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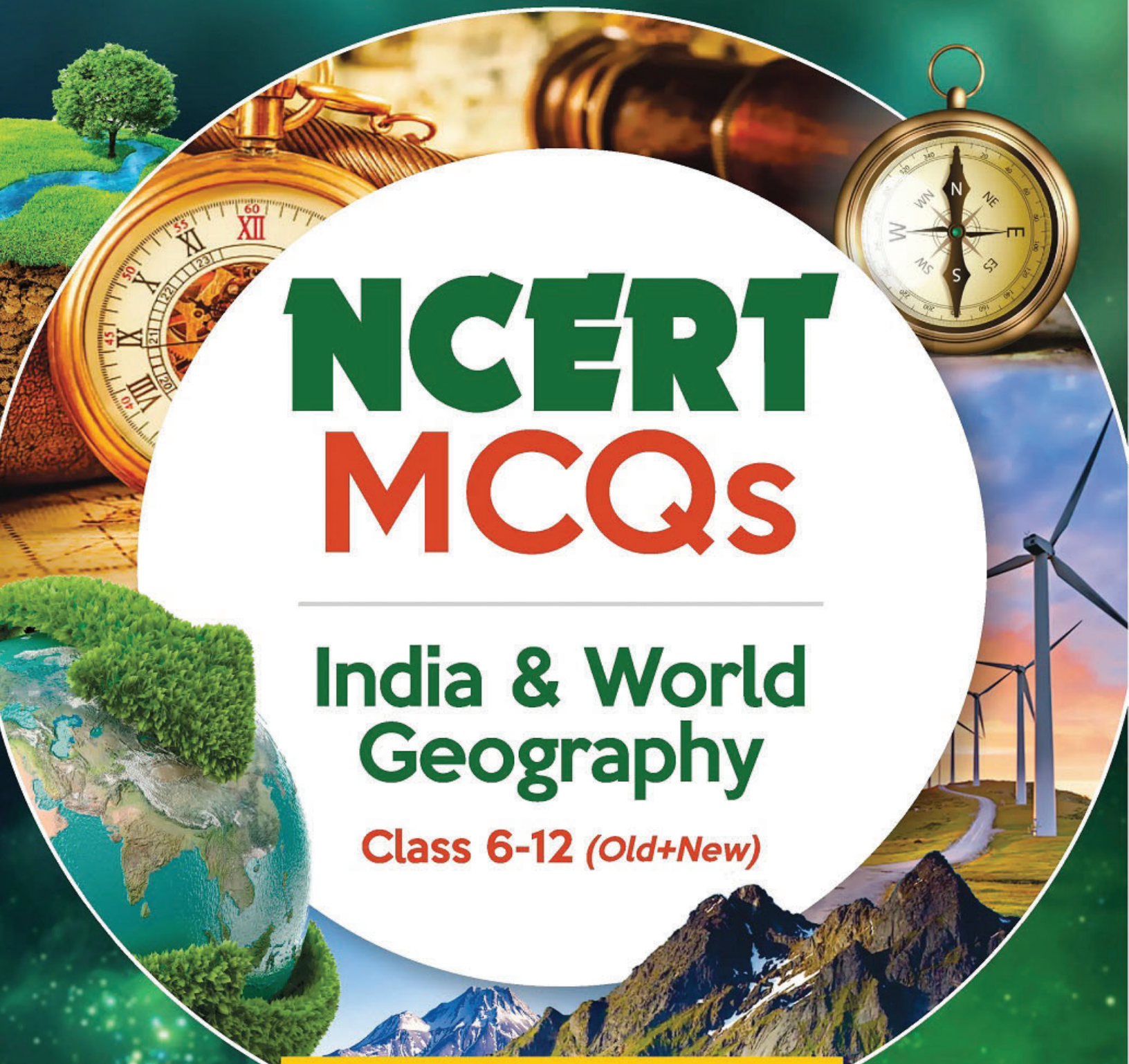

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The book is adorned with questions prepared by a team of experts along with a vital role played by the Project Management team with members: Mona Yadav (Project Manager), Divya Gusain (Project Coordinator), Shivani Dixit, Ayush Rajput (Proof readers), Vinay Sharma, Kamal Kishor, Sonu Kumar (DTP coordinators), Shanu and Mazher (Cover and Inner designer).

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We wish you all the very best for your preparation and journey!!

Publisher

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01

Geography as a Discipline

New NCERT Class XI (Geography as a Discipline), Old NCERT Class XI (Geography as a Discipline), New NCERT Class XII (Human Geography : Nature and Scope)

1. Which of the following statements with reference to the evolution of geography as a subject are incorrect? *(Chap 1, Class-XI, New NCERT)*

(a) The term Geography was first coined by a Greek scholar Eratosthenes.
(b) The subject matter of discipline has been taken from Natural sciences.
(c) Geography can be considered as the study of Areal Differentiation over Earth.
(d) Geography cannot be used to describe phenomenon on the Earth with a cause and effect relationship.

↗ *Ans. (d)*

Exp. Statement (d) is incorrect with reference to the evolution of geography as a subject because geography can be used to describe phenomenon on the Earth with a cause and effect relationship.

Geographers do not only study the variations in the phenomena over the Earth's surface (space) but also study the associations with the other factors which cause these variations.

2. Consider the following statements with reference to the evolution of geography. *(Chap 1, Class-XI, Old NCERT)*

1. The foundation of Geography as a science was mainly laid by Greek scholars.
2. German geographers such as AV Humboldt and Karl Ritter began the systematic study of geographical phenomenon in the early 19th century.

Which of the statements given above is/are correct?

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (c)*

Exp. Both the statements (1) and (2) are correct with reference to the evolution of geography.

As there are many scholars from India, Arab and Greece who tried to understand the universe around us but among them the foundation of Geography as a science was mainly laid by Greek scholars.

The word 'Geography' has been derived from two roots from Greek language Geo (earth) and Graphos (description).

In systematic approach, a phenomenon is studied all over the world as a whole, and then the identification of typologies or spatial patterns is done. This approach was introduced by Alexander Von Humboldt, a German geographer (1769-1859) and Karl Ritter.

3. Consider the following statements with reference to Possibilism and Determinism. *(Chap 1, Class-XI, Old NCERT)*

1. Possibilism views humans as capable of modifying the environment and using natural resources according to their own needs.
2. Determinism propounds that human choices and needs are restricted by natural factors.
3. F Ratzel belonged to the Deterministic School.

Which of the statement(s) given above is/are correct?

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (d)*

Exp. All the statements are correct with reference to Possibilism and Determinism because the Possibilism school of thought offers many choices to human. In this approach, emphasis is on human rather than nature and human is seen choosing his needs according to his own culture and is also "the judge of their use".

The French School of Geographers is firm supporter of possibilism. According to Determinism thought, human is a slave of nature. There is direct dependence of human beings on nature for resources and nature is taken as a powerful force, it is worshipped, revered and conserved.

Kant, Humboldt, Ritter and German expert Ratzel and his student Ellen Churchill Semple belong to the Deterministic School.

4. Which of the following pairs is/are matched correctly? *(Chap 1, Class-XII, New NCERT) (UPPSC Pre 1994)*

1. Neo Determinism – Griffith Taylor
2. Determinism – E Huntington
3. Possibilism – Vidal De La Blache

Codes

(a) 1 and 2 (b) 2 and 3
(c) Only 2 (d) All of these

↗ *Ans. (d)*

Exp. All the pairs are correctly matched as Griffith Taylor gave the concept of Neo Determinism also known as 'Stop and Go Determinism'.

Determinism can be defined as naturalisation of humans. E Huntington was one of the pioneers of this approach.

Vidal De La Blache was a pioneer of possibilism along with Lucian Febre. Possibilism means humanisation of nature.

5. Which of the following statements is/are correct regarding geography? *(Chap 1, Class-XI New NCERT)*

1. Biogeography is closely related to botany, zoology as well as ecology as human beings are located in different locational niche.
2. Geography is very much linked with the study of astronomical locations and deals with latitudes and longitudes.

Codes

(a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2

↗ *Ans. (c)*

Exp. Both the statements (1) and (2) are correct regarding geography. Biogeography is closely related to botany, zoology as well as ecology as human beings are located in different locational niche. Geography is very much linked with the study of astronomical locations and deals with latitudes and longitudes.

The shape of the Earth is Geoid but the basic tool of a geographer is a map which is two-dimensional representation of the Earth.

6. Match the following lists correctly and choose the correct code. *(Chap 1, Class-XI, Old NCERT)*

	List I (Geographer)		**List II** (Field of Work)
A.	H Mackinder	1.	Quantitative Methods
B.	W Christaller	2.	Regional Geography
C.	Peter Haggett	3.	Settlement Hierarchy
D.	W Davis	4.	Cycle of Erosion

Codes

	A	B	C	D		A	B	C	D
(a)	1	2	3	4	(b)	2	3	1	4
(c)	3	1	4	2	(d)	4	2	1	3

↗ *Ans. (b)*

Exp. The correct matching is A-2, B-3, C-1, D-4.

H Mackinder He gave his greatest contribution on Heartland Theory in the field of regional geography.

W Christaller He gave his greatest contribution on Central Place Theory in the field of settlement hierarchy.

Peter Haggett He was well-known for his work on quantitative methods as quantitative revolutionaries.

W Davis He gave the theory of cycle of erosion where he defined the three distinct stages of river erosion.

7. "Human geography is concerned with the study of changing relationship between unresting man and unstable Earth." Who gave this statement about human geography? *(Chap 1, Class-XII, New NCERT)*

(a) Paul Vidal De La Blache (b) Ellen Semple
(c) Ratzel (d) W Davis

↗ *Ans. (b)*

Exp. The statement about human geography was given by Ellen Semple.

According to Ellen Semple "Human geography is the study of the changing relationships between the unresting man and unstable Earth"

In general terms Human geography is defined as "the relationship between the physical/ natural and the human worlds, the spatial distribution of human phenomenon and how they come about, the social and economic difference between different parts of the world".

02

The Universe

New NCERT Class VI (The Earth in the Solar System), **Old NCERT Class VI** (The Earth in our Solar System), **New NCERT Class XI** (Origin and Evolution of Earth)

Study of Universe

1. **The state of universe before the occurrence of the 'Big Bang' can correctly described by which of the following terms?** ***(Chap 2, Class-XI, New NCERT)***

(a) Nebula (b) Singularity
(c) Point (d) Atom

↗ *Ans. (b)*

Exp. The term 'Singularity' correctly describes the state of universe before the occurrence of the 'Big Bang'.

