

1 कैच द रेन: जल संरक्षण के लिए राष्ट्रीय आह्वान (पृष्ठभूमि)

- जल शक्ति मंत्रालय की राष्ट्रव्यापी पहल।
- सिद्धांत: "जहां गिरे, जब गिरे, वहीं जल को रोके"।
- वर्षा जल संचयन व भूजल रिचार्ज को बढ़ावा।
- तालाब, झील, परंपरागत जल स्रोतों का पुनर्जीवन।
- समुदाय की भागीदारी व जल सुरक्षा पर जोर।
- जलवायु लचीलापन के लिए अत्यंत महत्वपूर्ण।



महत्वपूर्ण तथ्य: भारत विश्व का सबसे बड़ा भूजल उपयोगकर्ता है। ~85% ग्रामीण पेयजल एवं >60% सिंचाई भूजल पर निर्भर।

UPSC कीवर्ड्स: जल सुरक्षा, वर्षा जल संचयन, भूजल रिचार्ज, जल निष्का, जलवायु लचीलापन

2 CCPA ने रेस्तरां द्वारा अनिवार्य सर्विस चार्ज लगाने पर स्वतः संज्ञान लेकर कार्रवाई शुरू की

- उपभोक्ता संरक्षण प्राधिकरण (CCPA) ने स्वतः संज्ञान लेकर कार्रवाई की।
- सर्विस चार्ज डिफॉल्ट रूप से नहीं थोपा जा सकता।
- उपभोक्ताओं को चुनने व भूगतान का अधिकार।
- उल्लंघन पर उपभोक्ता संरक्षण अधिनियम, 2019 के तहत दंड।
- उपभोक्ता अधिकारों की रक्षा व पारदर्शिता।
- अनुचित व्यापार प्रथा के खिलाफ कदम।

सर्विस चार्ज बनाम GST

प्रकृति	सर्विस चार्ज		GST
	निजी शुल्क	सरकारी कर	
स्वच्छता	स्वैच्छिक	अनिवार्य	
भित्त का हिस्सा	वैकल्पिक	कर का हिस्सा	
कर नहीं	हों	नहीं	
असुविधा संभव	हों	नहीं	

महत्वपूर्ण तथ्य: CCPA का गठन उपभोक्ता संरक्षण अधिनियम, 2019 के तहत हुआ है। इसका उद्देश्य उपभोक्ताओं के हितों की रक्षा, संवर्धन व प्रवर्तन करना है।

UPSC कीवर्ड्स: CCPA, उपभोक्ता अधिकार, अनुचित व्यापार प्रथा, उपभोक्ता संरक्षण अधिनियम 2019, पारदर्शिता

3 भारतीय वायु सेना का एक्सरसाइज पिच ब्लैक 2026

- भारतीय वायु सेना ने ऑस्ट्रेलिया में पिच ब्लैक 2026 में भाग लिया।
- आयोजन: रॉयल ऑस्ट्रेलियन एयर फोर्स (RAAF)
- बहुराष्ट्रीय उच्च स्तरीय वायु युद्धाभ्यास।
- इंटरऑपरेबिलिटी, नेटवर्क-सेंट्रिक ऑपरेशन पर ध्यान।
- इंडो-पैसिफिक सहयोग को सुदृढ़ करता है।
- QUAD देशों की नियमित भागीदारी।



महत्वपूर्ण तथ्य: पिच ब्लैक में शहरी/दिवसीय/रात्रि ऑपरेशन, एयर कॉम्बैट, मिशन प्लानिंग शामिल।

UPSC कीवर्ड्स: पिच ब्लैक, वायु शक्ति, इंडो-पैसिफिक, सैन्य अभ्यास, इंटरऑपरेबिलिटी, QUAD

4 NAMASTE योजना: स्वच्छता कर्मियों की गरिमा, सुरक्षा एवं सामाजिक सुरक्षा

- पूर्ण नाम: नेशनल एक्शन फॉर मेकनाइज्ड सैनिटेशन इकोसिस्टम (NAMASTE)
- मैनुअल सीवर/सेप्टिक टैंक सफाई का उन्मूलन।
- मशीनीकरण, PPE, सुरक्षा उपकरण व कौशल प्रशिक्षण प्रदान।
- स्वास्थ्य बीमा, वैकल्पिक आजीविका व सामाजिक सुरक्षा।
- MoSJE व MoHUA के संयुक्त सहयोग से लागू।
- मानव गरिमा, स्वास्थ्य व सामाजिक न्याय को बढ़ावा।

NAMASTE के मुख्य स्तंभ



महत्वपूर्ण तथ्य: NAMASTE योजना का उद्देश्य मैनुअल स्कैवेंजिंग का पूर्ण उन्मूलन व स्वच्छता कर्मियों के कल्याण को सुनिश्चित करना है।

UPSC कीवर्ड्स: NAMASTE, स्वच्छता कर्म, सामाजिक न्याय, MoSJE, मानव गरिमा, वैकल्पिक आजीविका

5 कैंसर, डायबिटीज और मोटापे के विरुद्ध जन आंदोलन की अपील

- डॉ. जितेंद्र सिंह ने राष्ट्रव्यापी जन आंदोलन की अपील की।
- प्रारंभिक जाँच व वैज्ञानिक जागरूकता पर विशेष जोर।
- NCDs भारत में मृत्यु के प्रमुख कारण।
- स्वस्थ जीवनशैली, सही खान-पान व नियमित व्यायाम पर बल।
- राष्ट्रीय कार्यक्रम: NP-NCD, आयुष्मान भारत, हेल्थ एंड वेलनेस सेंटर से जुड़ा।
- निवारक स्वास्थ्य देखभाल पर बल (प्रिवेंटिव हेल्थकेयर)।

रणनीति: रोके → पहचानें → बचाएँ



महत्वपूर्ण तथ्य: NCDs (हृदय रोग, कैंसर, डायबिटीज, क्रॉनिक श्वसन रोग) कुल वयस्क मृत्यु का ~60% कारण हैं (WHO अनुमान)।

UPSC कीवर्ड्स: NCDs, प्रारंभिक जाँच, preventive healthcare, NP-NCD, स्वास्थ्य जागरूकता, जीवनशैली रोग

6 यूरोप के साथ भारत की आर्थिक साझेदारी को सुदृढ़ करने की दिशा में कदम

- वाणिज्य मंत्री ने स्पेन, बेल्जियम, फिनलैंड और एस्टोनिया का दौरा किया।
- भारत-EU आर्थिक साझेदारी को बढ़ाना।
- व्यापार, निवेश, प्रौद्योगिकी और हरित ऊर्जा पर फोकस।
- सेमीकंडक्टर, नवाचार, डिजिटल अर्थव्यवस्था पर सहयोग।
- सप्लाई चेन विविधीकरण व विश्वसनीय भागीदारी को बढ़ावा।
- भारत-EU FTA वार्ता के लिए सकारात्मक माहौल।

मुख्य सहयोग क्षेत्र



महत्वपूर्ण तथ्य: EU भारत का सबसे बड़ा व्यापार भागीदारों में से एक है। FTA से निर्यात, निवेश रोजगार के अवसर बढ़ेंगे।

UPSC कीवर्ड्स: भारत-EU संबंध, FTA, व्यापार, हरित प्रौद्योगिकी, सप्लाई चेन, आर्थिक कूटनीति

7 प्रधानमंत्री ने महान क्रांतिकारी मंगल पांडे जी को श्रद्धांजलि दी

- मंगल पांडे 34वीं बंगाल नेटिव इन्फैंट्री के सैनिक थे।
- 29 मार्च 1857 को बैरकपुर में विद्रोह की चिंगारी भड़की।
- 8 अप्रैल 1857 को फांसी दी गई।
- 1857 के विद्रोह के प्रमुख प्रेरक व्यक्तित्वों में से एक।
- साहस, स्वाधीनता व ब्रिटिश शासन के विरुद्ध प्रतिरोध का प्रतीक।



1857 की समयरेखा

29 मार्च 1857
बैरकपुर घटना
↓
8 अप्रैल 1857
मंगल पांडे को फांसी
↓
10 मई 1857
मेरठ से विद्रोह की शुरुआत

महत्वपूर्ण तथ्य: 1857 का विद्रोह भारतीय स्वतंत्रता संग्राम का पहला व्यापक सशस्त्र जनआंदोलन था।

UPSC कीवर्ड्स: मंगल पांडे, 1857 का विद्रोह, बैरकपुर, सैनिक असंतोष, कारतूस विवाद, औपनिवेशिक शासन के विरुद्ध प्रतिरोध

8 भारतीय पारंपरिक शिल्प: आर्थिक विकास का सशक्त आधार

- भारतीय शिल्प हमारी सांस्कृतिक विरासत का हिस्सा।
- ग्रामीण एवं अर्ध-शहरी क्षेत्रों में रोजगार सृजन।
- GI उत्पादों और हस्तशिल्प निर्यात को बढ़ावा।
- PM विश्वकर्म, ODOP और GI टैग पहल का समर्थन।
- MSME क्षेत्र को मजबूती, महिलाओं एवं कारीगरों का सशक्तिकरण।
- सतत आजीविका व समावेशी विकास को बढ़ावा।

शिल्प से समृद्धि तक



महत्वपूर्ण तथ्य: हस्तशिल्प क्षेत्र भारत के कुल निर्यात में महत्वपूर्ण योगदान देता है तथा लाखों लोगों को रोजगार प्रदान करता है।

UPSC कीवर्ड्स: हस्तशिल्प, GI, ODOP, PM विश्वकर्म, सांस्कृतिक अर्थव्यवस्था, MSME, समावेशी विकास

9 बिहार में हाईवे कनेक्टिविटी: केले के खेतों से मखाना बाजारों तक

- हाईवे परियोजनाएँ खेतों को बाजारों से जोड़ती हैं।
- केला, मखाना जैसे कृषि उत्पादों की आसान आवाजाही।
- परिवहन लागत व समय में कमी।
- फार्म-टू-मार्केट चैनल सुदृढ़।
- ग्रामीण अर्थव्यवस्था, आय और रोजगार में वृद्धि।
- PM गति शक्ति विजन को समर्थन।

फार्म टू मार्केट कनेक्ट



महत्वपूर्ण तथ्य: बेहतर सड़क संयर्क कृषि उत्पादकता, बाजार पहुँच और किसानों की आय बढ़ाता है।

UPSC कीवर्ड्स: कृषि अवसंरचना, मूल्य श्रृंखला, ग्रामीण अर्थव्यवस्था, PM गति शक्ति, परिवहन, मखाना

अन्य महत्वपूर्ण वन-लाइनर

मॉनसून पूरे भारत में छाया; सामान्य से एक दिन वाद कवरेज।



भारत और ऑस्ट्रेलिया ने यूरेनियम आपूर्ति समझौते पर हस्ताक्षर किए।



सुप्रीम कोर्ट: नागरिकता मामलों में निर्णय 'निष्पक्ष, विधिसम्मत और कानून के अनुसार' होने चाहिए।



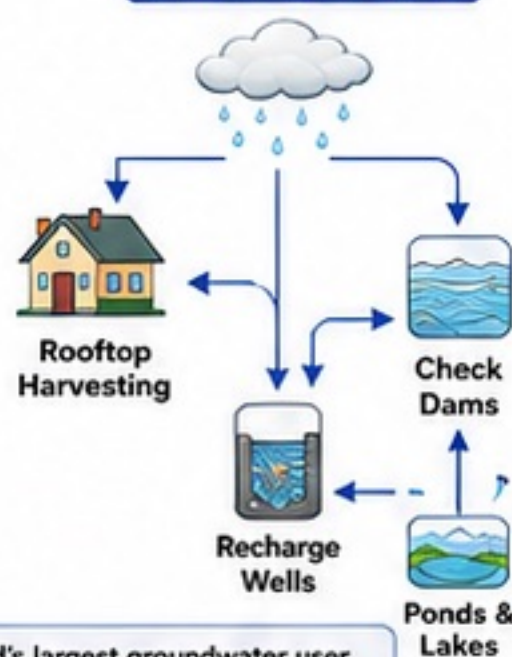
खुदरा मुद्रास्फोति 4.4% तक पहुँची; RBI के लक्ष्य (4%) से ऊपर।



नई तकनीक परमाणु अपशिष्ट जल को अधिक प्रभावी तरीके से फ़िल्टर करने में सक्षम।

1 CATCH THE RAIN: A RENEWED NATIONAL CALL FOR WATER CONSERVATION

- Nationwide campaign by Ministry of Jal Shakti.
- Principle: "Catch the rain, where it falls, when it falls."
- Promotes rainwater harvesting & groundwater recharge.
- Revives traditional water bodies & watershed management.
- Community participation at village & urban levels.
- Key for climate resilience & water security.



