

DIRECTORATE OF EDUCATION

Govt. of NCT, Delhi

**SUPPORT MATERIAL
2025-2026**

GEOGRAPHY

Class:XI

Under the Guidance of

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सचिव (शिक्षा)

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MESSAGE

The Directorate of Education remains steadfast in its vision to achieve excellence in the academic domain and its commitment to develop meaningful, engaging, and child-friendly learning content.

Each year, the Directorate carefully reviews and updates the Support Material to ensure alignment with the latest CBSE guidelines and emerging academic developments.

The Support Material provides comprehensive academic support through well-structured practice questions and exercises that strengthen conceptual understanding and exam readiness and aims to nurture students' critical thinking, analytical abilities, and problem-solving skills. Through such sustained efforts, the Directorate of Education continues to guide students towards academic excellence and holistic growth.

This Support Material is intended to bridge classroom learning and examination preparation, enabling students to consolidate knowledge through systematic practice. It has been thoughtfully designed for students, with the belief that its effective use will strengthen their understanding and support them in achieving their learning goals with confidence.

I appreciate the dedication and collaborative effort of all those involved in the development of this material and extends my best wishes to all students—may this Support Material serve as an essential academic aid, enhancing students' confidence and preparedness for examinations.

Best wishes.


(Pandurang K. Pole)

VEDITHA REDDY, IAS
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MESSAGE

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dated - 09/05/25

Education is the cornerstone of a progressive society, and providing students with the right learning resources is essential for their academic and personal growth. Keeping this in mind, the Directorate of Education, GNCT of Delhi, develops comprehensive Support Material every year for various subjects of Classes IX to XII.

The support material serves as an additional study resource to supplement textbooks by offering clear and easy-to-understand explanations of complex topics. Our dedicated team of expert faculty members has meticulously reviewed and updated this material, aligning it with the latest CBSE syllabus, question paper patterns and assessment guidelines. Our effort is to simplify difficult concepts and make them more accessible to students, helping them save time and effort with ready references for effective preparation.

As Ruskin Bond beautifully said, "Education must inspire the spirit of inquiry, creativity and Joy." True learning goes beyond memorization-it encourages curiosity, fosters creativity, and makes the learning process meaningful and enjoyable.

In alignment with the vision of NEP 2020, the CBSE framework now places emphasis on competency-based assessments for 50% of the evaluation, highlighting the need for students to develop critical thinking and problem-solving skills. The Support Material is designed to help students analyse concepts deeply, think innovatively, and apply their knowledge effectively, ensuring they are well-prepared not only for exams but also for real-life challenges.

I appreciate the dedicated efforts of the entire team of subject experts in developing this valuable learning resource. I am confident that both teachers and students will make the best use of these materials to enhance learning and academic success.

Wishing all students great success in their exams and a bright, fulfilling future ahead.


(VEDITHA REDDY, IAS)

Dr. RITA SHARMA
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MESSAGE

"Children are not things to be molded, but are people to be unfolded." -
Jess Lair

In line with this insightful quote, the Directorate of Education, Delhi, has always made persistent efforts to nurture and unfold the inherent potential within each student. This support material is a testimony to this commitment.

The support material serves as a comprehensive tool to facilitate a deeper understanding of the curriculum. It is crafted to help students not only grasp essential concepts but also apply them effectively in their examinations. We believe that the thoughtful and intelligent utilization of these resources will significantly enhance the learning experience and academic performance of our students.

Our expert faculty members have dedicated themselves to the support material to reflect the latest CBSE guidelines and changes. This continuous effort aims to empower students with innovative approaches, fostering their problem-solving skills and critical thinking abilities.

I extend my heartfelt congratulations to the entire team for their invaluable contribution to creating a highly beneficial and practical support material. Their commitment to excellence ensures that our students are well-prepared to meet the challenges of the CBSE examinations and beyond.

Wishing you all success and fulfilment in your educational journey.

(Dr. Rita Sharma)

DIRECTORATE OF EDUCATION

Govt. of NCT, Delhi

**SUPPORT MATERIAL
(2025-2026)**

GEOGRAPHY

Class : XI

NOT FOR SALE

PUBLISHED BY : DELHI BUREAU OF TEXT BOOKS

भारत का संविधान उद्देशिका

हम, भारत के लोग, भारत को एक ¹[संपूर्ण प्रभुत्व-संपन्न समाजवादी पंथनिरपेक्ष लोकतंत्रात्मक गणराज्य] बनाने के लिए, तथा उसके समस्त नागरिकों को :

सामाजिक, आर्थिक और राजनैतिक न्याय,
विचार, अभिव्यक्ति, विश्वास, धर्म
और उपासना की स्वतंत्रता,
प्रतिष्ठा और अवसर की समता
प्राप्त कराने के लिए,
तथा उन सब में

व्यक्ति की गरिमा और ²[राष्ट्र की एकता
और अखंडता] सुनिश्चित करने वाली बंधुता
बढ़ाने के लिए

दृढ़संकल्प होकर अपनी इस संविधान सभा में आज तारीख
26 नवंबर, 1949 ई. को एतद्वारा इस संविधान को
अंगीकृत, अधिनियमित और आत्मार्पित करते हैं।

1. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977 से) "प्रभुत्व-संपन्न लोकतंत्रात्मक गणराज्य" के स्थान पर प्रतिस्थापित।
2. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977 से) "राष्ट्र की एकता" के स्थान पर प्रतिस्थापित।

THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a ¹**[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC]** and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the ²[unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949 do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)

भारत का संविधान

भाग 4क

नागरिकों के मूल कर्तव्य

अनुच्छेद 51 क

मूल कर्तव्य - भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह -

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वज और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की संप्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण बनाए रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभावों से परे हो, ऐसी प्रथाओं का त्याग करे जो महिलाओं के सम्मान के विरुद्ध हों;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की, जिसके अंतर्गत वन, झील, नदी और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणिमात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत् प्रयास करे, जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई ऊँचाइयों को छू सके; और
- (ट) यदि माता-पिता या संरक्षक हैं, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य को शिक्षा के अवसर प्रदान करे।



Constitution of India

Part IV A (Article 51 A)

Fundamental Duties

It shall be the duty of every citizen of India —

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- * (k) who is a parent or guardian, to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

Note: The Article 51A containing Fundamental Duties was inserted by the Constitution (42nd Amendment) Act, 1976 (with effect from 3 January 1977).

