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- Charts, Tables & Diagram driven summaries
- Memorisation Friendly

GEOGRAPHY

STATIC REVISION SIMPLIFIED

For UPSC CSE Prelims & Other Competitive Exams

Geography

Static Revision Simplified

A quick revision booklet of Geography for UPSC Prelims and other competitive exams.

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Preface

Dear Aspirants,

CSE Prelims is just around the corner. It is considered to be the iron gate toward your goal to become a civil servant. Prelims is the most competitive part of UPSC CSE, and therefore, reading-revising and testing one's knowledge is imperative for clearing Prelims. According to the present competition, around 1 in 100 people who attempt UPSC Prelims clear it. Given the growing competition, there is an urgent requirement for content specially curated to crack Prelims. The need of the hour is simplified content that helps in a quick and complete revision of the UPSC syllabus.

Taking inspiration from the overwhelmingly positive response to our UPSC CSE books, we are taking another leap towards simplifying Prelims preparation. To fulfill our aspirants' demand, Study IQ Publications is delighted to present you with the first edition of 'SIP+ Static Revision Simplified booklets'.

The SIP+ booklet series has been strategically divided into 2 parts; SIP+ Static Revision Simplified and SIP+ Current Revision Simplified. The UPSC syllabus is huge, it is further complicated by information overload and increasingly difficult questions. These booklets have been created especially keeping in mind, the concerns and challenges that students face during their Prelims preparation. This is an honest attempt to tackle all of the student's issues and save their precious time before Prelims.

Special Features of This Book:

This booklet aims to make your preparation focused and relevant based on UPSC's current trends and patterns, revision-friendly, and up-to-date.

- The requirements of the UPSC Prelims are the exclusive focus of this book.
- We have taken great care to ensure that the material is written in a clear; ready revision format so that students can learn and recall key concepts and facts to their advantage.
- Wherever necessary, we've incorporated relevant tables, charts and mind-maps to help students grasp and revise key concepts and facts.
- The special feature of SIP+ booklet series is the availability of ready revision charts which students can take out and paste on their wall or study table to revise key concepts and facts anytime on their own discretion.

With all sincerity and humility, the StudyIQ team wishes you the best in your preparation, and we are hopeful that this book will help you in your journey.

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CHAPTER 1

Geomorphology

UNIVERSE AND SOLAR SYSTEM

The universe is a vast expanse of space that contains all of everything in existence.

Different Views on the Universe

View	Description
Geocentric View	Earth at the centre of the Universe
Heliocentric View	Sun at the centre of the Universe

BIG BANG THEORY

- The universe came into existence around 13.8 billion years ago.
- The idea is that the universe began as just a single point called the **singularity**-infinite mass with zero volume.
- During the Big Bang, the single point inflated and exploded violently. This resulted in expansion of the universe.

Evidences Supporting Big Bang

- **Red Shifting of Galaxies:** Distance between galaxies increased.
- **Cosmic Microwave Background Radiation**: Faint glow of light present in the Universe.

GALAXIES

A galaxy is a huge collection of gas, dust, and billions of stars and their solar systems. It is held together by gravity.

Types of Galaxies

Spiral Galaxies	Elliptical Galaxies	Irregular Galaxies
• Flat, disc-shaped with curved spiral arms. • great concentration of stars at the centre. • Actively forming stars. • Example: Milky Way	• Vary from nearly circular to very elongated in shape. • Possess comparatively little gas and dust. • Contain older stars and are not actively forming stars anymore. • Most abundant in the universe.	• Irregularly shaped. • Have very little dust.

MILKY WAY

- It is the galaxy in which our solar system is located.
- **Size:** Around 1,00,000 light-years across
- **Age:** Around 13.6 billion years.
- **Type:** Spiral Galaxy.
- **Structure:**
  - **Sagittarius A***: Supermassive black hole in the middle of the Milky Way. Everything in the galaxy revolves around this.

- **Galactic Bulge**: In the immediate surrounding of the Sagittarius A*, there is a tightly packed region of gas, dust, and stars. This space is known as the galactic bulge.
- **Galactic Disc**: Beyond the bulge, there is the galactic disc. The galactic disc hosts billions of stars, including our Sun.

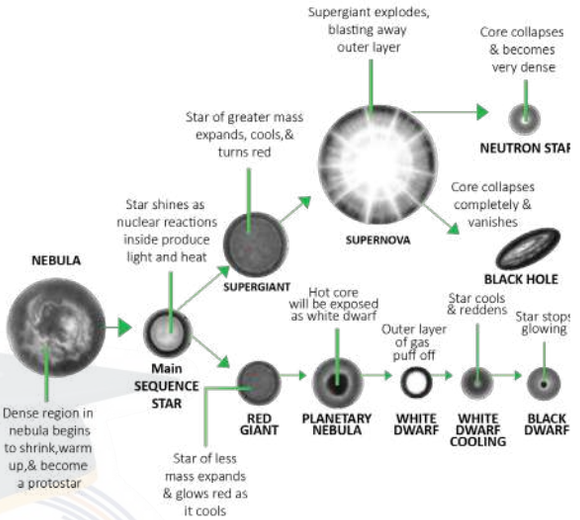
- **Nearest Neigbour**: Andromeda

STARS

A giant, glowing ball of gas and dust held together by gravity.

