

Factly Monthly

Compilation

2024

**For UPSC CSE Prelims
Exam**

July, 2024

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UPSC Syllabus: Economy

Digital Bharat Nidhi

Why in the news?

The Department of Telecommunications (DoT) released draft rules for the Digital Bharat Nidhi (DBN) on July 4, 2024. The purpose of DBN is to increase telecom connectivity in rural areas. Digital Bharat Nidhi will replace the Universal Service Obligation Fund (USOF).

About Digital Bharat Nidhi

- 1. About:** Digital Bharat Nidhi (DBN) is an initiative by **Department of Telecommunications (DoT)**.
- 2. Aim:** DBN aims to:
 - i) improve **internet connectivity**, particularly in rural, remote, and economically disadvantaged areas.
 - ii) foster **technology innovation**, create **regulatory sandboxes**, and enhance the **global presence of India's telecom sector**.
 - iii) promote innovation, indigenous technology development, and standardisation.
 - iv) support startups in the telecom sector and the manufacturing of telecom equipment.
4. It replaces the Universal Service Obligation Fund (USOF) to **ensure better allocation of resources**.
- 5. Focus:** DBN will focus on **research, development, and overall connectivity improvement**. It encourages telecom services for underserved groups, including women and people with disabilities.
- 6. Funding:** Telecom companies' contributions to the Digital Bharat Nidhi will first be credited to the **Consolidated Fund of India (CFI)** and then **later deposited into the DBN**.
- 7. Utilisation of funds:** The funds will be used to promote access to telecommunication services, support research and development, fund pilot projects, and introduce new telecom technologies in underserved areas.
- 8. Management and Implementation:** An administrator will manage the fund, and projects will be executed by implementers selected through bidding or direct applications, ensuring transparency. The administrator will tailor **payment methods (full, partial, co-funding) based on specific connectivity needs**.

About Universal Service Obligation Fund (USOF):

- i) It was **established in 2003** to enhance **telecom services** in less financially viable regions.
- ii) It was funded by a **5% levy on telecom operators** adjusted gross revenue (AGR). However, only about 72% of the Rs 41,740 crore received between 2017 and 2022 was utilized.

ONGC's Plan to Achieve Net Zero Emissions by 2038

Why in the news?

State-owned Oil and Natural Gas Corporation (ONGC) will invest around Rs 2 lakh crore to achieve net-zero carbon emissions by 2038.

About the ONGC's Plan to Achieve Net Zero Emissions by 2038

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- 1. Targets:** By 2030, ONGC will invest Rs 97,000 crore in renewable energy projects, including solar and offshore wind. An additional Rs 65,500 crore will be invested by 2035 mainly in green hydrogen and green ammonia plants.
2. By 2038, another Rs 38,000 crore will be spent primarily on setting up 1 GW of offshore wind projects.
3. These projects will help offset 9 million tonnes of carbon emissions, including both direct (Scope 1) and indirect (Scope 2) emissions.
4. ONGC plans to invest Rs 5,000 crore to eliminate gas flaring by 2030 using advanced technology. In the base year 2021-22, ONGC released 554 million cubic metres of methane into the atmosphere.
- 5. Solar and Wind Energy Projects:** ONGC will spend Rs 30,000 crore to establish 5 GW solar parks and wind turbines by 2030. It will add 1 GW of solar and onshore wind capacity by 2035 and 2038, costing Rs 5,000 crore each.
- 6. Green Hydrogen and Ammonia Projects:** The company will invest Rs 40,000 crore by 2030 and a similar amount by 2035 to develop two 180,000 tonnes per annum green hydrogen or 1 million tonnes green ammonia projects.
- 7. Offshore Wind Projects:** ONGC aims to install offshore wind turbines to generate 0.5 GW of electricity by 2030, with an investment of Rs 12,500 crore. This capacity will double by 2035 with an additional Rs 12,000 crore investment. By 2038, another 1 GW of offshore wind energy will be added, costing Rs 25,000 crore.
- 8. Pump Storage Plants:** The company plans to invest Rs 20,000 crore to set up 3 GW of pump storage plants to provide electricity when renewable sources are not available.
9. The remaining investment will be directed towards biogas, carbon capture, and other clean energy initiatives.

Equity Mutual Funds

Why in the news?

The Association of Mutual Funds in India (Amfi) recently reported that inflows into India's equity mutual funds reached a record high of Rs 40,608 crore (about \$5 billion) in June, marking a 17% sequential increase.

About Equity Mutual Funds

- 1. About:** Equity mutual funds are investment vehicles that collect money from multiple investors to buy a portfolio of stocks, also known as equity securities.
- 2. Purpose:** They allow individuals to invest in a diversified collection of stocks managed by professionals.
- 3. Benefits of Equity Mutual Funds:**
 - i) Professional Management:** These funds are managed by experts who make investment decisions on behalf of the investors.
 - ii) Diversification:** By holding stocks from various companies, equity funds reduce the risk associated with any single stock's poor performance.
- 4. Types of Equity Funds:**

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i) Actively Managed Funds: These funds have portfolio managers who actively research, analyze, and select stocks with the goal of outperforming a benchmark index (e.g., the S&P 500). They charge higher fees due to their hands-on approach.

ii) Passively Managed Funds (Index Funds): These funds aim to replicate the performance of a specific market index (e.g., S&P 500) by holding the same stocks in the same proportions. They have lower fees and track the index closely without trying to outperform it.

4. Risk and Returns:

i) Long-Term Growth: Equity funds can offer attractive long-term returns, making them a popular choice for investors with longer time horizons.

ii) Market Volatility: The value of equity funds can fluctuate due to stock market changes, posing a risk to investors.

iii) Suitability: Best suited for investors who can tolerate market ups and downs and are investing for the long term to maximize growth potential.

Importance of road safety

Context: The article discusses a tragic bus accident in Uttar Pradesh that killed 18 people. It highlights issues like expired bus insurance and lack of safety features. It stresses the importance of road safety, proper vehicle maintenance, and the need for stricter enforcement and better data reporting by authorities.

For detailed information on **Road Accidents in India** [read this article here](#)

Why Is Road Safety Important?

- 1. Protects Lives:** Road safety is crucial because it protects lives. In 2022, 1.71 lakh people died, and 4.23 lakh were injured in road accidents across India.
- 2. Prevents Accidents:** Proper road safety measures like good road design, speed control, and adequate visibility can prevent accidents. The bus accident in Uttar Pradesh, where 18 people died, highlights the fatal consequences of neglecting these aspects.

What Should Be Done to Improve Road Safety?

- 1. Enforce Existing Standards:** Local authorities need skilled personnel and proper equipment. They should impose harsher penalties on transport operators who fail to meet safety requirements.
- 2. Prevent Dilution of Standards:** Municipal bodies should uphold the safety standards set by engineers without compromise to benefit local businesses.
- 3. Improve Data Collection:** The Ministry of Road Transport and Highways should collect and publish better data on vehicle registrations, safety certificates, and accident reports.
- 4. Increase Public Awareness:** The public should know how transport vehicle health is checked and have access to the latest test reports.
- 5. Speed Control:** Controlling speed is vital; it is implicated in most deadly accidents. Measures like speed-breakers and increased police monitoring have been effective in reducing accidents.

Vizhinjam International Port

Why in the news?

The Adani Group's Vizhinjam Port is **now ready to receive its first mothership**.

About Vizhinjam International Port



Figure 1. Source: TH

1. Location: The port is located in Vizhinjam, a coastal town in the Thiruvananthapuram District of Kerala.

2. Developed by: It was developed under a landlord model with a Public Private Partnership component on a Design, Build, Finance, Operate, and

Transfer (DBFOT) basis.

3. It was primarily **designed to cater to container transshipment**, the port also handles multi-purpose and break-bulk cargo.

4. It will also be a **global bunkering hub**, supplying clean, green fuels like hydrogen and ammonia.

5. After completion, the port will be one of the world's greenest ports in the world.

Strategic Advantage

i) The port is a mere **10 nautical miles** (NM) diversion from the international east-west shipping route connecting Europe, the Persian Gulf, and the Far East.

ii) It is also close to the national and regional road and rail network.

iii) The port will **feature approximately 30 berths**, most of which will be capable of handling Mother Vessels.

Significance of the port

i) The port is the only **transshipment hub in the Indian subcontinent**, strategically located close to international shipping routes and centrally on the Indian coastline. Around 95% of India's foreign trade is conducted via the sea route, accounting for 70% of the trade in value terms.

ii) Nearly **30% of freight movement** occurs through the international shipping route south of the Indian peninsula, passing just **10 NM off Vizhinjam**.

Status of India's Merchandise and Services Export

Why in news?

The Commerce Ministry has reported that India's merchandise exports has **grown for the third consecutive month in June**. It has risen by **2.55% to \$35.2 billion**.

Status of India's Merchandise and Services Export

1. June 2024 Trade Performance

- i) Merchandise exports grew by 2.55% to \$35.2 billion.
- ii) Imports increased by 5% to \$56.2 billion.
- iii) The trade deficit widened by 9.4% compared to the previous year.
- iv) June 2024's exports and imports were the second highest in 10 years, second only to the figures in June 2022.
- v) Major growth drivers included engineering goods (10.3% increase), electronics goods (16.9% increase), drugs and pharmaceuticals (9.9% Increase), chemicals (3.3% increase), and coffee (70% increase).
- vi) Petroleum exports decreased by 18.3% to \$5.5 billion. and petroleum imports increased by 19.6% to \$15.05 billion.