* (k) was inserted by the Constitution (86th Amendment) Act, 2002 (with effect from 1 April 2010).



**Directorate of Education
GNCT of Delhi**

**Support Material 2025-26
Class-Xi
Subject - Geography**

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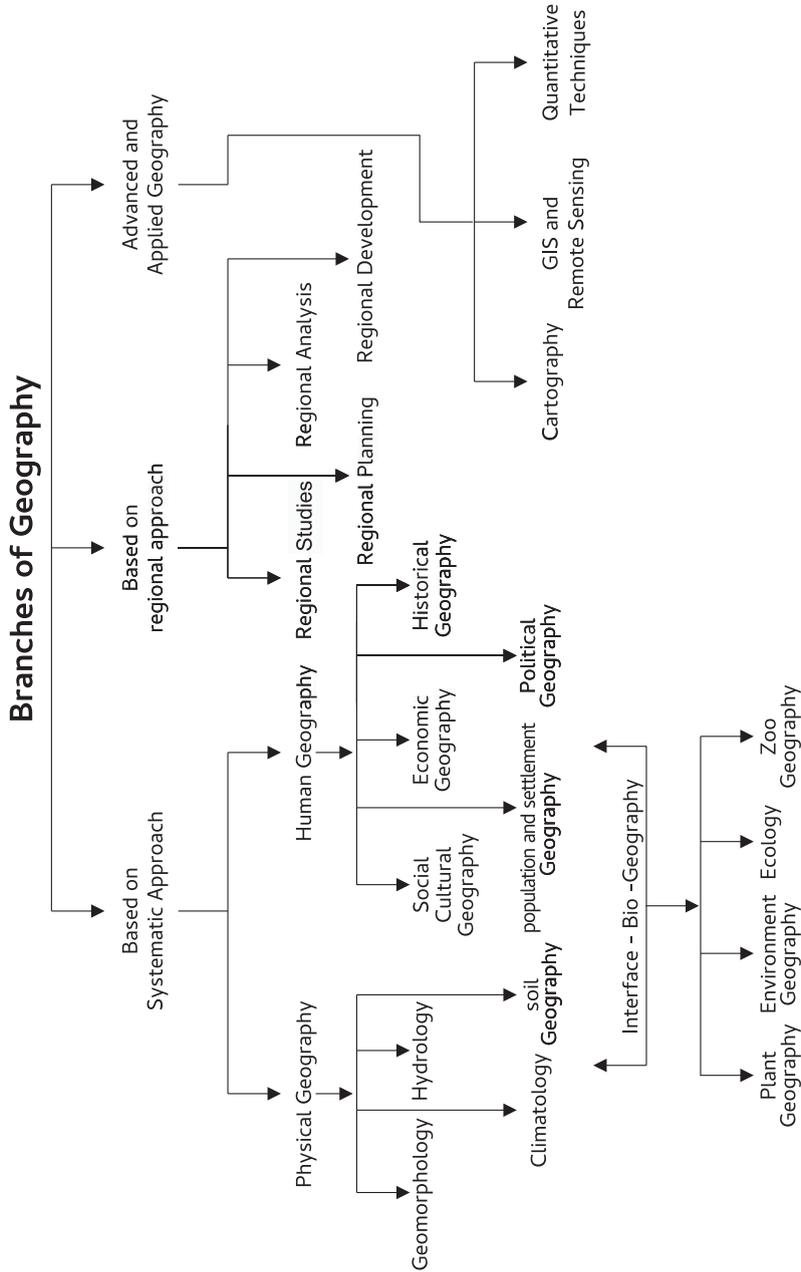
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Chapter – 1

Geography As A Discipline



Multiple choice Questions:-

Q.1 Which of the following geographer propogated/ introduced systematic approach to Study Geography?

- a) Karl Ritter
- b) Vidal-de-la-Blache
- c) Ratzel
- d) Alexander Von Humboldt

Ans. d) Alexander von Humboldt

Q.2 Which branch of geography has developed with the interface of human geography and physical geography?

- a) Regional analysis
- b) Plant geography
- c) Geomorphology
- d) Biogeography

Ans. d) Biogeography

Q.3 Which of the following Greek Scholors coined the term Geography?

- a) Ptolemy
- b) strabo,
- c) Eratosthenes
- d) Herodotus

Ans. c) Eratosthenes

Q.4 Which of the following is not correctly matched?

- | A | B |
|-----------------------|-----------------------------|
| a) Geomorphology | Study of landforms |
| b) Cartography | Art & Science of map-making |
| c) Economic Geography | studies spatial dynamics |

Ans. c) Studies Spatial dynamics.

Q.5 If a student is studying population distribution at the world, level then he/she is following which approach to study geography?

- a) systematic Approach
- b) Regional Approach
- c) Quantitative Approach
- d) Positive Approach

Ans. Systematic approach.

Q.6 Which of the following statement is not true with respect to regional geography?

- a) This approach was given by Karl Ritter.
- b) In this approach the world is divided into regions at different hierarchical levels.
- c) This approach is the same as that of general geography.
- d) In this approach a region is studied in a holistic manner.

Ans. c) This approach is the same as that of general geography.

Q.7 Geography studies the differences of phenomena usually related in different parts of the earth's surface. According to whom geography studies areal differentiation of the earth's surface?"

- a) Vidal-de la Blache
- b) Hettner
- c) Isaiah Bowman
- d) Haggett

Ans. b) Hettner.

Q.8 GPS stands for: -

- a) Global Positioning system,
- b) Google Posthoning. system
- c) Geographical Positioning system
- d) Geo-Informatics system.

Ans. a) Global Positioning system.

Q9. Make correct pairs from the following columns.

- | A | B |
|----------------|-------------------------|
| 1. Meteorology | A. Population Geography |
| 2. Demography | B. Soil Geography |
| 3. Sociology | C. Climatology. |
| 4. Pedology | D. Social Geography |

Ans. 1(C), 2(A), 3(D), 4(B).

Short Answer Questions

Q.1. Geography is the art and science of describing the Earth Justify.

Ans. Geography as a discipline is concerned with three sets of questions:-

1. some questions are concerned with the identification of the patterns of natural and cultural features as found over the surface of the earth. These are the questions about what?
2. where? few questions are related to the distribution, of the natural and human features over the Surface of the earth. These are questions about where.
3. But these two questions do not make geography a scientific discipline It is the third question, which is related to the explanation of the casual relationships between features and the processes that makes geography a scientific subject. These are questions about why? Thus geography is both art and science of studying earth.