VALUE ADDITION: India is the world's largest groundwater user. ~85% rural drinking water & >60% irrigation depend on groundwater.

KEYWORDS: Water Security, Rainwater Harvesting, Groundwater Recharge, Watershed

2 CCPA ACTION AGAINST RESTAURANTS LEVYING MANDATORY SERVICE CHARGE

- CCPA initiates suo motu action against unfair trade practice.
- Service charge cannot be imposed by default.
- Must be voluntary & clearly communicated.
- Consumers have right to choose & pay.
- Violations attract penalty under CPA, 2019.
- Strengthens consumer rights & transparency.

SERVICE CHARGE vs GST

SERVICE CHARGE	GST
Private Charge	Government Tax
Voluntary	Mandatory
Part of Bill	Added to Bill
Not Tax	Tax
Can be Refused	Cannot be Refused

VALUE ADDITION: CCPA established under Consumer Protection Act, 2019 to protect, promote & enforce consumer rights.

KEYWORDS: CCPA, Unfair Trade Practice, Consumer Rights, CPA 2019

3 INDIAN AIR FORCE EXERCISE PITCH BLACK 2026

- IAF participates in Exercise Pitch Black 2026 in Australia.
- Hosted by Royal Australian Air Force.
- Multinational high-end air combat exercise.
- Focus on interoperability, network-centric warfare.
- Enhances Indo-Pacific cooperation & strategic deterrence.
- QUAD partners regularly participate.



VALUE ADDITION: Builds operational synergy, boosts interoperability and strengthens Indo-Pacific security architecture.

KEYWORDS: IAF, Pitch Black, Indo-Pacific, Interoperability, Air Power

4 NAMASTE SCHEME: ENSURING DIGNITY, SAFETY & SOCIAL SECURITY FOR SANITATION WORKERS

- Fall Form: National Action for Mechanised Sanitation Ecosystem.
- Aims to end hazardous manual cleaning of sewers & septic tanks.
- Provides machines, PPE, safety gear & training.
- Ensures health insurance & retentive livelihoods.
- Implemented by MoSJE in collaboration with MoHUA.
- Upholds dignity, safety & social security.



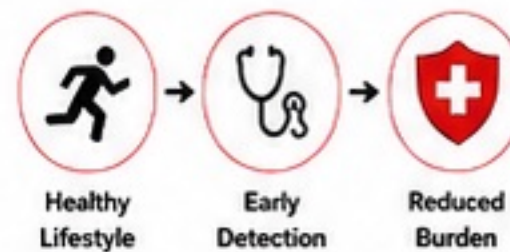
VALUE ADDITION: Aligns with Article 21 (Right to Life & Dignity) and SDGs 6, 8, 10. Promotes inclusive & humane urban development.

KEYWORDS: NAMASTE, Sanitation, Dignity of Labour, Social Justice, MoSJE

5 MASS PUBLIC MOVEMENT AGAINST CANCER, DIABETES & OBESITY

- Dr Jitendra Singh calls for nationwide movement against NCDs.
- Stresses early detection & scientific awareness.
- NCDs are leading cause of deaths in India.
- Early screening reduces mortality & cost.
- Aligns with NP-NCD, Ayushman Bharat & Fit India.
- Shift from curative care to preventive healthcare.

PREVENT → DETECT → PROTECT



VALUE ADDITION: NCDs account for ~60% of all deaths in India. Prevention is cost-effective and sustainable.

KEYWORDS: NCDs, Early Detection, NP-NCD, Preventive Healthcare, Lifestyle Diseases

6 INDIA'S ECONOMIC PARTNERSHIP WITH EUROPE

- Commerce Minister visits Spain, Belgium, Finland & Estonia.
- Strengthens India-EU economic partnership.
- Focus on trade, technology, clean energy & digital economy.
- Cooperation on supply chains, semiconductors & innovation.
- Supports India-EU FTA negotiations.
- Enhances strategic & economic connectivity.

KEY AREAS OF PARTNERSHIP



VALUE ADDITION: EU is India's largest trading partner. Focus on trusted partnerships, critical minerals & sustainable development.

KEYWORDS: India-EU, FTA, Trade, Green Tech, Supply Chains, Strategic Partnership

7 PM PAYS HOMAGE TO THE GREAT REVOLUTIONARY MANGAL PANDEY JI

- PM pays homage to Mangal Pandey Ji.
- Soldier of 34th Bengal Native Infantry.
- Incident at Barrackpore on 29 March 1857.
- Executed on 8 April 1857.
- Spark that ignited the Revolt of 1857.
- Symbol of courage and resistance against British rule.



1857 TIMELINE

29 March 1857 Barrackpore Incident 8 April 1857 Execution of Mangal Pandey 10 May 1857 Revolt begins at Meerut

KEYWORDS: Mangal Pandey, Revolt of 1857, Barrackpore, Freedom Struggle, Military Grievances

8 TRADITIONAL INDIAN CRAFTSMANSHIP DRIVING ECONOMIC GROWTH

- Traditional crafts reflect India's rich cultural heritage.
- Generate employment in rural & semi-urban areas.
- Promote GI products & handicrafts exports.
- Supported by PM Vishwakarma, ODOP & GI Tag initiatives.
- Strengthens cultural economy & sustainable livelihoods.
- Women artisans & MSMEs empowered.

CRAFTS TO COMMERCE



VALUE ADDITION: Handicrafts sector contributes significantly to MSMEs, exports and inclusive growth.

KEYWORDS: Handicrafts, GI, ODOP, PM Vishwakarma, Cultural Economy, Livelihoods

9 BIHAR HIGHWAY CONNECTIVITY: FROM BANANA FARMS TO MAKHANA MARKETS

- Highway projects connect farms to markets.
- Improves access to banana, makhana & other produce.
- Reduces transport cost & time.
- Strengthens farm-to-market value chain.
- Supports rural economy & PM Gati Shakti vision.
- Boosts agri-logistics & incomes.

FARM TO MARKET CONNECT



VALUE ADDITION: Better roads = better prices for farmers, lower post-harvest losses, stronger rural economy.

KEYWORDS: Infrastructure, Agriculture, Value Chain, Gati Shakti, Rural Economy

OTHER IMPORTANT ONE-LINERS



Monsoon covers entire India; one day later than normal.



India & Australia sign uranium supplies agreement.



SC: Citizenship rulings must be 'fair, lawful'.



Retail inflation rises to 4.4%; above RBI target.



New study finds efficient way to filter nuclear wastewater.

16 Match the metals with their source regions:

Metals	Source region
1. Gold	A. Afghanistan, Iran, Kolar (South India)
2. Copper	B. Khetri (Rajasthan), Baluchistan, Oman
3. Tin	C. Afghanistan, Iran
4. Lapis Lazuli	D. Shortughai, Afghanistan

Select the correct pair from the codes given below:

- (a) 1-B, 2-A, 3-D, 4-C
- (b) 1-A, 2-B, 3-C, 4-D
- (c) 1-C, 2-D, 3-A, 4-B
- (d) 1-D, 2-C, 3-B, 4-A

17 Match the metals with their source regions:

Metals	Source region
1. Jade	A. Pamir (Central Asia)
2. Lead	B. South India
3. Silver	C. Rajasthan, Mesopotamia
4. Steatite	D. Iran, South Rajasthan

Select the correct pair from the codes given below:

- (a) 1-B, 2-D, 3-A, 4-C
- (b) 1-C, 2-A, 3-D, 4-B
- (c) 1-D, 2-C, 3-B, 4-A
- (d) 1-A, 2-B, 3-C, 4-D

18 Match the following sites with their findings:

Site	Findings
1. Kalibangan	A. Fire altars showing the practice of sacrifice
2. Chanhudaro	B. Bead maker's shop
3. Dholavira	C. Unique water harvesting system

Choose the correct pair from the codes given below:

- (a) 1-C, 2-B, 3-A
- (b) 1-A, 2-C, 3-B
- (c) 1-A, 2-B, 3-C
- (d) 1-B, 2-C, 3-A

19 Which of the following is NOT a major cause for the decline of the Harappan Civilization?

- (a) Change in the course of rivers
- (b) Over-exploitation of natural resources
- (c) Aryan invasion
- (d) Climate change and drought

20 Which of the following statements about Harappan urban planning is correct?

- (a) Streets were laid out in a circular pattern.
- (b) Cities had separate citadel and lower town.
- (c) Houses did not have private bathrooms.
- (d) Town planning was unorganised and chaotic.

21 Which of the following crops were grown by the Harappans?

- (a) Wheat, Barley, Rice
- (b) Wheat, Barley, Cotton
- (c) Rice, Millets, Sugarcane
- (d) Millets, Gram, Cotton

22 Which of the following animals were domesticated by the Harappans?

- (a) Cow, Buffalo, Goat
- (b) Tiger, Rhinoceros, Elephant
- (c) Horse, Camel, Donkey
- (d) Dog, Cat, Pig

23 With reference to Harappan burials, which of the following statements is correct?

- (a) They practiced only cremation.
- (b) Burials were accompanied by grave goods.
- (c) All burials were in urns.
- (d) Burials were always solitary without any goods.

24 Which of the following is associated with the "Mature Harappan Phase"?

- (a) Regionalisation of culture
- (b) Standardisation of weights and measures
- (c) Decline of urban centres
- (d) Nomadic pastoralism

25 Which of the following is a characteristic feature of the Harappan script?

- (a) It is alphabetic and phonetic.
- (b) It is pictographic and not yet deciphered.
- (c) It was written on palm leaves.
- (d) It used Greek letters.

26 Which of the following items were used as weights and measures by the Harappans?

- (a) Binary system of weights
- (b) Standardised cubical weights
- (c) Irregular stone slabs
- (d) Animal bones

27 Which of the following is TRUE about the Harappan trade?

- (a) They traded only within India.
- (b) They had sea trade with Mesopotamia.
- (c) They used coins for trade.
- (d) They had no trade relations.

