EU's plan to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels in line with the European Climate Law.
- The CBAM is a policy tool aimed at reducing Carbon Emissions by ensuring that **imported goods are subject to the same carbon costs as products produced within the EU**.
- The CBAM will be implemented by requiring importers to declare the quantity of goods imported into the EU and their embedded Greenhouse Gas (GHG) emissions on an annual basis.
- To offset these emissions, importers will need to surrender a corresponding number of CBAM certificates, the price of which will be based on the weekly average auction price of EU **Emission Trading System** (ETS) allowances in €/tonne of CO_2 emitted.
- CBAM will ensure its climate objectives are not undermined by carbon-intensive imports and spur cleaner production in the rest of the world.

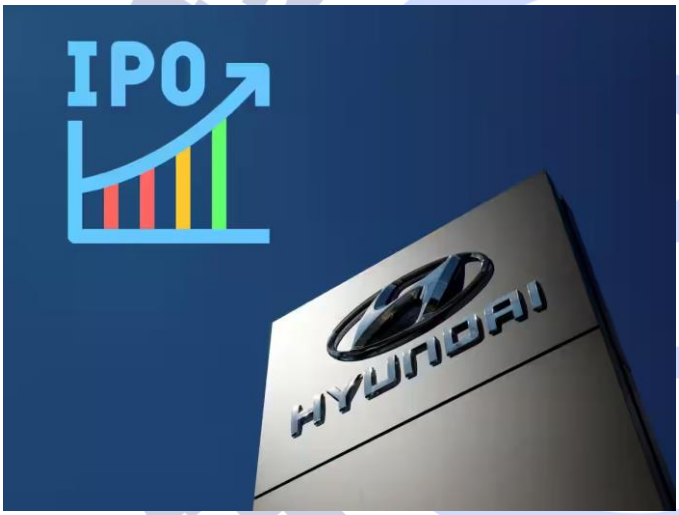
9966436875, 8374232308 csbiasacademy@gmail.com

- It can encourage non-EU countries to adopt more stringent environmental regulations, which would reduce global carbon emissions.
- It can prevent **carbon leakage** by discouraging companies from relocating to countries with weaker environmental regulations.
- The revenue generated from CBAM will be used to support EU climate policies, which can be learned by other countries to support Green Energy.
- It will have an adverse impact on India's exports of metals such as Iron, Steel and aluminum products to the EU, because these will face extra scrutiny under the mechanism.
- The carbon intensity of Indian products is significantly higher than that of the EU and many other countries because coal dominates the overall energy consumption.
- Therefore, direct and indirect emissions from iron and steel and aluminium are a major concern for India as higher emissions would translate to higher carbon tariffs to be paid to the EU.

Source : EU's CBAM, deforestation norms unilateral, arbitrary: FM (The Hindu)

TERMS IN NEWS

Initial Public Offering



- It is the process by which a privately held company like Hyundai, or a company owned by the government such as LIC, **raises funds by offering shares to the public or to new investors.**
- Following the IPO, the company is listed on the stock exchange. Stock exchange is an organized market for the sale and purchase of securities such as shares, stocks, and bonds.
- A listed company can raise share capital for growth and expansion in the future through a **follow-on public offering or FPO.**
- While coming up with an IPO, the company has to file its offer document with the market regulator Securities and Exchange Board of India (SEBI).

The offer document contains all relevant information about the company, its promoters, its projects, financial details, the object of raising the money, terms of the issue, etc.

MQ-9B drones

- It is a **high-altitude, long-endurance armed Unmanned Aerial Vehicle (UAV), capable of remotely controlled or autonomous flight operations.**
- The MQ-9B drones are also known as **"Predators".** They can fly for over 40 hours using a satellite.

9966436875, 8374232308 csbiasacademy@gmail.com

- They can be used for offensive missions, reconnaissance, surveillance, and intelligence operations.
- It is armed with strike missiles, allowing it to engage and eliminate enemy targets with high precision.
- This feature enhances its effectiveness in various roles, including land and maritime surveillance, anti-submarine warfare, anti-surface warfare, electronic warfare, and expeditionary missions.
- It is capable of automatic take-offs and landings, providing operational flexibility.
- It can safely integrate into civil airspace, enabling joint forces and civil authorities to obtain real-time situational awareness in the maritime domain, day or night.