Q.2. Explain different branches of Physical geography.

Ans. It has four sub-branches which are as follows:

- **Geomorphology:** It is concerned with the study of landforms, their evolution and related processes.
- **Climatology:** It is concerned with the study of structure of atmosphere and elements of weather and climates and climatic types and regions.
- **Hydrology:** It studies the realm of water over the surface of the earth including oceans, lakes, rivers and other water bodies and its effect on different life forms including human life and their activities.
- **Soil Geography:** Studies the study of the processes of soil formation, soil types, their fertility status, distribution and use.

Q.3. What is studied under Human Geography?

Ans. Following are examples of sub-disciplinary studies in Human Geography:

- **Social/Cultural Geography:** It is concerned with the study of society and its spatial dynamics as well as the cultural elements contributed by the society.
- **Population Geography:** It studies population growth, distribution, density, sex ratio, migration and occupational structure, etc.
- **Settlement Geography:** It studies the characteristics of rural and urban settlements.
- **Economic Geography:** It studies economic activities of the people including agriculture, industry, tourism, trade, and transport, infrastructure and services, etc.
- **Historical Geography:** It studies the historical processes through which the space gets organized. In other words, it studies historical experiences a region has undergone.
- **Political Geography:** It studies the impact of political events and studies boundaries, space relations between neighboring political units, delimitation of constituencies, election scenario and develops theoretical framework to understand the political behavior of the population.

Q.4. Geography is an integrated discipline: Justify

Ans. Geography, is a discipline of synthesis. It attempts spatial synthesis. That means that geography “as a subject studies all natural, human phenomenas with reference to space.

- Geography recognizes that the world is a system of interdependencies.
- Geography as an integrating discipline has interface with numerous natural and social sciences.
- Geography attempts to comprehend the associations of phenomena as related in sections of reality in a holistic way.

Q.5. Highlight the importance of Physical Geography?

Ans. Physical geography includes study of Lithosphere, Atmosphere, Hydrosphere and Biosphere. Each element is very important for human beings..

- The study of physical geography is emerging as a discipline of evaluating and managing natural resources. In order to achieve this objective, it is essential to understand the intricate relationship between physical environment and human beings.
- Physical environment provides resources, and human beings utilize these resources and ensure their economic and cultural development. For example land provide base for agriculture, industries and settlements.
- Accelerated pace of resource utilization with the help of modern technology has created ecological imbalance in the world. Therefore, a better understanding of physical environment is essential in study of Geography.

Q.6. With the help of technology relationship between physical environment and man has evolved through time. Explain

OR

Evaluate the changing relationship between man and nature.

Ans. The geographical phenomena, both the physical and human, are not static but highly dynamic. They change over times as a result of the interactive processes between ever changing earth and untiring and ever-active human beings.

1. Primitive human societies were directly dependent on their immediate environment. Human beings have come to terms with nature through adaptation and modification.
2. Present societies have modified their natural environment by inventing and using technology and thus, have expanded the horizon of their operation by appropriate utilization of the resources provided by the nature.

3. With the gradual development of technology, human beings were able to loosen the shackles of their physical environment. Technology helped in reducing the harshness of labour, increased labour efficiency and provided leisure to human beings to attend to the higher needs of life.

Q.7. Geography plays an important role for a country. How?

Ans. Geography is important for a country because:

- Geography studies the variations and association of the features on the earth surface e.g. cropping pattern differs from place to place and it is due to difference in the climate, soil, demand, transport facility and capacity of the farmer.
- Geography also studies the cause and effect relationships.
- The interaction between man and nature is highly dynamic and not static; so it is also called as the study of the relation between unstable earth and unresting man.
- It helps to predict weather and understand climate change.
- It helps in handling natural calamities.
- It provides a visual look of earth through GIS, Computer cartography, and Remote sensing.

Q.8. Differentiate between Systematic approach and Regional approach.

Ans. Main differences between systematic and regional approach are summarized below:

Systematic Approach	Regional Approach
1. The systematic geography approach was introduced by Alexander Von Humboldt, a German geographer.	Regional geography approach was developed by another German geographer and a contemporary of Humboldt, Karl Ritter.
2. In systematic approach, a phenomenon is studied world over as a whole, and then the identification of typologies or spatial patterns is done.	In the regional approach, the world is divided into regions at different hierarchical levels and then all the geographical phenomena in a particular region are studied. These regions may be natural, political or designated.
3. For example, study of natural vegetation at world level.	For example, when we study about population, area, wildlife, climate etc. in detail about Kerala.

Q.9. Differentiate between Physical geography and Biogeography.

Ans. The main differences between Physical geography and Biogeography are given below:

Physical Geography	Biogeography
1. It has developed as a subject concerned with study of evaluation and management of natural resources.	It has emerged as a result of the interface between physical geography and human geography.
2. It has many branches: Geomorphology, climatology, hydrology and soil geography	It has many branches: Plant Geography. Zoo Geography and Ecology & environment geography
3. It studies abiotic elements of the earth.	It studies biotic elements of the earth.

Q.10. How geography is concerned with other social sciences? Explain with suitable examples.

Ans. One of the branch of geography, human geography, is closely linked with all the social science. history, economics, political science, sociology, demography etc. in following way:

- (1) History is linked with geography as the subject areas of both the subjects are connected with space and time.
- (2) The core concern of political science is territory, people and sovereignty while political geography is also interested in the study of the state as a spatial unit.
- (3) Economics deals with basic attributes of economy which has spatial aspects and hence connected with economic geography.

With above examples it can be clearly established that geography has strong interface with natural and social sciences.

Long Answer Questions

Q.11. “History of a place is influenced by its geography”. Elaborate the statement with suitable examples.

Ans. Geography of a place influences history of that area to a extend. For e.g

1. Himalayas has acted as a barrier and protection for India for a long time but passes provided route to the invaders.
2. Long coastline encouraged Europeans to find sea routes and make settlements or trade towns in coastal locations.
3. Areas surrounded by mountains or water bodies provide natural protection in case of attack or war.

Q.12. “Physical geography is more close to natural sciences.” Comment.

