Prelim Bits 12-05-2022 | UPSC Daily Current Affairs

Tomato Flu

Tamil Nadu has ramped up surveillance at its borders in the wake of "tomato flu" cases being detected in Kerala.

- Tomato flu or fever is a viral disease. The flu gets its name because of the red blister it causes.
- The fever is affecting children below the age of five.
- **Symptoms** include red rashes, skin irritation and dehydration.
- It also includes tiredness, joint pain, stomach cramps, nausea, vomiting, diarrhoea, coughing, sneezing, runny nose, high fever, and body ache.
- In some cases, it may also change the colour of the legs and the hands.
- **Spread** - Like other cases of flu, tomato fever is also contagious.
- If someone is infected with this flu, they need to be kept in isolation as this could spread rapidly from one person to another.
- It is essential to prevent children from scratching the blisters caused by the flu. Proper rest and hygiene is also advised.
- **Treatment** - Tomato flu is a self-limiting one and there is no specific drug for this.
- This means that the symptoms will resolve overtime on their own if supportive care is given.
- Fluid intake would also help counteract dehydration.

Reference

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2. https://indianexpress.com/article/explained/what-is-tomato-flu-who-does-it-affect-7911890/
3. https://www.indiatoday.in/india/story/tomato-flu-symptoms-treatment-precautions-kerala-tomato-flu-1948129-2022-05-11

Conjugal Rights

- **Story behind** - The Delhi High Court has declined to strike down the marital rape exception.
- It said that the Centre's concern on criminalising marital rape may destabilise the institution of marriage is a "legitimate".
- Criminalising marital rape may require spouses to draw up a detailed agreement before sex or invite a third party to act as witnesses.
- **Not a rape, but an abuse** - The Court concluded that forced sexual intercourse between a husband and wife cannot be treated as rape.
- At worst, it can be treated as sexual abuse as is clear upon perusal of the definition of 'cruelty' found in Section 3 of the Protection of Women from Domestic Violence (DV) Act, 2005.
- The Section 3 of the DV Act, 2005 provides a definition for domestic violence, which includes physical, sexual, verbal and emotional abuse.
- **Conjugal Rights** - These are the rights, especially to sexual relations, regarded as exercisable in law by each partner in a marriage.
- The Section 9 of the Hindu Marriage Act, 1955 provides for restitution of conjugal rights.

- It says that if either the husband or the wife, without reasonable excuses, withdraws from the society of the other, the aggrieved party may approach the Court for restitution of conjugal rights.
- Remedy is available to both spouses and denial of sex by either spouse is construed as cruelty and, thus, is available as a ground for divorce.
- Referring to sado masochistic sex, the Court said that the signs of injury on a partner need not necessarily mean there has been non-consensual sex as 'in the age of sexual liberation' injuries could be a sign of 'passion'.
- **Conjugal Expectation** - In a marriage, the conjugal expectation is a **2-way street**, where consent is given as a part of spousal intimacy although the will to engage may be absent.
- If every such case was treated as marital rape, then the only way partners in a marriage may survive would be
    1. By drawing up a detailed written agreement and the steps to be observed for courtship or mating or,
    2. By creating a detailed evidentiary record of every act of intimacy and/or
    3. By inviting a third party to act as a witness - none of which is healthy for the survival of the institution of marriage.

Reference

1. https://www.thehindu.com/news/national/in-a-marriage-conjugal-expectation-is-a-two-way-street-delhi-hc-judge-who-declined-to-strike-down-marital-rape/article65405308.ece
2. https://blog.ipleaders.in/what-are-conjugal-rights-who-can-file-for-it-where-to-file-what-are-the-conditions-relating-to-it/

Marsquake

NASA has reported that its InSight Mars lander detected the largest quake ever observed on another planet.

- On Earth, quakes are caused by shifts in tectonic plates.
- However, Mars doesn't have tectonic plates, and its crust is a giant plate.
- Therefore, 'marsquakes' are caused due to stresses that cause rock fractures or faults in its crust.
- The recent Marsquake has been the largest ever recorded tremor on a planet other than earth, hence earning it the name of 'Monster Quake'.