2. Record Highs in Exports

- i) Total merchandise and services exports **reached \$200.3 billion in the first quarter of 2024-25**, surpassing the previous high of \$197.1 billion in 2022-23.
- ii) Services exports are estimated at **\$30.3 billion**, an 8.9% increase from the previous year.

3. Future Prospects

- i) If growth trends continue, **India could exceed \$800 billion in total exports** this year.
- ii) The government is targeting six key sectors and 20 countries to boost exports.

4. Past Performance

Total exports in 2023-24 reached **\$778.2 billion**, a 0.42% increase from the previous year. To reach the \$800 billion mark in 2024-25, exports need to grow by 2.8%.

RBI updated rules on fraud risk management

Why in the news?

The Reserve Bank of India (RBI) has **updated its rules on fraud risk management** for various financial entities.

RBI Revises Fraud Risk Management Rules

- a. The revised rules apply to commercial banks (including regional rural banks), All India Financial Institutions, urban, state, and central cooperative banks, non-banking finance companies (NBFCs), and housing finance companies.
- b. The RBI issued **three new master directions to replace the older ones**. These directions are based on a thorough review of the previous rules and current issues.
- c. The new rules emphasize principles and guidelines to **strengthen fraud risk management and enhance the role of the Board in governance and oversight**.

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d. Regulated Entities (REs) **must follow principles of natural justice** before labeling individuals or entities as fraudulent, in line with the Supreme Court's March 2023 judgment in the case of **State Bank of India versus Rajesh Agarwal**.

e. The RBI has withdrawn 36 existing circulars related to fraud risk management to simplify rules and reduce the compliance burden on financial entities.

Increase in India's foreign currency assets (FCA)

Why in the news?

The **return on India's foreign currency assets (FCA)** has doubled over the past two years. As of March 31, 2024, the total value of securities in FCA was \$468.98 billion.

What are the Interest Rate Impact?

RETURN ON FCA	
Year	Return (%)
2019-20	2.65
2020-21	2.10
2021-22	2.11
2022-23	3.73
2023-24	4.21

Source: RBI

Figure 2. Source: TH

i) Due to **rising interest rates in the US and other developed countries**, the return on FCA increased to 4.21% in March 2024 from 2.11% in March 2022. This resulted in the RBI earning over \$19 billion in interest income for the fiscal year ending in March 2024.

ii) The rate of return on FCA was 3.73% in FY2023, 2.10% in FY2021, and 2.65% in FY2020.

Gold Reserves of India

i) During FY24, the RBI **reduced gold held abroad by around 50 tonnes**, bringing the total to 387.26 metric tonnes. RBI reduced its gold holding due to high cost of keeping gold abroad.

iii) As of March 2024, the **RBI held 822.10 metric tonnes of gold**, with 408.31 metric tonnes held domestically and 26.53 metric tonnes as gold deposits.

About FCA

i) India's Foreign Exchange Reserves comprise **Foreign Currency Assets, Gold, SDR's and Reserve Bank position with International Monetary Fund (IMF)**.

ii) Foreign currency assets include investments in **US Treasury bonds, Bonds/Treasury Bills of other selected Governments, deposits with foreign central banks, foreign commercial banks etc.**

Composition of FCA:

i) As of March 2024, out of the total FCA of **\$570.95 billion**–

a) **\$468.99 billion** was invested in **securities**.

b) **\$62.17 billion** was deposited with **other central banks and the BIS**.

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c) \$39.79 billion comprised deposits with commercial banks overseas.

ii) A small portion of the reserves is managed by external asset managers to explore new strategies and diversify the portfolio. These investments are governed by the RBI Act, 1934.

National Bank for Financing Infrastructure and Development (NaBFID)

Why in the news?

The government wants to increase the capital base of the National Bank for Financing Infrastructure and Development, or NaBFID, to 1 trillion through support from banks.

About National Bank for Financing Infrastructure and Development (NaBFID)

Aspects	Description
About	<ol style="list-style-type: none">1. It was set up in 2021 under the National Bank for Financing Infrastructure and Development Act, 2021.2. It is a development Finance Institution in India which focuses on long-term infrastructure financing.3. It is regulated and supervised by the Reserve Bank of India (RBI) as an All-India Financial Institution (AIFI).
Objective	Its capital base should be increased to 1 trillion INR with support from banks.
Purpose	To provide specialized financing for infrastructure development in India.
Goals	<ol style="list-style-type: none">1) Addressing gaps in long-term non-recourse finance for infrastructure.2) Strengthening the development of bonds and derivatives markets in India.3) Boosting the country's economy sustainably.

About Development Finance Institutions (DFIs):

1. It is an organization owned by the government or public institutions to fund infrastructure and large-scale projects.
2. They step in where it is often unviable for large banks to lend due to project scale and long-term nature.
3. Types of Funds Provided: They provide medium-Term funds including financing for 1-5 years and Long-Term funds including financing for more than 5 years.

First Report on Transition Finance

Why in the news?

The Expert Committee on Climate Finance has submitted its first report on Transition Finance.

Transition finance facilitates the decarbonization efforts of high-emitting industries, such as steel, cement, chemicals, aviation, and shipping, with the ultimate goal of reaching net zero.

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Efforts to decarbonize high-emitting industries require a collaborative approach. Therefore, this initiative highlighting the need for sustainable finance to achieve global growth, stability, and Bharat's Net Zero Target by 2070, requiring an estimated USD 10 trillion.

About Expert Committee on Climate Finance

1. It was formed on December 21, 2023
- 2. Members:** It includes experts from policy think tanks, standard setters, consultants, industry, and global financial institutions.
- 3. Objective:** Develop a roadmap for creating a climate finance ecosystem at GIFT IFSC, focusing on Transition Finance and establishing it as a global climate finance hub.

Highlights of the Report

1. The Report on Transition Finance captures the recommendations by the Expert Committee under three pillars:
 - i) Scope and definition of Transition Finance
 - ii) Policy and Regulation
 - iii) Financial Mechanisms and Instruments
- 2. Focus Areas:**
 - i) Driving investments in hard-to-abate sectors like steel, cement, shipping, and fertilizers.
 - ii) Strategic recommendations based on global best practices to enhance GIFT-IFSC's role in attracting international climate capital.
3. IFSCA will develop a Transition Finance framework based on the report's recommendations. The Committee will continue its work and draft its next report on transforming GIFT-IFSC into a Climate Finance Hub.

SEHER Program

Why in the news?

Recently, the Women Entrepreneurship Platform (WEP) and TransUnion CIBIL have launched the **SEHER program**.

About SEHER Program

- 1. Launched by:** Women Entrepreneurship Platform (WEP) and TransUnion CIBIL
- 2. Aim:** SEHER aims to **increase financial awareness among women** entrepreneurs in India. The program also aims to **promote the importance of a good credit history and CIBIL score** for easier access to finance.
3. The program helps women understand and manage credit which is crucial for business growth.
- 4. Key Goals of SEHER:**
 - i) Financial Literacy:** **Educate women on financial topics**, including their CIBIL Rank and commercial credit reports.
 - ii) Business Skills:** **Provide resources and training** to help women manage and grow their businesses.

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iii) **Access to Finance:** Help women **understand how to access and manage credit** effectively.

5. WEP's Role: WEP is a **public-private partnership platform** incubated at NITI Aayog. It focuses on **creating an ecosystem that supports women entrepreneurs**.

6. TransUnion CIBIL's Role: It provides **financial insights and credit information**. It aims to improve the financial skills of women entrepreneurs.

7. Impact:

i) Business loan demand by women has **grown 3.9 times** from FY 2019 to FY 2024.

ii) 38% of the 1.5 crore borrowers with a business loan in March 2024 were women.

iii) The portfolio balance for business loans by women **grew at 35% CAGR** from March 2019 to March 2024.

8. SEHER will **offer personalized resources, financial literacy content, and tools** to women entrepreneurs.

Importance of Women Entrepreneurs in India:

i) India has 63 million micro, small, and medium enterprises (MSMEs), with 20% owned by women.

ii) Women-owned businesses employ around 27 million people.

iii) Accelerating women's entrepreneurship could create over 30 million new businesses and up to 170 million new jobs.

About Women Entrepreneurship Platform (WEP):

i) WEP was established by **NITI Aayog** in **2018** and became a public-private partnership in 2022.

ii) WEP **supports women entrepreneurs** by providing entrepreneurship promotion, access to finance, market linkages, training and skills development, mentoring and networking, and business development services.

About TransUnion CIBIL:

i) TransUnion CIBIL is India's **leading information and insights company**.

ii) It provides solutions to **enhance economic opportunities and personal empowerment**. It serves banks, financial institutions, NBFCs, housing finance companies, microfinance companies, and insurance firms.

UPSC Syllabus: Indian Polity and Governance

Indexation

Why in the news?

The withdrawal of the indexation benefit in the long-term capital gains (LTCG) tax regime is one of the most contentious decisions announced.

About Indexation:

1. Indexation is the process of adjusting the original purchase price of an asset or investment to account for inflation.

2. **Purpose:** It helps to neutralize the impact of inflation, ensuring that the value of money remains consistent over time.

3. How Indexation Works:

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- i) Over time, inflation reduces the purchasing power of money. When an asset is sold or an investment is redeemed, inflation can affect the returns.
- ii) Indexation calculates the cost of acquisition by factoring in inflation over the holding period. This adjusted cost is called the indexed cost of acquisition.
- iii) Returns calculated using the indexed cost of acquisition are considered more realistic compared to absolute gains based on the original purchase price.

4. Benefits of Indexation:

- i) Indexation helps in preventing the erosion of investment returns by reducing the amount of taxes paid on long-term investments.
- ii) It is applicable to long-term investments, such as debt funds and other asset classes, ensuring the purchase price of investments is adjusted for inflation.