SRIJAN INDIA ONE STATES OF INDIA

19 जुलाई 2026

जम्मू & कश्मीर (केन्द्र शासित प्रदेश)

धरती का स्वर्ग – सामरिक सीमाएं, समृद्ध संस्कृति और प्राकृतिक सौंदर्य

डेल झील, श्रीनगर

वैष्णो देवी मंदिर, कटरा

1. त्वरित तथ्य

ग्रीष्मकालीन राजधानी	: श्रीनगर
शीतकालीन राजधानी	: जम्मू
गठन	: 31 अक्टूबर 2019
राजभाषाएं	: कश्मीरी, डोगरी, उर्दू, हिंदी, अंग्रेजी
राज्य पशु	: हंगुल (कश्मीर हिरण)
राज्य पक्षी	: ब्लैक-नेकड क्रेन
राज्य पुष्प	: कमल
राज्य वृक्ष	: चिनार (चिनार)
जनसंख्या (2011)	: 1.23 करोड़ (लगभग)
क्षेत्रफल	: 42,241 वर्ग किमी
साक्षरता दर (2011)	: 67.2%

महत्वपूर्ण तथ्य

- विधानसभा वाला केंद्र शासित प्रदेश।
- विश्व प्रसिद्ध डेल झील, पश्मीना और केसर के लिए प्रसिद्ध।
- हिमालय की महान नदियाँ – झेलम, चिनाव, रावी, तावी।
- भारत की सबसे अधिक केसर उत्पादक क्षेत्र।
- भारत-पाक नियंत्रण रेखा (LoC) पर सामरिक रूप से स्थित।

2. स्थान एवं मानचित्र

जम्मू एवं कश्मीर तथा लद्दाख (आधिकारिक मानचित्र)



मुख्य नदियाँ

- झेलम
- चिनाव
- रावी
- तावी
- सिंध
- किशनगंगा

पड़ोसी राज्य / देश

- उत्तर : पाकिस्तान
- पूर्व : लद्दाख (UT)
- दक्षिण : हिमाचल प्रदेश
- दक्षिण-पश्चिम : पंजाब

4. अर्थव्यवस्था

- मुख्य क्षेत्र**
 - पर्यटन, कृषि, बागवानी, हस्तशिल्प, रेशम उद्योग, कस्बों, जलविद्युत, शिक्षा।
- प्रमुख उद्योग**
 - कालीन, पश्मीना, रेशम, अखरोट लकड़ी कटव, पेपर-मैशे, केसर, सेब प्रसंस्करण।
- खनिज**
 - चुना पत्थर, जिप्सम, बॉक्साइट, सीसा, जस्ता, मार्बल, शैल-पत्थर।
- अवसंस्चना**
 - चिनाव रेलवे पुल, बनीहल सुरंग, जेठ-मोह सुरंग, राष्ट्रीय राजमार्ग (NH-44, NH-701A)।
- मुख्य आर्थिक तथ्य**
 - भारत का सबसे बड़ा केसर उत्पादक।
 - सेब उत्पादन में अग्रणी।
 - पर्यटन और जलविद्युत की विशाल क्षमता।

चिनाव रेल पुल

बनीहल सुरंग

सेब के बागान

मुख्य फसलें

- धान, गेहूँ, मक्का, दालें, राजमा, मसूर।

बागवानी

- सेब, चेरी, नाशपाती, खुबानी, अखरोट, बादाम।

पशुपालन

- भेड़, कत्तनी, गाय, बैल, पोल्टी, याक (उच्च हिमालयी क्षेत्र)।

GI टैग

- कश्मीर केसर, कश्मीरी पश्मीना, बसोही पेंटिंग, कश्मीर अखरोट लकड़ी कला।

GI टैग : कश्मीर केसर

चावल



सेब



अखरोट



गेहूँ



केसर



पश्मीना बकरी



7. त्योहार

- व्युलिप महोत्सव** (बसंत उत्सव)
- लोहरी** (शीत ऋतु फसल)
- वैसाखी** (फसल उत्सव)
- ईद-उल-फित्र**
- ईद-उल-अज़हा**
- नवरात्रि**
- शिवरात्रि** (हेराथ)
- उर्स महोत्सव** (सूफी दरगाहें)

व्युलिप महोत्सव

8. पर्यावरण एवं जैव विविधता

राष्ट्रीय उद्यान

- दावीगाम, किश्तवाड़ उच्च हिमालयी राष्ट्रीय उद्यान।

वन्यजीव अभयारण्य

- ओवर-अरु, हिरपोरा, जसरोला।

रामसर स्थल

- सुनर झील, होकरर वैटलैंड, सुरीनसर-मानसर झील।

प्रमुख जीव-जंतु

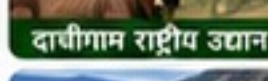
- हंगुल, हिमालयी भालू, कस्तूरी मृग, हिम गेंडुआ (डुआई गांसे क्षेत्र)।



दावीगाम राष्ट्रीय उद्यान



ब्लैक-नेकड क्रेन



सुनर झील



हिमालयी मोनाल

3. इतिहास एवं धरोहर

प्राचीन इतिहास

- कल्हण की 'राजतरंगिणी' में उल्लेख।
- मौर्यों के सम्राट अशोक के अधीन।
- कुषाण एवं कालचुर राजवंश का प्रभाव।

मध्यकालीन इतिहास

- शाह मीर वंश का शासन।
- मुगल काल (अकबर के अधीन कश्मीर)।
- अफगान शासक।
- सिख साम्राज्य (महाराजा रणजीत सिंह)।

आधुनिक इतिहास

- अमृतसर की संधि (1846) – डोगरा शासन।
- भारत में विलय पत्र (1947)।
- जम्मू-कश्मीर पुनर्गठन अधिनियम 2019 (31 अक्टूबर 2019) – केंद्र शासित प्रदेश।

प्रमुख व्यक्तित्व

- लाल डेड, शेख नूर-उद-दीन (नंद ऋषि)
- महाराजा गुलाब सिंह
- महाराजा हरि सिंह

धरोहर स्थल

- मुगल उद्यान, प्राचीन मंदिर, सूफी दरगाहें, बसोही पेंटिंग, पश्मीना कला।

मुगल गार्डन, श्रीनगर

मार्तंड सूर्य मंदिर

शंकराचार्य मंदिर

बसोही पेंटिंग

6. संस्कृति एवं परंपरा

लोक नृत्य

- रोफ, ड्रमहल, कुड, भांड पघेर।

लोक संगीत

- सुखियाना संगीत, चकरी, वानवुन।

कला रूप

- पेपर-मैशे, अखरोट लकड़ी नक्काशी, बसोही पेंटिंग।

हस्तशिल्प

- पश्मीना शॉल, कालीन, सिल्क, सूज़नी कड़ाई, लॉबे के बर्तन।

भाषाएं

- कश्मीरी, डोगरी, उर्दू, हिंदी, अंग्रेजी।

सांस्कृतिक विशेषताएं

- सूफी परंपरा, आतिथ्य सत्कार, प्रकृति के प्रति सम्मान।

रोफ नृत्य

पश्मीना शॉल

पेपर-मैशे आर्ट

9. पर्यटन एवं धरोहर

प्रमुख पर्यटन स्थल

- डेल झील, गुलमार्ग, पहलगाम, सोनमार्ग, वैसखी पैली, मुगल गार्डन।

धार्मिक स्थल

- वैष्णो देवी, अमरनाथ गुफा, शंकराचार्य मंदिर, हजूरतबल दरगाह।

सांस्कृतिक धरोहर

- मुगल गार्डन, मार्तंड मंदिर, पुराने शिन्ने एवं स्मारक।

गुलमार्ग

पहलगाम

अमरनाथ गुफा

हजूरतबल दरगाह

10. UPSC के लिए वैल्यू एडिशन

- प्रीलिम्स तथ्य**
 - विधानसभा वाला केंद्र शासित प्रदेश, राजधानियाँ (श्रीनगर/जम्मू), वुलन झील, हंगुल, केसर, शैविडन, LoC।
- मेन्स विषय**
 - भौगोलिक महत्व, सीमा अवसंरचना, जल सुरक्षा (इंडन बेसिन), बागवानी अवसंरचना, पर्यटन क्षमता, आपदा प्रबंधन, पारिस्थितिकी।
- करेंट अफेयर्स लिंक**
 - चिनाव रेल पुल, स्मार्ट सिटी परियोजनाएँ, पर्यटन नीति, हाइड्रोइलेक्ट्रिक बिजली, सीमा बुनवादीकरण, जलवायु परिवर्तन और हिमालयी पारिस्थितिकी।
- महत्वपूर्ण व्यक्तित्व**
 - लाल डेड, नंद ऋषि, महाराजा गुलाब सिंह, महाराजा हरि सिंह।

11. त्वरित पुनरावृत्ति – 15 महत्वपूर्ण तथ्य

- गठन – 31 अक्टूबर 2019
- ग्रीष्मकालीन राजधानी – श्रीनगर
- शीतकालीन राजधानी – जम्मू
- राजभाषाएं – कश्मीरी, डोगरी, उर्दू, हिंदी, अंग्रेजी
- क्षेत्रफल – 42,241 वर्ग किमी
- जनसंख्या (2011) – 1.23 करोड़ (लगभग)
- सबसे बड़ी झील – वुलन झील
- राज्य पशु – हंगुल (कश्मीर हिरण)
- राज्य पक्षी – ब्लैक-नेकड क्रेन
- राज्य पुष्प – कमल
- राज्य वृक्ष – चिनार
- भारत का प्रमुख केसर उत्पादक
- विश्व प्रसिद्ध – डेल झील, पश्मीना, सेब
- सामरिक महत्व – LoC, इंडन बेसिन और उत्तरी सीमाएं।



12. क्यों महत्वपूर्ण है जम्मू & कश्मीर?



सामरिक महत्व

पाकिस्तान के साथ अंतरराष्ट्रीय सीमा व LoC, उत्तरी सीमाओं की रक्षा के लिए महत्वपूर्ण।



कृषि और बागवानी

भारत का सबसे बड़ा केसर उत्पादक, सेब एवं अखरोट में अग्रणी।



जल सूरत

इंडस बेसिन की प्रमुख नदियों का उद्गम स्थल।



सांस्कृतिक विरासत

सूफी परंपरा, शिन्ने हस्तशिल्प, बहुभाषी संस्कृति की धरोहर।



पर्यटन क्षमता

प्राकृतिक सौंदर्य, धार्मिक स्थल और एडवेंचर पर्यटन की अपार संभावनाएँ।



विकास की संभावनाएँ

अवसंस्चना, जलविद्युत, शिक्षा, स्वास्थ्य और रोजगार के अवसर।

SRIJAN INDIA ONE STATES OF INDIA

19th JULY 2026

JAMMU & KASHMIR (UNION TERRITORY)

Paradise on Earth — Strategic Frontiers, Rich Culture & Natural Beauty

DAL LAKE, SRINAGAR

PAHALGAM VALLEY

1. QUICK FACTS

Capital (Summer)	: Srinagar
Capital (Winter)	: Jammu
Formation	: 31 October 2019
Official Languages	: Kashmiri, Dogri, Urdu, Hindi, English
UT Animal	: Hangul (Kashmir Stag)
UT Bird	: Black-necked Crane
UT Flower	: Lotus
UT Tree	: Chinar
Population (2011)	: 1.23 crore (approx.)
Area	: 42,241 sq km
Literacy Rate (2011)	: 67.2%

IMPORTANT FACTS

- ★ Northernmost Union Territory of India.
- ★ UT with Legislative Assembly.
- ★ World famous for Dal Lake, Pashmina & Saffron.
- ★ Himalayan rivers – Jhelum, Chenab, Ravi, Tawi.
- ★ Strategically located along LoC & International Border.

