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Chenab Bridge

- The Arch closure of the Chenab Bridge (Jammu & Kashmir) - the World's highest Railway Bridge - was completed by Indian Railways.
- Under this project, the Northern Railways constructed a railway line between Udhampur (Jammu) and Baramulla (Kashmir Valley).
- It is part of Udhampur-Srinagar-Baramulla rail link project (USBRL). It was declared a national project in 2002.
- This feat of construction is an example of changing work culture marked by the ethos of 'Sankalp se siddhi'.

Sankalp se Siddhi

- 'Sankalp se Siddhi' (Attainment through Resolve) scheme is a five year plan under which New India Movement 2017-2022 would take place.
- This scheme, with good governance as its aim, was launched by the Union government on the 75th anniversary of Quit India movement.
- New India movement aims to free up India from many social evils - poverty, corruption, terrorism, communalism, casteism and uncleanliness - by creating awareness among the people.
- It aims to unite the entire country by adopting good governance and using technology.

Advanced Chaff Technology

- This technology was developed by the Defence Research and Development Organisation (DRDO) to safeguard the Indian naval ships against enemy missile attack.
- Chaff (or Window) is a passive expendable electronic countermeasure technology used worldwide to protect naval ships from enemy's radar and Radio Frequency (RF) missile seekers.
- The most significant fact of this Technology is that it uses very less quantity of chaff material deployed in the air to deflect enemy's missiles for safety of the ships.
- Defence Laboratory Jodhpur (DLJ), a DRDO laboratory, has developed three variants of this critical technology,
    1. Short Range Chaff Rocket,

2. Medium Range Chaff Rocket and
3. Long Range Chaff Rocket.

- This technology is being given to the industry for bulk production in large quantities.

Others

- Unexploded Ordnance Handling Robot (UXOR) was developed for Indian Air Force and Indian Army. It can handle 1,000 kg of ordnance.
- Sindhu Netra satellite developed by DRDO was deployed in space in 2021 to boost the surveillance capability of India and monitor military warships and merchant shipping in the Indian Ocean Region.

First X-rays from Uranus

- Astronomers have found that Uranus is emitting X-rays (like other ringed planets Jupiter and Saturn) for the first time, using NASA's Chandra X-ray Observatory.
- NASA said that the Sun could cause Uranus to emit X-rays. Like Jupiter and Saturn, Uranus is also scattering X-ray light given off by the Sun.
- This is similar to how Earth's atmosphere scatters the Sun's light.
- In the case of Saturn, the planet's rings themselves produce X-rays.
- This could also be the case with Uranus since its rings collide with charged particles (electrons and protons) that could cause the rings to glow in X-rays.
- The X-rays from auroras on Jupiter come from two sources:
    a. Electrons travelling down magnetic field lines, and
    b. Positively charged atoms and molecules raining down at the polar regions of Jupiter.

Uranus

- Uranus is a cold planet that is made up of hydrogen and helium. It is also known as the 'sideways planet' because it rotates on its side, unlike any other planet in our solar system.
- While the rotation and magnetic field axes of other planets in our solar system are almost perpendicular to the plane of their orbit, the rotation axis of Uranus is nearly parallel to its path around the Sun.
- Since Voyager 2 was the only spacecraft to ever fly by Uranus, the astronomers rely on telescopes much closer to Earth, like Chandra and the Hubble Space Telescope to learn about it.

Chandra X-ray Observatory

- Previously known as the Advanced X-ray Astrophysics Facility, it is a Flagship-class space observatory launched by NASA in 1999.
- Chandra X-ray Observatory is an Earth satellite in a 64-hour orbit. This program is managed by Marshall Space Flight Center of the NASA.
- It is a vital source of information for scientists examining the solar system, along with the Hubble Space Telescope.
- It is one of the Great Observatories, along with,
    a. Hubble Space Telescope,
    b. Compton Gamma Ray Observatory (1991–2000), and
    c. Spitzer Space Telescope.

Auroras

- Auroras are natural phenomenon which is characterised by a display of a natural-coloured (green, red, yellow or white) light in the sky.
- Also known as 'polar light', it is a light show which is caused when high electrically-charged particles from the sun collide with particles from gases such as oxygen and nitrogen present in the Earth's atmosphere.
- X-rays are emitted in Earth's auroras, produced by energetic electrons after they travel down the planet's magnetic field lines to its poles and are slowed down by the atmosphere.