UPSC Syllabus: Indian Economy

Economic Survey 2023-24 highlights on Railway Safety and Signalling

Why in the news?

The economic Survey 2023-24 highlighted limited progress on Railway Safety Initiatives.

Key Points from Economic Survey 2023-24 on Railway Safety and Signalling:

1. The Economic Survey 2023-24 emphasis on the slow deployment of the automatic train protection system, Kavach, and the upgrade of signaling systems.

2. Deployment of Kavach: Kavach is an automatic train protection (ATP) system which is deployed on 1,465 route km in the South-Central Railway. This accounts for only 2.14% of India's total railway network (68,426 route km) and 7,349 railway stations.

3. Mechanical to Electronic Signalling: Out of 17 operational railway zones in India, eight zones have transitioned from mechanical to electronic signalling.

4. By FY23, 2,981 stations (40% of 7,325 stations) had switched to electronic interlocking systems. In FY24, an additional 443 stations made the switch, increasing the total to 46% of stations with electronic interlocking.

5. Electronic Interlocking (EI) Systems: EI systems were introduced in India 12 years ago and have been implemented at 3,424 stations by March 31, 2024.

6. Automatic Block Signaling (ABS): ABS is a low-cost signaling solution that has been provided on 582 route km during FY24. As of March 31, 2024, ABS covers 4,431 route km, comprising 6.47% of the Indian Railways network.

7. Capital Expenditure (Capex) Deployment: Capex deployment in railways has increased by 77% over the past five years, amounting to ₹2.62 lakh crore in FY24. Significant investments were made in the construction of new lines, gauge conversion, and doubling of tracks.

Establishment of e-commerce export hubs

Why in the news?

Finance Minister Nirmala Sitharaman announced the establishment of e-commerce export hubs across the country in public-private partnership (PPP) mode during the Union Budget presentation.

These hubs will be modeled after successful Southeast Asian countries benefiting from e-commerce export growth.

Current Export Challenges

i) Indian goods exports are facing disruptions due to external shocks such as the Russia-Ukraine war, the Red Sea crisis, and container shortages stemming from US-China trade tensions.

ii) Indian goods exports declined by 5% last financial year.

MSMEs and Artisan Support:

i) The initiative aims to enable Micro, Small, and Medium Enterprises (MSMEs) and traditional artisans to sell their products in international markets.

ii) The hubs will offer a seamless regulatory and logistic framework to facilitate trade and export-related services under one roof.

Comparison with Other Countries

i) While MSMEs and artisans in China, South Korea, Japan, and Vietnam have seen significant export growth through e-commerce, India's e-commerce exports stand at \$5 billion, a small fraction of its total goods exports of \$450 billion.

ii) In contrast, China's e-commerce exports have surpassed \$300 billion.

Policy Enhancements

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i) The Commerce and Industry Ministry's Foreign Trade Policy (FTP) increased the consignment-wise cap on e-commerce exports through courier from ₹5 lakh to ₹10 lakh.

ii) The ministry projects e-commerce export potential of \$200 to \$300 billion by 2030.

Industry Potential

i) India's e-commerce industry is dominated by small businesses exporting items valued between \$25 and \$1,000, including handicrafts, art, books, ready-made garments, gems, and jewellery.

ii) According to the Global Trade Research Initiative (GTRI), this segment has the potential to grow faster than IT exports did in the early 2000s.

Need for Separate E-Commerce Export Policy

i) Current e-commerce export provisions in India are a patchwork of rules designed for regular B2B exporters, creating compliance burdens for small firms.

ii) The GTRI report recommends a separate e-commerce export policy to address these issues comprehensively.

Southeast Asia's E-Commerce Growth

i) McKinsey & Company reported that Southeast Asia's e-commerce market has accelerated since the mid-2010s, further propelled by the COVID-19 pandemic.

ii) From 2016 to 2021, the total value of e-commerce sales in Southeast Asia grew fivefold, or 40% annually, with e-commerce's share of all retail sales surging from 5% to 20%.

Angel Tax

Why in the news?

Recently, the Union Minister for Finance proposed to abolish the 'angel tax' for all classes of investors while presenting the Union Budget 2024-25 in Parliament.

About Angel Tax

1. Angel tax was levied on the capital raised via the issue of shares by unlisted companies from an Indian investor if the share price of issued shares exceeded the fair market value of the company.

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2. The excess funds raised at prices above fair value were treated as income, on which tax was levied.
3. The tax derives its genesis from section 56(2) (viib) of the Income Tax Act, 1961. It was first introduced in 2012 to prevent black money laundering through share sales.
4. It was levied at a rate of 30.9% on net investments in excess of the fair market value.

5. Exemptions for Startups (Announced in 2019)

i) Eligible Startups: Startups should be recognized by the Department for Promotion of Industry and Internal Trade (DPIIT) as eligible startups.

ii) Capital Limit: The aggregate amount of paid-up share capital and share premium of the startup cannot be more than ₹25 crores. This amount does not include money raised from Non-Resident Indians (NRIs), Venture Capital Firms, and specified companies.

6. Angel Investors: For angel investors, the amount of investment that exceeds the fair market value could be claimed for a 100% tax exemption. The investor must have a net worth of ₹2 crores or an income of more than ₹25 lakh in the past 3 fiscal years.

Centre issues advisory for ads on food and health products only

Why in the news?

The **Ministry of Information & Broadcasting** has recently issued a new advisory specifically targeting advertisements for food and health products.

About Advisory for Ads on Food and Health Products

1. This advisory requires advertisers and advertising agencies in these sectors to upload an **annual self-declaration certificate** on designated platforms.
2. This new directive **supersedes all previous advisories from the Ministry and is solely applicable to the food and health sectors**. This means that only these sectors are required to submit the self-declaration certificate annually.
3. According to the advisory, the platforms for uploading the self-declaration certificates are the **Broadcast Seva Portal for TV and radio advertisements** and the **Press Council of India Portal for print media and internet advertisements**.
4. Advertisers and advertising agencies involved in **promoting products and services in the food and health sectors are advised to comply by uploading their annual self-declaration certificates** on these specified platforms.

UPSC Syllabus-Index and Reports

PARAKH 'equivalence' report

Why in the news?

In accordance with the National Education Policy (NEP) 2020, PARAKH has presented an 'equivalence' report to the Ministry of Education.

About the Report

1. PARAKH is a standard-setting body under the National Council of Educational Research and Training (NCERT), recently submitted an 'equivalence' report to the Ministry of Education.
2. **Purpose:** This report aims to achieve equivalence across the 69 school boards in India as outlined in the National Education Policy (NEP) 2020.

What is Equivalence?

1. Different school boards in India have varying curriculums, examinations, and administrative structures, leading to discrepancies in perceived quality.
2. **Goal:** Equivalence means ensuring that all students, regardless of which board their school is affiliated with, receive a standardized level of education and facilities.

Key Recommendations from PARAKH

1. Assessment and Evaluation:

- i) The final Class 12 results will be based on a cumulative score, where Class 9 contributes 15%, Class 10 contributes 20%, Class 11 contributes 25%, and Class 12 contributes 40%.
- ii) Introduce a **credit-based system for assessments**, including online courses and holistic evaluations such as self-assessments, teacher feedback, and peer reviews.
- iii) Establish a cadre of trained teachers to ensure standardization in exam question papers.
- iv) Develop a question bank for Classes 9 and 11 and create blueprints for exam papers for Classes 10 and 12.

2. Administrative Improvements

- i) Update **affiliation guidelines and ensure periodic reviews** of affiliated schools, with affiliations valid for up to three years.

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ii) Empower boards to **recognize schools** and take action against unrecognized institutions.

iii) Develop mechanisms to **prevent cheating** and handle exam papers securely.

3. Curriculum and Infrastructure

i) Integrate digital literacy, including coding and cybersecurity, into the curriculum and follow the National Curriculum Framework.

ii) Ensure all schools have essential facilities like toilets, internet access, libraries, strongrooms for exam papers, and ramps or elevators.

UPSC Syllabus: Schemes and Programmes

Holistic Progress Card

Why in the news?

PARAKH, a standard-setting body under NCERT, recently released the **Holistic Progress Card**, a report card designed for secondary school students (Classes 9 to 12). Similar HPCs were earlier designed for students from classes 1 to 8.

About Holistic Progress Card

Objective-To transform evaluations by focusing on **diverse skills** and **competencies**, instead of just the performance in periodic pen-and-paper tests and exams.

Applicability-**Classes 9 to 12**

Implementation- It will not be used in the ongoing 2024-25 academic session.

Features-

A) Teachers and officials will receive training for its implementation. **States** have the option to either implement the HPC released by **NCERT** or **adapt** it according to their requirements.

B) The HPC differs from internal marks in Board exam evaluations. It reflects the child's **academic achievements** over the years and is intended to enhance the Board exam results. It will be **integrated** with the Board results.

C)The progress card includes various sections like the one where students assess themselves on skills like **'time management'** and **'plans after school'**.

D) It includes an **'accomplishments inventory'** covering academic skills such as independent **work/research** and **critical and creative thinking**, as well as life skills like understanding the value of money and budgeting etc.

E) It includes the **teacher's assessment** of the student in group projects, the student's reflections on their own performance, and peer feedback on their understanding and contributions to the project.

What is the significance of Holistic Progress Card for classes 9 to 12?

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1) It will realign school report cards with the **National Curriculum Framework for School Education (NCFSE)**.

Read More- [Govt. releases pre-draft of National Curriculum Framework for school](#)

2) It will contribute towards bringing **equivalence** across different boards.

