



20 May, 2024

IMD's heatwave 'red alert'

Context: The Indian Meteorological Department (IMD) issued a red alert for heatwaves in Delhi, Punjab, Haryana, and the majority of Western Rajasthan for Sunday, May 19.

➤ What is a Heatwave?

- **Definition:** According to the IMD, a heatwave is a condition of air temperature that can be fatal to the human body when exposed. It is defined based on temperature thresholds over a region in terms of actual temperature or its departure from normal.

➤ Criteria:

- **For Plains:** Maximum temperature reaches at least 40°C.
- **For Hilly regions:** Maximum temperature reaches at least 30°C.
- **For Coastal areas:** Maximum temperature departure is 37°C or more than normal.
- **Declaration:** Must be recorded in at least two stations in a meteorological sub-division for at least two consecutive days. The heatwave is declared on the second day.

➤ What is a Severe Heatwave?

- **Definition:** Classified when the prevalent temperature is 4.5°C to 6.4°C more than normal.
- **Criteria:** A rise of more than 6.4°C is considered a severe heatwave.
- **Peak Month:** May is the peak month for heatwaves in India.

➤ What is a Heatwave Red Alert?

- **Definition:** Refers to an extreme heat warning.
- **Criteria:** Severe heatwave persisting for more than two days or total number of heat/severe heatwave days exceeding six days.

Colour Code	Alert	Warning	Impact	Suggested Actions
Green (No action)	Normal Day	Maximum temperatures are near normal	Comfortable temperature. No cautionary action required	Nil
Yellow Alert (Be updated)	Heat Alert	Heat wave conditions at isolated pockets persists on 2 days	Moderate temperature. Heat is tolerable for general public but moderate health concern for vulnerable people e.g. infants, elderly, people with chronic diseases	(a) Avoid heat exposure. (b) Wear lightweight, light-coloured, loose, cotton clothes. (c) Cover your head: Use a cloth, hat or umbrella
Orange Alert (Be prepared)	Severe Heat Alert for the day	(i) Severe heat wave conditions persists for 2 days (ii) Through not severe, but heat wave persists for 4 days or more	High temperature. Increased likelihood of heat illness symptoms in people who are either exposed to sun for a prolonged period or doing heavy work. High health concern for vulnerable people e.g. infants, elderly, people with chronic diseases.	(b) Avoid heat exposure—keep cool. Avoid dehydration. (b) Drink sufficient water— even if not thirsty. (c) Use ORS, homemade drinks like lassi, torani (rice water), lemon water, buttermilk, etc. to keep yourself hydrated
Red Alert (Take Action)	Extreme Heat Alert for the day	(i) Severe heat wave persists for more than 2 days. (ii) Total number of heat/severe heat wave days exceeding 6 days	Very high likelihood of developing heat illness and heat stroke in all ages.	Extreme care needed for vulnerable people.

- **Impact:** Very high likelihood of developing heat illness and heat stroke in all ages. Extreme care needed for vulnerable people (elderly, infants, those with chronic diseases).

- **Example:** Chandigarh administration considering shutting down schools by noon due to conditions.

➤ Impact of Climate Change

- **Research:** US-based group Climate Central states human-caused climate change has made intense heat more likely.
- **WHO Data:** More than 166,000 people died from heatwaves between 1998 and 2017.

➤ Treating Heatstroke

- **Immediate Actions:**
- Lay the person in a cool place, under shade. Wipe with a wet cloth/wash the body frequently. Pour normal-temperature water on the head to bring down body temperature.
- Give the person ORS/lemon sharbat/torani or other hydrating liquids.
- Take the person to the nearest health centre immediately. Medical attention is essential as heat strokes can be fatal.

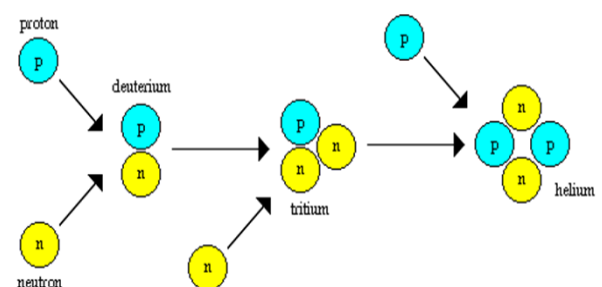
Nucleosynthesis

Context: The topic was explained in brief in *The Hindu*.

