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PM-Vidyalaxmi scheme

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved PM Vidyalaxmi Scheme recently.

- It is a ***Central Sector scheme*** to provide financial support to meritorious students through various measures in both public and private Higher Education Institutions (HEIs).
- It is a key initiative of National Education Policy, 2020.
- **Eligibility -** Any student who gets admission in quality Higher Education Institution (QHEIs) will be eligible.
- The scheme will be applicable to the top quality higher educational institutions of the nation, as determined by the NIRF rankings.
- It includes
    - All HEIs, government and private, that are ranked within the ***top 100*** in NIRF in overall, category-specific and domain specific rankings;
    - State government HEIs ranked in ***101-200*** in NIRF and all central government governed institutions.
- The scheme will be administered through a simple, transparent and student-friendly system that will be inter-operable and entirely digital.
- **Funding –** A special loan product will offer ***collateral free, guarantor free*** loan from banks and financial institutions to cover ***full amount*** of tuition fees and other expenses related to the course.
- For loan amount up to ₹ 7.5 lakhs, the student will also be eligible for a credit guarantee of 75% of outstanding default.
- This will give support to banks in making education loans available to students under the scheme.
- In addition to the above, for students
    - Having an annual family income of up to ₹ 8 lakhs, and
    - Not eligible for benefits under any other government scholarship or interest subvention schemes, 3% interest subvention for loan up to Rs.10 lakhs will also be provided during moratorium period.
- The interest subvention support will be given to one lakh students every year.
- Payment of interest subvention will be made through e-vouchers and Central Bank Digital Currency (CBDC) wallets.
- Preference will be given to students who are from government institutions and have opted for technical/ professional courses.
- **Portal** - The Department of Higher Education will have a unified portal “PM-Vidyalaxmi”.
- The portal has been developed and being maintained by NSDL e-Governance

Infrastructure Limited.
- Students will be able to apply for the education loan as well as interest subvention, through a simplified application process to be used by all banks.

References

1. PIB | PM-Vidyalaxmi scheme
2. Hindustan Times | PM-Vidyalaxmi scheme
3. Times of India | PM Vidyalaxmi

Lassa fever

Lassa fever has come into prominence after a recent case in Iowa, United States, involving the death of a traveler from West Africa.

- **Caused by -** The Lassa virus causes Lassa fever, a ***zoonotic disease*** that is part of the Arenaviridae family, with the ***Mastomys rat*** as its primary reservoir.
- **Identified in -** The disease was first identified in the town of Lassa in Nigeria in 1969
- **Symptoms -** Gradual onset of fever, general weakness, and malaise, followed after a few days by
    - More severe manifestations such as headache, sore throat, muscle and chest pain, nausea, vomiting, diarrhoea, cough, and abdominal pain.
- While approximately ***80% of infections are asymptomatic*** or mild, severe cases can present with high fever, severe headaches, and haemorrhage, potentially leading to organ failure.
- **Human Transmission** - Humans usually contract the virus through contact with food or items contaminated by the the Mastomys rat's urine or faeces.
- Secondary human-to-human transmission occurs through exposure to bodily fluids, raising significant risks, particularly in healthcare settings.
- **Vulnerable population -** Lassa fever poses particularly severe risks for pregnant women and infants.
- Infected pregnant women, especially those in their 3rd trimester, face an increased maternal mortality rate of over 30%.
- The disease's impact on the foetus is devastating, with a foetal death rate ***exceeding 85%.***
- For children up to 2 years old, Lassa fever can manifest as "swollen baby syndrome, "characterized by extensive swelling and associated with a higher fatality rate than that of adults.
- Vertical transmission has been reported from the mother to the foetus in the transmission of Lassa fever.
- **Prevention** - Minimising rat-to-human transmission is vital to controlling Lassa fever.
- **Fatality -** Lassa fever has a case fatality rate (CFR) of approximately 1% overall.
- However, the CFR can escalate to as high as 15-20% among hospitalised patients.
- Notable sequelae include varying degrees of deafness in nearly 25-50% of patients one to three months after recovery.
- Estimated 1,00,000 to 3,00,000 individuals annually, with around 5,000 deaths each

year.
- **Cases in India -** India's Ministry of Health and Family Welfare, has classified Lassa fever as a disease of international significance.
- India has ***not recorded any documented cases*** until now (officially, no case reported till 2022).

Reference

The Hindu | Lassa fever

Haast's eagle

The Haast's eagle gone extinct 500 years ago stands as the largest eagle ever existed.

- **Scientific Name -** Hieraaetus moorei.
- **Native -** It is native to the South Island of New Zealand.
- It is the ***largest eagle to ever exist***, Weighing about 10-18 kilos (22-40 pounds).
- It was much bigger in weight and length than the largest vultures that are still alive, such as the black vulture or the Andean condor.
- **Appearance** - For its size, its wingspan was rather short. The Haast's eagle has a pale head, large, black-and-white birds with a crimson crown and wings that were tinted with yellow-green.
- **Behavior -** It is a raptorial bird and an apex predator.
- Like other forest-dwelling raptors like goshawks or harpy eagles, Haast's eagles most likely hunted in New Zealand's deep woods and shrublands.
- **Prey** - The moa was one of the huge, flightless bird species that the Haast's eagle preyed on most, which finally caused the species to go extinct.
- Moa was up to ***15 times the weight of its predator***, the Haast's eagle, whose enormous beak could potentially tear into its prey's internal organs, causing blood loss that would have led to death.
- The moa, its prey, had a maximum weight of 200 kg (440 lb).
- A Haast's eagle could have easily monopolised a single enormous kill over several days because there were no other large predators or kleptoparasites around.
- **Extinction -** The species vanished around 1445 due to loss of prey.