2. LOCATION & MAP

MAP OF UT OF JAMMU & KASHMIR AND UT OF LADAKH



IMPORTANT RIVERS

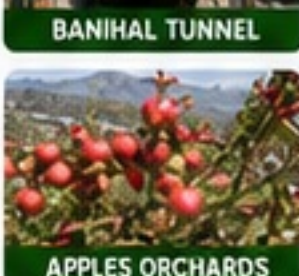
- ▶ Jhelum
- ▶ Chenab
- ▶ Ravi
- ▶ Tawi
- ▶ Sindh
- ▶ Kishanganga

NEIGHBOURS

- ▶ North & West : Pakistan
- ▶ East : Ladakh (UT)
- ▶ South : Himachal Pradesh
- ▶ South West : Punjab

4. ECONOMY

- Major Sectors**
 - Tourism, Agriculture, Horticulture, Handicrafts, Sericulture, Floriculture, Hydropower, Education.
- Major Industries**
 - Carpets, Pashmina, Silk, Paper Maché, Walnut Wood Carving, Apple Processing.
- Minerals**
 - Gypsum, Limestone, Bauxite, Lino, Building Stones, Marble.
- Infrastructure**
 - Chenab Rail Bridge, Banihal Tunnel, Z-Morh Tunnel, NH-44, NH-701A.
- Key Economic Facts**
 - India's largest producer of Saffron.
 - Major apple-producing region.
 - High potential in tourism & hydropower.



5. AGRICULTURE

- Major Crops**
 - Rice, Wheat, Maize, Pulses.
- Horticulture**
 - Apple, Cherry, Pear, Apricot, Walnut, Almond, Plum.
- Livestock**
 - Sheep, Goat, Cattle, Poultry, Yak (high altitude).
- GI Tags**
 - Kashmir Saffron,
 - Kashmir Pashmina,
 - Basohli Painting,
 - Kashmir Walnut Wood Carving.



GI TAG : Kashmir Saffron

8. ENVIRONMENT & BIODIVERSITY

- National Parks**
 - Dachigam NP, Kishtwar High Altitude NP.
- Wildlife Sanctuaries**
 - Overo-Aru, Hirpora, Jasrota.
- Ramsar Sites**
 - Wular Lake, Hokersar Wetland, Surinsar-Mansar Lakes.
- Important Species**
 - Hangul, Himalayan Black Bear, Musk Deer, Himalayan Monal.



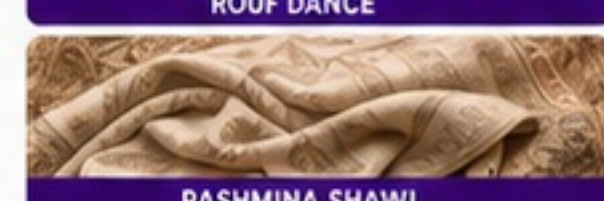
3. HISTORY & HERITAGE

- Ancient History**
 - Mentioned in Rajatarangini by Kalhana.
 - Mauryan rule under Ashoka.
- Medieval History**
 - Shah Mir Dynasty.
 - Mughal Rule under Akbar.
 - Sikh Empire under Maharaja Ranjit Singh.
- Modern History**
 - Treaty of Amritsar (1846) – Dogra Rule.
 - Instrument of Accession (1947).
 - Reorganized as UT on 31 Oct 2019.
- Important Personalities**
 - Lal Ded – Mystic Poet.
 - Sheikh Noor-ud-din (Nund Rishi).
 - Maharaja Gulab Singh – Founder of Dogra Rule.
 - Maharaja Hari Singh – Last Ruler.
- Heritage Highlights**
 - Mughal Gardens, Ancient Temples, Sufi Shrines, Forts & Heritage Sites.



6. CULTURE & TRADITION

- Folk Dances**
 - Rouf, Dumhal, Kud, Bhand Pather.
- Folk Music**
 - Sufi Music, Chakri, Wanwan.
- Art Forms**
 - Paper Maché, Walnut Wood Carving, Basohli Painting.
- Handicrafts**
 - Pashmina Shawls, Carpets, Silk, Sossni Embroidery, Copperware.
- Languages**
 - Kashmiri, Dogri, Urdu, Hindi, English.
- Cultural Practices**
 - Sufi Traditions, Hospitality, Respect for Nature.



9. TOURISM & HERITAGE

- Major Attractions**
 - Dal Lake, Gulmarg, Pahalgam, Sonamarg, Betaab Valley, Mughal Gardens.
- Religious Sites**
 - Valhmo Devi, Amarnath Cave, Shankaracharya Temple, Hazratbal Shrine.
- Cultural Landmarks**
 - Mughal Gardens, Pari Mahal, Lal Chowk Heritage.
- Adventure Tourism**
 - Skiing, Trekking, River Rafting, Golf, Mountaineering.



10. UPSC VALUE ADDITION

- Prelims Facts**
 - UT with Legislative Assembly, Capital (Srinagar/Jammu), Wular Lake, Hangul, Kashmir Saffron, LoC.
- Mains Points**
 - Geostrategic importance, Border infrastructure, Water security (Indus Basin), Horticulture economy, Tourism potential, Disaster management.
- Current Affairs Linkages**
 - Development projects, Chenab Rail Bridge, Tourism revival, G20 Tourism Working Group meetings in J&K (2023).
- Important Personalities**
 - Lal Ded, Nund Rishi, Maharaja Gulab Singh, Maharaja Hari Singh.

11. RAPID REVISION – 15 KEY FACTS

- 1 Formed as UT – 31 October 2019
- 2 Capitals – Srinagar (Summer), Jammu (Winter)
- 3 UT with Legislative Assembly
- 4 Area – 42,241 sq km
- 5 Population (2011) – 1.23 crore (approx.)
- 6 Major River – Jhelum
- 7 Largest Lake – Wular Lake
- 8 National Park – Dachigam NP
- 9 UT Animal – Hangul (Kashmir Stag)
- 10 UT Bird – Black-necked Crane
- 11 UT Flower – Lotus
- 12 UT Tree – Chinar
- 12 Famous Crop – Saffron
- 14 Famous Product – Pashmina
- 15 Strategic Importance – LoC, Indus Basin & Northern Frontier



12. WHY J&K MATTERS?

- Strategic Location**
 - Border with Pakistan, LoC, Gateway to Central Asia.
- Water Security**
 - Source of major Indus Basin Rivers.
- Tourism Potential**
 - One of India's top travel destinations.
- Agriculture Strength**
 - India's largest apple producer & only saffron growing region.
- Cultural Heritage**
 - Rich blend of Himalayan culture, Sufi traditions & historical legacy.
- Development Focus**
 - Infrastructure, tourism, economy & people-centric governance.

India's first privately made orbital rocket Vikram-1 places payloads into orbit

Hemanth C.S.
SRIHARIKOTA

India achieved a major milestone in its space journey on Saturday as the country's first privately developed orbital rocket, Vikram-1, successfully placed multiple technology demonstration payloads and postcards – including from Prime Minister Narendra Modi – into a low earth orbit.

Dubbed 'Mission Aagamam' (meaning arrival), the launch marked India's entry into an elite group of nations, becoming only the third country in the world to achieve the feat through a privately developed launch vehicle.

The mission was a "grand success", said private space launch company Skyroot Aerospace, which developed the rocket.

Vikram-1 lifted off from the Satish Dhawan Space Centre in Sriharikota at 12.05 p.m.

Defining moment: PM

Pawan Kumar Chandana, co-founder and CEO, Skyroot Aerospace, said that during the flight, Vikram-1 completed every principal mission milestone, validating the performance of its propulsion, avionics, and guidance, navigation and control systems under true operational conditions.

Following the successful launch, Prime Minister Narendra Modi had a phone conversation with the team of Skyroot Aerospace. Speaking to Mr. Chandana, the Prime Minister said that the launch is a defining moment in India's space journey.

"The growing participation of our private sector is opening new frontiers and accelerating innovation. This achievement will encourage youngsters to dream bigger and innovate fearlessly," Mr. Modi said.

Private entry

The 'Mission Aagamam' makes India the third country in the world to attain private orbital launch capacity

■ Developed by Skyroot Aerospace, Vikram-1 is a multi-stage orbital launch vehicle built with an all-carbon composite structure

■ It is powered by in-house developed propulsion systems, including 3D-printed engines

■ It is designed to carry small satellites weighing up to 350 kg to low earth orbit

PAYLOADS

- Embrace by CosmoServe Space
- Solaras Satellite by Grahaa Space
- Scope Satellite by Skyroot Aerospace

CONFIGURATION

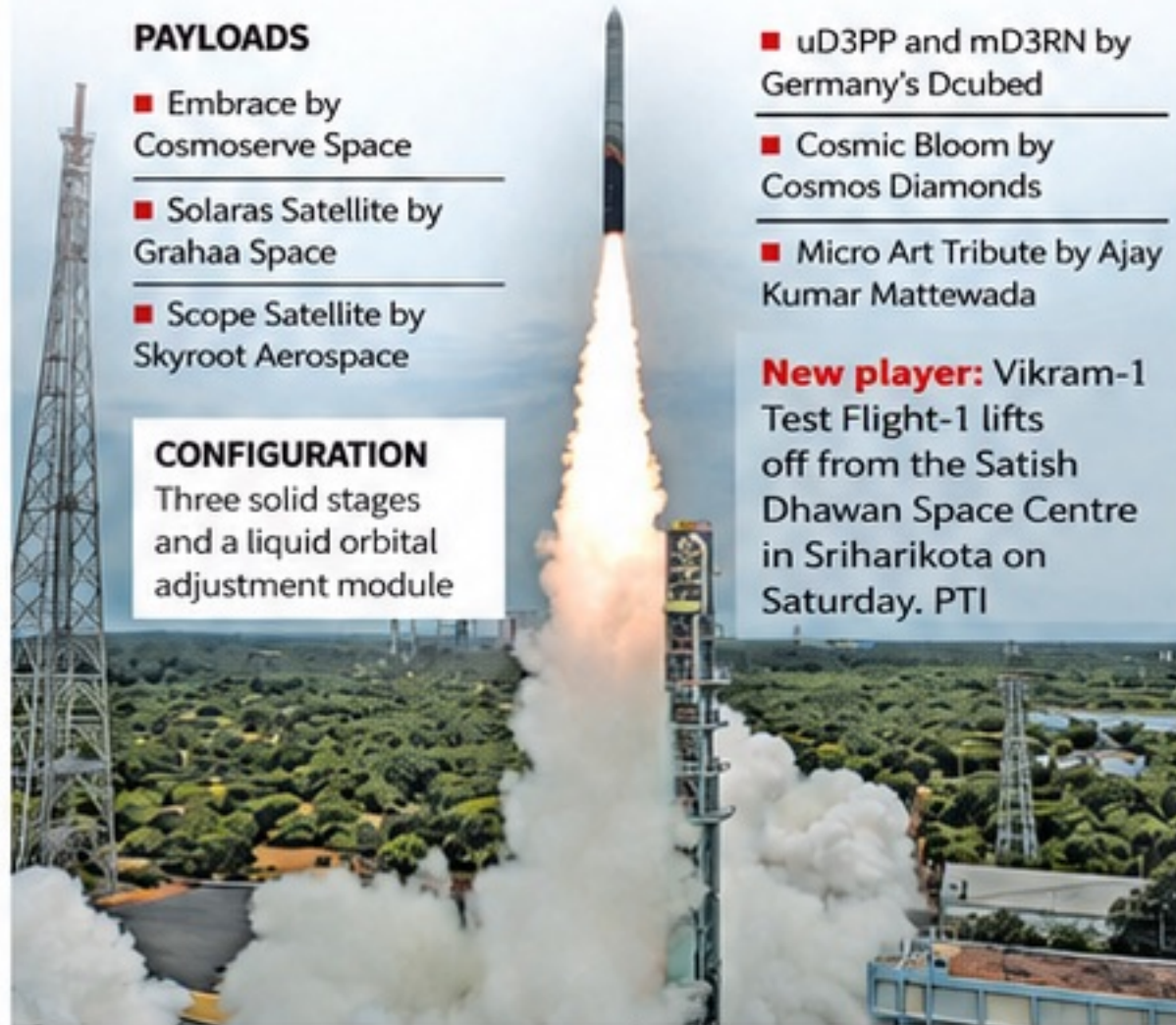
Three solid stages and a liquid orbital adjustment module