According to the 'Big Bang' theory (expanding universe hypothesis) in the beginning, all matter forming the universe existed in one place in the form of a 'tiny ball' (singular atom) with an unimaginably small volume, infinite temperature and infinite density. This existence was termed as singularity. At the Big Bang, the 'tiny ball' exploded violently, this led to a huge expansion of the universe.

2. **Which the following statements with respect to 'Expanding Universe Hypothesis' is/are correct?** ***(Chap 4, Class-XI, New NCERT)***

(a) The Expanding Universe Hypothesis was proposed by scientist Edwin Hubble in 1920.
(b) Edwin Hubble provided the evidence that the universe is expanding.
(c) Both 'a' and ' b'
(d) Neither 'a' nor ' b'

↗ *Ans. (c)*

Exp. Both the statements (a) and (b) are correct regarding the 'Expanding Universe Hypothesis', because the most popular argument about the origin of the universe was proposed by Edwin Hubble in 1920. In this argument, he provided evidence that the universe is expanding and galaxies are moving a part with the passage of time.

3. **Which of the following statement is/are not correct about the state of early universe?** ***(Chap 2, Class-XI, New NCERT)***

(a) The distribution of matter and energy was not even.
(b) Differences in the density led to differences in gravitational forces.
(c) Galaxies started forming by the accumulation of a large cloud of hydrogen gas.
(d) None of the above

↗ *Ans. (d)*

Exp. All the given statements are correct about the state of early universe. The distribution of matter and energy was not even in the early universe. This initial density differences gave rise to differences in gravitational forces and it caused the matter to get drawn together.

Hence, galaxies started forming by the accumulation of a large cloud of hydrogen gas.

A galaxy contains a large number of stars. Galaxies spread over vast distances are measured in thousands of light years. The diameters of individual galaxies range from 80,000-1,50,000 light years.

4. **Which of the following statements about the state of universe are correct?** ***(Chap 2, Class-XI, New NCERT)***

1. The universe is in an expanding state.
2. The space between galaxies is increasing.
3. The distance between the galaxies is found to be increasing and thereby, the universe is considered to be expanding.
4. The formation of universe started almost 13 billion years ago.

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1, 3 and 4 (d) 1, 2, 3 and 4

↗ *Ans. (d)*

Exp. All the given statements are correct about the state of universe.

According to scientist Edwin Hubble, the universe is in expanding state and with passing of time, the space between the galaxies is increasing. The Big Bang Theory is the most widely accepted theory about the genesis of the universe.

According to which, the formation of universe started almost 13.7 billion years before the present and it is still expanding.

5. Which of the following statements are correct about the formation of universe?

(Chap 2, Class-XI, New NCERT)

1. Before the Big Bang, the universe was concentrated in a singular atom.
2. The singular atom exploded violently which led to its rapid expansion.
3. The present rate of expansion of universe is more than its initial expansion.

Codes

(a) 1 and 3 (b) 1 and 2
(c) 2 and 3 (d) All of these

↗ *Ans. (b)*

Exp. Statements (1) and (2) are correct about the formation of universe as in the beginning, all matter forming the universe existed in one place in the form of a 'tiny ball' (singular atom) with an unimaginably small volume, infinite temperature and infinite density.

At the Big Bang, the 'tiny ball' exploded violently. This led to a huge expansion.

It is now generally accepted that the event of big bang took place 13.7 billion years before the present. The expansion continues even to the present day.

Statement (3) is incorrect as there was particularly rapid expansion within fractions of a second after the bang. But thereafter, the expansion has slowed down. Hence the present rate of expansion of universe is not more than its initial expansion.

6. Which one of the following statements is correct with reference to our Solar System?

(Chap 2, Class-XI, New NCERT) (IAS Pre 2002)

(a) The Earth is the densest of all planets in our Solar system.
(b) The predominant element in the composition of Earth is Silicon.
(c) The Sun contains 75% of the mass of the Solar system.
(d) The diameter of the Sun is 190 times that of the Earth.

↗ *Ans. (a)*

Exp. Statement (a) is correct with reference to our Solar System. The average density of the Earth is highest among all the other eight planets of our Solar System. It is about 5.514 g/cm^3.

Statement (b), (c) and (d) are incorrect. The largest constituent element of the Earth is Iron (32.07%), Oxygen (30.12%) is the second and Silicon (15.12%) is the third largest element in the composition of the Earth.

The Sun contains 99.8% of the mass of Solar System and the diameter of the Sun is roughly 109 times the diameter of the Earth.

7. Given below is a list of stages of formation of planets in the universe. Arrange the list in correct sequence using the codes given below.

(Chap 2, Class-XI, New NCERT)

1. Condensation of gas cloud around the core
2. Development of planetesimals
3. Formation of planets
4. Formation of localised gas lumps
5. Formation of core of gas cloud

Codes

(a) 1, 2, 4, 5, 3 (b) 4, 5, 1, 2, 3
(c) 2, 1, 4, 5, 3 (d) 4, 2, 1, 5, 3

↗ *Ans. (b)*

Exp. The correct sequence of the stages of the formation of planets in the universe is 4, 5, 1, 2, 3.

Formation of localised gas lumps The stars are localised lumps of gas within a nebula. The gravitational force within the lumps leads to the formation of a core of the gas cloud.

Formation of core of gas cloud A huge rotating disc of gas and dust develops around the core.

Condensation of gas cloud around the core In the next stage, the gas cloud starts getting condensed and the matter around the core develops into small rounded objects.

Development of Planetesimals The small rounded objects by the process of cohesion develop into what is called planetesimals. Larger bodies start forming by the collision and gravitational attraction causes the material to stick together.

Formation of Planet In the final stage, planetesimals which are a large number of similar bodies accrete to form a fewer larger bodies in the form of planets.

Solar System

8. Consider the following statements regarding the Solar System. ***(Chap 1, Class-VI, Old NCERT) (CGPSC Pre 2020)***

1. Mercury is the hottest planet in the Solar system.
2. Ganymede, satellite of Saturn, is the largest satellite in the solar system.

3. Neptune is surrounded by methane gas rings of sub-zero temperature.
4. Phobos and Deimos are two satellites of mars.

Which of the statements given above are correct?

(a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) 1, 2, 3 and 4

↗ *Ans. (c)*

Exp. Statements (3) and (4) are correct regarding Solar System. Neptune is surrounded by methane gas rings of sub-zero temperature. Mars has two small moons : Phobos and Deimos, which were discovered by American astronomer Asaph Hall in 1877.

Statements (1) and (2) are incorrect because Venus is the hottest planet in the Solar System, not Mercury because its dense atmosphere acts as a greenhouse and heats the surface to about 880°F.

Ganymede is the satellite of Jupiter. It is the largest satellite in the Solar System.

9. The planetoids, also known as asteroids, are planet-like objects that revolve around the Sun in our Solar System. These numerous small bodies are usually found between the orbits of which of the following planets? *(Chap 1, Class-VI, New NCERT)*

(a) Earth and Mars (b) Mars and Jupiter
(c) Jupiter and Saturn (d) Mercury and Venus

↗ *Ans. (b)*

Exp. The planetoids (also known as asteroids) are found between the orbits of Mars and Jupiter. They are rocky objects revolving around the Sun. Asteroids are made up of clay and silicate rocks and are dark in appearance. They are known to be among the most ancient objects in the Solar System.

10. Consider the following statements about terrestrial planets. *(Chap 2, Class-XI, New NCERT)*

1. The terrestrial planets were formed in the close vicinity of the parent star where it was too cold for gases to condense to solid particles.
2. The terrestrial planets are larger and their lower gravity could not hold the escaping gases.

Which of the statement(s) given above is/are incorrect?

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (c)*

Exp. Both the statements (1) and (2) are incorrect about terrestrial planets. The terrestrial planets were formed in the close vicinity of the parent star where it was too warm for gases to condense to solid particles. The solar wind was most intense, nearer the Sun; so, it blew off lots of gases and dust from the terrestrial planets. The terrestrial planets are smaller and their lower gravity could not hold the escaping gases.

11. Which among the following celestial objects will be found beyond the orbit of planet Neptune in the Solar System? *(Chap 2, Class-XI, New NCERT)*

(a) Asteroids (b) Comet
(c) Dwarf Planets (d) Both 'b' and 'c'

↗ *Ans. (d)*

Exp. Among the given celestial objects, Comet and Dwarf Planets will be found beyond the orbit of Neptune in the Solar System.

For instance, Pluto was previously considered as a planet (until August 2006). However, at a meeting of the International Astronomical Union, it was decided that Pluto, like other recently found astronomical objects (2003 UB 313), should be referred to as a 'Dwarf Planet'.

Comets orbit around the Sun, but most are believed to inhabit in an area known as the Oort Cloud, far beyond the orbit of Pluto.

While Asteroids belt is located roughly between the orbits of the planets Jupiter and Mars.

12. Which among the following statements can be considered as definitely true about the planets in Solar System? *(Chap 2, Class-XI, New NCERT)*

1. The asteroids are revolving around the Sun between the orbits of terrestrial planets and Jovian planets.
2. The terrestrial planets in the Solar System are much smaller than the Jovian planets.
3. The atmosphere of Jovian planets is made up of oxygen and argon.

Codes

(a) 1 and 3 (b) 2 and 3
(c) 1 and 2 (d) All of these

↗ *Ans. (c)*

Exp. Statements (1) and (2) are considered as definitely true about the planets in Solar System because out of the eight planets, Mercury, Venus, Earth and Mars are called as the inner planets as they lie between the Sun and the belt of asteroids.

The other four planets are called the outer planets. Alternatively, the first four are called terrestrial, meaning earth-like as they are made up of rock and metals, and have relatively high densities.

The rest four are called Jovian or gas giant planets. Jovian means Jupiter-like, most of them are much larger than the terrestrial planets.

Statement (3) is false because the atmosphere of Jovian planets is made up of helium and hydrogen.

Planets

13. Which of the following statements is/are correct regarding evolution of atmosphere and hydrosphere? *(Chap 2, Class-XI, New NCERT)*

(a) During the cooling of the Earth, gases and water vapour were released from the interior solid Earth.
(b) The process through which the gases were outpoured from the interior is called degassing.
(c) Continuous volcanic eruptions contributed water vapour and gases to the atmosphere.
(d) All of the above

↗ *Ans. (d)*

Exp. All of the given statements are correct regarding evolution of atmosphere and hydrosphere. During the cooling of the Earth, gases and water vapour were released from the interior of the earth by the mode of volcanic eruptions. This started the evolution of the present atmosphere. The early atmosphere largely contained water vapour, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen. The process through which the gases were outpoured from the interior is called degassing.
Continuous volcanic eruptions contributed water vapour and gases to the atmosphere. As the Earth cooled, the water vapour released started getting condensed.

