Total Lunar Eclipse or Blood Moon

Prelims: Current events of national and international importance and General Science

Why in news?

Recently, Skywatchers across Asia, Western Australia, and Europe turned their gaze towards the moon on to witness a rare 'Blood Moon' or the total lunar eclipse.

- **Eclipses** – They are rare and do not occur every full or new moon because the moon's orbit is *inclined about 5 degrees to the earth's orbit* around the Sun.
- **Lunar eclipse** – It occurs when the earth comes between the sun and the moon, casting its shadow on the lunar surface.
- The lunar eclipse will attain its maximum phase, the moon will be fully engulfed in Earth's dark umbral shadow.

Earth's umbral shadow *– The darkest, central region of the shadow cast by Earth when it blocks the Sun's light, completely obscuring direct solar radiation within this cone-shaped area.*

- **Total lunar eclipse** – It occurs when the Moon and Sun are on opposite sides of Earth.
- **Blood Moon** – It is caused when the Earth shades the moon from direct solar light, causing the moon to appear red.
- **Reason for red coloration** – It is due to the *Rayleigh scattering*, where Earth's atmosphere filters blue light and bends red light toward the Moon's surface.
- **Total Lunar eclipse, 2025** – This eclipse was the longest total lunar eclipse visible from India since 2022 for duration of 82 minutes and the first since July 27, 2018 to be observed from all parts of the country.
- **Next total lunar eclipse** – It will be visible from the country on December 31, 2028.
- **No need of special equipment** – Unlike solar eclipses, observing a total lunar eclipse does not require special equipment and is safe with the naked eye, binoculars, or a telescope.
- **Significance of perigee point** – The recent lunar eclipse has occurred just 2.7 days before the moon reaches perigee, the point in the moon's elliptical orbit where it comes closest to Earth.
- This makes it appear slightly bigger than its usual size.

References

1. The Hindu | Total Lunar Eclipse or Blood Moon

2. Indian Express | Total Lunar Eclipse

