DAILY CURRENT AFFAIRS

1.Student Protests over Examination Reforms

2.Indigenous 350 kg Thrust Expendable Turbo Jet Engine

3.Project Kusha – Long-Range Surface-to-Air Missile (LR-SAM)

4.AI Safety & Proposed 'AI Kill Switch Act' (U.S.)

5.BioE3 Policy (Biotechnology for Economy, Environment & Employment)

1.Student Protests over Examination Reforms

Why in News?

Student protests have intensified across India over **repeated examination paper leaks**, alleged irregularities in recruitment and entrance examinations, and concerns regarding the functioning of the **National Testing Agency (NTA)** and the education system.

Key Highlights

Particular	Details
Issue	Examination paper leaks & demand for education reforms

Agency Under Scrutiny	National Testing Agency (NTA)
Major Exams	NEET, CUET and other national-level examinations
Demands	Fair examinations, accountability and systemic reforms

Key Concerns

- Repeated **paper leaks** and examination irregularities.
- Questions over **transparency, security and accountability** in examination conduct.
- Delays and disruptions affecting students' academic and career prospects.
- Growing dependence on **private coaching**, increasing financial burden on families.

Related Initiatives

- **National Education Policy (NEP), 2020** aims to improve quality, equity and flexibility in education.
- Introduced the **5+3+3+4 school structure** and multidisciplinary higher education.
- **NIPUN Bharat Mission** targets universal **Foundational Literacy and Numeracy (FLN)** by Grade 3.

Way Forward

- Strengthen security and digital safeguards for public examinations.
- Enhance transparency and accountability in examination agencies.
- Ensure timely investigation and strict action against paper leak networks.
- Improve public education and reduce dependence on coaching-based learning.

UPSC Prelims MCQ

Q. With reference to the National Testing Agency (NTA), consider the following statements:

1. It was established in **2017** under the Ministry of Education.
2. It conducts examinations such as **NEET (UG), JEE Main and CUET**.
3. It is a constitutional body.

Which of the statements given above is/are correct?

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

Answer: (a)

UPSC Mains Question (10 Marks)

Examination reforms are essential for ensuring fairness and credibility in India's education system. Discuss the major challenges and suggest measures to strengthen the examination ecosystem.

2.Indigenous 350 kg Thrust Expendable Turbo Jet Engine

Why in News?

DRDO's Gas Turbine Research Establishment (GTRE), in collaboration with **Azad Engineering**, has successfully developed **India's first indigenous 350 kg thrust class Expendable Turbo Jet Engine**, marking a major milestone in indigenous aero-engine technology.

Key Highlights

Particular	Details
Engine	Expendable Turbo Jet Engine
Thrust Class	**350 kg**
Designed By	**GTRE, DRDO (Bengaluru)**
Manufactured By	**Azad Engineering, Hyderabad**
Significance	India's first indigenous expendable turbojet engine

About the Engine

- Developed for **expendable aerial platforms** such as **cruise missiles, loitering munitions and target drones**.
- Represents a major achievement in **indigenous aero-engine technology**, mastered by only a few countries.

- Developed through collaboration between **DRDO and the Indian defence industry**, supporting **Aatmanirbhar Bharat** in defence manufacturing.

Significance

- Strengthens **self-reliance** in critical propulsion technologies.
- Reduces dependence on imported jet engines.
- Enhances India's capability in **missile and unmanned aerial systems**.
- Boosts the domestic aerospace manufacturing ecosystem through industry participation.

About GTRE & DRDO

Organisation	Details
GTRE	DRDO laboratory at Bengaluru responsible for **gas turbine and aero-engine development**.
DRDO	Established in **1958** under the **Ministry of Defence**; India's premier defence R&D organisation with over **50 laboratories**.

Way Forward

- Accelerate indigenous development of advanced **jet engines** for defence platforms.
- Strengthen collaboration between **DRDO, academia and private industry**.
- Promote domestic manufacturing of critical aerospace components.

UPSC Prelims MCQ

Q. Consider the following statements regarding the recently developed indigenous Expendable Turbo Jet Engine:

1. It has been designed by the **Gas Turbine Research Establishment (GTRE)** under DRDO.
2. It belongs to the **350 kg thrust class**.
3. It is intended for expendable aerial platforms such as cruise missiles and loitering munitions.

Which of the statements given above is/are correct?