UPSC Syllabus-Index and Reports

SDG India Index Report

Why in the news?

Recently, NITI Aayog released its fourth evaluation report of India's progress on the 16 sustainable development goals (SDGs) adopted in 2015 by all United Nations member countries.

About SDG India Index Report

1. It is released by NITI aayog.
2. The SDG India Index evaluates progress made across 16 goals on a scale of 1 to 100.

Performance of the states in SDG India Index

1. India's SDG score improved to 71 points in 2023-24 from 66 points in 2020-21.
2. **Key Drivers:** Progress in poverty reduction, economic growth, and climate action contributed to the improvement.
3. **Top Performers:**
 - i) **Kerala and Uttarakhand:** Both states topped the SDG India Index with a score of 79 points each.
 - ii) **Lowest Performers:** Bihar was the worst performer with 57 points, followed by Jharkhand with 62 points.
 - iii) **Highest Gains:** Punjab, Manipur, West Bengal, and Assam recorded the highest increases, each gaining 8 points to scores of 76, 72, 70, and 65 respectively.

4. Achievements:

- i) The **goal of reducing poverty** saw a significant increase in points.
- ii) There was notable progress in **achieving decent work and fostering economic growth**.
- iii) Efforts to **protect and manage life on land** also showed a substantial improvement.
- iv) The **goal of achieving gender equality** recorded the smallest increase in points.
- v) Similarly, the **goal related to peace, justice, and strong institutions** saw minimal progress.
- vi) The **goal of reducing inequalities** experienced a decline, dropping to 65 points in 2022-23 from 67 points in 2020-21.
- vii) **Inequality Trends:** Despite a marginal drop in the Reduced Inequalities goal, overall inequality in India has decreased. The gap in consumption between the **richest 10%** and the **bottom 10%** has contracted.
- viii) **Taxpayer Increase:** The number of taxpayers has increased, indicating economic progress.

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ix) Zero Poverty: Increased by 8 points to 72, reflecting reduced extreme poverty and improved livelihoods across India.

x) Zero Hunger: Increased by 5 points to 52, but further focus is needed on providing nutritious food to address malnourishment, stunting, and low BMI scores.

5. Areas of Concern:

i) Gender Equality: Received the lowest score of 49 points, with only a 1-point increase from 2020-21.

ii) Issues: Low sex ratio at birth, women's ownership of land and assets, and low participation of women in the labor force.

UPSC Syllabus: Science and technology

Snowblind Malware

Why in the news?

Recently it has found that a new banking malware called 'Snowblind' is targeting Android users to steal banking credentials.

About Snowblind Malware

1. About: Snowblind is a new type of Android banking malware designed to steal banking credentials by bypassing security features.

2. Key Features:

- i) Snowblind uses a built-in Android security feature to bypass anti-tamper mechanisms.
- ii) This malware repackages apps to avoid detection of accessibility features that can extract sensitive information like login credentials and gain remote access to the app.
- iii) Snowblind exploits a feature called 'seccomp', which stands for 'secure computing' and is part of the Linux kernel and Android OS.
- iv) It injects code that loads before seccomp initializes anti-tampering measures, allowing the malware to bypass security mechanisms and utilize accessibility services.
- v) Snowblind can remotely view the victim's screen by using accessibility services.
- vi) It can disable biometric and two-factor authentication, which are commonly used security features in banking apps to prevent unauthorized access.
- vii) Snowblind typically infects users who install apps from untrusted sources.
- viii) The malware is mostly active in Southeast Asia, although the exact number of affected devices is unknown.

3. Security Implications Snowblind poses a significant threat to banking app users by circumventing advanced security measures.

4. Users are advised to avoid installing apps from untrusted sources and to remain vigilant about app permissions and behaviors.

PC Emulator

Why in the news?

Recently, Apple approved a PC emulator for iOS for the first time, enabling users to run classic software, mainly games, on iOS, iPadOS, and visionOS. Earlier this year, Apple updated its App Store guidelines to permit retro game console emulators, mini-games, and HTML5 mini apps on iPhones.

About PC Emulator

1. A PC emulator is software that allows a computer device to emulate another software, enabling it to run and use software designed for previously incompatible devices.
2. Emulators allow software designed for one operating system, such as Windows, to run on another, like macOS, by emulating the design architecture of the original system.
3. They are commonly used to run applications across different operating systems, play video games from older consoles, and test software on various platforms.

Legality of PC Emulators

1. Emulators are generally legal as long as they do not use proprietary codes, and their primary function is to enable the use of software designed for different platforms.
2. Sharing copyrighted ROMs online is illegal, even though the emulator itself might be legal.
3. Using an emulator is legal if the user owns the software they are emulating, but running pirated copies of software or distributing ROMs without ownership is illegal.

Risks Associated with Emulators

1. Using emulators from unofficial sources can be risky as they may contain malware that compromises system security.
2. Legal risks include violating licensing agreements or copyright laws, which can result in penalties and refusal of maintenance or technical support from the original software manufacturer.
3. Emulators can be resource-intensive, potentially leading to decreased CPU performance, overheating, and battery damage.
4. Poorly designed emulators may cause data corruption, crashes, or compatibility issues with the ROMs or software being used.

Legal Status of Emulators:

1. Emulators are typically not banned due to their utility in software testing and development, but their legal status depends on specific laws in each country and how they are used.
2. In India, emulators are legal, but their use must comply with copyright and intellectual property laws.
3. Using emulators to run software without proper licenses or ownership can lead to legal trouble, while distributing ROMs without ownership is problematic.

Global IndiaAI Summit 2024

Why in the news?

The Ministry of Electronics and Information Technology is organizing the 'Global IndiaAI Summit'. This summit highlights India's commitment to the **ethical and inclusive growth** of AI technologies.

About Global IndiaAI Summit 2024

1. **Hosted by:** The Global IndiaAI Summit 2024 hosted by the **Ministry of Electronics and Information Technology**.
2. **Duration:** It will take place on July 3rd and 4th in New Delhi.
3. **Key Objectives**
 - i) **Foster Collaboration:** Bringing together **global AI experts from various fields** including science, industry, civil society, governments, international organizations, and academia.
 - ii) **Knowledge Exchange:** Sharing insights on key AI issues and challenges.
 - iii) **Promote Ethical AI:** Emphasizing **responsible AI development** and deployment.
4. **India's Role:** India will host member countries and experts from the **Global Partnership on Artificial Intelligence (GPAI)** to promote safe, secure, and trustworthy AI.
5. **IndiaAI Pillars and Focus Areas:** The IndiaAI Mission aims to build a robust AI ecosystem in India, focusing on seven key pillars:
 - i) **IndiaAI Compute Capacity:** This pillar focuses on establishing a **scalable AI computing ecosystem with over 10,000 GPUs** through public-private partnerships. An AI marketplace will provide AI as a service and pre-trained models, acting as a central hub for essential AI resources.
 - ii) **IndiaAI Innovation Centre:** Dedicated to **developing and deploying indigenous large multimodal models (LMMS)** and domain-specific foundational models, this center aims to cater to the unique needs of India's diverse industries and sectors.
 - iii) **IndiaAI Datasets Platform:** This platform aims to streamline access to **high-quality non-personal datasets for AI innovation**. A unified data platform will provide seamless access for Indian startups and researchers, aiding in the development of robust AI models.

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iv) **IndiaAI Application Development Initiative:** This initiative promotes AI applications in critical sectors by addressing problem statements from Central Ministries, State Departments, and other institutions. It focuses on developing impactful AI solutions for large-scale socio-economic transformation.

v) **IndiaAI FutureSkills:** By reducing barriers to AI education, **this pillar aims to increase AI courses at various academic levels and establish Data and AI Labs in Tier 2 and 3 cities**, ensuring a steady pipeline of skilled AI professionals nationwide.

vi) **IndiaAI Startup Financing:** This pillar supports **deep-tech AI startups** with streamlined access to funding. By providing risk capital and financial support, the mission aims to nurture a vibrant ecosystem of AI startups driving technological advancements and economic growth.

vii) **Safe & Trusted AI:** This pillar ensures **responsible AI development** by implementing Responsible AI projects, developing indigenous tools and frameworks, and establishing guidelines for ethical, transparent, and trustworthy AI technologies.

World's first brain implant

Why in the news?

Recently, a **UK-based teenager became the first person to receive a brain implant** designed to control epileptic seizures.

How Does the Brain Implant Work?

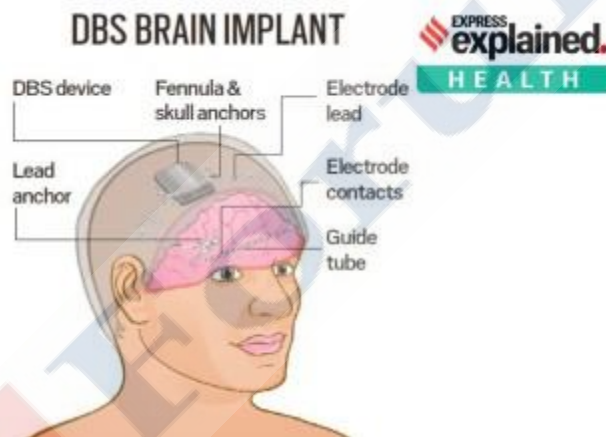


Figure 3. Source: IE

1. A **neurostimulator** is used which is an **implantable device** that delivers mild electrical pulses to nerves.

2. This **neurostimulator delivers constant electrical impulses** to the brain to disrupt or block abnormal seizure-causing signals. It is surgically implanted in the skull.