14. Which one of the following planets has the largest number of natural satellites or moons? *(Chap 1, Class-VI, Old NCERT) (IAS Pre 2009)*

(a) Jupiter (b) Mars
(c) Saturn (d) Venus

↗ *Ans. (c)*

Exp. Among the given options, Saturn has the largest number of natural satellites. It has total of 82 satellites. The number of moons of other planets are Mercury 0, Venus (0), Earth (1), Mars (2), Jupiter (79), Uranus (27) and Neptune (14).

15. Which among the following planets is made up of hydrogen and helium, with traces of methane, ammonia and water? *(Chap 2, Class-XI, New NCERT)*

(a) Mars (b) Jupiter
(c) Mercury (d) Venus

↗ *Ans. (b)*

Exp. The planet which is made up of hydrogen and helium, with traces of methane, ammonia and water is 'Jupiter'. Saturn, Uranus and Neptune are Jovian planets.

16. This planet takes almost same time to rotate on its axis and revolve around the Sun in its fixed orbit. Its shape and size is very much similar to the Earth. Its orbital period is shorter than the Earth. Identify the planet from the information given above. *(Chap 4, Class-X, NCERT)*

(a) Mercury (b) Saturn (c) Uranus (d) Venus

↗ *Ans. (d)*

Exp. The given information is about planet Venus. It takes almost same time to rotate on its axis (243 days) and revolve around the Sun (255 days) in its fixed orbit. It also considered as 'Earth's-twin' because its size and shape are very much similar to that of the Earth.

17. Consider the following statements regarding light year. *(Chap 2, Class-XI, New NCERT)*

1. Light travels at a speed of 3,00,000 km/second. Therefore, the distance the light will travel in one year is taken to be one light year.
2. The mean distance between the Sun and the Earth is 149,598,000 km.
3. The diameters of individual galaxies range from 80,000-1,50,000 light years.

Which of the statement given above is/are Correct?

(a) Only 1 (b) 2 and 3
(c) 1 and 3 (d) 1, 2 and 3

↗ *Ans. (d)*

Exp. All the given statements are correct regarding light year. A light year is a measure of distance. Light travels at a speed of 3,00,000 km/second. Considering this, the distance the light will travel in one year is taken to be one light year. This equals to 9.4611012 km. The mean distance between the Sun and the Earth is 149,598,000 km. In terms of light years, it is 8.311 minutes. The diameters of individual galaxies range from 80,000-1,50,000 light years.

18. Which of the statements is/are incorrect regarding formation of moon? *(Chap-2 Class-XI, New NCERT)*

(a) The formation of moon, as a satellite of the Earth, is an outcome of' 'giant impact' or what is described as 'the big splat.'
(b) A body of the size of one to three times that of mars collided into the Earth sometime shortly after the Earth was formed.
(c) Both 'a' and 'b'
(d) Neither 'a' nor 'b'

↗ *Ans. (d)*

Exp. None of the statement is incorrect regarding formation of moon. The moon's origin as a satellite of

the Earth is the result of a 'great impact,' often known as 'the big splat.' Shortly after the Earth was formed, a body, crashed with it that was the size of one to three times of Mars.

A big portion of the Earth was blown into space. About 4.44 billion years ago, a piece of the blasted material was orbiting the Earth that the current moon.

19. Arrange the following planets in increasing order of their size? *(Chap 1, Class-XI, New NCERT)*

(a) Mars, Earth, Uranus, Saturn
(b) Venus, Earth, Neptune, Saturn
(c) Mars, Mercury, Venus, Earth
(d) Both 'a' and 'b'

↗ *Ans. (a)*

Exp. The correct arrangement of planets in increasing order of their size is Mars, Earth, Uranus and Saturn. The size of planets can be compared on the basis of their radius.

The radius (Equatorial radius of Earth 6378.137 km = 1) of the planets are Mercury- 0.383, Venus- 0.949, Earth- 1.000, Mars- 0.533, Jupiter-11.19, Saturn-9.460, Uranus- 4.11 and Neptune- 3.88.

20. Which of the following factors have contributed to the formation of terrestrial rocky planets? *(Chap 2, Class-XI, New NCERT)*

1. Closeness to the parent star
2. Solar winds
3. Higher gravity

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (a)*

Exp. Closeness to the parent star and solar winds have contributed to the formation of terrestrial rocky planets. The terrestrial planets were formed in the close vicinity of the parent star where it was too warm for gases to condense to solid particles.

Jovian planets were formed at quite a distant location. The Solar wind was most intense, nearer the Sun; so, it blew off lots of gases and dust from the terrestrial planets. The solar winds were not all that intense to cause similar removal of gases from the Jovian planets. The terrestrial planets are smaller and their low gravity could not hold the escaping gases.

21. Consider the following statements regarding stages in the evolution of the present atmosphere. *(Chap 2, Class-XI, New NCERT)*

1. The first stage is marked by the loss of primordial atmosphere.
2. In the second stage, the hot interior of the Earth contributed to the evolution of the atmosphere.
3. Finally, the composition of the atmosphere was modified by the living world through the process of photosynthesis.

Which of the statements given above is/are correct?

(a) Only 1 (b) Only 2
(c) 1, 2 and 3 (d) 1 and 3

↗ *Ans. (c)*

Exp. All the given statements regarding the stages of evolution of present atmosphere are correct. There are the three stages in the evolution of the present atmosphere. The first stage is marked by the loss of primordial atmosphere.

In the second stage, the hot interior of the Earth contributed to the evolution of the atmosphere.

Finally, the composition of the atmosphere was modified by the living world through the process of photosynthesis.

22. Which among the following terms is used to describe small bodies that develop into large planets due to processes of cohesion? *(Chap 2, Class-XI, New NCERT)*

(a) Proto planets (b) Planetoids
(c) Planetesimals (d) Plutoids

↗ *Ans. (c)*

Exp. 'Planetesimals' is the term used to describe small bodies that develop into large planets due to process of cohesion.

In the second stage of formation of planets, the gas cloud starts getting condensed and the matter around the core develops into small rounded objects. These small rounded objects by the process of cohesion develop into larger planets which is called planetesimals.

Protoplanets are small celestial objects that are the size of a moon or a big bigger than that.

Planetoid is another term for asteroids. It is also known as minor planets.

Plutoids are celestial bodies in orbit around the Sun. They are basically dwarf planets that are farther from Sun.

03

The Earth

New NCERT Class VI (The Earth in the Solar System, Globe: Latitudes and Longitudes, Motions of the Earth), **Old NCERT Class VI** (The Earth in the Solar System, Latitudes and Longitudes, Motions of the Earth), **New NCERT Class XI** (The Origin and Evolution of the Earth) **Old NCERT Class XI** (The Earth: Its Origin and Evolution)

Origin of Earth

1. **Consider the following Assertion (A) and Reason (R) and choose the correct code.**
(Chap 1, Class-VI, New NCERT)

Assertion (A) The shape of the Earth is Geoid.
Reason (R) The Earth is slightly flattened at the poles not at the Equator.

Codes
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

↗ *Ans. (a)*

Exp. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). The Earth is slightly flattened at the poles not at Equator. That is why; its shape is described as a Geoid that means an Earth-like shape.

2. **Which of the following statements is incorrect about the Earth?** *(Chap 1, Class-VI, Old NCERT)*

(a) It is spherical in shape.
(b) The poles of Earth are flat.
(c) It is located nearest to the Sun.
(d) It is the only planet where life exists.

↗ *Ans. (c)*

Exp. Statement (c) is incorrect about the Earth as it is the third nearest planet to the Sun. Earth is nearest to Venus and Mars while Mercury is nearest to the Sun.

3. **Which among the following statements are correct about the Earth in its primitive form?**
(Chap 2, Class-XI, Old NCERT)

1. It was a cloud of dust and gases in its initial stages.
2. All the gases were concentrated in the core of Earth.
3. Life was present on the land in initial stages.
4. It took 4,600 million years in formation of Earth.

Codes
(a) 1, 2 and 3 (b) 2 and 4
(c) 1 and 4 (d) All of the above

↗ *Ans. (c)*

Exp. Statements (1) and (4) are correct about the Earth in its primitive form because the Sun is surrounded by solar nebula (a giant cloud) containing mostly, hydrogen and helium along with dust. It took around 4,600 million years for the evolution of life on the surface of the planet Earth.
Planet Earth initially was a barren, rocky and hot object with a thin atmosphere of hydrogen and helium. Hence, life was not present on the land in initial stages.
Statements (2) and (3) are incorrect as the Earth was mostly in a volatile state during its primordial stage. Due to gradual increase in density, the temperature inside the Earth increased. As a result, the material inside the Earth started getting separated depending on their densities.
There are no traces of life to be present on the land in initial stages.

4. **Many scientists gave the early theories of formation of Earth. Which of the following proposed that a wandering star was responsible for formation of Earth by separation of material from solar surface?**
(Chap 2, Class-XI, Old NCERT)

(a) Chamberlain and Moulton (b) Harold Jeffery
(c) Laplace (d) Otto Schmidt

↗ *Ans. (a)*

Exp. Chamberlain and Moulton proposed that a wandering star was responsible for formation of the Earth by separation of material from solar surface.

As the passing star moved away, the material separated from the solar surface continued to revolve around the Sun and it slowly condensed into planets.

5. Which of the following views was supported by Carl Weizsacker and Otto Schmidt about the origin of Earth? ***(Chap 2, Class-XI, Old NCERT)***

1. Sun was surrounded by a nebula of hydrogen and helium.
2. Collision and friction between gas particles formed the planets.
3. Planets were formed by the process of disintegration.

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (a)*

Exp. Statements (1) and (2) were supported by Otto Schmidt of Russia and Carl Weizsacker of Germany. They revised the 'nebular hypothesis', that was differing in details. They considered that the Sun was surrounded by solar nebula containing mostly the hydrogen and helium along with dust.

Statement (3) is not correct as planets were formed through the process of accretion not by the process of disintegration.

6. Consider the following statements.

(Chap 2, Class- XI, Old NCERT) (UPPSC Pre 2000)

1. The Northern end of the Earth's axis is called North Pole.
2. 45° latitude is half of the length of the equator.
3. Earth's axis is Parallel.
4. The Earth's speed of revolution is faster in aphelion position.