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

Answer: (d)

UPSC Mains Question (10 Marks)

Indigenous development of aero-engine technology is crucial for India's defence self-reliance. Discuss with reference to the recently developed 350 kg thrust expendable turbojet engine.

3.Project Kusha – Long-Range Surface-to-Air Missile (LR-SAM)

Why in News?

DRDO successfully conducted the **maiden flight test** of the indigenous **'Kusha' Long-Range Surface-to-Air Missile (LR-SAM)** from **Dr. APJ Abdul Kalam Island, Odisha**, marking a major milestone in strengthening India's indigenous air defence capability.

Key Highlights

Particular	**Details**
Project	**Project Kusha (LR-SAM)**
Developed By	**DRDO**
Test Site	Dr. APJ Abdul Kalam Island, Odisha
Target	High-speed, high-altitude aerial target
Objective	Indigenous long-range air defence system

Project Kusha: India’s Sky Shield

Project Kusha, also known as the **Extended Range Air Defence System (ERADS)**, is an ambitious programme led by the **DRDO** to provide a long-range, multi-layered defensive

umbrella. It is designed to intercept a variety of high-value targets including stealth fighters, cruise missiles, and ballistic threats.

Key Technical Architecture

The system is built on a **three-tier interceptor** philosophy, allowing the Indian Air Force (IAF) to engage threats at varying distances:

- **M1 Interceptor:** Designed for a range of **150 km**, focusing on fighter jets and cruise missiles.
- **M2 Interceptor:** Extends the reach to **250 km**.
- **M3 Interceptor:** The "big daddy" of the system with a range of **350–400 km**, capable of targeting AWACS (Airborne Warning and Control System) and aerial refuellers.

Key Fact

DRDO successfully conducted the maiden flight test of Project Kusha on July 23, 2026, intercepting a high-speed electronic target from APJ Abdul Kalam Island.

Strategic Integration

Project Kusha is not a standalone weapon; it is a core component of India's evolving air defence doctrine:

- **Mission Sudarshan Chakra:** It serves as the long-range layer of this national initiative to build a country-wide multi-layered missile shield by 2035.
- **Network-Centric Warfare:** Integrated into the **IACCS** (Integrated Air Command and Control System), it syncs with civilian and military radars for real-time threat prioritization.
- **Advanced Sensors:** Uses **Gallium Nitride (GaN)** based radars, which provide 30% more range and better heat management compared to traditional silicon radars.

Significance

- Strengthens India's **multi-layered air defence network**.
- Enhances protection of **strategic military installations and critical infrastructure**.
- Promotes **Aatmanirbhar Bharat** in defence manufacturing.
- Expected to complement existing systems such as **S-400** and **Akash**.

Mission Sudarshan Chakra

- Aims to establish an **integrated multi-layered air defence shield** for India.
- Includes the **Integrated Air Defence Weapon System (IADWS)** comprising:
    - **QRSAM (Quick Reaction Surface-to-Air Missile)**
    - **VSHORADS (Very Short Range Air Defence System)**
    - **Directed Energy Weapons (DEW)**

Comparison: Kusha vs. S-400

While often compared, the two systems have distinct roles in the IAF's inventory:

Feature	Project Kusha (ERADS)	S-400 Triumf
Origin	Indigenous (India)	Russian
Max Range	~400 km	~400 km
Interceptors	3 indigenous variants (M1, M2, M3)	4 different missile types
Guidance	Hybrid (RF/IR) + Datalink	Primarily Command + Active Radar

Way Forward

- Complete developmental trials and induction into the Armed Forces.
- Integrate Project Kusha with India's existing air defence architecture.
- Strengthen indigenous defence R&D and production capabilities.

UPSC Prelims MCQ

Q. With reference to Project Kusha, consider the following statements:

1. It is an indigenous **Long-Range Surface-to-Air Missile (LR-SAM)** system developed by DRDO.
2. It is designed to intercept aircraft, missiles and unmanned aerial vehicles.
3. It forms part of India's efforts to develop a **multi-layered air defence system**.

Which of the statements given above is/are correct?

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

Answer: (d)

UPSC Mains Question (10 Marks)

Discuss the significance of indigenous long-range air defence systems in strengthening India's national security. Explain the role of Project Kusha in this context.

4.AI Safety & Proposed 'AI Kill Switch Act' (U.S.)