Ans. Yes, this is true that physical geography is closer to natural sciences as it shares its content with physics, biology, chemistry, botany, maths etc. For example:

1. Geographer use knowledge of maths for various calculations and data interpretation.
2. The cartography and quantitative techniques require proficiency in mathematics.
3. To understand basic physical laws of climate knowledge of physics is needed.
4. Geomorphology derives it's base from geology.
5. Bio geography as much in common with botany, zoology etc.

For video -@coreacadmunitdocdelhicl7787classXI

Chapter – 2

The Origin and Evolution of the Earth

Multiple choice Questions

Q.1 Which of the following theories / hypothesis is a modern theory, explaining formation of the Universe -

- a) Nebular Hypothesis,
- b) Binary theories
- c) Wandering star Hypothesis
- d) Expanding Universe hypothesis.

Ans. d) Expanding Universe hypothesis is also known as the Big Bang theory.

Q.2. Arrange the following in a logical and meaningful sequence (largest to smallest) Galaxy, Planets, Universe, The Moon Natural satellite)

Ans. Universe, Galaxy, Planets, The Moon

Q.3. Make correct pairs from the following columns and choose a correct option:-

Column A

- (i) Differentiation
- (ii) The big splat
- (iii) Degassing
- (iv) Planetesimal

Column B

- a) A large number of celestial bodies
- b) Explains formation of Moon
- c) Process through which the earth forming Material got separated into different layers.
- d) process through which the gases were out poured from interior of the Earth.

1. i(b), ii(d), iii(a), iv(c)
2. i(c), ii(b), iii(d), iv(a)
3. i(a), ii(b), iii(c), iv(d)
4. i(d), ii(c), iii(b), iv(a)

Ans. 2. i(c), ii(b), iii(d), iv(a)

Q.4. Which alternative theory to the Big bang theory argues against the idea of expanding Universe?

- a) Nebular Hypothesis,
- b) steady state concept.
- c) Binary theory
- d) The Big Splat

Ans. b) Steady state concept by Hoyle.

Q.5. What was suggested by Sir George Darwin about the formation of the Moon?

- a) Formation of moon is an outcome of a giant impact.
- b) Earth collided with Mars due to which moon was formed
- c) Moon was formed with the accumulation of hydrogen gas.
- d) The earth and the moon formed a single rapidly rotating dumb-bell-shaped body which “Eventually broke.

Ans. d) The earth and the moon formed a single rapidly rotating dumb-bell-shaped body which “Eventually broke.

Q.6. Which of the following gases were composed of Primordial atmosphere?

- a) Nitrogen and oxygen,
- b) Hydrogen and helium
- c) Carbon dioxide and oxygen
- d) Neon and Argon

Ans. b) Hydrogen and helium

Q.7. Make correct pairs from the following two columns and mask the correct.

- | | |
|---|---------------------------------------|
| 1. The small rocky particles found between the orbits of mars and Jupiter | A. A very large cloud of hydrogen gas |
| 2. Nebula | B. Gas Gaint Plant |
| 3. Mercury | C. Asteroids |
| 4. Saturn | D. Inner Planets |

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

Ans. (d) 1-C, 2-A, 3-D, 4-B

Q.8. What does Expansion of universe stands for?

- a) Increase in the number of stars.
- b) Increase in space between the galaxies.
- c) Discovery of new celestial bodies.
- d) Increase in the speed of rotation of planets

Ans. b) Increase in space between the galaxies.

Q.9. Which of the following is not true with regard to big bang theory?

- A) There was a tiny ball with infinite temperature and infinite density.
- B) Explosion led to huge expansion which continues even to the present day.
- C) This expansion continues till present day, and at a very rapid speed matter is expanding now.
- D) Within few minutes of explosion first atom was formed.

Ans. C) This expansion continues till present day, and at a very rapid speed matter is expanding now.

Q.10. Which is the deepest drilled part on Earth?

Ans. The Kola Superdeep Borehole (depth of 12 Kms) in Arctic Ocean.

Short answer questions

Q.1. Define a light year.

Ans. A light year is the distance that light travels in one year. A light year is equal to the number of kilometers traveled by light per second. It is a measure of distance and not of time. Light travels at a speed of 300,000 km/second. Therefore, the distance the light will travel in one year is taken to be one light year.

Q.2. Define degassing.

Ans. During the cooling of the earth, gases and water vapor were released from the interior cold earth. This process through which the gases were out poured from the earth's interior is called degassing. This process started evolution of the present atmosphere.

Q.3. Before 2006 solar system consisted of 9 planets. But today we have only 8 planets. Why?

Ans. Till recently i.e. 2006, Pluto was also considered a planet. However, in a meeting of International Astronomical Union, a decision was taken to group Pluto as a dwarf planet, with other recently discovered celestial objects, due to its smaller size.

Q.4. What are the differences between terrestrial planet and Jovian planets?

Ans. The main differences between the two are summarized below:

- 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 a quite distant location.
- The solar wind was most intense nearer the sun, so it blew off lots of gas and dust from the terrestrial planets. The solar winds were not all that intense to cause similar removal of gases from the Jovian planets.

- Terrestrial planets are more earth like as they are made up of rocks and metals. Jovian or gas giant planets are more like Jupiter as most of them are much larger than the terrestrial planet. Terrestrial planets have relatively high density whereas Jovian planets have thick atmosphere.
- The terrestrial planets are smaller and their lower gravity could not hold the escaping gases. Jovian planets are bigger and have high gravity.

Q.5. Explain different phases of evolution of planets.

Ans. Evolution of planets can be understood in three stages:

1. **Formation of Disc:** The stars are localised lumps of gas within a nebula. The gravitational force within the lumps leads to the formation of a core to the gas cloud and a huge rotating disc of gas and dust develops around the gas core.
2. **Formation of Planetesimal:** In the next stage, 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 collision develop into what is called planetesimal.
3. **Formation of Planets:** In the final stage, these large number of small planetesimal accrete to form fewer large bodies in the form of planets.

Q.6. What is the “big splat theory”, related with the formation of moon?

Ans. According to this theory, A large size body like Mars collided with the earth and that portion was separated from the earth. The same portion became moon which revolves around the earth.

Long answer Questions

Q.1. How did the earth's interior become layered?

Ans. The planet earth initially was a barren, rocky arid hot object with a thin atmosphere of hydrogen and helium.

- Due to gradual increase in density the temperature inside has 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. During the formation of moon, the earth was further heated up.
- It is through the process of differentiation that the earth forming material got separated into different layers.