Which of the statement(s) given above are correct?

(a) 1 and 2 (b) 2 and 3 (c) 3 and 4 (d) 1 and 3

↗ *Ans. (d)*

Exp. Statements (1) and (3) are correct. The North Pole is the Northern point of Earth i.e. northern end of the Earth's axis which is called North Pole. Both the axis of the Earth are tilted at an angle of $23\frac{1^\circ}{2}$ and are parallel to each other.

Statements (2) and (4) are incorrect because the length of 45° Parallel line is 2833.039 km, while the length of the equator is 40075.62 km.

Earth travels fastest at the perihelion (point of orbit closet to Sun) gradually slowing down until it reaches the aphelion (point of orbit farthest from Sun) where it increases its speed until the perihelion.

7. The stages of formation of the Earth are given in the options given below. Arrange the stages in a correct sequence and choose the correct answer using the codes given below.

(Chap 2, Class-XI, Old NCERT)

1. Formation of ridges and basins
2. Swirling ball of dust and clouds
3. Formation of crust of the Earth
4. Floating of gases to form atmosphere
5. Formation of oceans

Codes

(a) 2, 1, 3, 5, 4 (b) 2, 3, 1, 4, 5
(c) 1, 2, 4, 5, 2 (d) 5, 1, 3, 4, 2

↗ *Ans. (b)*

Exp. Option (b) is the correct sequence. At the beginning, Earth was a giant ball of dust and cloud known as Nebula.

After that, through the process of accretion, the planet Earth started to form. This process allowed heavier materials (like iron) to sink towards the centre of the Earth and the lighter ones to move towards the surface.

The crust started to form along with ridges and basins.

In the next stage, the Earth's atmosphere started to form with floating gases and at last after 500 million years from the formation of the Earth, the oceans started to form.

8. Which among the following is the earliest theory to describe the formation of Earth?

(a) Big Bang Theory ***(Chap 2, Class-XI, New NCERT)***
(b) Expanding Universe Hypothesis
(c) Nebular Hypothesis
(d) Steady State Hypothesis

↗ *Ans. (c)*

Exp. Earliest theory to describe the formation of Earth is known as Nebular Hypothesis. A large number of hypotheses were put forth by different philosophers and scientists regarding the origin of the Earth. One of the earlier and popular arguments was given by German philosopher Immanuel Kant.

Mathematician Laplace revised it in 1796 and named as Nebular Hypothesis. Both Big Bang and Expanding Universe Hypothesis are related to the origin of universe and Steady State Hypothesis state that the density of matter in the expanding universe remains unchanged over time because of the continuous creation of matter.

9. Consider the following Assertion (A) and Reason (R) and choose the correct code.

(Chap 2, Class-XI, New NCERT) (IAS Pre 2003)

Assertion (A) Moving from one place on earth to another place of high latitude, the weight of an object decreases.

Reason (R) Earth is not a perfect sphere.

Codes

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false

(d) A is false, but R is true

↗ *Ans. (d)*

Exp. Assertion (A) is false and Reason (R) is true.

The centrifugal force generated by the Earth's axis rotation is maximum at equator. As the result of this force, the weight of any object is minimum at Equator and maximum at poles and also increases towards high latitude. Earth is not perfect sphere because it is slightly flattened at the poles and not the Equator.

10. According to the early theories of Earth formation, the accretion of, which of the following materials led to the formation of planet Earth?

(Chap 2, Class-XI, New NCERT)

(a) Nitrogen

(b) Hydrogen and helium

(c) Silicon and oxygen

(d) Iron and nickel

↗ *Ans. (b)*

Exp. According to the early theories of Earth formation, the accretion of hydrogen and helium gases led to the formation of planet Earth. They initially formed the Earth's surface. The early atmosphere with hydrogen and helium is supposed to have been stripped off as a result of intense solar wind. This happened not only in Earth, but also in all the terrestrial planets, which were supposed to have lost their primordial atmosphere through the impact of solar winds.

11. Which among the following statements about the evolution of Earth's lithosphere is correct?

(Chap 2, Class-XI, New NCERT)

1. The materials inside the lithosphere have arranged according to density differences.
2. During its formation, the heavier materials have sunk towards the centre of the Earth.
3. During its formation, the increase in density inside the Earth has resulted is increase in temperature.

Codes

(a) 1 and 2 (b) Only 2

(c) Only 3 (d) 1, 2 and 3

↗ *Ans. (d)*

Exp. All the statements are correct about the evolution of Earth's lithosphere.

The Earth was mostly in a volatile state during its primordial stage.

Due to gradual increase in density, the temperature inside increased. As a result, the material inside started getting separated depending on their densities.

This allowed heavier materials (like iron) to sink towards the centre of the Earth and the lighter ones to move towards the surface.

With passage of time, it cooled further and solidified and condensed into a smaller size. This later led to the development of the outer surface in the form of a crust.

12. During the evolution of the Earth, the hydrogen and helium gases of early atmosphere were stripped off by, which of the following?

(Chap 2, Class-XI, New NCERT)

(a) High density of Earth (b) Solar winds

(c) Solar spots (d) Rainfall

↗ *Ans. (b)*

Exp. During the evolution of the Earth, the hydrogen and helium gases of early atmosphere were stripped off, as a result of the solar winds. This happened not only in the Earth, but also in all the terrestrial planets, which were supposed to have lost their primordial atmosphere through the impact of solar winds.

13. The major components of the present atmosphere of Earth have been released from, which of the following sources? *(Chap 2, Class-XI, New NCERT)*

(a) The Sun in Solar System

(b) A large mass of rock revolving around the Earth

(c) Interior of the Earth

(d) Volcanic eruptions

↗ *Ans. (c)*

Exp. The major components of the present atmosphere of Earth have been released from interior of the Earth because during the cooling of the Earth, gases and water vapour were released from the interior of solid Earth. This started the evolution of the present atmosphere.

14. Which among the following were not the components of Earth's atmosphere during its origin? *(Chap 2, Class-XI, New NCERT)*

1. Carbon dioxide 2. Helium
3. Hydrogen 4. Oxygen

Codes

(a) 1, 2 and 3 (b) 1 and 4
(c) 2 and 3 (d) 1, 2 and 4

↗ *Ans. (b)*

Exp. Carbon dioxide and oxygen were not the components of Earth's atmosphere during its origin. Only hydrogen and helium are the gases, which were found at the primordial stage of the Earth's atmosphere.

15. Which of the following pairs are matched correctly? *(Chap 2, Class-XI, New NCERT)*

1. Origin of life on Earth – 3,800 million years ago
2. Photosynthesis begins – 2,500-3,000 million years ago
3. Release of oxygen in atmosphere – 2,000 million years ago

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (d)*

Exp. All of the pairs are matched correctly as the origin of life on Earth began 3,800 million years ago. It was just after the formation of ocean around 4,000 million years ago.

Around 2,500-3,000 million years ago, the process of photosynthesis evolved. Then the oceans began to have the contribution of oxygen through this process.

Eventually, oceans were saturated with oxygen and 2,000 million years ago, the oxygen began to flood the atmosphere.

Geological Time Scale

16. The first plant on the Earth appeared in, which of the following Era? *(Chap 2, Class-XI, New NCERT)*

(a) Mesozoic Era (b) Palaeozoic Era
(c) Cainozoic Era (d) Pre-Cambrian Era

↗ *Ans. (b)*

Exp. The first plant on Earth appeared in Palaeozoic Era. This era was present 245 to 570 million years ago. This era has been divided into six periods. These are Permian, Carboniferous, Devonian, Silurian, Ordovician and Cambrian.

The major events in this era are

- Reptile Dominate-Replace amphibians
- First Reptiles
- Vertebrates: Coal beds amphibians
- First trace of life on land: Plants
- First fish
- No terrestrial life : Marine invertebrate

17. Dinosaurs got extinct from the Earth during which of the following periods? *(Chap 2, Class-XI, New NCERT)*

(a) Jurassic period (b) Carboniferous period
(c) Triassic period (d) Cretaceous period

↗ *Ans. (d)*

Exp. Dinosaurs got extinct from Earth. In Cretaceous period (65 - 144 million years ago), which is the part of Mesozoic era. It is the last period of Mesozoic era.

18. During, which of the following periods, the first fish appeared in the oceans? *(Chap 2, Class-XI, New NCERT)*

(a) Cambrian period (b) Ordovician period
(c) Permian period (d) Devonian period

↗ *Ans. (b)*

Exp. In Ordovician period, the first fish appeared in the oceans. The Ordovician period is a part of Palaeozoic era. The age of this period is 438 to 505 million years ago.

19. Arrange the following periods in the correct sequence of the Geological Time Scale. *(Chap 2, Class-XI, New NCERT)*

1. Tertiary Period
2. Carboniferous
3. Cambrian Period
4. Jurassic Period

Codes

(a) 1, 2, 3, 4 (b) 3, 2, 4, 1
(c) 2, 3, 4, 1 (d) 1, 3, 2, 4

↗ *Ans. (b)*

Exp. Cambrian period is the oldest period among the given options as it existed 505-570 million years ago.

Then, the next is Carboniferous period as it existed 286-360 million years ago.

The third is Jurassic period, which existed 286-360 million years ago.

The fourth is Tertiary period, which is the youngest among the given options as it existed 2-65 million years ago.

20. Match the following lists correctly and choose the correct code. *(Chap 2, Class-XI, New NCERT)*

List I (Period)	**List II** (Major Event)
A. Carboniferous	1. Early human ancestors
B. Silurian	2. Appearance of first reptiles
C. Jurassic	3. First traces of life on land
D. Tertiary	4. Dominance of dinosaurs

Codes

	A	B	C	D
(a)	1	2	4	3
(c)	3	1	2	4

	A	B	C	D
(b)	2	3	4	1
(d)	2	4	1	3

↗ *Ans. (b)*

Exp. The correct matching is A-2, B-3, C-4, D-1.

Carboniferous It is a part of Palaeozoic era. The age of Carboniferous period is 286-360 million years. The major event of this period is the appearance of first reptiles.

Silurian It is also a part of Palaeozoic era. The age of Silurian period is 408 - 438 million years before present. The major event of this period is the first traces of life on land.

Jurassic It is a part of Mesozoic era. The age of Jurassic period is 144-208 million years before present. The major event of this period is the dominance of dinosaurs.

Tertiary It is a part of Cenozoic era. The age of this period is 2–65 million years. The major event of this period is early human ancestors.