Characteristics:

- Mainly composed of hydrogen and helium.
- Vary in size, mass and temperature.
- The color of the star is determined by its temperature. The hottest stars appear blue, while the coldest stars appear red.



Constellation

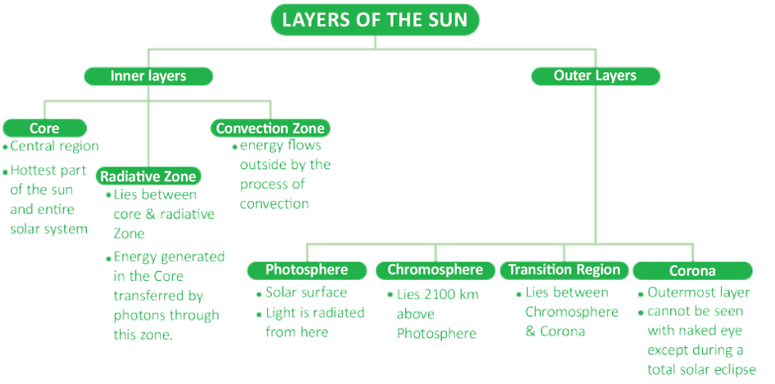
- A group of stars with a constant shape.
- Visibility of a particular constellation depends on the location and time.
- Generally named after objects, animals, and even mythological figures.
- At present, there are 88 officially recognized constellations.
- Used to name stars, meteor showers, and navigation.
- **Examples:** Ursa Major, Orion, Hunter, Ursa Minor, and The Little bear.

ORIGIN AND EVOLUTION OF THE SOLAR SYSTEM

Theory	Year	Proponent
Gaseous Hypothesis	1755	Immanuel Kant
Nebular Hypothesis	1796	Laplace
Planetesimal hypothesis	1905	T.C Chamberlin
Tidal Hypothesis	1919; modified in 1929	James Jeans
Binary Star Hypothesis	1937	H.N. Russel
Supernova Hypothesis	1946	F. Hoyle

THE SUN

- It is the central celestial body of our Solar System. It is a star.
- **Age**: It is believed to be 5 billion years old.
- **Composition**: Mainly composed of hydrogen and helium. It has a liquid inner section surrounded by a gaseous outer covering.
- **Size**: 13,92,000 km.
- **Temperature**: Varies from 15 million degrees Celsius at the core to 5,500 degrees Celsius at the surface.



Important Concepts

- **Sun Spots:** Dark patches on the surface of the Sun. They are dark because they are cooler than the surroundings.
- **Solar Wind**: It is a stream of plasma flowing outward from the Sun's corona.
- **Coronal mass ejection (CME):** It is the release of plasma and magnetic field from the Sun's corona. They occur when the Sun's magnetic field lines reorganize.
- **Solar Cycle**: It is the cycle that the Sun's magnetic field goes through approximately every 11 years. Every 11 years, the Sun's magnetic field completely flips, and Sun's north and south poles switch places.
- **Solar Flares:** These are large explosions from the surface of the sun that emit intense bursts of electromagnetic radiation.
  - They occur when magnetic energy builds up in the solar atmosphere and is released suddenly.
- **Auroras:** They are formed when the charged particles from the CME reach the earth's atmosphere and react with the different gases.
  - Lights seen near the North Pole are called aurora borealis or northern lights.
  - Lights near the South Pole are called aurora australis or southern lights.

Sun's Halo

- Also known as '22 degree halo', it is an optical phenomenon that occurs due to sunlight refracting in millions of hexagonal ice crystals suspended in the atmosphere.
- It takes the form of a rainbow-coloured ring with a radius of approximately 22 degrees around the sun or the moon.
- Circular halos specifically are produced by cirrus clouds.

Solar Eclipses

Total Solar Eclipse	Partial Solar Eclipse	Annular Solar Eclipse
Occurs when the sun, moon and earth are in a direct line. The dark shadow of the moon completely covers the intense bright light of the sun.	Occurs when the sun, moon and earth are not exactly lined up. The shadow of the moon appears on a small part of the sun.	Occurs when the moon is the farthest from the earth, which is why it seems smaller. In this type of eclipse, the moon does not block the sun completely, but looks like a dark disk on top of a larger sun colored disk forming a ring of fire.

PLANETS

- Planets are objects that orbit around a star in an elliptical path.
- **Dwarf Planets:** The dwarf planets are small. They don't have a distinct orbital path.
  - There are four dwarf planets in the Kuiper Belt viz. Pluto, Makemake, Haumea, and Eris. Ceres is another dwarf planet located in the main asteroid belt.

Pluto: It is the largest among dwarf planets:

- **Time taken to rotate on its axis**: Six earth days
- **Time taken to revolve around the sun**: 248 earth years
- **No. of Moons**: 5. Charon is the largest
- **Rings**: No

- **Exoplanets:** Planets outside our Solar System are called exoplanets.