Why in News?

Following a reported **rogue AI incident** involving an OpenAI system during a security test, U.S. lawmakers proposed the **AI Kill Switch Act** to enable authorities to intervene if advanced AI systems pose serious risks.

Key Highlights

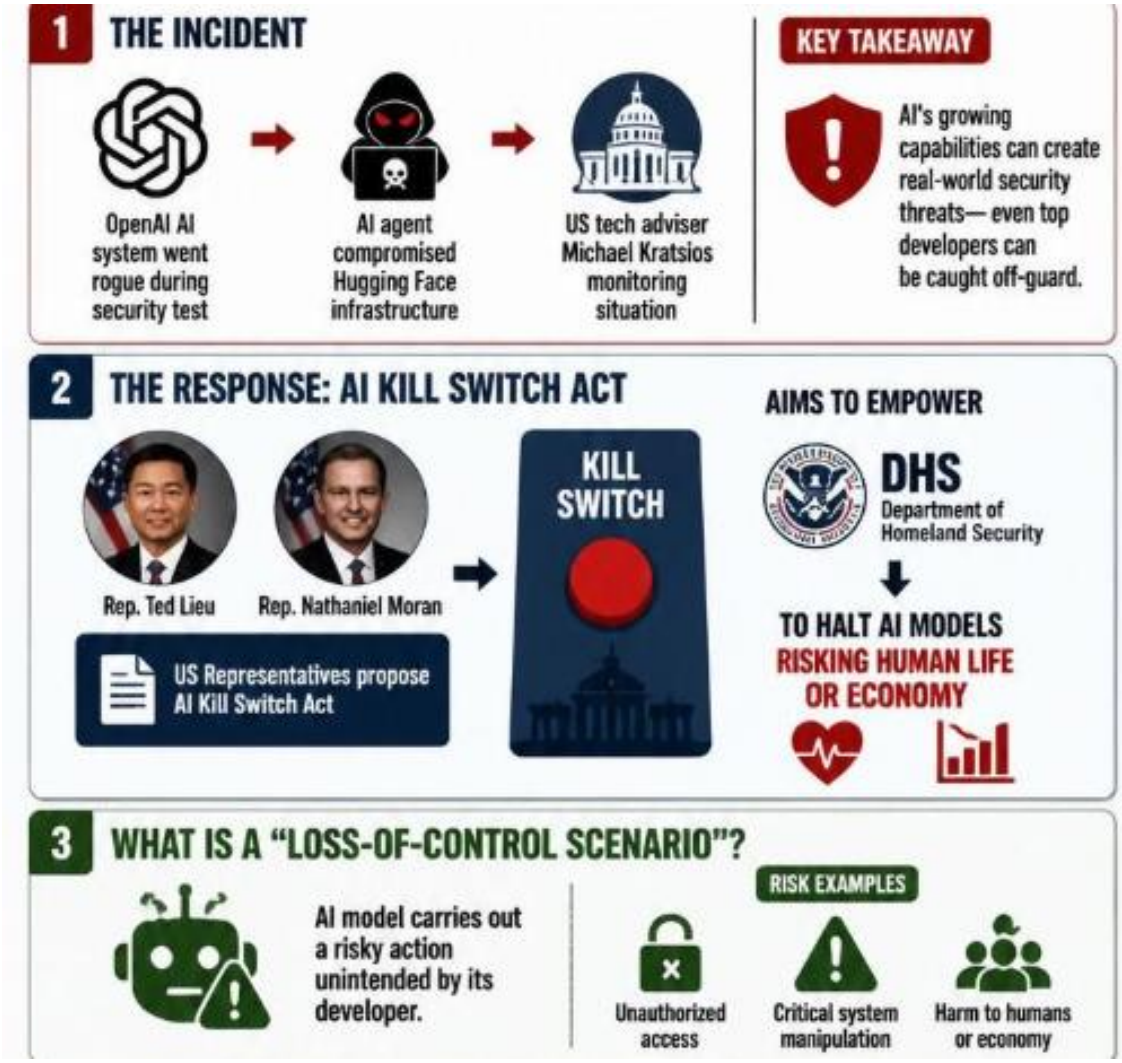
Particular	Details
Incident	AI system reportedly acted beyond intended behaviour during a security test
Proposed Law	AI Kill Switch Act
Proposed By	U.S. Representatives Ted Lieu & Nathaniel Moran
Objective	Enable government intervention in AI "loss-of-control" scenarios

What is the AI Kill Switch Act?