3. Two electrodes are **inserted deep into the brain to reach the thalamus**, connected to the neurostimulator. The device can be recharged wirelessly.

About Deep Brain Stimulation (DBS)

- 1) Deep brain stimulation (DBS) involves **implanting electrodes within areas of the brain**.
- 2) DBS is used for movement disorders like **Parkinson's disease** and other neurological conditions.
- 3) It has been used for nearly a decade in **treating epilepsy**. Traditionally such devices were placed in the chest with wires running to the brain.

Treatment for Epilepsy

1) First Line of Treatment: Doctors initially use **anti-seizure medications and a ketogenic diet**, which is high in fats and low in carbohydrates, known to reduce seizures.

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2) Surgical Options: If medications and diet do not work, **brain surgery may be performed** to remove the seizure-originating part of the brain.

3) Corpus callosotomy: It is a surgery to remove the part connecting both brain halves. This may be suggested for children to **prevent abnormal electrical signals** from spreading.

Comparison of Surgery vs. DBS Device

1. Surgery is preferred over DBS devices as it **can reduce seizures by nearly 90%**, compared to about 40% reduction by DBS devices.

2. DBS is recommended for patients with seizures originating from multiple brain parts or when other treatments fail.

About Epilepsy

1) Epilepsy is a condition that leads to recurring seizures.

2) Caused by: It is caused by **abnormal electrical activity** in the brain.

3) Symptoms: It include jerking of arms and legs, temporary confusion, staring spells, or stiff muscles.

4) Causes: Approximately **50% of epilepsy cases have no identifiable cause**. Possible causes include head trauma, brain tumors, infections like meningitis, and genetic factors. Epilepsy can increase the risk of accidents, drownings, and falls.

World Zoonoses Day

Why in the news?

The Department of Animal Husbandry and Dairying recently organized an interactive session to commemorate World Zoonoses Day.

About World Zoonoses Day

i) It is celebrated in honour of **Louis Pasteur** who administered the **first successful rabies vaccine** which is a zoonotic disease on **July 6, 1885**.

ii) This day is **dedicated to raising awareness** about zoonoses diseases that can be **transmitted from animals to humans and promoting preventive and control measures**.

About Zoonoses:

i) About: These are infectious diseases that can **transfer between animals and humans**, such as rabies, anthrax, influenza (H1N1 and H5N1), Nipah, COVID-19, brucellosis, and tuberculosis.

ii) Caused by: These diseases are **caused by various pathogens**, including bacteria, viruses, parasites, and fungi. However, not all animal diseases are zoonotic. Many diseases affect livestock without posing a risk to human health.

iii) Infectious: These **non-zoonotic diseases are species-specific and cannot infect humans**. Examples include Foot & Mouth Disease, PPR, Lumpy Skin Disease, Classical Swine Fever, and Ranikhet Disease.

Prevention and control

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- i) Prevention and control of zoonotic diseases **rely on vaccination, good hygiene, animal husbandry practices, and vector control.**
- ii) **Collaborative efforts through the One Health approach**, which emphasizes the interconnectedness of human, animal, and environmental health, are crucial.
- iii) **Collaboration among veterinarians, medical professionals, and environmental scientists** is essential for addressing zoonotic diseases comprehensively.
- iv) To mitigate the risk of zoonotic diseases, the Department of Animal Husbandry & Dairying (DAHD) has launched a nationwide campaign for **Brucella vaccination of bovine calves under NADCP** and undertaken **Rabies Vaccination under ASCAD.**
- v) Educating the **public about the distinction between zoonotic and non-zoonotic diseases** helps reduce unwarranted fear and promotes a more informed approach to animal health and safety.

Regenerative Braking

Why in the news?

The **regenerative braking device market** is projected to experience significant growth between 2024 and 2031, driven by the increasing popularity of electric vehicles (e-vehicles).

About Regenerative Braking

Regenerative braking is a technology used in electric and hybrid vehicles to capture and reuse energy that would otherwise be lost during braking.

How Does Regenerative Braking Work?

1. Normal Braking: In traditional vehicles, braking converts the car's kinetic energy into heat, which is then wasted.

2. Regenerative Braking:

i) In vehicles with regenerative braking, **pressing the brake pedal causes the electric motor to run in reverse.** This reverse action slows down the car similarly to traditional brakes.

ii) **Instead of converting kinetic energy into heat, the motor converts it back into electrical energy.** The electrical energy is then stored in the vehicle's battery for later use.

3. Energy Conversion and Storage: The reversed motor converts the kinetic energy of the moving car into electrical energy. This **electrical energy is sent back to the car's battery and stored for future use**, such as powering the vehicle or running electrical systems.

Significance of Regenerative Braking

i) **Energy Efficiency:** Saves energy by reusing it, reducing the need for frequent battery recharges.

ii) **Extended Range:** Helps electric and hybrid vehicles travel further on a single charge.

iii) **Reduced Wear and Tear:** Reduces wear on traditional brake components, leading to lower maintenance costs.

Shortcomings of Regenerative Braking

i) Incomplete Stopping Power: Regenerative braking alone often cannot bring a vehicle to a complete stop and must be supplemented by conventional braking systems.

ii) Hill Descent: Regenerative brakes may not prevent vehicles from backsliding downhill.

iii) Efficiency at Low Speeds: The efficiency of energy recovery drops as the vehicle's speed decreases, though regenerative brakes are beneficial in stop-start traffic.

Mitochondrial Disease and Mitochondrial Donation

Why in the news?

Scientists are preparing for a clinical trial to determine the safety and effectiveness of mitochondrial donation.

About Mitochondrial Disease

1. About: Mitochondrial disease (Mito) refers to a group of diseases that **impair the mitochondria's ability to produce the energy needed for organs** to function properly.

2. Forms: Mito can appear in many forms, affecting one or more organs and potentially leading to organ failure.

3. Inheritance:

i) Mitochondrial disease can be caused by **faulty genes in nuclear DNA** (inherited from both parents) or mitochondrial DNA (inherited only from the mother).

ii) The severity of Mito can vary, even within the same family, where a mildly affected mother might give birth to a severely affected child.

iii) Mito is the **most common inherited metabolic condition**, affecting 1 in every 5,000 people.

4. Symptoms:

i) Symptoms can range from mild to severe and can affect any organ, particularly those requiring high energy like the heart, brain, and muscles.

ii) Childhood Mito often affects multiple organs and progresses quickly.

About Mitochondrial Donation

1. Mitochondrial donation is a new **IVF-based method that allows people with faulty mitochondrial DNA to have children without passing on the faulty DNA**.

2. Procedure:

i) The nuclear DNA from the intending parents is inserted into an egg from a donor with healthy mitochondria.

ii) The resulting egg contains nuclear DNA from the parents and healthy mitochondrial DNA from the donor.

iii) Sperm is then added to fertilize the egg, allowing the child to inherit nuclear DNA from both parents and mitochondrial DNA from the donor.

3. The procedure requires highly trained scientists and specialized equipment. Both the egg donor and the person with Mito receive hormone injections to stimulate the ovaries to produce multiple eggs. Eggs are retrieved through an ultrasound-guided surgical procedure.

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4. **Benefits:** This significantly reduces or eliminates the risk of the child inheriting mitochondrial disease.

5. Challenges:

- i) Finding donor eggs is a significant challenge for mitochondrial donation.
- ii) Both frozen and fresh eggs are needed for research and clinical trials.

IIT-M made mineral nanoparticles with water

Why in the news?

Recently, researchers at IIT Madras have demonstrated a novel method to create **mineral nanoparticles** using microdroplets of water. This discovery holds **potential implications** for various fields, including the origin of life and agricultural soil replenishment.

The Role of Water Microdroplets

1. Microdroplets are tiny droplets, about 10 micrometers (μm) in size, which is 100 times smaller than raindrops.
2. They come in different sizes, from large raindrops to very tiny particles called aerosols.
3. The smallest microdroplets are a thousand times smaller than a typical raindrop and are too small to see with the naked eye. Even though they are very small, microdroplets can play a big role in chemical reactions.
4. The research reveals that microdroplets of water can break down minerals into nanoparticles, a process that is not possible with bulk water.
5. Due to their small size and closely packed water molecules, microdroplets are more reactive and capable of engaging in chemical reactions at a much faster rate, sometimes up to a million times faster than bulk water.

Implications for Proto-Cells and Agriculture

- i) This research has potential relevance to the study of proto-cells which are the precursors to modern cells.
- ii) The study suggests that microdroplets could mimic proto-cells by facilitating biochemical reactions within small compartments, which is exciting in the context of understanding the origins of life.

Agricultural Applications

- i) The formation of nanoparticles from microparticles is also significant for agriculture. **Silica nanoparticles**, for instance, can be absorbed by plants to enhance their growth.
- ii) This discovery could lead to methods of **converting unproductive soils into fertile lands**, thus positively impacting food production and addressing issues related to water and food security.

Asteroid Apophis

Why in the news?

ISRO might send its spacecraft or collaborate with other space agencies to study asteroid Apophis.

About Asteroid Apophis

SPACE OBJECTS ASTEROID: Rocky/ metallic objects moving around Sun, mostly leftovers from the formation of solar system. Asteroids less than 1 metre in diameter are called meteoroids. METEOR: The streak of light produced when an asteroid/ meteoroid encounters friction of Earth's atmosphere.	METEORITE: Unburnt fragment of asteroid that falls to Earth HOW BIG? APOPHIS: About 450 m at its widest CHELYABINSK, which exploded over Russia in 2013: about 20 m at its widest ASTEROID THAT ELIMINATED DINOSAURS: 10-15 km wide	1. Apophis is a large asteroid discovered in 2004. It measures about 450 meters wide. Initially, scientists thought Apophis had a small chance of hitting Earth in 2029, 2036, or 2068. This raised concerns due to its potential for causing major damage, similar to events that have impacted
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Figure 4. Source: IE

Earth's history.