- **Definition:** Nucleosynthesis is the process that creates new atomic nuclei from pre-existing nucleons (protons and neutrons) and nuclei.

Nucleosynthesis

as the Universe cools, protons and neutrons can fuse to form heavier atomic nuclei



➤ Major Types of Nucleosynthesis

1. Big Bang Nucleosynthesis:

- Occurred within the first three minutes of the universe.
- Produced 1H (protium), 2H (deuterium), 3He, 4He, and traces of 7Li and 7Be.

2. Stellar Nucleosynthesis:

- Occurs in stars during their evolution.
- Produces elements from carbon to iron through nuclear fusion processes.
- Involves the triple-alpha process, s-process, and others.

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3. Explosive Nucleosynthesis:

- Occurs in supernovae and involves rapid neutron capture (r-process) and other rapid processes.
- Responsible for elements from silicon to nickel.

4. Neutron Star Mergers:

- Main source of r-process elements.
- Eject neutron-rich matter forming heavy elements during collisions.

5. Cosmic Ray Spallation:

- Generates light elements (3He, 9Be, 10,11B) by fragmenting nuclei.
- Occurs in the interstellar medium and other environments.

➤ Important Nucleosynthesis Processes

- Proton-Proton Chain:** Hydrogen burning in stars.
- CNO Cycle:** Another hydrogen burning process in stars.
- Triple-Alpha Process:** Fusion of helium into carbon.
- s-process:** Slow neutron capture converting iron into heavier elements.
- r-process:** Rapid neutron capture producing neutron-rich isotopes of heavy elements.
- rp-process:** Rapid proton capture creating lighter elements.
- p-process:** Photodisintegration of existing nuclei in explosive environments.

➤ Evidence and Observations

- Technetium Detection (1952):** Provided first evidence of nucleosynthesis within stars.
- Stardust Isotopic Compositions:** Showed nucleosynthesis within stars.
- Supernova 1987A Gamma-Ray Lines:** Confirmed explosive nucleosynthesis.

Fixed Income Funds

Context: SEBI has defined the new guidelines for fixed income fund after the chaos among the small investors.

➤ Categories of Mutual Funds

- Open-ended funds:** Purchased from the Asset Management Company (AMC), can be redeemed with the AMC, and the corpus size changes daily.
- Close-ended funds:** Listed on exchanges (NSE/BSE) for trading, cannot be bought or redeemed from the AMC, and the corpus size remains constant; NAV is impacted by market price changes.

➤ Equity vs. Fixed-Income Funds

- Equity funds:** Require long investment horizons; returns mainly come from price appreciation rather than dividend yield.
- Fixed-income funds:** Suitable for various investment horizons; returns primarily from accrual (known interest rates) and partially from mark-to-market gains, influenced by daily market price changes.

➤ Important Concepts

- Accrual:** In fixed-income funds, daily addition of proportionate interest to the NAV.
- Mark-to-market:** NAV reflects daily price changes, which add to or reduce accrual based on market movements.

➤ Fixed-Income Fund Categories

- Liquid Funds:**
 - Invest in instruments with residual maturity up to three months.
 - Low mark-to-market volatility.
 - Suitable for emergency cash equivalents with a 1-2 week investment horizon.
- Money Market Funds:**
 - Invest in instruments maturing within one year.
 - Limited mark-to-market impact.
 - Suitable for horizons of a few months.
- Banking and PSU Funds:**
 - Invest at least 80% in bank and PSU instruments.
 - No defined portfolio maturity.
 - Recommended for a 3-year horizon.
- Corporate Bond Funds:**
 - Invest at least 80% in highest credit rating instruments.
 - Typically have a portfolio maturity of 3-5 years.
 - Recommended for a 3-year horizon.
- Dynamic Bond Funds:**
 - Allow fund manager to adjust portfolio maturity based on market conditions.
 - Recommended for a 5-year horizon.
- Gilt Funds:**
 - Invest at least 80% in government bonds.
 - Have long maturity periods.
 - Recommended for a 10-year horizon.
- Target Maturity Funds (TMFs):**
 - Have a defined maturity period with bond maturity matching fund maturity at launch.
 - High credit quality.
 - High visibility on returns if held to maturity.

