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Amchang Wildlife Sanctuary

The Amchang Wildlife Sanctuary is a wildlife sanctuary located on the eastern fringe of Guwahati, Assam, India. Amchang's habitat is dominated by tropical moist deciduous forest with semi-evergreen forest in depressions and river-valleys. It is known for its elephants which have become isolated with no movement with other elephant-populations. The first published information of these elephants was found in 1985 The sanctuary has other mammals such as Chinese pangolin, slow loris, Assamese macaque, rhesus monkey, hoolock gibbon, leopard, leopard cat, jungle cat, sambar, barking deer, red serow, Malayan giant squirrel, crestless Himalayan porcupine

FACTS --> The Union Cabinet approved four projects under the India Semiconductor Mission (ISM). Two of the projects will be in Bhubaneswar in Odisha, and one each will be in Punjab and Andhra Pradesh. The firms behind the four new projects are SiCSem (which will make a silicon carbide integrated facility in Info Valley, Bhubaneswar); Continental Device India Private Limited, which will expand its existing "discrete semiconductor manufacturing facility" in Mohali; 3D Glass Solutions Inc., which will set up a "vertically integrated advanced packaging and embedded glass substrate unit" in Bhubaneswar; and Advanced System in Package (ASIP) Technologies, which will set up a semiconductor unit in Andhra Pradesh, with the location yet to be chosen.

MUON 2 & FERMILAB

Muon & g-factor Basics Muon: elementary particle, similar to electron but 207 times heavier. Has spin → behaves like a small magnet. Magnetic strength expressed by g-factor. Classical theory: g = 2; quantum effects cause a small deviation (anomalous magnetic moment).

In physics, it typically refers to the Landé g-factor, which describes the magnetic properties of particles and nuclei.

Measurements of the g-2 of the muon were first made at CERN with a definition of 4,000 ppm. Fermilab started measuring g-2 in 2017 and quickly reached a precision of 0.460 ppm. Fermi National Accelerator Laboratory, located in Batavia, Illinois, near Chicago, is a United States Department of Energy national laboratory specializing in high-energy particle physics

Bread Staling & Starch Retrogradation

Definition of Staling Bread loses its soft texture, becoming dry and hard. Not just due to water loss the main cause is starch retrogradation. Process During Baking Heat makes starch molecules in flour absorb water and swell. Forms a soft, gel-like mass in the bread crumb.

Retrogradation After Baking As bread cools, starch molecules slowly recrystallise. This process pushes water out of the starch structure into other parts of the bread. Leads to a firmer crumb and less pleasant chewing texture.

Moisture Content Insight Staling can occur even without significant moisture loss. It is about molecular rearrangement, not just drying.

Effect of Storage Temperature Refrigeration speeds up retrogradation → bread goes stale faster in the fridge. Bakers recommend: Store at room temperature for short term use. Freeze for long-term storage — freezing halts retrogradation until thawing

Difference from Moulding Mould is caused by fungal spores feeding on bread nutrients in warm, humid conditions. Staling can happen before mould appears. Practical Tip Freeze leftover slices to stop staling. Toast frozen slices when needed to restore taste and texture.

Topic ⟶ The Chachapoyas

The Chachapoyas, also known as the "Warriors of the Clouds", were a pre-Inca Andean civilization inhabiting the cloud forests of present-day northern Peru. They are renowned for their distinctive architecture, including fortified settlements like Kuelap, and elaborate cliffside burial sites.

The Chachapoyas fiercely resisted both Inca and Spanish rule before ultimately being incorporated into the Inca Empire.

Warriors of the Clouds: They earned this name due to their homeland's misty, cloud filled environment.

Fortified Cities: They built impressive, well-defended settlements like Kuelap, which served as both urban centers and strongholds Key Sites: Kuelap: A massive, fortified city with impressive stone walls and structures, often referred to as the "Machu Picchu of the north" Revash: A site with cliffside tombs adorned with painted figures Karajia: Known for its impressive sarcophagi, large anthropomorphic figures placed on cliffs

Employment Linked Incentive (ELI) Scheme

Approval & Objective Approved by Union Cabinet chaired by PM Narendra Modi. Aim: Support employment generation, enhance employability, and social security across all sectors, with special focus on manufacturing. Part of PM's five-scheme package announced in Union Budget 2024–25 to create opportunities for 4.1 crore youth with a total outlay of ₹2 lakh crore.

