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Daily News

Analysis

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1. Inhalable Microplastics

- **Prelims** - Inhalable Microplastics
- **Mains** - GS 3 - Environment (Pollution)

Why in the news?

- A recent study has investigated the presence of inhalable microplastics across four Indian cities.

Inhalable Microplastics

- **What is it?:** They are minuscule airborne plastic particles, **smaller than 10 micrometres (μm)**, that remain suspended in the air and can be inhaled into the lungs, unlike larger microplastics.
- **Sources:** Synthetic clothes (polyester), Vehicular wear and tear, plastic packaging, paints, cosmetics, and waste burning.
- **Exposure:**
 - Concentrations are comparatively higher indoors because of poor ventilation and the presence of enclosed plastic materials.
 - **Levels surge during winter evenings**, with concentrations increasing by 74%, intensifying smog conditions.
- **Health Risks:**
 - Higher risk of cancer, hormone related diseases, breast problems as well as respiratory illness.
 - **Co-pollutants** include **heavy metals** such as lead and cadmium, along with **hormone-disrupting chemicals** like diethyl phthalates.
 - Can carry microbes like *Aspergillus fumigatus*, which contain Antimicrobial Resistance genes- Can lead to **Antibiotic resistance risk**.

2. Ekam AI and Project SAMBHAV

- **Prelims** - Ekam AI and Project SAMBHAV
- **Mains** - GS 3 - Science and Technology (ICT)

Why in the news?

- During the Vijay Diwas celebrations, the Indian Army showcased various indigenous technologies, including the Ekam AI and SAMBHAV project.

Ekam AI

- **What is it?:** Ekam AI is a **fully indigenous and secure artificial intelligence platform** specifically designed for **sensitive and strategic environments**, such as defence and national security domains.
- **Features:**
 - Enables **data analysis, document management, and decision-support** functions.
 - Operates **without reliance on foreign software or external cloud infrastructure**, ensuring operational autonomy.
 - Designed for **ease of use**, allowing personnel at various hierarchical levels to use AI tools **without specialised technical knowledge**.

Project SAMBHAV

- **What is it?:** SAMBHAV is a **portable communication system** that provides **mobile connectivity through satellite support**, designed to ensure communication in areas where conventional networks are unavailable or disrupted.
- **Features:**
 - **Rapidly deployable**, making it suitable for **remote, border, and disaster-affected regions**.
 - Enhances communication capabilities for **both military personnel and civilians** during emergencies.
 - Operates independently of terrestrial communication infrastructure.

3. DHRUV64 Microprocessor

- **Prelims** - DHRUV64 Microprocessor
- **Mains** - GS 3 - Science and Technology (Indigenization of Technology)

Why in the news?

- India launched its first fully indigenous microprocessor named DHRUV64.

DHRUV64 Microprocessor

- **What is it?:** DHRUV64 is a **fully indigenously developed microprocessor** of India.
- **Developed By:** Centre for Development of Advanced Computing (C-DAC) as a part of the **Microprocessor Development Programme (MDP)**
- **Key Features:**
 - A **64-bit dual-core processor** operating at **1.0 GHz**, capable of handling **multiple tasks efficiently**.
 - Uses **superscalar execution**, enabling the processor to initiate multiple instructions simultaneously, thereby enhancing performance.
 - Compact design makes it suitable for deployment across diverse systems.
- **Potential Applications:**
 - Supports both **strategic and commercial applications**.
 - Suitable in applications like 5G infrastructure, Automotive electronics, Consumer electronics, Industrial automation and Internet of Things (IoT).

4. Nitrofurans

- **Prelims** - Nitrofurans
- **Mains** - GS 3 - Science and Technology (Basic Biology- Antibiosis)

Why in the news?

- FSSAI initiates an egg safety drive following an uproar over the detection of nitrofurans.

Nitrofurans

- **What is it?:** Nitrofurans are **synthetic, broad-spectrum antibiotics**.
- **Key Features:**
 - Classified as **synthetic chemotherapeutic agents** with a **broad antimicrobial spectrum**.
 - Effective against both **Gram-positive and Gram-negative bacteria**.
 - Active against pathogens such as **Salmonella, Giardia species, trichomonads, amoebae**, and some **coccidial species**.
 - Show **higher activity in acidic environments**, with an optimal pH of around **5.5**.
 - Primarily **bacteriostatic** in action, but can become **bactericidal at higher doses**.
- **Concerns:**
 - **Carcinogenic potential:** Certain nitrofurans have demonstrated **carcinogenic effects in animal studies**.
 - **Toxicity concerns:** May cause **toxic effects and adverse health outcomes**, particularly with **prolonged exposure or high doses**.
 - Injudicious use may lead to **Antimicrobial Resistance risk**.

5. Prelims Pointers

- **Param Vir Chakra:**

- It is **India's highest military decoration** awarded for exceptional acts of **valour, courage, and self-sacrifice in the face of the enemy during war.**
- Applicable to personnel from the **Army, Navy, Air Force, Reserve Forces, Territorial Army, Militia, and any other lawfully constituted Armed Forces.**
- The award **can be conferred posthumously.**

- **Exercise Desert Cyclone II:**

- It is a **joint military exercise** between **India and the United Arab Emirates (UAE).**
- Aims to enhance **interoperability** between the armed forces of India and the UAE.
- **First Edition** of the exercise was held in **2024.**