■ uD3PP and mD3RN by Germany's Dcubed

■ Cosmic Bloom by Cosmos Diamonds

■ Micro Art Tribute by Ajay Kumar Mattewada

New player: Vikram-1 Test Flight-1 lifts off from the Satish Dhawan Space Centre in Sriharikota on Saturday. PTI



The launch comes 46 years after India launched its first experimental satellite launch vehicle, SLV-3. On July 18, 1980, India became the sixth member of an exclusive club of spacefaring nations when the SLV-3 was successfully launched from the same venue as Vikram-1.

"The vehicle deployed its customer payloads and generated a wealth of in-flight data that will directly inform future Vikram missions and the continued evolution of Skyroot's launch programme," Mr. Chandana said.

"We have a team of freshers, experienced persons and a diversified workforce," he said.

high-thrust solid-fuel rocket boosters. It is designed to carry small satellites weighing up to 350 kg to low earth orbit.

During the flight, Vikram-1 deployed six technology demonstration payloads from Grahaa Space, CosmoServe, DCubed and Skyroot, along with Cosmos Diamonds' artwork 'Cosmic Bloom', and a micro-art piece.

Pawan Goenka, chairman, IN-SPACE, said: "Only a handful of nations can reach space on their own, and today a private Indian company joined that exclusive club. What lifted off today is the culmination of years of work, a team of over a thousand people, and efforts of close to 400 suppliers with it. Congratulations to team Skyroot. You have given us an India moment."



- Vikram-1 is India's first privately developed orbital rocket.
- Successfully placed multiple technology demonstration payloads into low Earth orbit.
- Mission named 'Mission Aagamam'.
- Makes India the third country in the world to achieve private orbital launch capability.



- Developed by Skyroot Aerospace.
- Multi-stage orbital launch vehicle with all-carbon composite structure.
- Powered by in-house developed propulsion systems including 3D-printed engines.
- Designed to carry small satellites up to 350 kg to low Earth orbit.



- Payloads include satellites from Grahaa Space, CosmoServe, Dcubed (Germany), Skyroot.
- Also carried artwork 'Cosmic Bloom' and a micro-art piece.
- Demonstrates India's growing private space ecosystem and innovation capability.



- Part of India's entry into an elite group of spacefaring nations.
- Success validates performance of propulsion, avionics, guidance, navigation & control systems.
- PM Modi called it a defining moment for India's space journey.
- 1000+ team members and ~400 suppliers contributed to the mission.



- Launch from Satish Dhawan Space Centre, Sriharikota at 12:05 p.m.
- Comes 46 years after India's first launch vehicle SLV-3 was launched (18 July 1980).
- Vikram-1 is a 7-storey-tall, multi-stage vehicle with solid-fuel boosters.
- Achieved all mission milestones – a grand success.



- Reflects growing private sector participation in space.
- Encourages innovation and inspires youth.
- Strengthens India's position in small satellite launch market.
- Supports Atmanirbhar Bharat, technological self-reliance and space economy.

What goals does Semicon 2.0 aim to achieve?

What are the key focus areas of Semicon 2.0? How is it different from the first phase? Why is India focusing on semiconductor manufacturing? What incentives does the Mobile Phone Manufacturing Scheme offer?

Aroon Deep

The story so far:

On July 15, the Union Cabinet cleared the second phase of the India Semiconductor Mission (ISM), and the Mobile Phone Manufacturing Scheme (MPMS), with a ₹1.27 lakh crore and ₹62,500 crore outlay, respectively. The programmes are aimed at encouraging the next cohort of semiconductor fabrication, assembly, and packaging facilities in India, as well as following through on encouraging more phone assembly and component manufacturing in the country. **The government expects the scheme to draw ₹4 lakh crore in investment, ₹2 lakh crore in production, and ₹1 lakh crore in exports over its tenure of five years.**

How is this different from the first phase?

ISM's first phase was approved in December 2021 with an outlay of ₹76,000 crore. Following an amendment in 2022, the programme was empowered to provide for up to 50% capital subsidy for big-ticket projects, such as Micron's memory chip packaging facility in Sanand, Gujarat. The funds were also directed to the Electronics Component Manufacturing Scheme, which was designed to incentivise additional

The government has insisted that building domestic capacities is essential even if it takes decades to reach the level of countries, such as the Netherlands and Taiwan, whose companies are critical in chipmaking

manufacturing of smaller electronics components.

The Gazette notification laying out the precise details of the second phase is set to be published by next month. In the meantime, Information Technology Minister Ashwini Vaishnaw and Ministry of Electronics and Information Technology (MeitY) Additional Secretary Amitesh Kumar Sinha have offered a few details of the expanded scope of the programme.

The main change is that the ISM programme will now cover a larger part of the electronics manufacturing ecosystem, including areas that were partially addressed in the previous phase. These include encouraging chip design talent, capital machinery (the large equipment used in chip-making facilities), chemicals and gases that are of semiconductor-grade purity, and research and development efforts.

The newer scheme will also trim capital subsidies to 30–40%, Mr. Sinha said, as the semiconductor industry is likely to get more attractive in India even with less incentives. The government is also less likely to offer land support, as State governments have shown increasing enthusiasm for hosting such projects by providing land at token prices and offering their own incentives on top of those provided by the Union government.

What have been the outcomes of phase 1?

Of the 12 manufacturing and packaging units approved in phase 1, with a total committed investment of ₹1.64 lakh crore, most are semiconductor packaging units. Nine such units are spread across Gujarat, Uttar Pradesh, Punjab, Assam, Odisha, and Andhra Pradesh. In addition, there is a silicon fabrication unit, and one gallium-nitride Micro LED display fabrication unit. **The Tata Electronics fab is set to start commercial production in 2028.**

The scheme included a design-linked incentive programme, under which 24 projects have been approved. The government has also obtained licences for expensive semiconductor design software and provided them free of cost to universities and startups. The Semiconductor Lab, Mohali, which is being revamped, is being positioned as a facility to help "tape out" chips designed by students and researchers.

Why is India focusing on semiconductor manufacturing?

From the COVID-19 era supply chain disruptions to export controls initiated by the U.S. during the trade war with China, there has been a growing sense that India needs to integrate more tightly with global electronics value chains. The government has insisted that building domestic capacities is essential even if it takes decades to reach the level of countries, such as the Netherlands and Taiwan, whose companies are critical in chipmaking.

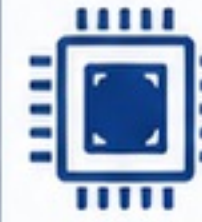
How sophisticated are the chips targeted in the current facilities?

While the most powerful phones use "frontier" grade chips, with a process node of 7 nanometres or even less, the Union government has targeted 28nm chips (which are made in what are called "legacy" process nodes). There is a massive market for these chips, Mr. Vaishnaw reasoned, as everyday electronics, where size and computing power are not constraints, require such components too.

As ISM 2.0 progresses, the government hopes that the ecosystem will progress to frontier nodes, especially by improving the level of domestically owned intellectual property and research for such chips. While semiconductor designers are aplenty in India, most work for either foreign firms or on their behalf, leaving royalties and a startup's limited help, involving depending on expertise outside the domestic industry.

Why is MPMS being notified?

While a growing share of iPhone sales around the world come from handsets assembled in India, most components remain imported, and there are barely any Indian-designed handsets in the market. The MPMS aims to incentivise both the expansion of domestic phone assembly as a way to grow the ancillary market, and to incentivise domestic design and research and development. **To that end, the scheme provides for incentives ranging from 2.25% to 5%, depending on the level of local design involved in the handsets.**



- Semicon 2.0 launched with ₹1.27 lakh crore outlay.
- Aims to attract ₹4 lakh crore investment over 5 years.
- Focus on complete semiconductor ecosystem in India.



- Encourage chip design talent.
- Support capital machinery, chemicals, gases, R&D.
- Capital subsidy reduced to 30–40%.
- States to provide land & additional incentives.



- Phase 1 (₹76,000 crore) approved in Dec 2021.
- 12 units approved; ₹1.64 lakh cr committed investment.
- 9 packaging units across 6 states.
- Tata Electronics fab to start production in 2028.



- Global supply chain disruptions highlight need for self-reliance.
- Integration with global value chains is the goal.
- Long-term vision: build capacities like Netherlands, Taiwan.



- Current focus on 28nm (legacy nodes) chips.
- Large market for everyday electronics.
- Aim to move towards frontier nodes over time.
- Need for IP creation & research.



- MPMS to boost domestic phone assembly & component ecosystem.
- Incentives range from 2.25% to 5%.
- Promote Indian design & R&D in handsets.



- Key Institutions: MeitY, ISM, Semiconductor Lab Mohali.
- Schemes: ISM 2.0, MPMS, Design Linked Incentive.
- Relevant for: GS III – Economy, Science & Tech, Industry.



Union IT Minister Ashwini Vaishnaw showcases 'Made in India' semiconductor chips while speaking during a Cabinet briefing in New Delhi. PTI

What are the gains from the India-U.K. trade deal?

How do the two countries benefit from the deal? What changes will the deal bring for Indian workers in the U.K.? What were the intractable issues left out of the deal? Why does this deal stand out in particular?

T.C.A. Sharad Raghavan

The story so far:

The India-U.K. Comprehensive Economic and Trade Agreement (CETA) came into effect on July 15, a year after it was signed. At the same time, the India-U.K. Double Contribution Convention (DCC) also comes into effect. The trade deal has been hailed by both sides, with Commerce Secretary Rajesh Agrawal even calling it the "gold standard" of India's free trade agreements.

What trade benefits does India get?

While speaking to the media a day before the deal came into force, Mr. Agrawal said the CETA stood out not just for its breadth, but also depth. That is, not only does it cover a wide range of tariff and non-tariff issues, but it also yields deep concessions within many of these issues.

As per the deal, the U.K. will immediately remove tariffs on 96.8% of its tariff lines, accounting for 97.7% of trade by value. An additional 2% of tariff lines, amounting to 1.8% of trade value, will see reduced tariffs based on quotas. In total, this covers 98.8% of tariff lines and 99.5% of trade value.