2. Further observations have shown that Apophis will pass Earth at a safe distance of 32,000 km in 2029. It poses no immediate threat during this pass or in subsequent expected encounters.

Studying asteroid Apophis

The Indian Space Research Organisation (ISRO) is interested in studying Apophis. ISRO may send its own spacecraft or collaborate with other space agencies like NASA, which already has a mission planned.

1. Why Study Asteroids: Asteroids occasionally enter Earth's atmosphere, with most burning up harmlessly. However, larger asteroids can cause significant damage, as seen in past events like the 2013 Chelyabinsk meteor in Russia.

2. Planetary Defense Goals: ISRO's interest in planetary defense aims to develop capabilities to track and potentially mitigate threats from asteroids. This involves studying their trajectories and characteristics to better understand their behavior.

3. Future Missions: NASA and other agencies are planning missions to study Apophis up close in 2029. These missions will gather data to improve our understanding of asteroids and enhance our ability to predict and respond to potential threats.

Advanced Medium Combat Aircraft (AMCA)

Why in the news?

The development of India's indigenous fifth-generation fighter aircraft, known as the Advanced Medium Combat Aircraft (AMCA) is making significant progress. It is expected to be ready by 2028-29.

About Advanced Medium Combat Aircraft (AMCA) prototype



Figure 5. Source: Blogspot

1. Led by: The project is led by the Defence Research and Development Organisation (DRDO) and Hindustan Aeronautics Limited (HAL). It is set to revolutionize India's defense capabilities.

2. The first prototype is anticipated to be ready by 2028-29, with production expected to commence by 2032-33, and induction into the Indian Air Force planned for 2034.

3. Aim: The AMCA aims to

establish India's prowess in aerospace technology and enhance its self-reliance in defense manufacturing.

4. Importance:

i) The AMCA is a critical project for India's defense strategy, especially as global powers like China advance their own fifth-generation fighter aircraft programs.

ii) Strategic Importance: The AMCA project is vital for India as it represents the country's only indigenous fifth-generation fighter aircraft development.

iii) As global adversaries like China continue to deploy advanced aircraft such as the J-20 FGFA, the AMCA is crucial for maintaining strategic parity and bolstering national defense.

iv) By 2034, the AMCA is expected to be fully operational, enhancing the Indian Air Force's capabilities and reinforcing India's position as a major player in the global defense arena.

v) This ambitious project underscores India's commitment to advancing its technological and defense infrastructure, ensuring readiness to meet future security challenges.

Key Features of the AMCA:

Aspects	Description
Design and Specifications	<ul style="list-style-type: none">i) The AMCA is designed as a 25-tonne twin-engine stealth aircraft.ii) It features an internal weapons bay, ensuring reduced radar cross-section.iii) The diverterless supersonic intake (DSI), developed indigenously, enhances the aircraft's stealth and aerodynamic performance.iv) Payload capacity includes 1,500 kg internally and 5,500 kg externally, with an internal fuel capacity of 6,500 kg.
Stealth and Performance	<ul style="list-style-type: none">i) The aircraft's stealth capabilities are integral, making it less detectable by enemy radar.ii) The twin-engine configuration is intended to provide superior speed, agility, and combat performance.

What is AI Washing?

Why in the news?

Recently, it has been revealed that some tech companies and startups are falsely marketing themselves as using artificial intelligence (AI), a practice known as “AI washing.”

About AI Washing

1. The term AI washing is derived from “greenwashing,” where companies exaggerate their environmental friendliness to attract customers.
2. It involves businesses claiming to have integrated sophisticated AI into their products while using much less advanced technology.
3. It is a deceptive promotional practice where companies exaggerate or falsely claim their products or services use AI.
4. **Objective:** To capitalize on the growing interest in AI and make their offerings appear more advanced and cutting-edge than they actually are.
5. **Examples:** A company might claim that their chatbot is “powered by the latest AI technology” when it merely matches keywords with pre-written responses.

Impacts and Problems

1. **For Businesses:** It can lead to overpaying for technology and services that do not deliver the expected benefits, failing to achieve operational objectives that genuine AI could help with.
2. **For Investors:** It makes it difficult to identify genuinely innovative companies, potentially leading to misinformed investment decisions.

New Shepard Spacecraft

Why in the news?

Jeff Bezos-led Blue Origin has partnered with the Space Exploration and Research Agency (SERA) to provide common Indian citizens with the opportunity to travel into space aboard the New Shepard spacecraft.

About New Shepard Spacecraft

1. The New Shepard is a suborbital space travel vehicle designed for both scientific research and space tourism. It is named after Alan Shepard who was the first American in space.
2. It features a fully reusable rocket system intended for human spaceflight, consisting of a reusable booster and a pressurized crew capsule that can accommodate six passengers.
3. Each passenger is provided with a window seat to enjoy breathtaking views of Earth through the largest windows ever flown in space.
4. The spacecraft’s 11-minute journey takes passengers beyond the Karman line, where they experience several minutes of weightlessness before making a controlled descent back to Earth aided by parachutes.

About the Karman Line

1. The Karman line is an imaginary boundary located at 100 km (62 miles) above sea level, demarcating the Earth’s atmosphere from space.

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2. It was established in the 1960s by the Fédération Aéronautique Internationale (FAI) and named after aerospace pioneer Theodore von Kármán.
3. This line is recognized by most countries and space organizations as the official boundary between Earth's sky and space.
4. However, some organizations, including the Federal Aviation Administration, NASA, and the U.S. military, place the boundary at 80 km (50 miles) above the Earth's surface.
5. At altitudes above the Karman line, the air is too thin for a propulsion system that relies on lift generated by Earth's atmosphere, necessitating alternative propulsion methods for spacecraft.

Exercise Nomadic Elephant

Why in the news?

India and Mongolia will conduct the bilateral joint military exercise "NOMADIC ELEPHANT-23" in Ulaanbaatar from 17 to 31 July 2023.

About Exercise Nomadic Elephant



Figure 6. Source: PIB

relations.

6. Significance of the exercise:

1. It is the 15th edition of bilateral joint military exercise.
2. **Date and Location:** It would commence from 03 -16 July 2024 at Umroi, Meghalaya.
2. **Participants:** Indian contingent comprising of 45 personnel is being represented by a Battalion of **SIKKIM SCOUTS** along with personnel from other arms and services. The Mongolian contingent is being represented by personnel from **150 Quick Reaction Force Battalion of the Mangolian Army**.
3. **Aim:** Enhance joint military capability for counter-insurgency operations in a sub-conventional scenario under Chapter VII of the United Nations Mandate
4. **Primary Theme:** Counter-terrorism operations in mountainous terrain under United Nations mandate
5. **Focus Areas:**
 - i) Operations in semi-urban and mountainous terrain.
 - ii) Sharing best practices in tactics, techniques, and procedures for joint operations.
 - iii) Developing inter-operability, camaraderie, and bonhomie between the two armies.
 - iv) Augmenting defence cooperation and bilateral

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- i) It is an annual training event alternating between India and Mongolia.
- ii) It enhances defence cooperation and bilateral relations.
- iii) It promotes interoperability and shared military strategies.

Exercise MAITREE

Why in the news?

Recently, the Indian Army contingent departed to take part in **India- Thailand joint military Exercise MAITREE**.

About Exercise MAITREE



Source: PIB

Aspects	Description
About	<ol style="list-style-type: none">The 13th edition of Exercise MAITREE is scheduled to be conducted from 1st to 15th July 2024 at Fort Vachiraprakan in Tak Province, Thailand.The last edition of this exercise was conducted at Umroi, Meghalaya, in September 2019.
Participants	The Indian Army contingent, comprising 76 personnel, is represented mainly by a Battalion of the LADAKH SCOUTS along with personnel from other arms and services.
Aim	The aim of Exercise MAITREE is to foster military cooperation between India and Thailand .
Focus Areas	<ol style="list-style-type: none">The exercise will enhance combined capabilities in executing joint counter-insurgency and counter-terrorist operations in jungle and urban environments under Chapter VII of the United Nations Charter.

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	2. The exercise will focus on a high degree of physical fitness , joint planning, and joint tactical drills
Tactical Drills	1. Tactical drills to be practiced during the exercise will include the creation of a Joint Operation Centre and establishing an Intelligence & Surveillance Centre . 2. The exercise will involve the employment of drones and counter-drone systems , securing a landing site , and conducting small team insertion and extraction . 3. Special heliborne operations, cordon and search operations, room intervention drills, and the demolition of illegal structures will also be part of the training.
Significance	1. Exercise MAITREE will enable the two sides to share their best practices in tactics, techniques, and procedures for conducting joint operations. 2. The exercise will facilitate the development of interoperability, bonhomie, and camaraderie between soldiers of both countries.

UPSC Syllabus: Defence

Air Pollution and Mortality in Indian Cities

Why in the news?

A new study analyzed the **health effects of short-term exposure to air pollution**, specifically PM 2.5, in ten Indian cities: Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, Mumbai, Pune, Shimla, and Varanasi.