Q.2. Differentiate between inner planets and outer planets.

Ans. The difference between inner planets and outer planets.

Inner Planets	Outer Planets
1. Mercury, Venus, Earth and Mars are called Inner Planets	1. Jupiter, Saturn, Uranus, Neptune are Outer Planets
2. They are found between belt of asteroids and the sun	2. They are found after the belt of asteroids
3. They are also called terrestrial planets i.e earth like.	3. They are called Jovian planets which means Jupiter-like
4. Smaller in size	4. Larger in size
5. High density	5. Low density
6. Solid rocky state	6. Gaseous state
7. They have high temperature	7. They are comparatively colder

Q.3. What are different stages of development of atmosphere?

Ans. There are three stages in the evolution of the present atmosphere.

1. In the early stage the atmosphere with hydrogen and helium is supposed to have been stripped off as a result of intense solar winds.
2. In the second stage during the cooling of the earth, gases and water vapour were released from the interior solid earth. Continuous volcanic eruptions contributed water vapour and gases to the atmosphere. As the earth cooled, the water vapour released started getting condensed.
3. Third stage was the stage of release of oxygen through the process of photosynthesis.

Q.4. Explain” Expanding universe theory”. Who propounded this theory?

Ans. The Big Bang Theory, also called as expanding universe hypothesis. Edwin Hubble in 1920 provided the evidence that the universe is expanding. The galaxies move farther as the time passes. It says that galaxies are moving away from each other. The universe appears to be growing larger.

The Big Bang Theory:

1. In the beginning, all matter forming the universe existed in one place in the form of a ‘tiny ball’ with an unimaginably small volume, infinite temperature and infinite density.
2. At the Big bang “tiny ball” exploded violently. This led to a huge expansion. This continues even to the present day. There was particularly rapid expansion within fractions of a second after the bang. Thereafter, the expansion has slowed down within first three minutes from the Big Bang event, the first atom began to form.
3. Within 300,000 years from the big Bang, temperature dropped to 4,500k and gave rise to atomic matter. The universe became transparent.

Q.5. Explain the collision and accretion hypothesis associated with the evolution of the earth.

Or

Explain the earliest theory associated with the origin of the earth.

Ans. Below are the early theories that tries to explain origin of the earth.

1. Collision Hypothesis: It was given by Sir James and Harold Jeffrey.

- According to this theory, a large nebula 'wandering in the space came very close to smaller nebula (Sun) and its huge upsurge of matter on the surface of smaller nebula. The matter was detached from the smaller nebula and on cooling condensed into planets.

2. Accretion Hypothesis: It was given by Schmidt and Carl Weizascar.

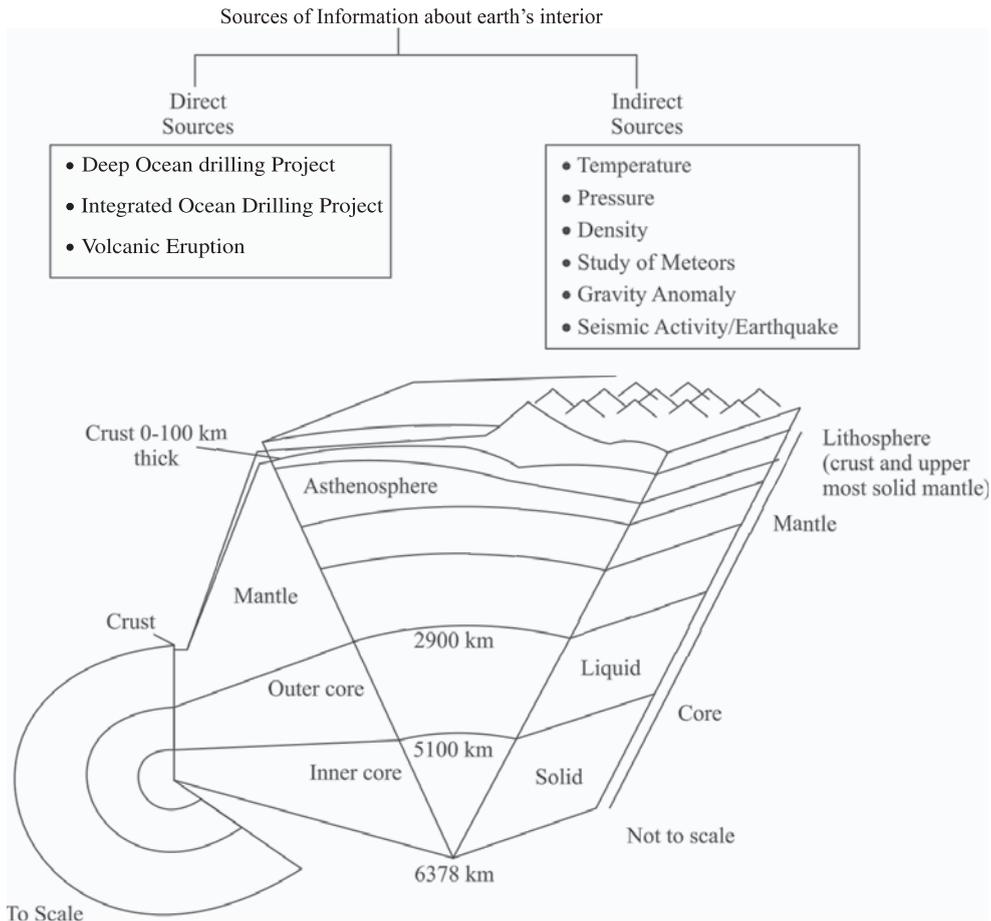
- According to them, solar system started out as a cloud of gas and dust drifting in a space called nebula. This gaseous cloud exploded violently to form supernova. The explosion left the vast spinning cloud and gases and thus to collapse under its own gravity and develop as denser core.
- The denser core became larger and hotter and began to bulge. Later it developed into protostar which finally evolved as infant Sun.
- Away from its central surface, particles of dust began to clump together and converted into first smaller fragments of rocks and then becoming larger bodies which were called planetesimal which collided with one another to form rocky inner planets like Mercury, Venus, Earth and Mars and the remaining were outer planets.

3. The Nebular hypothesis -

This is the idea that a spinning cloud of dust made of mostly light elements called a nebula, flattened into a disk a of dense rotating gas surrounding young newly formed star, and became a solar system consisting of a star with orbiting planets.