Apart from tariffs, the 30 chapters of the CETA also cover digital trade, government procurement, small and medium enterprises, innovation, labour, environment, and gender. They also address non-tariff barriers such as Sanitary and Phytosanitary Measures and Technical Barriers to Trade so that they do not become insurmountable trade restrictions in the future.

The CETA also incorporates a significant section on services, which is of considerable interest to India since services exports are a vital engine of growth. The U.K. has agreed to grant commercial presence rights to Indian companies in sectors such as computer services, consultancy, and environmental services. This means Indian companies operating in these

sectors can set up branches, subsidiaries, or representative offices in the U.K.

What is the DCC and how does it help Indian workers in the U.K.?

One big win for India is the DCC. Under this deal, Indian workers in the U.K. and their employers will no longer need to pay social security in the U.K. if that payment is being made in India. The duration of this relief was initially three years, but was revised to five.

The problem was that Indian workers in the U.K. were paying social security in both India and in the U.K. Most Indian workers in the U.K. are there for short periods of up to five years. However, under U.K. law, workers can claim social security benefits only after making contributions for 10 years. As a result, Indian workers would pay into the system but return to India before becoming eligible to receive the benefits. Now, the five-year relief under the DCC means that about 90% of Indian workers in the U.K. will no longer have to part with about 23% of their salaries towards U.K. social security, as long as they are paying social security in India. Mr. Agrawal said this will benefit over 75,000 Indian workers and more than 900 employers.

What does the U.K. gain?

The U.K. stands to gain significantly in terms of market access in both goods and services, even as India has sought to protect its sensitive sectors from foreign competition.

India will immediately remove tariffs on goods accounting for 30.3% of trade value, with tariffs on an additional 47% of trade value being eliminated in a phased manner. It will also offer reduced tariff rates under quota arrangements for goods accounting for 12.1% of trade value. In total, this will cover 89.5% of tariff lines and 89.4% of trade value.

In terms of popular U.K. products, alcohol from the U.K., especially whiskey, is set to become cheaper in India, and so are British cars, and engineering products.

India has also agreed to open up some of its key service sectors to U.K. firms, such as accounting, auditing, financial services, telecom, and environmental services. This means that U.K. companies in these sectors can offer their services to Indian customers without first having to establish a local presence here. India has also agreed to recognise U.K. professional qualifications in law and accounting.

Are there any unusual aspects of the deal?

Apart from its breadth and depth, the CETA stands out for two other reasons: automobile tariffs and government procurement.

This deal is the first under which India has agreed to reduce tariffs on automobile imports.

Trade notified the tariff rates that will apply to auto imports from the U.K. Under the arrangement, 20,000 completely built petrol and diesel passenger vehicles will be allowed to enter India in the first year at concessional tariff rates of 30-50%, depending on engine size and vehicle type, down from the standard import duty of 66-110%.

The quota will gradually increase to 37,000 such vehicles by the fifth year of the deal, before gradually falling to 15,000 by the 15th year and beyond. The tariffs on these in-quota vehicles will fall to 10% in the fifth year and remain there. There are separate quotas and tariffs for alternative fuel passenger vehicles and commercial vehicles.

Regarding government procurement, U.K. firms will now be allowed to participate in Indian Central government procurement bids. However, they can participate only as Class-II local suppliers in eligible tenders.

Indian suppliers, on the other hand, will continue to receive Class-I local supplier preference in the U.K. However, U.K. market access will be limited to non-sensitive Central government entities and utilities, excluding central PSUs and State/local government procurement. According to the Ministry of Commerce, this provides Indian suppliers legal access to the U.K. government procurement market worth around £90 billion (\$122 billion). India is providing reciprocal opportunities of around \$114 billion.

What has been left out of the deal?

Commerce Minister Piyush Goyal has repeatedly said that India and the U.K. have not let the best become the enemy of the good in negotiating this deal. That is, issues that were intractable were left out of the deal and are being worked out separately.

One key element is an investment agreement. The Trade and Economic Partnership Agreement (TEPA) India has signed and implemented with the four European Free Trade Association (EFTA) countries includes a provision where the EFTA bloc has committed to facilitating investment of \$100 billion in India over 15 years. The India-New Zealand free trade agreement too includes a provision where New Zealand will facilitate investments of \$20 billion in India over 15 years. The U.K. deal does not include any such provision.

Another is investor-state dispute resolution.

Ever since India unilaterally cancelled all its Bilateral Investment Treaties (BITs) in 2017, dispute resolution has been a key sticking point for foreign investors. Under the earlier BITs, investment disputes could be referred to international arbitration in a neutral third country. With their cancellation, the disputes are being arbitrated in India. The perception is that this is not a fair process.

India has also not managed to wring any concessions from the U.K. regarding the latter's upcoming Carbon Border Adjustment Mechanism tariffs. However, no country has managed to achieve this so far.

Key Takeaway



- Comprehensive, balanced FTA
- Strong gains for both sides
- DCC major relief for workers
- Strategic economic partnership



India's Gains

- 96.8% U.K. tariff lines removed
- 98.8% tariff lines covered overall
- Deep concessions & market access
- Services, digital trade, SMEs boost



DCC Benefit

- No social security payment in U.K. if paid in India
- Relief extended to 5 years
- Benefits ~90% Indian workers
- 75,000+ workers, 900+ employers



U.K. Gains

- 89.5% tariff lines covered
- Whiskey, cars, engineering goods to become cheaper in India
- Market access in key service sectors
- Legal access to £90 billion market



Automobile Provisions

- 20,000 cars allowed in 1st year at 30-50% concessional tariff
- Quota rises to 37,000 in 5th year
- Falls to 15,000 by 15th year
- Tariff falls to 10% in 5th year



Govt Procurement

- U.K. firms can bid in Indian tenders as Class-II local suppliers
- India retains Class-I preference in U.K. tenders
- Access limited to non-sensitive central entities & utilities



Left Out of Deal

- Investment agreement excluded
- Investor-state dispute resolution excluded
- No concession on Carbon Border Adjustment Mechanism



UPSC Relevance

- GS II: Bilateral Relations
- GS III: Economy, Trade, Services
- GS III: Employment, Labour Rights
- Governance & Policy Making



Union Minister of Commerce and Industry Piyush Goyal addresses a press conference in New Delhi. SHOUNIK KAR

How does India's newly launched train powered by hydrogen work?

How new is this technology? What is its future in India? Is hydrogen a safe fuel?

Maitri Porecha

The story so far:

In July 17, Prime Minister Narendra Modi flagged off India's first train powered by hydrogen. It operates on an 89-km stretch between Jind and Sonipat in Haryana.

What is a hydrogen-powered train?

India's hydrogen fuel cell-powered train is a 10-coach train with a capacity of carrying around 2,600 passengers. Unlike conventional electric trains that draw power from overhead lines, it generates its own electricity onboard using hydrogen, known as the cleanest fuel.

Unlike conventional diesel locomotives that burn fuel to generate mechanical power, a hydrogen train carries a small power plant onboard in the form of a proton exchange membrane fuel cell. Hydrogen stored in the train's cylinders combines with oxygen from the surrounding air inside the fuel cell, producing electricity that powers the traction motors and turns the wheels. The only direct by-products of this electrochemical reaction are water vapour and heat. There is no combustion, no smoke, and no tailpipe carbon emissions.

The train consists of two Hydrogen Driving Power Cars (DPCs) and eight Trailer Coaches. Each DPC houses fuel cells, lithium iron phosphate batteries, and hydrogen storage cylinders that work together to provide traction

power, ensuring reliable operation under varying operating conditions.

The two power cars, one at each end, each produce 1,200 kW (1,600 hp) of power. Their combined

2,400 kW output enables the train to reach its design speed of 110 km/h.

Where does the hydrogen come from?

The dedicated hydrogen storage, compression and dispensing facility established at Jind will support refuelling operations, the Indian Railways has stated. Just like a petrol pump or a CNG station, the train needs a place to refuel.

First, hydrogen is produced on site through electrolysis, in which water is split into hydrogen and oxygen using electricity at the green hydrogen plant, and is then stored safely in dedicated storage tanks. In the second step, the hydrogen is compressed to 500 bar, enabling a larger quantity to be stored in a smaller volume. Finally, it is dispensed through two independent hydrogen dispensers at a regulated pressure of 350 bar, allowing both DPCs to be refuelled simultaneously and reducing turnaround time.

The facility stores nearly 3,000 kg of hydrogen at a time, sufficient to support regular operations of the train set, and its storage and supply system has been approved by the Petroleum and Explosives Safety Organisation.

Is it safe to travel on a hydrogen-powered train when hydrogen is an inflammable fuel?

Hydrogen is colourless, odourless, tasteless and non-toxic. However, it is inflammable and needs to be handled with care. Since it cannot be seen or smelled, the project's safety design focuses on detecting even the smallest leak instantly.

The train and the plant are fitted with devices that continuously watch for hydrogen leaks, unusual heat, flames, or smoke. Continuous ventilation keeps air moving through the train at all times, so that even if a tiny amount of hydrogen were to leak, it is safely carried away and diluted in the open air.

There is also an automatic shut-off system. If any unusual activity is detected, the system can automatically cut off the hydrogen supply on its own, without waiting for a person to react.

The Jind hydrogen plant has protections, including leak detectors, flame detectors, automatic shutdown systems, water sprays to control any fire, and fire alarms.

Before being commissioned, the entire system underwent an independent third-party safety assessment by TÜV SÜD, Germany, one of the world's leading technical inspection and certification agencies, an Indian Railways spokesperson said.

What is the status of hydrogen-powered trains globally?

They are still at a nascent stage. Germany was the first country to introduce commercial hydrogen passenger trains, while France, Italy, China, Japan and others are pursuing pilot projects or limited deployments. However, these trains typically have two to four coaches and serve mainly regional routes.

What is the future of such trains in India?

Indian Railways is exploring the deployment of hydrogen technology on heritage railways, including the Kalka-Shimla route. They intend to transition to a structured national programme for hydrogen-powered rolling stock, which will contribute to the National Green Hydrogen Mission and the country's long-term Net Zero Emission goals, an Indian Railways spokesperson said.



- India's first hydrogen fuel cell train flagged off on 17 July.
- Operates on 89 km stretch between Jind and Sonipat (Haryana).
- 10-coach train with capacity of ~2,600 passengers.
- Generates its own electricity using hydrogen fuel cells.
- Cleanest fuel: only water vapour and heat as by-products.
- Design speed: 110 km/h; Output: 2,400 kW (DPCs at both ends).



- Works on Proton Exchange Membrane (PEM) fuel cell.
- Hydrogen + oxygen → electricity → motors → wheels.
- Two Hydrogen Driving Power Cars + eight Trailer Coaches.
- Each DPC: fuel cells + batteries + hydrogen storage.
- No combustion, no smoke, no tailpipe emissions.
- Focus on instant detection of even the smallest leak.



- Hydrogen production through electrolysis (green hydrogen).
- Stored in tanks, compressed to 500 bar.
- Dispensed via two dispensers at 350 bar (simultaneous refilling).
- Facility at Jind stores ~3,000 kg hydrogen at a time.
- Dedicated storage, compression & dispensing facility at Jind.
- Approved by Petroleum and Explosives Safety Organisation.