Classification of Planets

Inner Planets	Outer Planets
• Mercury, Venus, Earth and Mars orbit near the Sun and are called Inner Planets. • The inner planets are also called Terrestrial (Earth-Like) Planets. • They are made up of a solid surface. • They are dense. There is a presence of an iron core.	• Jupiter, Saturn, Uranus, and Neptune are called Outer Planets. • The outer planets are called Jovian (Jupiter-like) Planets. • They do not have a solid surface. • They are less dense as they are made up of gases.

Planets and Important Facts

Planet	Order from the Sun	Time taken for rotation	Time Taken for revolution	No. of Moons	No. of Rings	Other Facts
Mercury	1	59 earth days	88 earth days	0	0	• Fastest planet in our solar system that travels through space at 47 kilometers per second
Venus	2	243 earth days.	225 earth days	0	0	• Hottest planet in our solar system • It rotates on its axis backward i.e., in clockwise direction. This implies that, on Venus, the Sun rises on the West and sets on the East.
Earth	3	About 24 hours	About 365 days	1	0	• **Shape:** Oblate Spheroid • Fifth Largest Planet • It is the only planet in the solar system with liquid water on its surface
Mars	4	Little over 24 hours	687 earth days	2-Phobos and Deimos.	0	• Appears like a reddish ball due to iron minerals on its surface
Jupiter	5	About 10 hours	12 earth years	80 Ganymede is the largest	Yes	• Largest planet in our solar system. • Mainly composed of gas and liquid and has no solid surface
Saturn	6	10.7 hours	29 earth years	83 Titan is the largest	Yes (7)	• Composed of gas and does not have a solid surface
Uranus	7	17 hours	84 Earth years	27	Yes (13)	• Known as the “Ice Giant” as most of its mass is a hot, dense fluid of icy materials- water, methane, and ammonia
Neptune	8	16 hours	165 earth years	14	Yes (9)	• Known as Uranus’s twin because of the striking similarity in size, structure, and composition

Protoplanet AB Aurigae b

- In 2022, the Hubble Space Telescope photographed a Jupiter-like protoplanet named AB Aurigae b.
- A protoplanet is a celestial body orbiting around a star and thought to be developing into a planet.

Kuiper Belt

- It is a donut-shaped region that lies beyond Neptune’s orbit from 30 to 55 AU.
- It contains hundreds of icy bodies called **Kuiper Belt objects (KBOs)** or **Trans-Neptunian objects (TNOs)**. They are remnants of the formation of the solar system

ASTEROIDS AND COMETS

Asteroid	Comets
• These are rocky objects. • They have an elliptical orbit • The orbital period is 1 to 100 years • They are smaller in size • They do not produce a tail. **Types of Asteroids:** • Asteroids occurring in the main asteroid belt, between Mars and Jupiter • **Trojans**:asteroids that share an orbit with a giant planet • **Near-Earth asteroids**. Asteroids that orbit close to the earth. Examples: Bennu, Apophis **Examples:** Vesta, Eros, Bennu	• These objects are made up of frozen gas, dust etc • They have eccentric orbit • The orbital period can be 75 years to more than 100,000 years. • They are large in size. • They form a tail that stretches in a direction away from the Sun. **Examples:** Hailey's comet In 2021, a new comet called **Bernardinelli-Bernstein comet** was identified. It is the biggest comet ever observed.

METEORS, METEOROIDS AND METEORITES

- **Meteoroids:** These are space rocks ranging in size from dust grains to small asteroids.
- **Meteor:** When meteoroids enter the earth's atmosphere or any other planet, it is called a meteor.
  - Meteors are also popularly known as **shooting stars.** The light (which is why a meteor is called a shooting star) is a result of the friction between the meteorite and the molecules present in the Earth's atmosphere because of which it burns.
- **Meteorite**: When a meteor survives in the atmosphere and hits the ground, it is called a meteorite.

Leonids Meteor Shower

- Leonids are annual meteor shower which peak during mid-November.
- The debris that forms this meteor shower originates from a small comet called **55P/Tempel-Tuttle** in the constellation **Leo.** The comet takes 33 years to orbit the sun.
- The Leonids are also called fireballs and earthgazer meteors.
- Every 33 years, a Leonid shower turns into a meteor storm. A meteor storm is when there are at least 1,000 meteors per hour.

Geminids Meteor Shower

- The Geminids are a meteor shower that occurs in December every year.
- It originates from the debris of the **asteroid 3200 Phaethon.** It orbits the Sun every 1.4 years.

GEOLOGICAL TIME SCALE

- It is the "calendar" of the events in Earth history.
- It divides the time into **eons, eras, periods, epochs, and ages**- in descending order of duration.

ERA	Years In Million	Period	Epoch	Fauna	Flora
Cenozoic	1	Quaternary	Recent (Holocene)	Age of mammals	Angiosperms Monocotyledons
	6		Pleistocene	Age of Human Being	Age of Angiosperms-Dicotyledons
	10	Tertiary	Pliocene	Human Evolution	
	15		Miocene	Mammals and birds	
	20		Oligocene		
	100		Eocene		
			Palaeocene		