Lithified Slag

- Human activity has drastically transformed the Earth's landscape, leading to the creation of new geological formations, such as **sedimentary rocks formed from slag**, a by-product of the steelmaking industry.
- Slag is a composite material from steel production, containing metal oxides and silicon dioxide.
- It becomes a significant component of artificial ground, contributing to sedimentary material in the environment.
- **Slag undergoes lithification, turning into sedimentary rock through natural weathering.**
- This process can sequester greenhouse gases like carbon dioxide through mineral carbonation, mimicking natural processes.
- This process **can potentially reduce the carbon footprint** of the steel industry by reusing slag deposits.
- Repurposing slag deposits for carbon capture could eliminate the need for additional processing facilities.

9966436875, 8374232308 **csbiasacademy@gmail.com**

Unified Genomic Chip

- The Unified Genomic Chip is an initiative aimed at improving **livestock breeding** in India, specifically targeting cattle and buffalo.
- It aims to help farmers identify high-quality cattle early and improve dairy farming efficiency in India.
- The chip comes in two versions: the **'Gau Chip' for cattle and the 'Mahish Chip' for buffalo.**
- Both versions are tailored specifically for Indian cattle breeds.
- The chip was developed by the **Department of Animal Husbandry and Dairying (DAHD)** under the Ministry of Fisheries, Animal Husbandry, and Dairying.
- It helps farmers make informed decisions regarding animal selection **by identifying high-quality bulls at an early age.**
- It aims to improve cattle quality and enhance dairy productivity, contributing to farmers' economic growth.
- The use of this genomic chip is expected to boost the quality and productivity of the dairy farming sector in India, benefiting the overall agricultural landscape.

Humsafar Policy

- The Humsafar Policy **aims to improve infrastructure on India's national highways, focusing on comfort, convenience, and inclusivity for travellers.**
- It aligns with the Ministry of Road Transport and Highways' goals to bring national highways to international standards.
- It's objective is to enhance the travel experience by providing essential services and making highways more user-friendly.

Key Features

- Installation of clean and well-maintained toilets at regular intervals for travellers.
- Adequate parking facilities at fuel stations and rest stops to manage traffic flow.
- Installation of EV charging stations along highways to promote eco-friendly transportation.
- Establishment of restaurants and food courts at regular intervals to offer quality meals and refreshments.

9966436875, 8374232308 csbiasacademy@gmail.com

Major Atmospheric Cherenkov Experiment (MACE) Observatory

.

- MACE is an **Imaging Atmospheric Cerenkov Telescope (IACT)** located in Hanle Dark Sky Reserve (HDSR), Ladakh, India.
- An imaging Cherenkov telescope (IACT) is a large-aperture telescope that **detects gamma rays** by indirectly interacting with the atmosphere.
- The observatory features the largest imaging Cherenkov telescope in Asia, located at an altitude of approximately 4,300 meters, making it the highest observatory of its kind globally.
- Built indigenously by Bhabha Atomic Research Centre (BARC) with support from Electronics Corporation of India Limited
- Aims to advance **cosmic-ray research and observe high-energy gamma rays,** aiding the understanding of universe phenomena like supernovae, black holes, and gamma-ray bursts.

PRACTICE QUESTIONS

Q1 : The term Alphafold, often seen in the news is associated with which of the following?

a) AI based protein structure prediction tool

b) Supernova that was discovered recently

c) Under Water Mountain range Discovered recently

d) New Foldable Telescope to detect cosmic rays

Q2 : Consider the following statements regarding NBFCs

1. They can accept public deposits for a minimum of 12 months and a maximum of 60 months.
2. NBFCs cannot accept demand deposits.
3. They do not form part of the payment and settlement system

How many of the above statements are incorrect?

a) Only One

b) Only Two

c) All of the above

d) None of the above

Q3 : Fit for 55 Package, often seen in the news is related to which of the following?

a) Humanitarian Aid for Ukraine

b) Relief Package for Gaza

c) Carbon Emission Reduction

d) Quantum Computing Budget

Q4 : Which among the following options represent the term MQ-9B, Commonly known as Predators

a) Unmanned Aerial Vehicle

b) Ballistic Missiles

c) Hypersonic Missiles

d) Advanced Battlefield Helicopters

Q5 : Humsafar Policy that was launched recently is related to which of the following?

a) Road Transportation

b) Railway infrastructure

c) Green Shipping

d) Aviation Market

Answers

1. **A**
2. **D**
3. **C**
4. **A**
5. **A**

9966436875, 8374232308 csbiasacademy@gmail.com