- Hydrogen is inflammable but colourless, odourless, non-toxic.
- Safety design: detect smallest leak instantly.
- Continuous ventilation keeps air moving inside the train.
- Automatic shut-off system cuts supply on detection.
- Plant safety: leak detectors, flame detectors, fire alarms, water sprays, automatic shutdown systems.
- Third-party safety assessment by TÜV SÜD, Germany.



- Hydrogen trains at nascent stage globally.
- Germany: first country with commercial hydrogen trains.
- France, Italy, China, Japan: pilot projects / limited deployments.
- Typically 2–4 coaches; used mainly on regional routes.

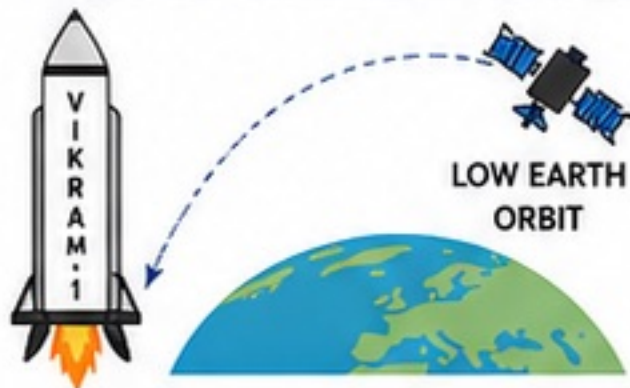


- Indian Railways exploring deployment on heritage railways.
- Kalka-Shimla route identified for initial rollout.
- Transition to national programme for hydrogen rolling stock.
- Supports National Green Hydrogen Mission.
- Contributes to India's long-term Net Zero Emission goals.



- Static Linkages: Green Hydrogen Mission, National Hydrogen Energy Mission (NHM), Net Zero 2070, Clean Mobility.
- Related Sectors: Railways, Renewable Energy, Environment.
- UPSC Relevance: Science & Technology • Environment Economy • Infrastructure • Governance

1. VIKRAM-1: INDIA'S FIRST PRIVATE ORBITAL LAUNCH



- Vikram-1 places multiple payloads into LEO in Mission Aagaman
- First privately developed Indian orbital rocket
- 350 kg payload capacity to LEO
- Launched from SDSC, Sriharikota
- Built with carbon composite structures, 3D-printed engines
- Validates indigenous tech & private capability

Space Economy • ISRO • IN-SPACe • NSIL
GS III • Sci & Tech • Innovation • Atmanirbhar Bharat

4. INDIA-U.K. FREE TRADE AGREEMENT



- Better market access for goods & services
- Boost to textiles, marine, gems, engineering
- Growth in IT, finance, education, healthcare
- Greater mobility for Indian professionals
- Increased FDI, tech transfer & partnerships
- Strengthens strategic economic ties

Trade Liberalisation • Export Growth • FDI
GS III • IR • Economy • International Cooperation

7. KNOWLEDGE WORK IN THE AGE OF AGENTIC AI



- Agentic AI plans & executes complex tasks
- Automates routine cognitive work
- Humans focus on judgement, creativity, ethics
- Boosts productivity & decision speed
- Risks: bias, overdependence, accountability
- Need skilling, governance & human oversight

Digital Transformation • AI • Productivity
GS III • Employment • Governance • Ethics

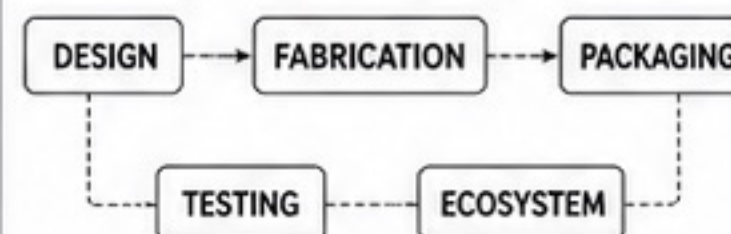
2. THE WEIGHT OF A NATION'S FOOD



- Move from calorie security to nutrition security
- Diversify diet: pulses, millets, fruits, dairy, protein
- Address hidden hunger & micronutrient deficiency
- Reduce food waste across supply chain
- Sustainable agriculture: water, soil, climate
- Policies must link health, environment & equity

Food Security • Nutrition • Sustainability
GS II • Social Justice • Agriculture • Health

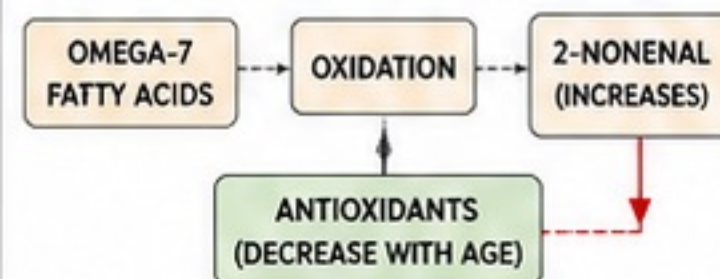
5. SEMICON 2.0: BUILDING THE CHIP ECOSYSTEM



- Build complete semiconductor ecosystem
- Focus on design, fab, packaging, testing
- PLI, DLI schemes to boost manufacturing
- Strengthen R&D, skills & supply chains
- Reduce import dependence; ensure security
- Enable growth of AI, 5G, EV, defence, space

Make in India • Electronics • Technology Sovereignty
GS III • Economy • Industry • Innovation

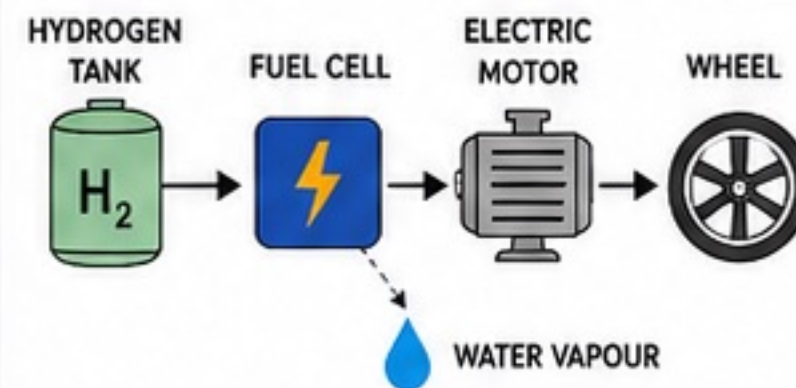
8. CHANGING CHEMISTRY: WHY BODY ODOUR CHANGES



- 2-Nonenal formed by oxidation of fatty acids
- Antioxidant defence weakens after mid-age
- More 2-Nonenal → stronger age-related odour
- Water-repellent; hard to wash away
- Antioxidant diet & persimmon extract helpful
- Shows role of oxidative stress in ageing

Biochemistry • Oxidation • Ageing
GS III • Health • Science • Biology

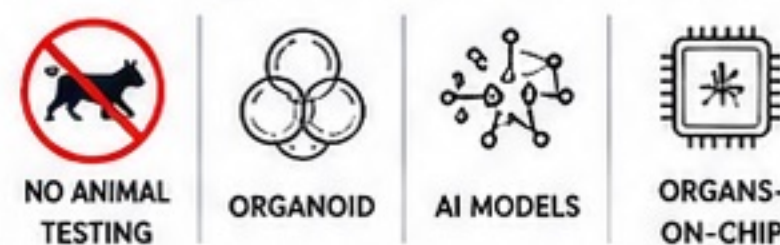
3. HOW DOES INDIA'S HYDROGEN TRAIN WORK?



- Hydrogen + Oxygen in fuel cell → electricity
- Electricity powers motor → drives train
- Only emission is water vapour
- Ideal for non-electrified rail routes
- Supports National Green Hydrogen Mission
- Key step towards clean & sustainable mobility

Green Hydrogen • Clean Mobility • Net Zero
GS III • Environment • Energy • Science & Tech

6. NON-ANIMAL TESTING IS KEY TO NEXT PHASE OF PHARMA



- Alternatives: organoids, organs-on-chip, AI models
- More human-relevant & accurate predictions
- Faster drug discovery, lower cost
- Follows 3Rs: Replace, Reduce, Refine
- Regulatory acceptance & validation needed
- India can become a global biotech hub

Biotechnology • Innovation • Ethical Science
GS III • Health • Science & Tech • Research

9. VIKRAM-1 ORBIT SUCCESS, SKYROOT'S NEXT CHALLENGE



- Repeated launches needed for reliability
- Compete with global players on cost
- Build customer trust & insurance confidence
- Scale manufacturing & supply chains
- Secure funding for R&D & future missions
- Key to long-term commercial viability

Commercial Space • Startups • Innovation
GS III • Economy • Science & Tech • Industry

QUICK NEWS

- 1 Article 370 bags top honour; Mammootty wins 4th National Award
- 2 T.N. rolls out 'e-Zero FIR' for faster action against cyber fraud
- 3 Unwanted guests turn sweet hosts for Assam butterflies
- 4 Power grids face unexpected slow-burn threat from solar storms
- 5 Surprise found in why some ancient brains don't decay
- 6 Central African monkey with striking patch is new species
- 7 A small imbalance breaks open a soggy physics puzzle
- 8 Trading years of conflict for livelihood and a stable future
- 9 Ctrl+Alt+Delete for IT sector? AI to transform, not replace

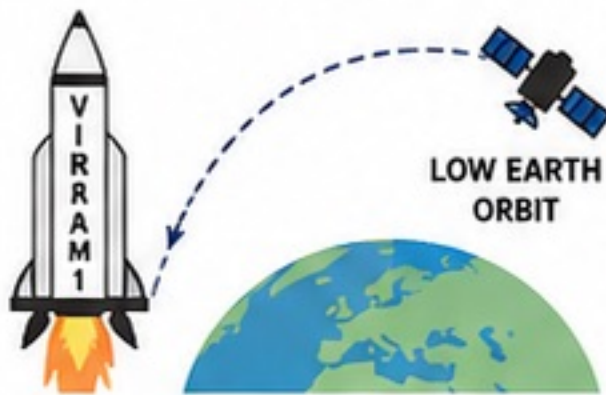
PRELIMS FACTS

- 1 Vikram-1 — India's first private orbital launch vehicle
- 2 LEO — Low Earth Orbit
- 3 Hydrogen Train — Uses fuel cell, emits only water vapour
- 4 Semicon 2.0 — Build complete semiconductor ecosystem
- 5 BNSS Section 173 — Legal basis for e-Zero FIR
- 6 CCTNS — Crime & Criminal Tracking Network & Systems
- 7 Solar Storms — Cause geomagnetically induced currents in grids
- 8 2-Nonenal — Compound behind age-related body odour
- 9 Agentic AI — Plans, executes & adapts tasks autonomously

VOCABULARY

- 1 **Resilience** — Ability to recover quickly from difficulties
- 2 **Convergence** — Coming together of ideas, people or systems
- 3 **Prudence** — Wise judgement with care and foresight
- 4 **Catalyst** — Person or event that brings about change
- 5 **Autonomy** — Capacity for self-governance

1. VIKRAM-1 की ऐतिहासिक उड़ान



- भारत का पहला निजी तौर पर निर्मित ऑर्बिटल रॉकेट
- स्कायरूट एयरोस्पेस द्वारा विकसित
- 350 किग्रा पेलोड को LEO में पहुंचाया
- भारत के निजी अंतरिक्ष क्षेत्र के लिए मील का पत्थर
- वैश्विक वाणिज्यिक लॉन्च बाजार में प्रवेश
- ISRO-IN-SPACe-NSIL के सहयोगी इकोसिस्टम