Renewable Capacity Statistics Report 2021

- The Renewable Capacity Statistics 2021 report was released by the International Renewable Energy Agency (IRENA).
- It said that 260 gigawatts (GW) of new renewable energy capacity was added worldwide in 2020, up 50% from the year before, as countries further reduced their reliance on fossil fuel power.
- More than 80% of all new electricity capacity added in 2020 was renewable, with solar and wind accounting for 91% of new renewables.
- Rise in new capacity was partly due to the decommissioning of fossil fuel power generation in Europe, North America and in Armenia, Azerbaijan, Georgia, Russia and Turkey.
- China, the world's largest market for renewables, added 136 GW of renewables last year, while the United States installed 29 GW.
- Share of renewables in energy generation worldwide stands at 30%.
- Nations are switching from fossil fuels to renewables in an effort to meet the long-term goal, agreed under the 2015 Paris Agreement, of limiting a rise in average temperatures to below 2^{o} C above pre-industrial levels.
- This requires countries to reach net zero carbon emissions by 2050.

Uttarakhand Forest Fires

- The Centre has provided two MI-17 helicopters to Uttarakhand State for fire-fighting - each deployed in Kumaon and Garhwal regions.
- Uttarakhand has 38,000 sq. km. of forests (71% of its geographical area).
- 'Forest fire season' begins in mid-February continues till mid-June in the summer. Peak time is 3rd week of May when temperature is highest.
- In hilly areas, the surface gets drier faster than plains due to lower accumulation of rainwater.

- **Causes of forest fires** - Fuel load (Quantity of dry leaves), oxygen, temperature, deliberate fires by locals, friction of electricity cables with fuel load, carelessness, farming-related activities and natural reasons.
- Setting forest on fire is a punishable offence under Indian Penal Code.

- **Preventive measures** - Van Panchayats should be given rights and incentives for protecting the forests.
- The Forest Act of 1988 dissociates the local community with the forests and, in the absence of a sense of belonging, local community villagers do not initiate dousing fires on their own.
- Waterholes should be developed across the mountains to recharge groundwater and maintain moisture in the soil.
- Awareness should be given through programs to motivate locals to protect forests from fire because they act as first responder.

Study on Tropical Cyclones

- Tropical Cyclone is the combined name used for the three cyclonic storms - cyclones, hurricanes and typhoons.
- They are named differently based on which ocean they form in. They are created by warm ocean waters.
- A new joint study has said that the intensity of tropical cyclones might increase in the next century due to global warming.
- If the world warmed by 2^{o} C by 2100, cyclonic wind speeds can peak at more than 300 kms per hour, it could increase up to a maximum of 5%.
- Rising sea water levels will intensify the destructive impact of the cyclones due to increased storm surges which flood coastal areas bringing in sea-water that decreases soil fertility.
- Amount of rainfall carried by the storms might increase by an average of 14% due to the warming-fuelled increase in moisture in the atmosphere.
- Rapid intensification happens when there is an increase of maximum sustained winds of a cyclone by at least 55 kms/ hour within 24 hours.
- Stronger storms might occur in areas closer to the North and South Poles - this means that seas in these regions are becoming warmer.
- **North Atlantic Ocean** - The impact of climate change on cyclones was

especially visible here, as it experienced numerous intense hurricanes.

- **North Pacific Ocean** - Intensity of tropical cyclones making landfall along the coasts of eastern and south eastern Asia from 1977-2014 had increased by 12-15%.
- **Indian Ocean region** - The chances of low pressure areas on the sea surface that may transform into cyclones have increased in Arabian Sea. This happened due to decrease in vertical wind shear in the Arabian Sea.
- [Vertical wind shears are localised winds around a cyclone in the vertical direction. When they are strong, they usually destabilise a cyclone and make it less intense.]
- In the Bay of Bengal, the number of cyclones growing to become severe cyclones had increased. This had happened because of low level cyclonic vorticity which intensified cyclones.

Source: PIB, The Hindu, The Indian Express, Down To Earth, Business Line, Economic Times, NASA, India Today

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