21. **Match the following lists correctly and choose the correct code.** ***(Chap 2, Class-XI, New NCERT)***

List I (Epoch)	**List II** (Age)
A. Holocene	1. 24-37 million years
B. Pliocene	2. 0-10,000 years
C. Oligocene	3. 37-58 million years
D. Eocene	4. 2-5 million years

Codes

	A	B	C	D
(a)	1	2	4	3
(c)	3	1	2	4

	A	B	C	D
(b)	2	3	4	1
(d)	2	4	1	3

↗ *Ans. (d)*

Exp. The correct matching is A-2, B-4, C-1, D-3.

Holocene It is a part of Quaternary period. The age of Holocene Epoch is 0-10,000 years. The major event of this epoch is the development of modern man.

Pliocene It is a part of Tertiary period. The age of Pliocene epoch is 2-5 million years before present. The major event in this time is emerging of early human ancestor.

Oligocene It is also a part of Tertiary period. The age of Oligocene epoch is 24-37 million years before present. The major event of this period is the emerging of anthropoid ape.

Eocene It is a part of Tertiary period. The age of Eocene epoch is 37-58 million years before present. The major event of this period is the emerging of rabbit and hare.

Motions of Earth

22. **Consider the following statements.** ***(Chap 4, Class-VI, Old NCERT) (IAS Pre 2018)***

1. The Earth's magnetic field has reversed every few hundred thousand years.
2. When the Earth was created more than 4000 million years ago, there was 54% oxygen and no carbon dioxide.
3. When living organisms originated, they modified the early atmosphere of the Earth.

Which of the statement(s) given above is/are correct?

(a) Only 1 (b) 2 and 3 (c) 1 and 3 (d) 1, 2 and 3

↗ *Ans. (c)*

Exp. Statements (1) and (3) are correct. The magnetic field of Earth has reversed every few hundred thousand years. When living organisms originated, they modified the early atmosphere of the Earth.

Statement (2) is not correct as the Earth is approximately 5 billion years old and the oxygen was completely absent at that time.

23. **Which of the following statements is/are correct about the revolution of Earth around the Sun?** ***(Chap 3, Class-VI, New NCERT)***

(a) The orbit of the Earth around the Sun is helical in shape.

(b) During its revolution, the inclination of the Earth remains constant.

(c) The shape of the Earth changes during its revolution.

(d) All of the above

↗ *Ans. (b)*

Exp. Statement (b) is correct about the revolution of Earth around the Sun. The movement of the Earth around the Sun is a fixed path or orbit is called Revolution. The axis of the Earth which is an imaginary line makes an angle of $66\frac{1}{2}^{\circ}$ with the orbital plane.

The orbit of the Earth around the Sun is an elliptical orbit. Throughout its orbit, the Earth is inclined in the same direction.

The shape of the Earth does not change during Revolution. The Revolution is responsible for change in climate.

24. **The Earth rotates on its inclined axis in, which of the following directions?** ***(Chap 4, Class-VI, Old NCERT)***

(a) From East to West throughout the year

(b) From West to East throughout the year

(c) East to West in summers and West to East in winters

(d) East to West in winters and West to East in summers

↗ *Ans. (b)*

Exp. The Earth rotates on its inclined axis from West to East throughout the year. Rotation is the movement of the Earth on its axis. The Earth takes about 24 hours to complete one rotation around its axis and it moves from West to East throughout the year. The period of rotation is known as the Earth day.

25. Consider the following statements about Earth's inclined axis. *(Chap 4, Class-VI, Old NCERT)*

1. The axis of Earth is an imaginary line.
2. The axis of Earth coincides with the circle of illumination.
3. The axis is tilted at 23 1/2° to the orbital plane of Earth.

Which of the statement(s) given above is/are correct?

(a) 1 and 2 (b) Only 2
(c) Only 1 (d) All of these

↗ *Ans. (c)*

Exp. Statement (1) is correct about Earth's inclined axis because Earth's axis is an imaginary pole or line passing through the center of the Earth and makes an angle of 66½° with its orbital plane.

Statements (2) and (3) are incorrect because the circle that divides the day from night on the globe is called the circle of illumination. This circle does not coincide with the axis. Also the axis is tilted at 66 ½° to the orbital plane of Earth.

26. It is because of the Earth's rotation on its axis that there is day and night in regular succession in all parts of Earth. Days and nights on the Earth are divided by, which of the following circles? *(Chap 3, Class-VI, New NCERT)*

(a) Circle of ellipse (b) Circle of inclination
(c) Circle of illumination (d) Circle of division

↗ *Ans. (c)*

Exp. Days and nights on the Earth are divided by circle of illumination. The imaginary line that separates day from night on Earth is called the circle of illumination. It is basically the region that is experiencing sunshine. The circle of illumination cuts all latitudes into half on the spring and autumnal equinoxes.

27. What would happen if the Earth stops rotating on its axis? *(Chap 4, Class-VI, Old NCERT)*

(a) There will be no seasons.
(b) There will be complete day on one side.
(c) The crust of Earth will melt.
(d) The atmosphere of Earth will disappear.

↗ *Ans. (b)*

Exp. If the Earth stops rotating on its axis then there will be complete day on one side. The portion of the Earth facing the Sun would always experience day. It will bring continuous warmth to the region. The other half would remain in darkness and be freezing cold all the time. Life would not have been possible in such extreme conditions.

28. Different places on the Earth experience sunrise, noon, sunset and midnight at the same time. Which of the following most appropriately explains this phenomenon? *(Chap 4 , Class-VI, Old NCERT)*

(a) Revolution of the Earth around the Sun
(b) Rotation of the Earth on its axis
(c) Axial tilt of the Earth
(d) Earth's elliptical orbit

↗ *Ans. (b)*

Exp. Different places on the Earth experience sunrise, noon, sunset and midnight at the same time due to rotation of the Earth on its axis. The Earth's axis runs from the North Pole to the South Pole. The Earth takes 24 hours or one day, to make one complete rotation around this invisible line. As the Earth rotates, each area of its surface gets a turn to face and be warmed by the Sun. This is important to all life forms on the Earth.

29. Which of the following statements is/are correct regarding Earth's revolution around the sun? *(Chap 4, Class-VI, Old NCERT)*

1. The Earth's movement around the Sun in its orbit is called revolution.
2. The Earth's revolution is responsible for occurrence of leap year on Earth.

Codes

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (c)*

Exp. Both the statements (1) and (2) are correct regarding Earth's revolution around the sun.

The Earth's movement around the Sun in its orbit is called revolution. It takes 365 1/4 days (one year) to revolve around the Sun. We consider it a year, as consisting of 365 days only and ignore six hours for the sake of convenience. Six hours saved every year are added to make one day (24 hours) over a span of four years.

This surplus day is added to the month of February. Thus, every fourth year, February is of 29 days instead of 28 days. Such a year with 366 days is called a leap year. Thus, the Earth's revolution is responsible for occurrence of leap year on Earth.

30. Consider the following statements about the revolution of Earth. *(Chap 4, Class-VI, Old NCERT)*

1. The Earth's revolution takes place in an elliptical orbit.
2. The Earth rotates from West to East.
3. Revolution of Earth on its tilted axis causes formation of seasons.

Which of the statement(s) given above is/are correct?

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (d)*

Exp. All the statements are correct about the revolution of Earth. The Earth takes 365¼ days (one year) to revolve around the Sun in an elliptical orbit.

The Earth rotates on its own axis and it rotates in the Eastward direction and in a counter-clockwise motion. So, the direction of the Earth's rotation is considered from West to East.

The revolution of Earth on its tilted axis causes formation of seasons because change of seasons is the result of changing in the position of the Earth around the Sun.

31. Consider the following statements about the revolution of Earth and it associated effects. *(Chap 4, Class-VI, Old NCERT)*

1. When the Northern Hemisphere is tilted towards the Sun, days are longer and nights are shorter in Northern Hemisphere.
2. When the Southern Hemisphere is tilted towards the Sun, the North Pole has 24 hours day.
3. When the Southern Hemisphere is tilted towards the Sun, the North Pole has 24 hours night.

Which of the statements given above is/are correct?

(a) 1 and 2 (b) Only 2 (c) 2 and 3 (d) 1 and 3

↗ *Ans. (d)*

Exp. Statements (1) and (3) are correct about the revolution of Earth and it associated effects because when 21st June, the Northern Hemisphere is tilted towards the Sun. The rays of the Sun fall directly on the Tropic of Cancer. As a result, it is summer in the regions North of the equator. The longest day and the shortest night at these places occur on 21st June. On 22nd December, the Tropic of Capricorn receives direct rays of the Sun as the South Pole is tilted towards it. Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights. The reverse happens in the Northern Hemisphere and the North Pole has 24 hours night.

Statement (2) is incorrect because when the Southern Hemisphere is tilted towards the Sun, the South Pole has 24 hours night.

32. Match the following lists correctly and choose the correct code. *(Chap 3, Class-VI, New NCERT)*

List I (Date)	**List II** (Event)
A. 21st June	1. Summer Solstice
B. 22nd December	2. Autumn Equinox
C. 23rd September	3. Winter Solstice
D. 21st March	4. Spring Equinox

Codes

	A	B	C	D
(a)	1	2	4	3
(c)	3	1	2	4

	A	B	C	D
(b)	1	3	2	4
(d)	3	4	1	2

↗ *Ans. (b)*

Exp. The correct matching is A-1, B-3, C-2, D-4.

21st June, the Southern Hemisphere experiences On the winter season and it is summer in the Northern hemisphere. At that point of time, the position of the Earth on 21st June is called the Summer Solstice.

On 22nd December, the Tropic of Capricorn receives direct rays of the Sun as the South Pole tilted towards it. As the Sun's rays fall vertically at the Tropic of Capricorn, a larger portion of the Southern Hemisphere gets light. This position of the Earth is called the Winter Solstice.

On 23rd September, direct rays of the Sun fall on the equator. This is called an equinox. At this time, it is autumn season in the Northern Hemisphere and spring season in the Southern Hemisphere. It is called as Autumn Equinox.

21st March is opposite case on 21st March, when it is spring in the Northern Hemisphere and autumn in the Southern Hemisphere. It is also known as Spring Equinox.

33. On which of the following days, the length of day and night on the North Pole and South Pole will be exactly same? *(Chap 4, Class-VI, Old NCERT)*

(a) 23rd December (b) 22nd September
(c) 21st March (d) 31st December

↗ *Ans. (c)*

Exp. On 21st March, the length of day and night on the North Pole and South Pole will be exactly same. During the spring and autumn equinoxes, i.e., on 21st March and 23rd September, the Sun is exactly overhead the Equator and the North and South Poles lie at an equal distance from the Sun. This is the reason, days and nights are of equal length throughout the world on these two days.