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NEWS IN BETWEEN THE LINES

World Bee Day



World Bee Day is observed on May 20.

About World Bee Day:

- World Bee Day is **celebrated annually on May 20** to raise awareness of the importance of **pollinators**, the **threats** they face and **their contribution** to sustainable development.
- The date was chosen to honor the birthday of **Anton Jansa**, an **18th-century Slovenian pioneer** of modern beekeeping techniques, recognizing his contributions to the field.
- In **2017**, the **United Nations General Assembly** declared **World Bee Day** following a proposal by **Slovenia**, with support from **115 countries**.
- The Government of India has also launched the **National Beekeeping and Honey Mission (NBHM)** in **2020** to promote and develop scientific beekeeping.
- Bees play a vital role in **pollinating one-third of the world's crops** and **90%** of wild flowering plants, ensuring plant reproduction and ecosystem health.
- They also produce **honey, wax, propolis** and other valuable products with nutritional, medicinal and economic benefits.
- India** is a significant **producer and consumer of honey**, with an estimated annual production of **1.2 lakh metric tonnes** and exports to **over 83 countries**.
- Top honey-producing states include **Uttar Pradesh, West Bengal, Punjab, Bihar** and **Rajasthan**, contributing to the country's agricultural economy.

Artara'24



Recently, the Artara'24 has made its mark in Dubai as a platform for discovering and nurturing emerging artistic talents from the country.

About Artara'24:

- Artara'24 is a **fine arts exhibition and competition** held in **Dubai**, specifically at the **Al Jalila Cultural Center** and was organized by **Jazzrockers**.
- The primary objective of Artara'24 was to **uncover and nurture emerging artistic talents**, especially focusing on the **Indian talent residing in Dubai**.
- It aimed to **provide a prestigious stage for lesser-known artists**, students and art enthusiasts to showcase their extraordinary abilities.
- It featured an impressive collection of over **250 pieces of art**, each telling its own unique story and **reflecting the diverse backgrounds** and perspectives of the talented participants.
- In addition to the main exhibition, Artara'24 included a **fine arts competition for children called Expressions'24**.

The AK-203 Assault Rifle



The Indian Army has begun receiving the Russian AK-203 assault rifles after facing delays in the deal, partly due to the conflict in Ukraine and payment issues.

About AK-203 Assault Rifle:

- The AK-203 assault rifle is a **variant of the AK-100 series rifles**, developed by **Kalashnikov Concern in Russia**.
- The rifles are to be **manufactured under license in India** as part of a joint venture between **India and Russia**.
- Joint venture named **Indo-Russian Rifles Private Ltd. (IRRPL)** was established for this purpose.
- It is an improved version of the **AK-47**, known for its **reliability, simplicity** and **durability**.
- It fires the **7.62×39mm cartridge** and has a selective fire capability (semi-automatic and automatic modes).
- The AK-203 rifles are intended to **replace the indigenous INSAS rifles**, addressing the Army's need for modernization and standardization of weaponry.

Calcium Carbide



Recently, the Food Safety and Standards Authority of India (FSSAI) issued a stern warning to traders, fruit handlers and Food Business Operators (FBOs) against using calcium carbide for artificial ripening of fruits, particularly during the mango season.

