ECLIPSE

Solar Eclipse – Solar eclipse occurs when the Moon passes between the Sun and the Earth, and the Moon fully or partially blocks the Sun. This can happen only during a new moon (*when moon is just returning from darkness to a crescent*), when the Sun and the Moon are in conjunction as seen from Earth. *If the Moon were in a circular orbit close enough to the Earth and in the same orbital plane, there would be total solar eclipses every single month. However, the Moon's orbit is angled at more than 5 degrees to the earth's orbit around the sun so its shadow at new moon often misses the Earth.*

Lunar Eclipse – A Lunar eclipse can occur only at full moon or near full moon (*A lunar eclipse occurs when the Moon passes behind the Earth so that the Earth blocks the Sun's rays from striking the Moon. This can occur only when the Sun, Earth, and Moon are aligned exactly, or very closely so, with the Earth in the middle. Hence, a lunar eclipse can only occur the night of a full moon*). Total eclipse is possible only because apparent dia of the two are almost same.

Solar vs **Lunar Eclipse** – A solar eclipse might last for a few minutes as apparent size of moon changes (depending upon its position between apogee and perigee).

- Unlike a solar eclipse, which can only be viewed from a certain relatively small area of the world, a lunar eclipse may be viewed from anywhere on the night side of the Earth.
- A lunar eclipse lasts for a few hours, whereas a total solar eclipse lasts for only a few minutes at any given place, due to the smaller size of the moon's shadow.

Earth's atmosphere is also capable of diminishing the solar flow to moon by scattering it. The full shadow cast by earth (area of umbra) is surrounded a region of partial shadow (called penumbra). The earth and moon both caste shadows in sunlight, the shadow having a dark cone shaped inner region – the umbra – and an outer penumbral region.

The Umbra (Latin for "shadow") is the innermost & darkest part of the shadows, where the light source is completely blocked by the occluding body. An observer in the umbra experiences a total eclipse.

The Penumbra (from the Latin paene "almost, nearly" and umbra "shadow") is the region in which only a portion of the light source is obscured by the occluding body. An observer in the penumbra experiences a partial eclipse.

The Antumbra is the region from which the occluding body appears entirely contained within the disc of the light source. *If an observer in the antumbra moves closer to the light source, the apparent size of the occluding body increases until it causes a full umbra*. An observer in this region experiences an annular eclipse, in which a bright ring is visible around the eclipsing body.

Moon experiences only first two because its orbits path is fixed and its apogee is never so far that it may experience Antumbra.