References

1. Business Standard | Haast's eagle
2. Times of India | Haast's eagle

RNA editing

A biotechnology company in Massachusetts in the U.S. named Wave Life Sciences made for becoming the first company to treat a genetic condition by editing RNA at the clinical level.

- **Transcription –** Transcription is the process of making an RNA copy of a gene's DNA sequence.
- This copy, called messenger RNA (mRNA), carries the gene's protein information encoded in DNA.
- **Faulty proteins -** During this process of transcription, the cell may make mistakes in the mRNA's sequence and based on it produce faulty proteins.
- Many of these proteins have been known to cause debilitating disorders.
- **RNA Editing -** RNA editing allows scientists to fix mistakes in the mRNA after the cell has synthesized it but before the cell reads it to make the proteins.
- One technique involves a group of enzymes called ***adenosine deaminase acting on RNA (ADAR).***
- Adenosine is one of the building blocks of RNA.
- ADAR works by converting some of the adenosine blocks in mRNA to another molecule called ***inosine.***
- This is useful because inosine mimics the function of a different RNA building block called guanosine.
- Because guanosine-like function is found where adenosine is supposed to be, the cell detects a mistake and proceeds to correct it, in the process restoring the mRNA's original function.
- And then the cell makes normal proteins.
- Scientists took advantage of ADAR's effects to pair it with a guide RNA (or gRNA), the gRNA guides ADAR to a specific part of the mRNA, where the ADAR works its magic.

- They expect a variety of serious genetic conditions can be treated using such site-specific RNA editing.
- **Recent Finding in RNA editing -** Wave Life Sciences used RNA editing ***to treat α-1 antitrypsin deficiency (AATD),*** an inherited disorder.
- In patients suffering from AATD, levels of the protein α-1 antitrypsin build up and affect the liver and the lungs.
- People with AATD affecting the lungs currently go through weekly intravenous therapy for relief, among people where AATD has affected the liver, a liver transplant is the sole treatment option.
- In its therapy, dubbed WVE-006, the company used a gRNA to lead ADAR enzymes to specific single-point mutations in the mRNA sequence of the SERPINA1 gene.
    - SERPINA1 gene contains the instructions for cells to make α-1 antitrypsin.
- A single-point mutation occurs when a single building block of the mRNA is wrong.
- Once at the target, the ADAR enzymes fix the mRNA and the cells produce α-1 antitrypsin at normal levels.
- Wave Life Sciences is planning to extend its RNA editing technology to treat Huntington's disease, Duchenne muscular dystrophy, and obesity.
- The first two and some forms of obesity are associated with single-point mutations.

DNA editing	RNA editing
• DNA editing makes permanent changes to a person's genome and sometimes this can lead to irreversible errors.	• RNA editing makes temporary changes, allowing the effects of the edits to fade over time.
• CRISPR-Cas9 and other DNA editing tools require proteins acquired from certain bacteria to perform the cutting function, but these proteins can elicit undesirable immune reactions in some cases.	• RNA editing relies on ADAR enzymes, which already occur in the human body and thus present a lower risk of allergic reactions. • This is useful for people who require repeated treatment and/or who have immune sensitivities.

Reference

The Hindu | RNA editing

Regional Comprehensive Economic Partnership (RCEP)

The CEO of NITI Aayog recently said that India should join the Regional Comprehensive Economic Partnership (RCEP), a China-backed Asian trade bloc it rejected years ago.

- It is a ***free trade agreement*** of the world's largest trade bloc.
- **Members -** It groups
    - ***15 Asia-Pacific economies***, including Australia, Japan, New Zealand, China, South Korea and
    - The 10 member-states of the ***Association of Southeast Asian Nations (ASEAN).***

Members of ASEAN were Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

- **Began in -** The RCEP was signed in November 2020 and came into effect on January 1, 2022.
- **Objectives**
  - **Trade** -Reduce or eliminate tariffs and non-tariff barriers to trade.
  - **Investment** - Increase investment and encourage foreign investment.
  - **Supply chains** - Facilitate trade and investment among member nations, and enhance regional supply chains.
  - **Economic growth** - Promote economic growth and regional stability.
- **Covering areas -** RCEP will cover trade in goods, trade in services, investment, economic and technical cooperation, intellectual property, competition, dispute settlement and other issues.
- **Trade volume –** It is the world's largest free trade agreement by members' GDP, with the 15 member countries accounting for about ***30% of the world's population and 30% of global GDP***.

- **India –** India was the ***founding member*** of RCEP.
- In 2019, India decided to not join the bloc, on the grounds that the deal would hurt its farmers, businesses, workers and consumers.
- **Significance for India** - Joining the trade blocs of RCEP and CPTPP will help India boost its manufacturing base and exports by small and medium firms that constitute 40% of the country's exports.

Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a free trade agreement between 11 countries.

- India's goods exports during April-September 2024 rose by 1.02% from a year earlier to $213.22 billion.

Reference

Economic Times | Regional Comprehensive Economic Partnership (RCEP)