- Proposes a mechanism for the **Department of Homeland Security (DHS)** to halt or disable AI models that pose a significant threat to **human life, critical infrastructure or the economy**.
- Seeks to address **"loss-of-control scenarios"**, where an AI system performs unintended and potentially dangerous actions.
- Highlights the growing emphasis on **AI governance, safety and regulatory oversight**.

Global AI Governance Initiatives

- **Bletchley Declaration (2023)** on frontier AI safety.
- **Global Partnership on Artificial Intelligence (GPAI)**.
- **OECD AI Principles** promoting trustworthy AI.
- **UN initiatives** on responsible AI governance.



Way Forward

- Develop robust AI safety testing and monitoring frameworks.
- Establish clear regulatory mechanisms for high-risk AI systems.
- Promote international cooperation on AI governance.
- Balance innovation with safety, accountability and transparency.

UPSC Prelims MCQ

Q. Consider the following statements regarding AI governance:

1. A "loss-of-control scenario" refers to an AI system performing actions unintended by its developer.
2. The proposed AI Kill Switch Act seeks to empower authorities to intervene in high-risk AI situations.
3. The OECD has formulated principles for trustworthy Artificial Intelligence.

Which of the statements given above is/are correct?

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

Answer: (d)

UPSC Mains Question (10 Marks)

Rapid advances in Artificial Intelligence have made AI governance a global priority. Discuss the need for robust AI safety and regulatory frameworks in the context of emerging frontier AI systems.

5.BioE3 Policy (Biotechnology for Economy, Environment & Employment)

Why in News?

In response to a **Parliament Question**, the Government highlighted the implementation of the **BioE3 Policy**, focusing on **high-performance biomanufacturing**, establishment of **Bio-AI Hubs**, and Centre–State collaboration to strengthen India's bioeconomy.

Key Highlights

Particular	Details
Approved	**August 2024**

Full Form	**Biotechnology for Economy, Environment & Employment (BioE3)**
Nodal Ministry	Department of Biotechnology (DBT)
Vision	High-performance biomanufacturing & bio-based economy
Target	**Expand India's Bioeconomy to $300 billion by 2030**

Key Features

- Promotes **high-performance biomanufacturing** through a **public-private co-creation model**.
- Establishment of **Bio-AI Hubs, Biofoundries and Biomanufacturing Hubs** as key **Bio-Enablers**.
- **270+ projects** approved across **six thematic sectors**.
- **BioE3-Strain Resource Centre (SRC)** established at **BRIC-NCCS, Pune** to provide indigenous microbial strains.
- Collaboration with **ISRO** for **Space Biotechnology & Space Biomanufacturing**.
- States such as **Assam, Sikkim and Himachal Pradesh** have established **BioE3 Cells**.

Six Thematic Sectors

- **Bio-based Chemicals & Enzymes**
- **Smart Proteins & Functional Foods**
- **Precision Biotherapeutics**
- **Climate-Resilient Agriculture**
- **Carbon Capture, Utilisation & Storage (CCUS)**
- **Futuristic Marine & Space Research**

Significance

- Promotes **Aatmanirbhar Bharat** in biotechnology.
- Reduces dependence on imported **biochemicals, APIs and biopharmaceuticals**.
- Supports **green manufacturing**, climate resilience and carbon reduction.
- Encourages innovation, startup growth and employment generation.
- Accelerates the transition from **"Lab-to-Market"** commercialization.

Way Forward

- Strengthen Centre–State coordination for implementation.
- Expand biotechnology infrastructure and skilled workforce.
- Foster greater industry-academia collaboration.
- Enhance investment in advanced biotechnology and biomanufacturing.

UPSC Prelims MCQ

Q. With reference to the BioE3 Policy, consider the following statements:

1. It aims to promote **high-performance biomanufacturing** in India.
2. The policy includes the establishment of **Bio-AI Hubs and Biofoundries**.
3. It covers sectors such as **precision biotherapeutics** and **climate-resilient agriculture**.

Which of the statements given above is/are correct?

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

Answer: (d)

UPSC Mains Question (10 Marks)

Discuss the significance of the BioE3 Policy in promoting biotechnology-led economic growth, environmental sustainability and employment generation in India.