अंतरिक्ष अर्थव्यवस्था • निजी भागीदारी • LEO मिशन
GS III • विज्ञान एवं प्रौद्योगिकी • अंतरिक्ष नीति

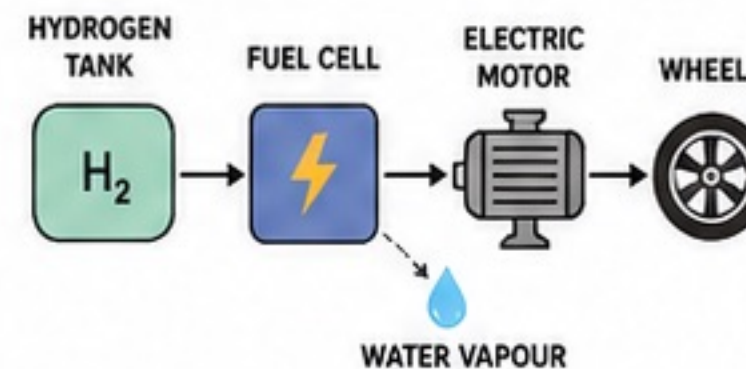
2. देश के भोजन का भार



- खाद्य सुरक्षा से आगे बढ़कर पोषण सुरक्षा पर जोर
- कुपोषण, खाद्य अपव्यय और असंतुलित आहार चुनौती
- सतत कृषि और फसल विविधीकरण की आवश्यकता
- मोटे अनाज, दालें, फल और सब्जियों को बढ़ावा
- जलवायु-सक्षम कृषि और जल संसाधन प्रबंधन पर बल
- पोषण-केंद्रित नीतियों से स्वस्थ भारत का निर्माण

पोषण सुरक्षा • सतत कृषि • खाद्य अपव्यय
GS II • सामाजिक न्याय • स्वास्थ्य • कृषि

3. हाइड्रोजन से चलेगी ट्रेन



- हाइड्रोजन फ्यूल सेल से बिजली उत्पन्न
- केवल जल वाष्प का उत्सर्जन, शून्य कार्बन निकास
- नेशनल ग्रीन हाइड्रोजन मिशन से संबद्ध
- स्वच्छ और सतत गतिशीलता को बढ़ावा
- आयातित ईंधन पर निर्भरता कम करने में सहायक
- हरित परिवहन के क्षेत्र में भारत की पहल

ग्रीन हाइड्रोजन • स्वच्छ ऊर्जा • हरित परिवहन
GS III • ऊर्जा • पर्यावरण • अवसंरचना

QUICK NEWS

- 1 राष्ट्रीय फिल्म पुरस्कार घोषित 'आर्टिकल 370' सर्वश्रेष्ठ फिल्म
- 2 तमिलनाडु में e-Zero FIR शुरू 1930 हेलपलाइन से तुरंत कार्रवाई
- 3 असम में आक्रामक पौधों से लाभ तितलियों को भोजन और आवास
- 4 सौर तूफान से पावर ग्रिड खतरे में लंबे समय तक करंट कर सकता है नुकसान
- 5 प्राचीन दिमाग सुरक्षित क्यों रहते हैं? विशेष प्रोटीन संरचना का खुलासा
- 6 नए बंदर की प्रजाति की पहचान लाइववेली, मध्य अफ्रीका
- 7 रिवर्स स्प्रिंकलर का रहस्य सुलझा छोटे असंतुलन से बनती है घूर्णन गति
- 8 संघर्ष से आजीविका की ओर स्थायी शांति के लिए पुनर्वास जरूरी
- 9 IT सेक्टर के लिए Ctrl+Alt+Delete? AI से बदल रहा कार्य और कौशल

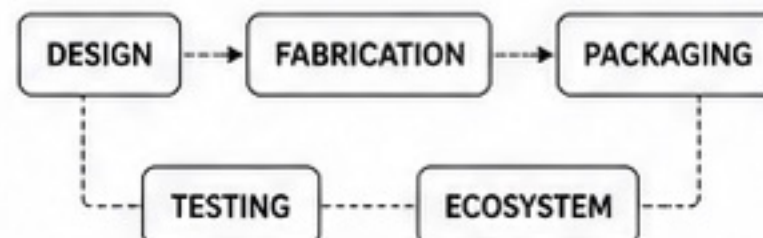
4. भारत-यू.के. व्यापार समझौता



- माल और सेवाओं के निर्यात के अवसर बढ़ेंगे
- भारतीय वस्तुओं के लिए बाज़ार पहुंच में सुधार
- निवेश, नवाचार और तकनीकी सहयोग को बढ़ावा
- रणनीतिक आर्थिक साझेदारी को मजबूती
- आपूर्ति श्रृंखला विविधीकरण में सहायक
- आर्थिक विकास और रोजगार सृजन को बल

मुक्त व्यापार समझौता • निर्यात • निवेश
GS II • अंतरराष्ट्रीय संबंध • अंतरराष्ट्रीय व्यापार

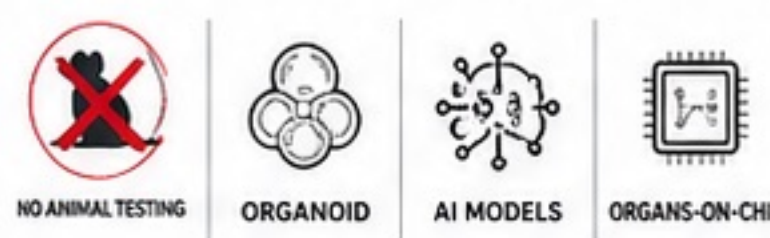
5. SEMICON 2.0 की महत्वाकांक्षा



- संचूर्ण सेमीकंडक्टर इकोसिस्टम का निर्माण लक्ष्य
- डिजाइन, विनिर्माण, पैकेजिंग, परीक्षण पर फोकस
- कुशल मानव संसाधन और अनुसंधान को बढ़ावा
- वैश्विक आपूर्ति श्रृंखला में भारत की भागीदारी
- तकनीकी आत्मनिर्भरता और रणनीतिक सुरक्षा
- इलेक्ट्रॉनिक्स विनिर्माण को नई गति

आत्मनिर्भर भारत • सेमीकंडक्टर • प्रौद्योगिकी
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6. नॉन-एनिमल टेस्टिंग की आवश्यकता



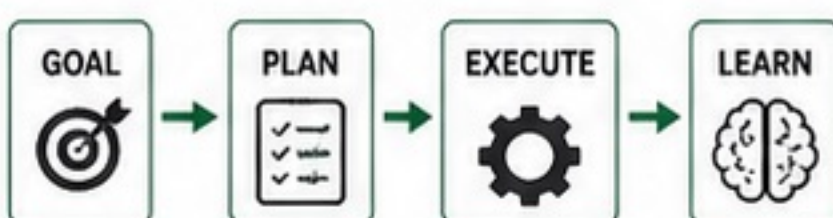
- ऑर्गन-ऑन-चिप, ऑर्गेनॉइड और AI तकनीक उपयोगी
- दवा अनुसंधान में सटीकता और विश्वसनीयता बढ़ती
- पशु परीक्षण पर निर्भरता कम होगी
- नैतिक, वैज्ञानिक और पर्यावरणीय लाभ
- लागत और समय की बचत में सहायक
- फार्मा उद्योग के सतत विकास हेतु महत्वपूर्ण

नैतिक विज्ञान • नवाचार • फार्मा अनुसंधान
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PRELIMS FACTS

- 1 विक्रम-1 — निजी भारतीय ऑर्बिटल रॉकेट
- 2 LEO — लो अर्थ ऑर्बिट
- 3 ग्रीन हाइड्रोजन — स्वच्छ ऊर्जा स्रोत
- 4 SEMICON 2.0 — सेमीकंडक्टर मिशन
- 5 BNSS धारा 173 — e-Zero FIR कानूनी आधार
- 6 CCTNS — अपराध ट्रेकिंग नेटवर्क प्रणाली
- 7 सौर तूफान — भूचुंबकीय व्यवधान
- 8 2-नोनिनाल — उम्र से जुड़ी शरीर की गंध
- 9 एजेंटिक AI — स्वायत्त AI प्रणाली

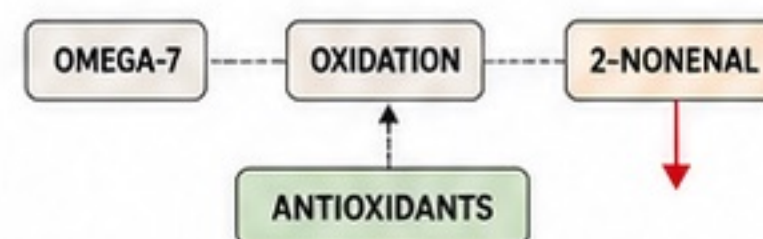
7. एजेंटिक AI और नॉलेज बर्क



- एजेंटिक AI स्वयं योजना बनाकर कार्य करता है
- बहु-चरणीय कार्यों को न्यूनतम मानव हस्तक्षेप से पूरा करता
- ज्ञान कार्य का स्वरूप तेजी से बदल रहा है
- मानव की भूमिका: निर्णय, पर्यवेक्षण, रचनात्मकता
- उत्पादकता, दक्षता और नवाचार में वृद्धि
- कौशल उन्नयन और नैतिक AI शासन आवश्यक

AI परिवर्तन • ज्ञान अर्थव्यवस्था • कौशल
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8. बदलती केमिस्ट्री: उम्र और शरीर की गंध



- 2-नोनननाल उम्र बढ़ने से बढ़ने वाला यौगिक
- ओमेगा-7 फैटी एसिड के ऑक्सीकरण से बनता है
- एंटीऑक्सिडेंट सुरक्षा कम होने पर अधिक बनता है
- जल-विमिश्रित; सामान्य धुलाई से नहीं हटता
- एंटीऑक्सिडेंट आहार, हाइड्रेशन सहायक
- पर्सिमोन एक्सट्रैक्ट से कम करने में सहायक

ऑक्सीडेटिव स्ट्रेस • 2-नोनिनाल • एंटीऑक्सिडेंट
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9. कक्षा में नहीं, बाजार में परीक्षा



- विक्रम-1 की सफलता पहली सीढ़ी मात्र
- नियमित लॉन्च, विश्वसनीयता और ग्राहक विश्वास जरूरी
- वैश्विक प्रतिस्पर्धा और लागत चुनौती बड़ी
- विनिर्माण पैमाना और पूंजी निवेश की आवश्यकता
- बढ़ते छोटे उपग्रह बाजार से अवसर
- वाणिज्यिक टिकाऊपन के लिए लंबा सफर

अंतरिक्ष बाजार • वाणिज्यिक व्यवहार्यता • प्रतिस्पर्धा
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VOCABULARY

- 1 Resilience — लचीलापन कठिनाई से उबरने की क्षमता
- 2 Convergence — अभिसरण एक जगह पर आना या मिलना
- 3 Prudence — दूरदर्शिता सही निर्णय लेने की बुद्धिमत्ता
- 4 Catalyst — उत्प्रेरक परिवर्तन को गति देने वाला तत्व
- 5 Autonomy — स्वायत्तता स्वशासन या स्वतंत्र निर्णय क्षमता