34. **The rotation of Earth in its elliptical orbit causes seasons on Earth. Seasons differ in both the Northern Hemisphere and the Southern Hemisphere. Which of the following statements about the seasons in Southern and Northern Hemispheres is/are correct?**

(Chap 3, Class-VI, New NCERT)

1. In the month of September, the Southern Hemisphere has spring season.
2. In the month of June, the Northern Hemisphere has summer season.
3. In the month of December, the Southern Hemisphere has winter season.

Codes

(a) 1 and 3 (b) 2 and 3
(c) Only 2 (d) 1 and 2

↗ *Ans. (d)*

Exp. Statements (1) and (2) are correct about the seasons in Southern and Northern Hemisphere.

As on 21st March and 23rd September, direct rays of the Sun fall on the equator. At this position, neither of the poles is tilted towards the Sun; so, the whole Earth experiences equal days and equal nights. On 23rd September, it is autumn season in the Northern Hemisphere and spring season in the Southern Hemisphere.

Also in Northern Hemisphere, the longest day and the shortest night take places on 21st June. Hence, we can conclude that in the month of June, the Northern Hemisphere has summer season.

Statement (3) is incorrect as in the month of December, the Southern Hemisphere has summer season while the Northern Hemisphere has winter season.

35. **Which of the following statements is incorrect about the Summer Solstice?**

(Chap 3, Class-VI, New NCERT)

(a) The North Pole of Earth has 24 hours daylight.
(b) The South Pole has 24 hours night.
(c) The Northern Hemisphere has autumn season.
(d) The Southern Hemisphere has winter season.

↗ *Ans. (c)*

Exp. Statement (c) is incorrect about the summer solstice because on 21st June, the Northern Hemisphere is tilted towards the Sun. The rays of the Sun fall directly on the Tropic of Cancer. As a result, these areas receive more heat. The areas near the poles receive less heat as the rays of the Sun are slanting.

Since, a large portion of the Northern Hemisphere is getting light from the Sun, it is summer in the north regions of the equator. The longest day and the shortest night at these places occur on 21st June.

At this time in the Southern Hemisphere all these conditions are reversed. It is winter season there. The nights are longer than the days. This position of the Earth is called the Summer Solstice.

36. **The Winter Solstice occurs on 22nd December. During Winter Solstice, which of the following phenomenon can be observed in the Southern Hemisphere?** ***(Chap 3, Class-VI, New NCERT)***

1. The length of days will be longer in the Southern Hemisphere.
2. Southern Hemisphere experiences winter season.
3. The South Pole has 24 hours day for 6 months.

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) All of these

↗ *Ans. (c)*

Exp. Phenomena mentioned in Statements (1) and (3) can be observed in the Southern Hemisphere.

During Winter Solstice, the length of days will be longer in the Southern Hemisphere and the South Pole has 24 hours day for 6 months. This is because on 22nd December, the Tropic of Capricorn receives direct rays of the Sun as the South Pole tilts towards it.

Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights. This position of the Earth is called the Winter Solstice.

Phenomenon mentioned in statement (2) cannot be observed as during this time Southern Hemisphere experiences summer season and Northern Hemisphere experiences winter season.

37. **Consider the following Assertion (A) and Reason (R) and choose the correct code.**

(Chap 3, Class-VI, New NCERT)

Assertion (A) All the places on Earth will have equal length of days and nights on 23rd September.

Reason (R) The rays of the Sun fall directly on the Equator during Equinox.

Codes

(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

↗ *Ans. (a)*

Exp. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). because on 21st March and 23rd September, direct rays of the Sun fall on the equator. At this position, neither of the poles is tilted towards the Sun, so the whole Earth experiences equal days and equal nights. This is called an equinox.

38. During certain period of the year, the rays of the Sun are falling directly over the Tropic of Cancer (23 1/2° N). Which of the following is most likely to occur during this period?

(Chap 4, Class-VI, Old NCERT)

(a) Northern Hemisphere will have longer days and shorter nights.
(b) There will be 24 hour day on the North Pole.
(c) The length of days and nights will be equal at all places.
(d) Both 'a' and ' b'

↗ *Ans. (d)*

Exp. During the period mentioned in question, Northern Hemisphere will have longer days and shorter nights. Also there will be 24 hour day on the North Pole because on 21st June when the rays of the Sun fall directly on the Tropic of Cancer, Northern Hemisphere receive more heat. Since, a large portion of the Northern Hemisphere is getting light from the Sun, it is summer in the regions North of the equator with longer days and shorter nights.

Statement (c) is incorrect because during this time, days are longer in Northern Hemisphere and nights are shorter but in Southern Hemisphere all these conditions are reversed. Thus, the length of days and nights are equal at all places when the rays of the Sun are falling directly over the Tropic of Cancer.

39. Which among the following statements are incorrect about the rotation of Earth on its tilted axis? *(Chap 4, Class-VI, Old NCERT)*

1. The Earth's rotation on its tilted axis is responsible for causing seasons on Earth.
2. If the Earth stops rotating, all the places will have equal days and equal nights.
3. Earth's rotates at an axial tilt of 23 1/2° from the plane of Earth's orbit.

Codes

(a) Only 1 (b) 1 and 3 (c) 2 and 3 (d) All of these

↗ *Ans. (d)*

Exp. All of the statements are incorrect about the rotation of Earth on its tilted axis. The revolution of Earth around the Sun is responsible for causing seasons on Earth.

If the Earth stops rotating, the portion of the Earth facing the Sun would always experience day, thus bringing continuous warmth to the region. The other half would remain in darkness and be freezing cold all the time.

Earth's rotates at an axial tilt of 66 1/2° from the plane of Earth's orbit.

The Moon

40. Which of the following statements can be considered as certainly true about the Moon?

(Chap 1, Class-VI, Old NCERT)

(a) The diameter of Moon is one-fifth of the Earth.
(b) A person on Earth will always see the same side of the Moon.
(c) The revolution period of Moon is more than the rotation period.
(d) Water and soil are present in abundant quantities on Moon.

↗ *Ans. (b)*

Exp. Statement (b) can be considered as certainly true about the moon because Earth has only one satellite, i.e., the Moon. Its diameter is only one-quarter to that of the Earth.

It appears so big because it is nearer to our planet than other celestial bodies. It is about 3,84,400 km away from us. It revolves around the Earth and rotates about its own axis in about the same time, due to, which only one side of the Moon is visible to us. Water and soil are not present on the Moon. Hence, the Moon does not have favourable conditions for life.

41. Consider the following statements about the Moon. *(Chap 1, Class-VI, Old NCERT)*

1. The Moon revolves around the Earth in a fixed path.
2. The Moon appears bright due to reflected light of the Sun.
3. The surface of Moon is characterised by unevenness.

Which of the statements given above are correct?

(a) 1 and 2 (b) 2 and 3 (c) 1 and 3 (d) All of these

↗ *Ans. (d)*

Exp. All the statements are correct about the moon because it revolves around the Earth and rotates about its own axis in about the same time.

The Moon does not have its own light; it gets its light from the Sun so, the Moon appears bright due to reflected light of the Sun. The surface of Moon is characterised by unevenness as it has mountains, plains and depressions on its surface. These cast shadows on the Moon's surface.

Latitudes, Longitudes and Time

42. **Which one of the following longitudes alongwith the Prime Meridian forms a great circle on the globe?** *(Chap 2, Class-VI, New NCERT) (UPPSC Pre 2000)*

(a) 0° (b) 90°E (c) 90°W (d) 180°

↗ *Ans. (d)*

Exp. 180° longitudes alongwith the Prime Meridian forms a great circle on the globe. The Prime Meridian is the zero degree line of longitude that passes near London.

It forms a great circle at globe at 180°. The Prime Meridian was accepted as zero degrees longitude at an International Conference in 1884.

43. **All major latitudes are parallel to the Equator. Some are marked in the Southern Hemisphere whereas some are in the Northern Hemisphere. From the given list, identify the latitudes, which are marked in the Southern Hemisphere.** *(Chap 2, Class-VI, New NCERT)*

1. Tropic of Cancer 2. Tropic of Capricorn
3. Arctic Circle 4. Antarctic Circle

Codes

(a) 1, 2 and 3 (b) 2 and 3
(c) 1 and 3 (d) 2 and 4

↗ *Ans. (d)*

Exp. From the given list, Tropic of Capricorn and Antarctic Circle are marked in the Southern Hemisphere. There are four important parallels of latitudes

(i) Tropic of Cancer (23 1/2° N) in the Northern Hemisphere.
(ii) Tropic of Capricorn (23 1/2° S) in the Southern Hemisphere.
(iii) Arctic Circle at 66 1/2° North of the Equator.
(iv) Antarctic Circle at 66 1/2° South of the Equator.

44. **Which of the following statements is/are incorrect regarding measurement of latitudes?** *(Chap 2, Class- VI, New NCERT)*

1. The Equator represents the zero degree latitudes.
2. 90° North latitude marks the North pole and 90° South latitude marks the South pole.

Codes

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (d)*

Exp. None of the given statement is incorrect regarding measurement of latitudes. The Equator represents the 0° latitude. Since, the distance from the equator to either of the poles is one-fourth of a circle around the Earth. It will measure 1/4th of 360° i.e. 90°. Therefore, 90° North latitude marks the North Pole and 90° South latitude marks the South Pole.

45. **If the length of all the major latitudes on Earth is measured in kilometres, which of the following will be the longest latitude?** *(Chap 3, Class-VI, Old NCERT) (UPPSC Pre 2001)*

(a) 23 1/2° N (b) 23 1/2° S
(c) 0° (d) 90° N

↗ *Ans. (c)*

Exp. If the length of all the major latitudes on Earth is measured in kilometres, the longest latitude will 0° latitude.

It is known as the Equator, which divides the Earth into two equal halves i.e., the Northern Hemisphere and the Southern Hemisphere. It also called the largest circle because all other latitudes become smaller as they move towards the poles from the equator.

46. **Zero degree latitude and zero degree longitude lies in the** *(Chap 2, Class-VI, New NCERT)*

(a) Atlantic Ocean (b) Arctic Ocean
(c) Indian Ocean (d) Pacific Ocean

↗ *Ans. (a)*

Exp. Zero degree latitude and zero degree longitude lies in the Atlantic Ocean. The point at which Equator (0° latitude) and the Prime Meridian (0° longitude) intersect has no real significance but it is in the Gulf of Guinea in the Atlantic Ocean.