Scheme Scope & Targets Total outlay: ₹99,446 crore. Target: 3.5+ crore jobs in 2 years. 1.92 crore beneficiaries will be first-time entrants to the workforce.

Structure Two Parts:

Part A → Incentive for first time employees.

Part B → Incentive for employers to create additional jobs.

Part A First-Time Employee Incentives Target group: First-time employees registered with EPFO. Benefit: One-month EPF wage up to ₹15,000 in two instalments.

Eligibility: Salary up to ₹1 lakh Payment schedule: 1st instalment → after 6 months of service. 2nd instalment → after 12 months of service + completion of financial literacy programme.

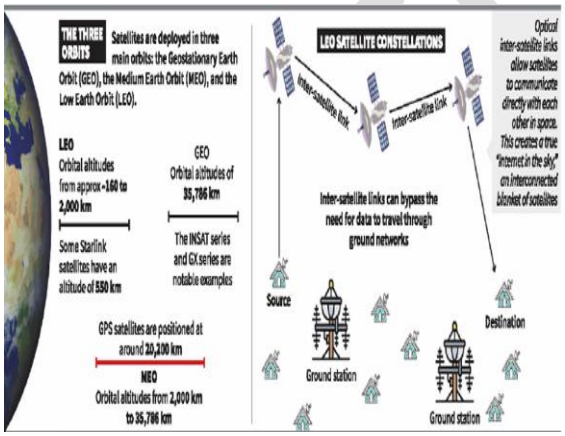
Savings habit promotion: Portion of incentive placed in a fixed deposit/savings instrument for later withdrawal. Expected reach: ~1.92 crore first-time employees. Part B – Employer Incentives Covers additional employment generation in all sectors, with extra focus on manufacturing. Eligibility: Employees with salary up to ₹1 lakh. Incentive: Govt to pay up to ₹3,000/month per additional employee for 2 years. Manufacturing sector gets extended incentives for 3rd & 4th years. Hiring condition: Firms with 1. Incentive Payment Mechanism Part A payments → Direct Benefit Transfer (DBT) via Aadhaar Bridge Payment System (ABPS) to employees. Part B payments → Direct transfer into PAN-linked accounts of employers.

Incentive Payment Mechanism

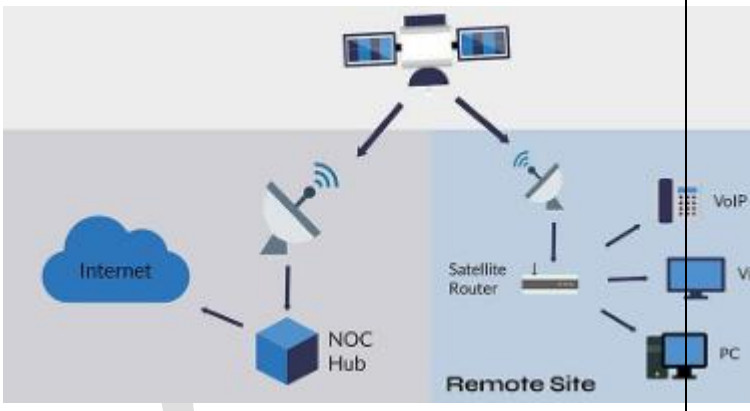
Part A payments → Direct Benefit Transfer (DBT) via Aadhaar Bridge Payment System (ABPS) to employees.

Part B payments → Direct transfer into PAN-linked accounts of employers. Expected Outcomes Catalyse job creation in all sectors, especially manufacturing. Incentivise youth to join formal workforce. Promote workforce formalisation and extend social security coverage to crores of young workers.

How does satellite internet work?



Structure of Satellite Internet Two Segments: Space segment → comprises the satellites orbiting Earth. These are the main communication hubs in space and represent the costliest part of the network. Ground segment → includes all user terminals, gateways, and control stations on Earth that connect to and communicate with the satellites.



Service Life: Satellites typically function for 5–20 years, after which they either degrade or are replaced. This lifespan affects long-term planning and investment cycles. Orbital Altitude Importance: The height at which a satellite is placed determines signal latency, coverage area, and launch costs. Choosing the right orbit is crucial for balancing performance and expense.