Chapter – 3

The Interior of the Earth



Multiple Choice Questions

Q.1. Which one of the following describes the lithosphere?

- (a) Upper and middle mantle (b) Crust and Upper mantle
(c) crust and core (d) Mantle and core

Ans. (b) Crust and Upper mantle

Q.2. Fast moving seismic waves which are first to arrive at the surface :

- (a) Alpha Waves (b) S-Waves
(c) P-Waves (d) Beta Waves.

Ans. (c) P-Waves

Q.3. The upper portion of mantle is called:

- (a) Asthenosphere (b) Crust
(c) Lithosphere (d) Fossil Sphere.

Ans. (a) Asthenosphere

Q.4. What is the approximate depth of mantle?

- (a) 2400 km (b) 2900 km
(c) 3200 km (d) 3500 km.

Ans. (b) 2900 km

Q.5. Core is made of which metals?

- (a) Iron and Magnesium (b) Iron and Silicon
(c) Nickel and Iron (d) Nickel and Silicon

Ans. (d) Nickel and Iron

Q.6. Density at the core is the highest because-

- (a) Due to heavy pressure of overlying rocks
- (b) Due to heavy temperature of overlying rocks
- (c) Due to heavy density of overlying rocks
- (d) Due to the depth.

Ans. (a) Due to heavy pressure of overlying rocks

Q.7. Which seismic waves cannot travel through liquid matter?

- (a) Primary Waves
- (b) Secondary waves
- (c) Surface waves
- (d) All of the above

Ans. (b) Secondary waves

Q.8. Which region of the earth have the greatest density?

- (a) The crust
- (b) The mantle
- (c) outer core
- (d) Inner core

Ans. (d) Inner core

Q.9. Match the following and choose the correct option:

Intrusive structure

Definition

- | | |
|--------------|---|
| 1. Lapolith | A. Horizontal Intrusions |
| 2. Dykes | B. Saucer shaped, concave structures |
| 3. Phacofith | C. Vertical intrusions |
| 4. Sill | D. Wavy mass found in folded structures |

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

Ans. (d) 1-B, 2-C, 3-D, 4-A

Short Answer Questions

Q.1. Name and define the two types of forces that shapes the earth's surface.

Ans. There are two types of forces that brings changes in the earth's surface:-

1. **Exogenic forces:** These are the forces on the surface of the earth like weathering, erosion, mining, etc.
2. **Endogenic forces:** These are the forces working under the surface of the earth, like volcanic eruption, earthquake and any other seismic activity, tectonic plates.

Q.2. What do you mean by gravitational anomaly?

Ans. The difference in gravitation at different places is called gravity anomaly. Gravity anomaly gives us information about the distribution of mass of the material present beneath the earth's surface.

Q.3. What is an earthquake? Define focus/ hypocentre and epicenter. How do we measure magnitude and intensity of an earthquake

Ans. An earthquake is sudden shaking of the earth's surface. It's a natural event. It is caused due to release of energy, which generates waves that travel in all directions.

- **Focus/Hypocentre:** The point where the energy is released is called the focus/ Hypocentre of an earthquake.
- **Epicentre:** The point on earth's surface where the effects of an earthquake is felt most strongly as it lies directly above the focus of an earthquake.

Measurement of earthquake:

- **Magnitude:** It is measured by Richter Scale. That is the amount of energy released is measured seismograph.
- **Intensity:** It is measured by Mercalli Scale. i-e the effect impact of an earthquake.

Q.4. Give a brief description of caldera.

Ans. Caldera's are the most explosive type of earth's volcanoes. They are usually so explosive that when they erupt they tend to collapse on themselves rather than building any tall structure. The collapsed depressions are called calderas.

Their explosiveness indicates that the magma chamber supplying the lava is not only huge but is also in close vicinity.

The hills produced by them are similar to the one made by composite volcanoes.

Q.5. Differentiate between Primary waves and Secondary waves

P-Waves	S-Waves
1. These are called primary waves.	These are called secondary waves.
2. These seismic waves move faster and are the first to arrive at the surface.	These arrive at surface with some time lag.
3. The shadow zone of P-wave is much smaller than that of the S-waves.	The shadow zone of S-wave is much larger than that of the P-waves.
4. They travel through gaseous, liquid and solid materials.	S-waves can travel only through solid materials.

Q.6. What are the effects of an earthquake?

Ans. The following are the immediate hazardous effects of an earthquake

- **Loss of life and property:** Ground shaking takes place in earthquake. It leads to loss of life and property. Many buildings fall off and take life of people who were in and around the building.

- **Change in land:** Due to earthquake we can see many changes in the land. Many areas get converted into pits. There are cracks in mountains.
- **Causes landslides and tsunami:** It leads to landslides in mountainous regions and tsunami in oceans. It may further aggravate the calamity and loss of human life and property.
- **Destruction of means of communication and transportation:** It leads to destruction of means of communication and transportation. It creates problem in sending help and relief to victims.
- Other effects: Earthquake may also lead to breaking or damage of dams which may lead to floods.

Q.7. Differentiate between Lacoliths and Batholiths .

Ans. Lacoliths: These are large dome-shaped intrusive bodies with a level base and are connected by a pipe-like conduit from below. It resembles the surface volcanic domes of composite volcano. These are located at deeper depths.

Batholiths: A large body of magmatic material that cools in the deeper depth of the crust develops in the form of large domes. Batholiths are the cooled portion of magma chambers.

Q.8. What are the major materials that comes out during volcanic eruption?

Ans. The material that reaches the ground includes lava flows, pyroclastic debris, volcanic bombs, ash and dust and gases such as nitrogen compounds, sulphur compounds and minor amounts of chlorine, hydrogen and argon.

Q.9. Differentiate between Magma and Lava?

Ans.

Lava	Magma
1. Magma that reach the earth's surface is called Lava.	1. Magma is molten rocks that lies beneath the earth's Surface.
2. The temperature of Lava is slightly colder.	2. Temperature of magma comparatively high.
3. Does not contain gas.	3. contains gas.

Long Answer Questions

Q.1. Explain different types of earthquakes.