47. **Which of the following statements about the latitudinal heat zones is correct?** *(Chap 2, Class-VI, New NCERT)*

1. The region between the Tropic of Cancer and Tropic of Capricorn is known as the Torrid Zone.
2. The region around the North Pole of the Earth is known as the Frigid Zone.

Codes

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) None of the above

↗ *Ans. (c)*

Exp. Both the statements (1) and (2) are correct about the latitudinal heat zones as the mid-day Sun is exactly overhead at least once a year on all latitudes in between the Tropic of Cancer and the Tropic of Capricorn. Therefore, this area receives the maximum heat and is called the Torrid Zone.

Areas lying between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere,

are very cold. It is because the Sun here does not rise much above the horizon. Its rays are always slanting and provide less heat. Therefore, these are called Frigid Zones (very cold).

48. Consider the following statements about the meridians of longitude on Earth.

(Chap 2, Class-VI, New NCERT)

1. All the meridians of longitude are of same length.
2. Prime Meridian is marked by 0° longitude.
3. All the meridians are full circles.
4. Distance between longitudes becomes zero at the poles.

Which of the statement(s) given above is/are correct?

(a) 1, 2 and 4 (b) 2, 3 and 4
(c) 2 and 4 (d) All of these

↗ *Ans. (a)*

Exp. Statements (1), (2) and (4) are correct about the meridians of longitude on Earth. The line of reference running from the North Pole to the South Pole are called the meridians of longitude.

Unlike parallels of latitude, all meridians are of equal length. The Prime Meridian is the imaginary line used to indicate 0° longitude that passes through Greenwich. It is also known as Greenwich Meridian because it passes through the place called Greenwich in London.

The distances between them are measured in 'degrees of longitude'. Each degree is further divided into minutes, and minutes into seconds.

Statement (3) is incorrect as all the meridians are semi circles while all the latitudes are full circle.

49. Consider the following statements about the meridians on Earth. *(Chap 2, Class-VI, New NCERT)*

1. The Prime Meridian converges with all other meridians at North Pole and South Pole.
2. A meridian runs along East-West directions along the equator.
3. The 180° meridian connects North Pole and South Pole.
4. As we move towards higher latitudes, the distance between two meridians increases.

Which of the statement(s) given above is/are correct?

(a) 2 and 3 (b) 1 and 3
(c) 1, 2, and 3 (d) All of these

↗ *Ans. (b)*

Exp. Statements (1) and (3) are correct about the meridians on Earth as the Prime Meridian also converges at North Pole and South Pole. The Prime Meridian value is 0° longitude and from it we count 180° Eastward as well as 180° Westward.

The Prime Meridian and 180° meridian divide the Earth into two equal halves, the Eastern Hemisphere and the Western Hemisphere and like other meridians. This 180° meridian connects North Pole and South Pole.

Statements (2) and (4) are incorrect as a meridian runs along North-South direction and towards the higher latitudes, the distance between two meridians decreases.

50. Which of the following statements about the longitudes on Earth is correct?

(Chap 2, Class-VI, New NCERT)

(a) The distance between longitudes is constant from equator to poles.
(b) All the longitudes are parallel to each other.
(c) All the longitudes converge at poles.
(d) Longitudes divide the Earth into Northern and Southern Hemispheres.

↗ *Ans. (c)*

Exp. Statement (c) is correct about the longitudes on Earth as the meridians or longitudes are semicircles and the distance between them decreases steadily pole wards until it becomes zero at the poles, where all the meridians meet.

51. Consider the following Assertion (A) and Reason (R) and choose the correct code.

(Chap 2, Class-VI, New NCERT)

Assertion (A) All the places located on the East of prime meridian will be 2.5 hours ahead of the time at London.

Reason (R) All the places on a given meridian will have same local time.

Codes

(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

↗ *Ans. (d)*

Exp. Assertion (A) is false, but the Reason (R) is true.

The Earth rotates from West to East, those places East of Greenwich will be ahead of Greenwich time and those to the West will be behind it. The rate of difference can be calculated as follows : The Earth rotates 360° in about 24 hours, which means 15° an hour or 1° in four minutes.

Thus, when it is 12 noon at Greenwich, the time at 15° east of Greenwich will be $15 \times 4 = 60$ minutes, i.e., 1 hour ahead of Greenwich (London) time, which means

1 p.m. A local time is a time calculated on the basis of a specific meridian passing through a particular place, though the place may be included in some other time zones.

52. Consider the following statements about the longitudes and latitudes. ***(Chap 2, Class-VI, New NCERT)***

1. All the longitudes are parallel to the equator.
2. All the latitudes converge at the poles.
3. Distance between longitudes decreases from equator to the poles.
4. All the longitudes are of same length.

Which of the statement(s) given above are correct?

(a) 1, 2 and 3 (b) 2 and 4
(c) 3 and 4 (d) All of these

↗ *Ans. (c)*

Exp. Statements (3) and (4) are correct about the longitudes and latitudes as longitudes are semicircles and the distance between them decreases steadily pole wards until it becomes zero at the poles, where all the meridians meet. All the longitudes are of same length. Each line of longitude equals to half of the circumference of the Earth because each extends from the North Pole to South Pole.

Statements (1) and (2) are incorrect because all the latitudes are parallel to the equator and all the longitudes converge at the poles.

53. Which of the following statements about the longitudes and latitudes is/ are correct?

(Chap 2, Class-VI, New NCERT)

1. To find the location of a place on Earth, both the latitude and longitude of a place must be known.
2. Distance between meridians is measured in 'degrees of longitudes'.
3. Each degree of longitude is divided into minutes and seconds.

Codes

(a) Only 1 (b) 2 and 3 (c) Only 2 (d) All of these

↗ *Ans. (d)*

Exp. All of the statements are correct about the longitudes and latitudes. To find the location of a place on Earth, both the latitude and longitude of a place must be known. This latitudes and longitudes help us to fix the position of a place. The distance between them is measured in 'degrees of longitude'. Each degree is further divided into minutes, and minutes into seconds.

54. Which among the following statements about the Standard Time and meridians is/are correct?

(Chap 2, Class-VI, New NCERT)

(a) Places located on different meridians will have different time.
(b) The local time at Greenwich is considered as reference time for the whole world.
(c) Places on the East of Greenwich are ahead of Greenwich Time .
(d) All of the above

↗ *Ans. (d)*

Exp. All the statements about the Standard Time and Meridians are correct because since the Earth rotates from West to East, the places East of Greenwich are ahead of Greenwich Mean Time (GMT) and those to the West are behind it. Areas on the East of the Prime Meridian are ahead of areas on the West. Each place crosses the Sun at different times. So, the time of sunrise also differs from place to place.

As the reference for GMT, the Prime Meridian at Greenwich therefore became the centre of world time and the basis for the global system of time zones.

55. Which of the following statements about time zones on Earth is incorrect?

(Chap 2, Class-VI, New NCERT)

(a) The Earth has been divided into 24 time zones.
(b) Countries with a wider longitudinal extent have more time zones.
(c) Each time zone covers 30° longitude.
(d) Local time of a place depends upon its longitudinal value.

↗ *Ans. (c)*

Exp. Statement (c) is incorrect about the time zones on Earth because the Earth rotates 360° in about 24 hours, which means 15° an hour or 1° in four minutes. Thus, each time zone covers 15° of longitude.

56. Which of the following statements about the parallel of latitudes are correct?

(Chap 3, Class-VI, Old NCERT)

1. The length of parallels decreases as away from the equator.
2. The Tropic of Cancer is the largest parallel of latitude.
3. Latitudinal value of a place is used to determine the local time.

Codes

(a) 1 and 2 (b) 2 and 3
(c) 1 and 3 (d) None of these

↗ *Ans. (d)*

Exp. None of the statements is correct about the parallel of latitudes. The parallels of latitudes are always parallel to the equator, so the length of parallels does not decrease as away from the equator. The equator is the largest parallel of latitude. Longitudinal value of a place is used to determine the local time.

04

Geomorphology

New NCERT Class VII (Inside Our Earth), **Old NCERT Class VIII** (Inside the Earth), **Old NCERT Class IX** (Our Environment), **New/Old NCERT Class XI** (Interior of the Earth), **New NCERT Class XI** (Land forms and their Evolution, Distribution of Continents and Oceans, Geomorphic Processes)

Earth's Internal Structure

1. Which of the following statement(s) is/are incorrect about the Earth's interior?

(Chap 2, Class-VII, New NCERT) (IAS Pre 2018)

(a) The depth of the crust of Earth varies over oceans and continents.
(b) The central core of Earth has the highest. temperature and pressure among all the layers.
(c) The mantle is located between crust and core.
(d) None of the above

↗ *Ans. (d)*

Exp. None of the statement is incorrect about the Earth's interior. Our Earth is made up of several concentric layers with one inside another. These layers are three in number– crust, mantle and core. The uppermost layer over the Earth's surface is called the crust. It is about 35 km thick on the continental masses and only 5 km thick on the ocean floor. Hence, the depth of the crust of Earth varies over oceans and continents.

The mantle extends up to the depth of 2900 km and lies between the crust and the core.

The core is the innermost layer with a radius of 3,500 km. With every 1 km depth, temperature inside the Earth increased by 25°C. Due to this increase, the central core has the highest temperature among all layers. Even minerals (iron and nickel) inside the core are found in a molten state.

2. Which of the following constituents form the continental crust of Earth?

(Chap 2, Class-VII, New NCERT)

1. Silica
2. Magnesium
3. Aluminium
4. Iron

Codes

(a) 1 and 4 (b) 2, 3 and 4
(c) 1 and 3 (d) All of these

↗ *Ans. (c)*

Exp. Silica and Aluminium (SiAl) form the continental crust of the Earth. Continental crust is located in the uppermost layer over the Earth's surface.

The oceanic crust mainly consists of silica and magnesium (SiMa).

The inner core of the Earth consists of nickel and iron (NiFe). Thus aluminium and iron are not constituent element of continental crust.

3. Consider the following statements.

(Chap 2, Class-VIII, Old NCERT)

1. According to current technological developments, Scientists have been able to drill upto 13 km inside Earth.
2. The interior structure and composition of Earth has been determined by using direct sample collected from all layers of Earth.
3. Study of seismic waves and volcanic activities can be useful in determining interior structure of Earth.

Which of the statement(s) given above is/are correct?