InSight Mars Lander

- Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) is a **Mars lander** that was landed on Mars in 2018.
- InSight was designed by **NASA** to give Mars its first thorough checkup since it formed 4.5 billion years ago.
- It is the first outer space robotic explorer to study in-depth the "inner space" of Mars: its crust, mantle, and core.
- InSight is not looking for life on Mars, but is studying what Mars is made of, how its material is layered, and how much heat seeps out of it.
- This mission is part of NASA's Discovery Program for highly focused science missions that ask critical questions in solar system science.
- **Significance** - With InSight, Earth and Mars can be compared, and it will help better understand how a planet's starting materials make it more or less likely to support life.
- Studying Mars' interior structure answers key questions about the early formation of rocky

planets in our inner solar system - Mercury, Venus, Earth, and Mars, as well as rocky exoplanets.
- InSight also measures tectonic activity and meteorite impacts on Mars.
- It measures the planet's vital signs - its "pulse" (seismology), "temperature" (heat flow), and "reflexes" (precision tracking).
- Some missions studying the possibility of life on Mars include UAE's Hope, China's Tianwen-1, and NASA's Perseverance.

Reference

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Magnetic Reversals

A new study says that a rare outburst from the 1ES 1927+654 galaxy over 236 million light-years away could have been caused by a spontaneous flip of the magnetic field surrounding its central black hole.

- Big galaxies often host supermassive black holes at their centre.
- When matter falls towards these black holes, it collects into a vast flattened structure called the **accretion disk**.
- The material slowly spirals inwards, heats up and emits visible, UV and lower-energy X-ray light.
- A cloud of extremely hot particles near the black hole, called the corona, produces higher-energy X-rays. The brightness of these emissions from the black hole depends on how much material streams towards it.
- **Magnetic reversal** is where the North Pole becomes South and vice versa.
- The field initially weakens, leading to greater heating and brightening in visible and UV light.
- As the reversal happens, the magnetic field becomes weak at the outskirts of the accretion disk.
- It becomes so weak that the black hole can no longer support the corona, leading to the X-ray emissions vanishing.
- Slowly, the magnetic field begins strengthening in its new orientation.
- **Commonality** - Magnetic reversals are common events in the universe as geological records show that the Earth's field flips unpredictable, reversing a few times every million years in the recent past.
- The Sun undergoes a magnetic reversal much more often as part of its normal cycle of activity.
- It switches its north and south poles roughly **every 11 years**.

Magnetic Excursion

- Sometimes, rather than a reversal, the magnetic field may only undergo an '**excursion'**.
- Here, it suffers a large decrease in its overall strength, that is, the force that moves the compass needle.
- During an excursion the field does not reverse, but later regenerates itself with the same polarity, that is, North remains North and South remains South.

Reference

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2. http://www.geomag.bgs.ac.uk/education/reversals.html#:~:text=By%20magnetic%20reversal%2C%20or%20'flip,'%2C%20rather%20than%20a%20reversal.

Black Widow Binary

Astronomers have spotted a "black widow binary", which has the shortest orbital period yet identified.

- Black widow binary is a unique system that consists of a pulsar (rapidly spinning neutron star) that is circling and slowly consuming a smaller companion star.
- The system derives its name from the "black widow" spiders, in which the female eats the male after mating.
- Named ZTF J1406+1222, the newly discovered black widow binary in a wide hierarchical triple has a 62-minute orbital period.
- The system has a pulsar and a companion star that circle each other every 62 minutes.
- It seems to host a third far-flung star that orbits the other two every 10,000 years. This could possibly be a 'triple black widow'.
- **Theory on triple black widow** - A "triple black widow" system is a pair of stars that rapidly circle each other before one is consumed by the other.
- Just like with most black widow binaries, the triple system likely arose from a dense constellation of old stars known as a globular cluster.
- The particular cluster from which this system formed may have drifted towards the supermassive black hole at the centre of the Milky Way.
- The gravity of this central black hole must have been enough to pull the cluster apart while leaving the triple black widow intact.
- This system has probably been floating around in the Milky Way for longer than the sun has been around.
- **Discovery** - Every black widow binary discovered to date was detected due to the gamma and X-ray flashes from the pulsar.
- But for this system, the optical flashing of the companion star was used.
- This was possible because the companion star's dayside (the side always facing the pulsar) can be many times hotter than the night side due to the radiation it receives from the pulsar.
- A star whose brightness was changing periodically by a huge amount, it would be a strong signal that it was a binary with a pulsar.

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