About Calcium Carbide:

- Calcium Carbide is a **chemical compound** with the formula **CaC₂**.
- It consists of a **calcium cation (Ca²⁺)** and a **carbide anion (C₂²⁻)**.
- Calcium Carbide is a **grayish-black or brownish solid**.
- It has a **high melting point (around 2,300°C)** and is relatively dense.
- It is produced industrially by heating a **mixture of lime (CaO) and coke (carbon)** in an electric arc furnace at about 2,000 to 2,200°C.
- It reacts with water to **produce acetylene gas (C₂H₂)**, used in welding and as a raw material in the chemical industry.
- It is used to manufacture **calcium cyanamide (CaCN₂)**, an **important fertilizer** and **chemical feedstock**.
- It is also used (illegally in many places) to **artificially ripen fruits** due to its ability to **release acetylene**, which acts similarly to ethylene, a natural ripening agent.

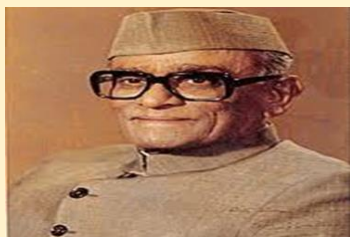
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Personality in News

Neelam Sanjiva Reddy



Recently, President Droupadi Murmu paid floral tributes to former President Neelam Sanjiva Reddy on his birth anniversary at Rashtrapati Bhavan.

Neelam Sanjiva Reddy (19 May 1913-1 June 1996)

Neelam Sanjiva Reddy, an Indian politician who served as the sixth President of India from 25th July 1977 to 25th July 1982 was born in Illur, Andhra Pradesh.

Contributions:

- Neelam Sanjiva Reddy **joined the Indian freedom struggle**, inspired by Mahatma Gandhi and actively participated in the **Quit India Movement in 1942**.
- He became the **first Chief Minister of Andhra Pradesh from 1956 to 1960**.
- He played a key role in the formation of the state by **merging the Telugu-speaking areas of Hyderabad State with the Andhra State**.
- He was elected **Speaker of the 4th Lok Sabha (1967-1969)**, where he was known for his impartiality and effective conduct of the house.
- He authored a book, **Without Fear or Favour: Reminiscences and Reflections of a President**, published in **1989**.

Ethical Values: Integrity, Impartiality, Patriotism, Simplicity, etc.

Place in News

Kyrgyzstan

Recently, the clarification came that there has been no report of attacks by local people in Kyrgyz Republic against Indian students over the past three days.

Kyrgyzstan (Capital: Bishkek)

Location: Kyrgyzstan is a **landlocked** country in **Central Asia**.

Political Boundaries: Kyrgyzstan shares its borders with **China** (East & Southeast), **Uzbekistan** (West), **Kazakhstan** (North) and **Tajikistan** (South).

Physical Features:

- Jengish Chokusu** is the highest point in Kyrgyzstan.
- Naryn River, Talas, Chu and Syr Darya** are the major river in Kyrgyzstan.
- The **Kumtor Gold Mine** in Kyrgyzstan is the largest **open-pit gold mine** in Central Asia.
- Kyrgyzstan possesses significant mineral resources including **gold, uranium, coal, antimony, mercury, lead and zinc**.



POINTS TO PONDER

- Recently, which two countries signed an agreement to jointly develop interceptors for hypersonic missiles?
– **United States and Japan**
- Recently, the world's highest competition pool has been opened in which country? – **Bhutan**
- What is the theme of 'World Telecommunication and Information Society Day 2024'?
– **Digital Innovation for Sustainable Development**
- Recently, where was the third session of the India-Zimbabwe Joint Trade Committee (JTC) held? – **New Delhi**
- Recently, where was the 12th India-Mongolia Joint Working Group (JWG) meeting on defence held? – **Ulaanbaatar**

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DELHI MUKHERJEE NAGAR: 9205274741, 42 | **LAXMI NAGAR:** 9205212500, 9205962002 | **RAJENDRA NAGAR:** 9205274743 | **UTTAR PRADESH PRAYAGRAJ:** 0532-2260189, 8853467068 | **LUCKNOW (ALIGANJ):** 0522-4025825, 9506256789 | **LUCKNOW (GOMTI NAGAR):** 7234000501, 7234000502 | **GREATER NOIDA:** 9205336037, 38 | **KANPUR:** 7887003962, 7897003962 | **GORAKHPUR:** 7080847474, 9161947474 | **ODISHA BHUBANESWAR:** 9818244644/7656949029



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