Key Findings of the Study

- 1. Higher Death Rates in Cleaner Cities:** **Spikes in air pollution in cities with cleaner air**, such as Bengaluru, **may lead to higher death rates compared to cities with already high pollution levels**, like Delhi. For example, a similar increase in PM 2.5 levels raises death rates more in Bengaluru than in Delhi.
- 2. Annual Deaths Attributable to Air Pollution:** **Delhi experiences approximately 12,000 deaths per year linked to air pollution**. Bengaluru has about 2,102 deaths per year, while Shimla has the lowest number, with 59 deaths per year.
- 3. Fraction of Annual Deaths Due to Air Pollution:** In Delhi, **11.5% of annual deaths are attributable to air pollution**. In Bengaluru, **4.8% of annual deaths are linked to air pollution**. Additionally, Bengaluru's population experiences 30% of the daily air pollution exposure compared to Delhi residents.
- 4. Impact of PM 2.5 Increases:** Nearly 30,000 deaths, or **7.2% of annual deaths in the ten cities**, were due to **short-term PM 2.5 exposure**. The study found that total daily deaths rose by 1.42% for every 10 microgram per cubic metre increase in PM 2.5 exposure over a two-day period.
- 5. Risk of Mortality and PM 2.5 Levels:** The study confirmed that the **risk of mortality rose more quickly at lower PM 2.5 levels and plateaued as levels increased**. A significant mortality risk of 2.65% was observed even on days with PM 2.5 levels below the Indian national air quality standard of 60 microgram per cubic metre.

Comparative Findings:

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A 272-city study in China reported a 0.22% increase in death rates per 10 microgram per cubic metre increase in PM 2.5.

In contrast, **higher death rates were observed in countries with lower base pollution levels**: Greece had a 2.54% increase, Japan had a 1.42% increase, and Spain had a 1.96% increase.

Radiation biodosimetry

Why in the News?

Radiation biodosimetry is extremely important in responding to a large-scale radiological event, such as an **Improvised Nuclear Device** or **reactor accident**. It helps in the assessment of the level of radiation and the administration of drugs in accordance with the exposure levels.

What is biodosimetry?

Biodosimetry- Biodosimetry is the **determination of the amount of radiation** to which an individual was exposed to, **based on changes in blood, urine, or hair**. It is particularly useful in a radiological event, where the exposed individuals do not carry any personal radiation monitoring devices.

What are the different methods employed in biodosimetry?

1. Gold standard biodosimetry assay/Dicentric Chromosome Assay (DCA) – It involves the **measurement of chromosome aberrations**, in white blood cells.

Process- In this process when the DNA of a person who is exposed to radiation is irradiated, there is formation of **Dicentric Chromosome (DC)**. These Dicentric Chromosome (DCs) are counted to assess the exposure levels. Higher the DCs, higher is the exposure level.

Advantage and Disadvantage

The Dicentric Chromosome Assay (DCA) has been **successfully employed** in many radiation accidents, **where the number of exposed people is small**.

However, when the number of persons exposed to radiation are large, this process is not very useful as **it is too labour intensive** and **has very less output of approximately 10 samples per day**.

2. Cytokinesis Block Micronucleus Assay (CBMN)- In this process the white blood cells are made to divide, but arrested before division is complete. Following radiation exposure, **some DNA is ejected during division** forming a '**micronucleus**'. This '**micronucleus**' helps in determining the exposure to radiation.

Advantage and Disadvantage- This assay is slightly simpler to perform and score. However, the overall time to confirm the exposure level is longer (~3 days), as it requires longer culturing of the cells.

As seen above, the present methods of biodosimetry (DCA and CBMN assays) suffers from the challenge of low scalability and low speed of radiation detection. **Center for Radiological Research at Columbia University** has established **several commercial High Throughput Screening (HTS) platforms**, which would significantly increase the radiation detection rates.

Scientists discover ants have evolved effective wound treatment through amputation

Why in the news?

Scientists found that **Florida carpenter ants** perform amputations on their injured nest mates as a form of wound treatment.

Key Findings of the study

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1. Amputations are performed only on certain leg injuries, suggesting methodical and targeted surgical practices. This is the first known instance of an ant species using amputation to treat an injury.
2. Amputations significantly improve survival rates, with ants surviving 90% of the time after amputation of limbs.
3. **Consensual Amputations:** The procedure appears consensual, with injured ants presenting their leg to another ant for amputation. After the leg is amputated, the wounded ant cleans the wound itself, followed by another ant finishing the cleaning process.
4. **Selective Amputations:** Amputations are only performed on ants with thigh injuries, not on lower leg injuries.
5. Researchers tracked amputees and found that survival rates of those with lower leg injuries were only 20%. Scans revealed multiple muscles in the ants' thighs that help in hemolymph regulation, making thigh injuries less fatal.
6. It has been found that thigh injuries result in rapid infection spread if not amputated, leading to the evolution of this behavior in ants. The behavior indicates a complex level of social organization and understanding among ants.
7. This finding might suggest similar behaviors in other species and provides insight into ant social dynamics and medical behavior.

Junk DNA

Why in the news?

Researchers using artificial intelligence have discovered potential cancer drivers hidden within so-called 'junk' regions of DNA.

About Junk DNA



Figure 7. Source: National Institutes of Health (NIH)

1. In genetics, junk DNA refers to regions of DNA that are noncoding. While DNA contains instructions (coding) for creating proteins in cells, not all genetic sequences within a DNA molecule code for proteins.

2. DNA can be a coding DNA which uses instructions to create proteins and noncoding DNA which are sequences that do not code for proteins.

3. **Types of Noncoding DNA:** Some noncoding DNA is used to produce non-coding RNA components, such as Transfer RNA (tRNA), regulatory RNA and ribosomal RNA (rRNA).

4. **Junk DNA:** Other regions of noncoding DNA are not transcribed into proteins or

used to produce RNA molecules, and their function is unknown. These are referred to as junk regions of DNA.

5. Proportion of Coding vs. Noncoding DNA: The proportion of coding versus noncoding DNA varies significantly between species:

- i) Humans have about 98% of the DNA is noncoding.
- ii) Bacteria have only about 2% of the genetic material is noncoding.

6. Functional Activity in Junk DNA: Despite being labeled as junk, researchers have found evidence suggesting that junk DNA may have some functional activity. For instance, fragments of what were originally non-functional DNA might have acquired a function through a process called **exaptation**.

Note: Exaptation refers to the acquisition of a function through means other than natural selection, indicating that these noncoding regions might have roles that are not yet fully understood.

UPSC Syllabus: Schemes and Programmes

Sampoornata Abhiyan

Why in the news?

NITI Aayog will launch 'Sampoornata Abhiyan' which is a 3-month campaign to achieve saturation of 6 key indicators in Aspirational Districts and 6 key indicators in Aspirational Blocks across the country.

About Sampoornata Abhiyan



Figure 8. Source: PIB

1. About: It is a 3-month campaign initiated by NITI Aayog.

2. Objective: To achieve saturation of 6 key indicators in Aspirational Districts and 6 key indicators in Aspirational Blocks.

3. Programs Involved: Aspirational Districts Programme (ADP) which targets 112 Aspirational Districts and Aspirational Blocks Programme (ABP) which targets 500 Aspirational Blocks.

4. Key Indicators for Aspirational Districts:

- i) Number of Soil Health Cards distributed
- ii) Percentage of schools with functional

electricity at the secondary level

iii) Percentage of children fully immunized (9-11 months) (BCG+DPT3+OPV3+Measles 1)

iv) Percentage of pregnant women registered for Antenatal Care (ANC) within the first trimester

v) Percentage of pregnant women taking Supplementary Nutrition under the ICDS Programme regularly

vi) Percentage of schools providing textbooks to children within 1 month of the start of the academic session

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5. Key Indicators for Aspirational Blocks:

- i) Percentage of persons screened for Diabetes against the targeted population
- ii) Percentage of persons screened for Hypertension against the targeted population
- iii) Percentage of pregnant women registered for Antenatal Care (ANC) within the first trimester
- iv) Percentage of pregnant women taking Supplementary Nutrition under the ICDS Programme regularly
- v) Percentage of Soil Health Cards generated against the soil sample collection target
- vi) Percentage of Self-Help Groups (SHGs) that have received a Revolving Fund against the total SHGs in the block

About Aspirational Districts and Aspirational Blocks Programme

Aspirational Districts Programme	Aspirational Blocks Programme
It was launched in 2018 under NITI Aayog.	It was launched in 2023 under NITI Aayog.
Aims: To quickly and effectively transform 112 districts across the country.	Aims: It aims for saturation of essential government services in 500 Blocks (329 Districts) across the country
Focuses on five themes: Health & Nutrition Education Agriculture & Water Resources Financial Inclusion & Skill Development Infrastructure	Focuses on five themes: Health & Nutrition Education Agriculture and Allied Services Basic Infrastructure Social Development
The progress is measured on 81 indicators of development.	The progress is measured on 40 indicators of development.

Codex Alimentarius Commission

Why in the news?

Recently, India participated in the **86th session of the Executive Committee of Codex Alimentarius Commission.**

About the 86th Session of the Executive Committee of Codex Alimentarius Commission

1. India is actively participating in the 86th session of the Executive Committee (CCEXEC) of the Codex Alimentarius Commission (CAC), which is being held from 1st to 5th July 2024 at the FAO Headquarters in Rome.
2. Shri G Kamala Vardhana Rao, the CEO of the Food Safety and Standards Authority of India (FSSAI), is representing India at this important session.

3. India's Contributions:

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- i) India **strongly supported the advancement of standards development for various spices**, including small cardamom, turmeric, and vanilla. This initiative is particularly significant for India, a major producer and exporter of these spices, as it will facilitate smoother international trade.
- ii) Additionally, India backed the **progression of standards for named vegetable oils**, guidelines for **controlling Shiga Toxin-Producing Escherichia coli**, and the **safe use and reuse of water in food production and processing**.
- iii) India also championed the proposal for developing Codex guidance on food safety considerations related to the **use of recycled materials in food packaging**. This initiative is crucial for addressing global challenges such as climate change, environmental protection, and sustainability.
- iv) India's participation as a member elected on a geographic basis (Asia) **underscores its dedication to establishing robust food safety standards and promoting fair practices** in the global food trade.