(a) 1 and 3 (b) 1 and 2
(c) 2 and 3 (d) All of these

↗ *Ans. (a)*

Exp. Statements (1) and (3) are correct. The Earth's radius is 6,370 km. According to current technological developments, scientists have been able to drill upto 13 km inside Earth. Study of seismic waves and

volcanic activities can be useful in determining interior structure of Earth.

Statement (2) is not correct as it is not possible to collect direct sample from all layers of the Earth because no one can reach the centre of Earth.

4. Consider the following Assertion (A) and Reason (R) and choose the correct code.

(Chap 2, Class-VIII, Old NCERT)

Assertion (A) The continental crust of Earth is less denser and more thicker than the oceanic crust.

Reason (R) The continental crust is made up of basaltic rocks.

Codes

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true, but R is false.

(d) A is false, but R is true.

↗ *Ans. (c)*

Exp. The Assertion (A) is true but the Reason (R) is false. The continental crust of Earth is less denser and more thicker than the oceanic crust. Oceanic crust has density of about 2.9-3 grams/ cubic centimetre, whereas the density of the continental crust is about 2.7 grams/cubic centimetre.

On the other hand, continental crust is thicker than the oceanic crust as the mean thickness of oceanic crust is 5 km, whereas the continental is around 30 km.

Also, the continental crust is not made up of basaltic rocks. It is mostly composed of different types of granites.

5. The Mohorovich discontinuity separates, which of the following layers of interior Earth?

(a) Mantle and inner core *(Chap 2, Class-VIII, Old NCERT)*

(b) Outer core and mantle

(c) Crust and mantle

(d) Oceanic crust and continental crust

↗ *Ans. (c)*

Exp. The Mohorovich discontinuity or Moho discontinuity separates the crust and mantle. There are five discontinuities inside the Earth, which are as follows

Conrad Discontinuity It is transition zone between SiAl and SiMa.

Mohorovich Discontinuity It is transition zone between the crust and the mantle.

Repiti Discontinuity It is transition zone between outer mantle and inner mantle.

Gutenberg Discontinuity It is transition zone between mantle and core.

Lehman Discontinuity It is transition zone between outer core and inner core.

6. Which of the statements given below is/are correct? *(Chap 2, Class-VIII, Old NCERT)*

(a) The inner core of Earth is composed of iron and nickel.

(b) The inner core of Earth is in solid state.

(c) Inner core of Earth has more depth than the outer core.

(d) All of the above

↗ *Ans. (d)*

Exp. All the given statements are correct.

The core is the innermost portion of the Earth. It has been divided into two concentric layers, i.e., Outer core and Inner core.

The outer core is in liquid state while the inner core is in solid state.

The inner core is sometimes referred to as the 'Nife' layer because it composed of iron and nickel. The depth of the core is from 2900 km to 6378 km where inner core of the Earth has more depth than the outer core.

7. Temperature and density inside the Earth is highest in the core and yet the inner core is in solid state. Which of following is most appropriate explanation of this phenomenon?

(Chap 3, Class-XI, Old/New NCERT)

(a) Radioactive decay of rocks in inner core.

(b) Increasing velocity of P waves inside inner core.

(c) Increasing pressure inside inner core due to overlying rock layers.

(d) Presence of igneous rocks in inner core.

↗ *Ans. (c)*

Exp. Statement (c) is the most appropriate explanation of the phenomenon mentioned in the question.

Temperature and density inside the Earth is highest in the core and yet the inner core is in solid state. The outer core is a liquid because the high temperatures melt the iron-nickel alloy at the outer core but very high pressure from the weight of rocks lying above the inner core makes it solid.

8. Consider the following statements.

(Chap 3, Class-XI, New NCERT)

1. The asthenosphere is the major source of magma on the Earth's surface.
2. The core of the Earth is also known as the SiMa layer.

Which of the statement(s) given above is/are correct?

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) None of these

↗ *Ans. (a)*

Exp. Statement (1) is correct as the asthenosphere is the zone of the Earth, which lies beneath the lithosphere. The depth of this layer ranges from 100 to 700 km. It is a source of magma on the Earth's surface, which comes out as a form of lava during volcanic eruption.

Statement (2) is incorrect because the core is known as NiFe (Nickel and Ferrous) layer.

9. Which of the following statements is correct about the lithosphere? *(Chap 2, Class-VIII, Old NCERT)*

1. It consists of crust and upper mantle.
2. It is in melted state.
3. It is floating over the asthenosphere.
4. Its thickness is over 100 km.

Codes

(a) 1, 2 and 4
(b) 2, 3 and 4
(c) 1, 3 and 4
(d) 1, 2 and 3

↗ *Ans. (c)*

Exp. Statements (1), (3) and (4) are correct about lithosphere as is the solid crust or the hard top layer of the Earth, which floats over asthenosphere. Thickness of lithosphere is over 100 km. It includes the crust and the uppermost mantle. Lithosphere is also responsible to support the tectonic plates and the entire Earth crust lying above the fluidic asthenosphere underneath.

Statement (2) is incorrect as lithosphere is the solid crust or the hard top layer of the Earth.

10. Which of the following statements about the movement of seismic waves inside the Earth is correct? *(Chap 3, Class-XI, Old/New NCERT)*

(a) 'S' waves do not travel after the mantle core boundary at 2900 km.
(b) The velocity of P waves declines after the mantle-core boundary.
(c) The velocity of P waves declines further in the inner core.
(d) Both 'a' and 'b'

↗ *Ans. (d)*

Exp. Both the statements (a) and (b) are correct about the movement of seismic waves inside the Earth. The velocity of waves changes as they travel through materials with different densities.

'S' wave can only travel through solid materials. So, 'S' wave cannot pass through outer core because the outer core is in a liquid form.

That is why S waves do not travel after the mantle core boundary at 2900 km.

The velocity of P wave declines after the mantle core boundary due to the different depth of materials from the mantle and core and outer core is in liquid form so, the density of outer core is less than the mantle.

Statement (c) is incorrect because the velocity of P wave gets increased in the inner core because of increase density.

11. Which of the following statements is correct about seismic shadow zone? *(Chap 3, Class-XI, New NCERT)*

1. The shadow zone of P waves is larger than that of S waves.
2. P waves do not occur in a zone of 105° to 145°.

Codes

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (b)*

Exp. Statement (2) is correct about seismic shadow zone because it was observed that seismographs located within 105° from the epicentre, recorded the arrival of both P and S waves. However, the seismographs located beyond 145° from epicentre, recorded the arrival of only P-waves.

Thus, a zone between 105° and 145° from epicentre was identified as the shadow zone for both the types of waves.

Statement (1) is incorrect because the entire zone beyond 105° does not receive any S-waves.

Thus, the shadow zone of S wave is much larger than that of the P waves.

12. Which of the following statements is/are correct about pressure and density inside the Earth? *(Chap 3, Class-XI, Old NCERT)*

1. The rate of increase in temperature from the surface to the depth of the Earth is constant.
2. The central core of Earth has the highest density among all the layers.

Codes

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

↗ *Ans. (a)*

Exp. Statement (1) is incorrect about pressure and density inside the Earth as the temperature from the surface to the depth of the Earth is not constant. The inner core have the highest temperature and density among all the layers.

Density is used to rank the layers of the Earth's interior. The solid metal inner core is densest layer, the mantle is intermediately dense, and the lithosphere particularly the continental lithosphere, is the least dense layer.

13. Match the following lists correctly and choose the correct code. *(Chap 3, Class-XI, Old NCERT)*

List I (Layer of Earth)	List II (% of volume)
A. Crust	1. 15 %
B. Mantle	2. 1 %
C. Core	3. 84 %

Codes

	A	B	C		A	B	C
(a)	1	2	3	(b)	1	3	2
(c)	2	3	1	(d)	3	2	1

↗ *Ans. (c)*

Exp. The correct matching is A-2, B-3, C-1.

The crust forms only 1% of the volume of the Earth and is a very thin hard top layer of the Earth.

84% of the volume of the Earth is formed by mantle, which is divided into two parts i.e., upper mantle and lower mantle.

Core accounts for 15% of the Earth's volume, which is the innermost layer of the Earth. It is also divided into two parts i.e., Outer core and Inner core.

14. Which of the following sources are used by scientists to study the interior of Earth? *(Chap 3, Class-XI, New NCERT)*

1. Samples of Earth's core
2. Gold Mines
3. Volcanic Magma
4. Meteors
5. Gravity Anomalies

Codes

(a) 1, 2, 3 and 4 (b) 2, 3, 4 and 5
(c) 1, 3, 4 and 5 (d) 2, 4 and 5

↗ *Ans. (b)*

Exp. Gold mines, volcanic magma, meteors, gravity anomalies, are used by scientists to study the interior of Earth.

Gold Mines Through the mining activity, it is known that temperature and pressure increase with the increasing distance from the surface towards the interior in deeper depths.

Volcanic Magma During volcanic eruption, the molten material (magma) is thrown onto the surface of the Earth. This magma becomes an invaluable tool for laboratory analysis.

Meteors They are solid bodies developed out of materials similar to, our planet.

Gravity Anomalies They give us information about the distribution of mass of the material in the crust of the Earth. Gravity anomalies are caused due to unusual concentrations of mass in a region.

15. Which of the following statements is incorrect about the distribution of material inside the Earth? *(Chap 3, Class-XI, New NCERT)*

(a) There is even distribution of mass material inside the Earth.
(b) The crust of Earth consists of magnetic materials.
(c) Gravity Anomaly gives a clear picture of distribution of mass inside Earth.
(d) None of the above

↗ *Ans. (a)*

Exp. Statement (a) is incorrect about the distribution of material inside the Earth because scientists have estimated that the values of temperature, pressure and the distribution of mass is uneven at different depths inside the Earth. Magnetic surveys provide information about the distribution of magnetic materials in the crust and thus, provide information about the distribution of materials in this part.

16. Consider the following statements about the earthquake shadow zone. *(Chap 3, Class-XI, New NCERT) (CGPSC Pre 2020)*

1. The shadow zone of one earthquake is totally different from the shadow zone of another earthquake.
2. Seismometres record both 'P' and 'S' waves at any distance out of 105° from earthquake's epicentre.

Which of the statement(s) given above is/are incorrect?

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) None of these

↗ *Ans. (b)*

Exp. Statement (2) is incorrect about the earthquake shadow zone. Seismometres record both 'P' and 'S' waves at any distance within 105° from earthquake's epicentre. Earthquake waves get recorded in seismographs. However, there exist some specific areas where the waves are not recorded, such a zone is called the 'Shadow Zone'. The study of different events reveals that for each earthquake, there exists an altogether different shadow zone.