Three Main Orbits and Their Characteristics a. GEO (Geostationary Earth Orbit) 35,786 km Matches.

Earth's rotation → appears fixed relative to the ground. Coverage: One GEO satellite can cover ~⅓ of Earth's surface (excluding polar areas), which makes them efficient for broadcasting and weather monitoring.

Example: Viasat's Global Xpress (GX) network. Functionality: Acts like a "bent-pipe" relays signals without processing them. Limitations: High latency (~600 ms) due to long signal travel distance. Not suitable for real-time applications like live video calls or online gaming.

MEO (Medium Earth Orbit) – 2,000 to 35,786 km Offers a middle ground between GEO's coverage and LEO's low latency. Requires a constellation of multiple satellites for full coverage. Example: O3b (20 satellites). Latency is lower than GEO (~150–200 ms) but still may not be ideal for highly time sensitive uses. Satellites are still large and expensive to launch.

LEO (Low Earth Orbit) – below 2,000 km Very close to Earth → extremely low latency (~20–40 ms), comparable to fibre broadband. Satellites are smaller (often table-sized), cheaper, and quicker to produce/deploy. Limited coverage footprint → need mega-constellations to provide continuous global coverage. Example: Starlink → 7,000+ satellites already launched, plans for up to 42,000. Frequent satellite replacement is required due to shorter lifespan in low orbit

Mega-Constellations – How They Work Definition: Large groups (hundreds or thousands) of small satellites working together to provide global, low-latency internet coverage.

Key Technologies: On-board signal processing → satellites process data themselves before transmitting, improving efficiency and reducing the complexity (and cost) of ground equipment. Optical Inter-Satellite Links (OISLs) → satellites talk directly to each other via laser communication, creating a "mesh network in space." Reduces dependency on ground stations. Improves speed by routing data across space instead of via Earth. Seamless Handoff → Since LEO satellites move at ~27,000 km/h and pass over a user in minutes, the network uses steerable antennas to automatically switch the user's connection to the next satellite without interruption.

Applications of Satellite Internet Consumer Access: Easy-to-install terminals; no technician needed. Higher cost compared to terrestrial broadband (~$500 terminal + $50/month service). Especially useful in remote and rural areas, maritime shipping, aviation, and military. Direct-to-Device Services: Companies like AST Space Mobile and Starlink are testing connectivity directly to smartphones, which could remove the need for separate dishes or terminals.

Sectoral Benefits: Communications: Internet of Everything (IoE), bridging rural connectivity gaps. Transportation: Better navigation, support for autonomous vehicles, improved logistics tracking. Disaster Management: Real time alerts, coordination of rescue teams, and

continued connectivity during infrastructure failures. Healthcare: Telemedicine, remote diagnostics, and patient monitoring in rural areas. Agriculture: Precision farming, soil health monitoring, crop disease detection. Environment & Energy: Tracking pollution, monitoring forests, and aiding in oil/gas exploration. Defence: Secure communication, intelligence gathering. Tourism: Supporting adventure and cruise operations in remote regions.

Challenges and Strategic Considerations Security Risks: Signals can be intercepted or jammed; satellites can be targeted in conflicts. Space Debris: Mega constellations increase congestion in low Earth orbit. Regulation: Need for global coordination on spectrum use and satellite placement. Strategic Power: Nations see satellite internet as a tool for technological and geopolitical influence.

India's Path Forward Integration: Include satellite internet in national digital resilience strategies. Digital Divide: Use it to bring affordable internet to underserved rural areas. Economic Growth: Enable innovation in agriculture, healthcare, and logistics. Global Role: Actively participate in forming rules for global satellite internet governance to protect national interests.

TERM ---> Hyphenated identity refers to a term used to describe individuals who identify with multiple cultural, national, or ethnic backgrounds, often represented by a hyphen between two identities (e.g., African-American, Mexican-American).

Culture in News ⟶ The Moussem festival, also known as Mawsim, is a regional festival celebrated in the Maghreb region, particularly in Morocco. It combines religious celebrations with festivities and commercial activities, often attracting people from distant places. The Tan-Tan Moussem, specifically, is an annual gathering of nomadic peoples in southwest Morocco, showcasing their cultural heritage through music, poetry, and traditional craft.