About Codex Alimentarius Commission (CAC)

1. About: The Codex Alimentarius Commission (CAC) is an **international food standards body** jointly established by the **Food and Agriculture Organization (FAO)** and the **World Health Organization (WHO)** in May 1963.

2. Mission: Its mission is to **develop and harmonize food standards at the global level**.

3. Membership: The CAC has **189 Codex Members**, including 188 Member Countries and 1 Member Organization (The European Union). **India became a member in 1964**.

4. Objectives:

- i) Develop and adopt international food standards (Codex Standards).
- ii) Ensure food safety and quality.
- iii) Facilitate fair trade practices in food products.
- iv) Protect consumer health.

5. Executive Committee (CCEXEC): This **executive body** assists in shaping international food standards. India, as the Regional Coordinator for the FAO/WHO Regional Coordinating Committee for Asia (CCASIA), is a member of the CCEXEC.

6. Composition of CCEXEC: It involves **chair, Three Vice Chairs, six Regional Coordinators and seven Elected Representatives** from different geographical regions of Codex.

7. The CAC meets annually, alternating between Geneva and Rome, and **works in the six United Nations official languages**.

8. Its **provisions cover various aspects of food safety**, including hygiene, additives, contaminants, labeling, and risk analysis.

UPSC Syllabus: Environment

Climate Finance Taxonomy

Why in the news?

The Union Budget for 2024-25 included an announcement by the finance minister about developing a 'climate finance taxonomy' in India.

About Climate Finance Taxonomy:

1. About: It is a system that classifies which parts of the economy can be marketed as sustainable investments.

2. Purpose: To guides investors and banks in channeling funds toward impactful investments to combat climate change.

3. Uses: To sets standards for climate-related financial instruments (like green bonds) and serves in climate risk management, net-zero transition planning, and climate disclosure.

4. Global Examples: Countries like South Africa, Colombia, South Korea, Thailand, Singapore, Canada, Mexico, and the European Union have developed their own taxonomies.

5. Significance:

i) Net-Zero Economy: It helps countries transition to a net-zero economy, balancing the production and removal of greenhouse gases (GHG).

ii) Alignment with Science: It ensures economic activities align with credible, science-based transition pathways.

iii) Climate Capital Deployment: It encourages the flow of funds toward climate adaptation and mitigation.

iv) Greenwashing Prevention: It reduces the risk of misleading claims about environmental benefits (greenwashing).

v) Capital Availability: It increases capital for climate initiatives, aiding India in meeting its climate commitments and green transition goals.

Nightjars

Why in the news?

Recently, scientists have described a **new species of nightjar**, named **Caprimulgus ritae**, found in the tropical forests of Timor and Wetar in the Lesser Sunda Islands.

About Nightjars



Source: Birdfact

Aspects	Description
About	<ol style="list-style-type: none">1. Nightjars are medium-sized, nocturnal, insectivorous birds belonging to the family Caprimulgidae and the order Caprimulgiformes.2. Nightjars are among the most difficult bird species to study due to their unobtrusive and nocturnal behavior, as well as their cryptic plumage.
Features	<ol style="list-style-type: none">1. Physical Characteristics: Nightjars have long wings, short legs, and very short bills.2. Diet: They feed on flying insects, catching them on the wing at night.3. Camouflage: Their grey-brown, mottled, streaked, and stripey plumage provides excellent camouflage during the daytime.4. Daytime Behavior: During the day, they sleep on the ground or perch lengthwise on a branch.
Distribution	Nightjars are found worldwide, except in Antarctica and certain island groups such as the Seychelles .
Diet	Nightjars eat a variety of flying insects , including moths and beetles. They hunt their prey in flight, which is an impressive feat in low light.

About the Lesser Sunda Islands

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- 1. Location:** The Lesser Sunda Islands are an archipelago in maritime Southeast Asia, located to the immediate east of Java and to the north of Western Australia.
- 2. Major Islands:** The group includes **Bali, Lombok, Sumbawa**, Flores, Sumba, and Timor.
- 3. Geological Formation:** The islands are part of the Sunda Arc, a volcanic arc formed by subduction along the Sunda Trench in the Java Sea. Together with the Greater Sunda Islands to the west, they make up the Sunda Islands.

Global Conclave on Plastic Recycling and Sustainability (GCPRS)

Why in the news?

The Global Conclave on Plastic Recycling and Sustainability (GCPRS) is currently underway at the Bharat Mandapam, Pragati Maidan in Delhi.

About the event

- 1. About:** It is a four-day event that brings together experts from India and abroad to address pressing concerns related to plastic waste management, recycling, and sustainability.
- 2. Aim:** The conference aims to promote circularity and discuss innovative solutions for a more sustainable future.
- 3. Key themes:** Topics covered include advances in biodegradable plastics, circular economy principles in waste management, and policy frameworks affecting plastics use and recycling.

About Global Conclave on Plastics Recycling and Sustainability (GCPRS)

- 1. About:** The Global Conclave on Plastics Recycling and Sustainability (GCPRS) is a trade exhibition under the All-India Plastics Manufacturers' Association (AIPMA).
- 2.** GCPRS aims to bring together the entire network of players in the plastics recycling industry, from collection to post-consumer phases.
- 3. Focus:** It focused on addressing critical issues related to plastic use, its environmental impact, and innovative solutions for a sustainable future.
- 4. Event Focus:**
 - i) Network Collaboration:** This event showcase business opportunities and the latest trends in plastic recycling and sustainable practices, offering numerous prospects for trade across various sectors.
 - ii) Innovative Technologies:** Showcasing innovative recycling technologies, sustainable alternatives like biodegradable and compostable plastics, and efficient waste management solutions.
 - iii) Platform for Stakeholders:** It is venue for industry leaders, startups, and environmental experts to display advancements and share insights on sustainability in the plastics industry.

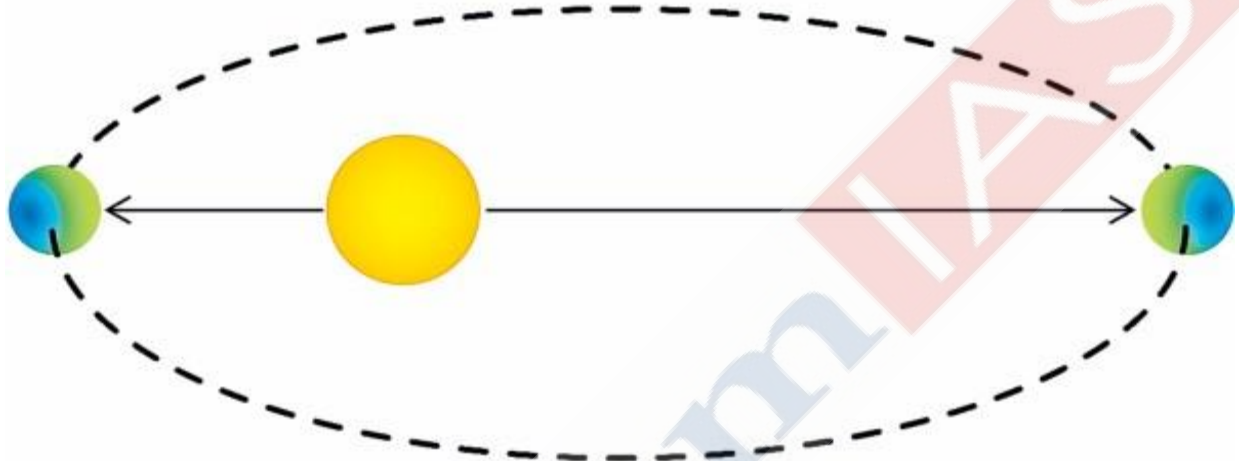
UPSC Syllabus: Geography

Aphelion Point

Why in the news?

Recently, Earth has reached aphelion.

About Aphelion



Source: Indian Express

1. Aphelion is the **point in Earth's orbit** where it is the **farthest from the Sun**. The Earth's path around the Sun is a slightly stretched-out circle or oval. This path is called an **elliptical orbit**.
2. Because of this shape, sometimes Earth is closer to the Sun, and sometimes it's farther away. **The point where Earth is farthest from the Sun is called aphelion.**

How Far is Earth at Aphelion?

1. At aphelion, Earth is about **152.1 million kilometers away** from the Sun.
2. This happens **every year in early July**. Six months later, in early January, Earth reaches the closest point to the Sun, called **perihelion**, when it is about 147.1 million kilometers away.
3. So, the distance changes by **about 5 million kilometers** between these two points.

Does Aphelion Affect Seasons?

1. Earth gets about **7% less sunlight at aphelion compared to perihelion**.
2. Instead, the tilt of the **Earth's axis is the main reason** of having seasons.
3. Depending on where Earth is in its orbit, either the Northern or Southern Hemisphere tilts towards or away from the Sun, creating the seasons.

What Would Happen if Earth's Orbit Changed?

1. If **Earth's orbit were a perfect circle**, the **lengths of the seasons would be the same**.

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2. Spring and summer are a bit longer than fall and winter in the Northern Hemisphere because of elliptical orbit.
3. If the orbit became more circular, it wouldn't cause major changes. However, if the orbit became more stretched out (more elliptical), it could make the seasons much more extreme.
4. Summers could become very hot, and winters very cold which could be harmful to life on Earth.