Ans. The various types of earthquakes are:-

- **Tectonic earthquake:** The most common ones are the tectonic earthquakes. These are caused due to sliding of rocks along a fault plane.
- **Volcanic earthquake:** A special class of tectonic earthquake is sometimes recognised as volcanic earthquake. However, these are confined to areas of active volcanoes.
- **Collapse earthquake:** In the areas of intense mining activity, sometimes the roofs of underground mines collapse causing minor tremors. These are called collapse earthquakes.
- **Explosion earthquake:** Ground shaking may also occur due to the explosion of chemical or nuclear devices. Such tremors are called explosion earthquakes.
- **Reservoir Induced earthquake:** The earthquakes that occur in the areas of large reservoirs are referred to as reservoir induced earthquakes. Sometimes earthquakes also occur in mines due to mining processes. Sometimes earthquakes also occur below the oceans on surface of the ocean causing tsunamis.

Q.2. What are different sources of information about the interior of the earth? Explain with examples.

Ans. Some of the direct sources are-

- **Mining:** It is a process by which commercially valuable mineral resources are extracted from Earth's surface which includes precious stones, rocks and solid fuels.
- **Drilling:** Scientists world over are working on two major projects such as "Deep Ocean Drilling projects" and "integrated ocean drilling project". The deepest drill at Kola, in Arctic Ocean, has so far reached a depth of 12 km.
- **Volcanic Eruptions:** When molten material is thrown onto the surface of the earth during volcanic eruption it becomes available for analysis.

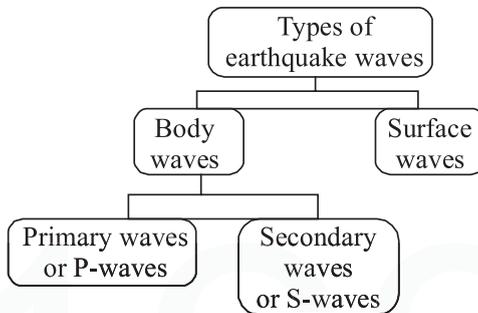
Some of the indirect sources of information:

- Knowing the total thickness of the earth, scientists have estimated the values of temperature, pressure and the density of materials at different depths.
- **Meteors:** The material and the structure observed in the meteors are similar to that of the earth. They are solid bodies developed out of materials same as, or similar to, our planet. Hence, this becomes yet another source of information about the interior of the earth.
- **Gravitation:** The gravitation force (g) is not the same at different latitudes on the surface. It is greater near the poles and less at the equator. This is because of the distance from the centre at the equator being greater than that at the poles. The gravity values also differ according to the mass of material.

- **Magnetic surveys:** Magnetic surveys also provide information about the distribution of magnetic materials in the crustal portion, and thus, provide information about the distribution of materials in this part.
- **Earthquake:** Through Earthquake waves we get better insight about the earth's interior.

Q.3. Explain different types of earthquake waves.

Ans.



Earthquake waves are basically of two types body waves and surface waves.

- **Body waves:** These are generated due to the release of energy at the focus. They move in all directions travelling through the body of the earth. These are less destructive than the surface waves.
- **Surface waves:** The body waves interact with the surface rocks and generate new set of waves called surface waves. These waves move along the surface. The surface waves are the last to report on seismograph. These waves are more destructive. They cause displacement of rocks, and hence, the collapse of structures occurs.

There are two types of body waves. They are called P- and S-waves,

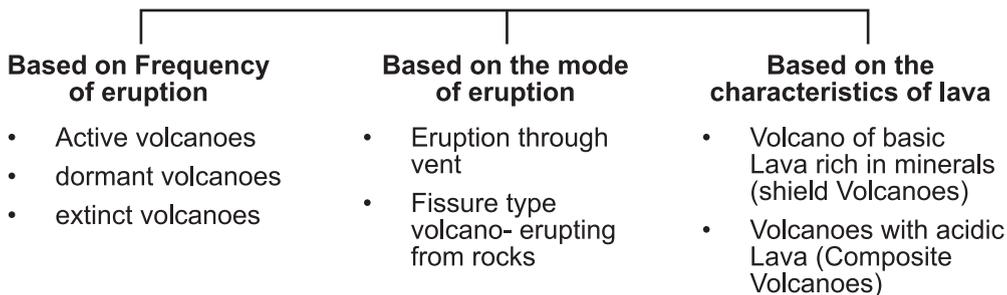
- **P-waves:** They move faster and are the first to arrive at the surface. These are also called primary waves'. The P-waves are similar to sound waves. They travel through gaseous, liquid and solid materials.
- **S-Waves:** S-waves arrive at the surface with some time lag. These are called secondary waves. An important fact about S-waves is that they can travel only through solid materials. This characteristic of the S-waves is quite important. It has helped scientists to understand the structure of the interior of the earth. Reflection causes waves to rebound whereas refraction makes waves move in different directions. The variations in the direction of waves are inferred with the help of their record on seismograph.

Q.4. Explain what are shadow zone .

Ans. Earthquake waves get recorded in seismographs located at far off locations. However, there exist some specific areas where the waves are not reported. 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.

Q.5. Describe the major type of volcanoes found in the world.

Ans. "Volcanoes are classified on the basis of nature of eruption and the form developed at the surface. Major types of volcanoes are as follows:



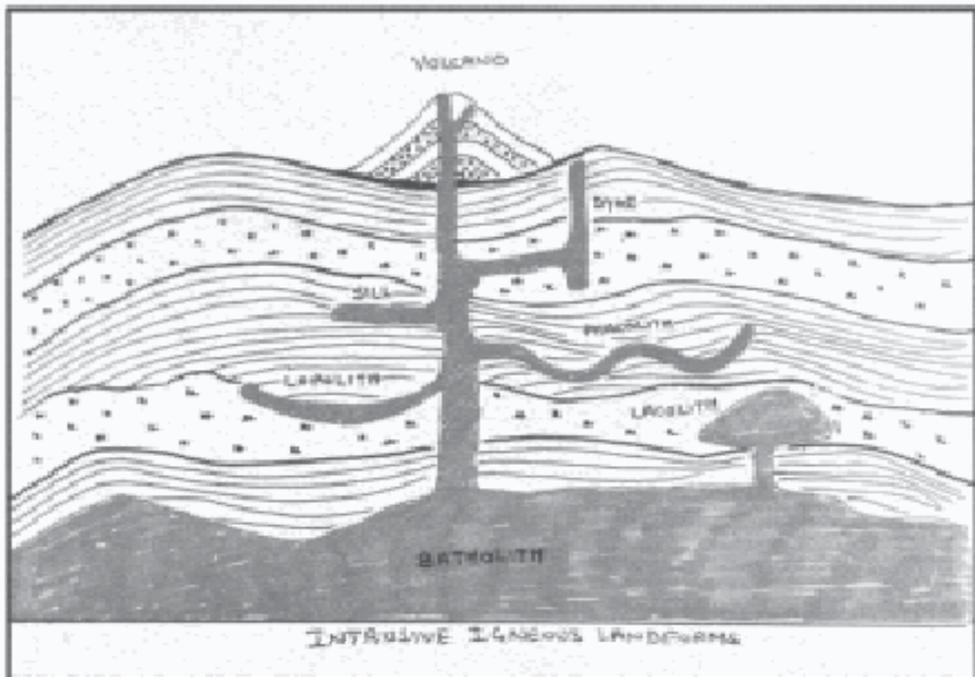
1. **Shield Volcanoes:** the shield volcanoes are the largest of all the volcanoes on the earth. These volcanoes are mostly made up of basalt, a type of lava that is very fluid when erupted. For this reason, these volcanoes are not steep.
2. **Composite Volcanoes:** These volcanoes are characterised by eruptions of cooler and more viscous lavas than basalt. These volcanoes often result in explosive eruptions. Along with lava, large quantities of pyroclastic material and ashes find their way to the ground. This material accumulates in the vicinity of the vent openings leading to formation of layers, and this makes the mounts appear as composite volcanoes.
3. **Caldera:** These are the most explosive of the earth's volcanoes. They are usually so explosive that when they erupt they tend to collapse on themselves rather than building any tall structure. The collapsed depressions are called calderas.
4. **Flood Basalt Provinces:** These volcanoes outpour highly fluid lava that flows for long distances. Some parts of the world are covered by thousands of sq. km of thick basalt lava flows. There can be a series of flows with some flows attaining thickness of more than 50 m. The Deccan Traps from India, are a much larger flood basalt province.
5. **Mid-Ocean Ridge Volcanoes:** These volcanoes occur in the oceanic areas. There is a system of mid-ocean ridges more than 70,000 km long that stretches through all the ocean basins. The central portion of this ridge experiences frequent eruptions.

Q.6. What are plutonic rocks? Describe major intrusive structures with diagram.

Ans. The cooling of magma may take place either on reaching the surface or also while the lava is still in the crustal portion. When

cooling of magma takes place below or within crust that forms plutonic rocks. On the basis of shapes intrusive structures can be classified as:

1. **Batholiths:** A large body of magmatic material that cools in the deeper depth of the crust develops in the form of large domes. These are granitic bodies. Batholiths are the cooled portion of magma chambers.
2. **Lacoliths:** These are large dome-shaped intrusive bodies with a level base and connected by a pipe-like conduit from below. It resembles the surface volcanic domes of composite volcano.
3. **Lapolith:** As and when the lava moves upwards, a portion of the same may tend to move in a horizontal direction wherever it finds a weak plane. It may get rested in different forms. In case it develops into a saucer shape, concave to the sky body, it is called lapolith.
4. **Phacolith:** A wavy mass of intrusive rocks, at times, is found at the base of synclines or at the top of anticline in folded igneous country. Such wavy materials have a definite conduit to source beneath in the form of magma chambers (subsequently developed as batholiths). These are called the phacoliths.
5. **Sills:** The near horizontal bodies of the intrusive igneous rocks are called sill or sheet, depending on the thickness of the material. The thinner ones are called sheets while the thick horizontal deposits are called sills.
6. **Dykes:** When the lava makes its way through cracks and the fissures developed in the land, it solidifies almost perpendicular to the ground. These vertical structures are called dyke.



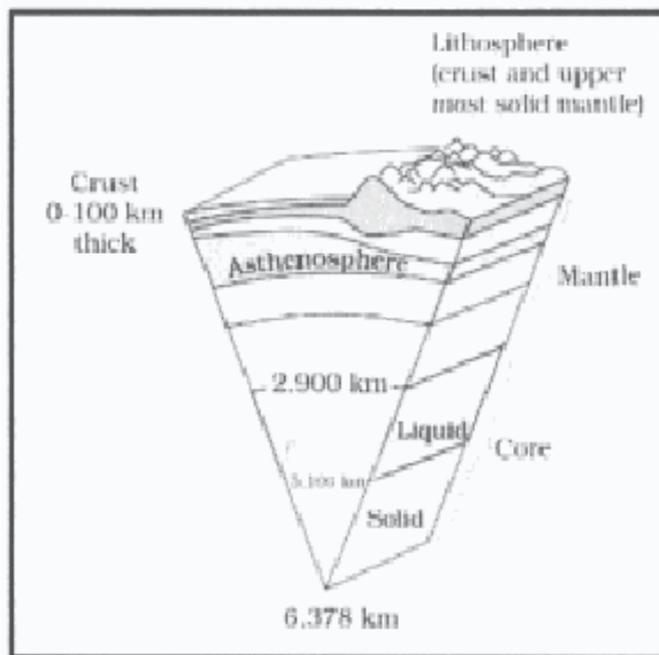
Q.7. Describe the interior structure of the earth with diagram.

Ans. On the basis of direct and indirect evidences earth's interior can be divided into three layers:

1. The Crust: It is the outermost solid part of the earth. The thickness of the crust varies under the oceanic and continental areas. The mean thickness of oceanic crust is 5 km whereas that of the continental is around 30 km. It has very low density and majorly made up of silica and aluminium.
2. The Mantle: The portion of the interior beyond the crust is called the mantle. The mantle extends from Moho's discontinuity to a depth of 2,900 km. The upper portion of the mantle is called asthenosphere. The word astheno means weak. It is considered to be extending upto 400 km. It is the main source of magma that finds its way to the surface during volcanic eruptions. The crust and the uppermost part

of the mantle are called lithosphere. Its thickness ranges from 10-200 km. The lower mantle extends beyond the asthenosphere. It is in solid state.

3. The Core; The innermost layer of earth is called core . The outer core is in liquid state while the inner core is in solid state. The core is made up of very heavy material mostly constituted by nickel and iron. It is sometimes referred to as the nife because of its composition.



Chapter – 4

Distribution of Oceans and Continents

Multiple-Choice Questions

Q.1. Which one of the following term is related to polar fleeing force?

- (a) Revolution of the Earth (b) Gravitation
(c) Rotation of the Earth (d) Tides

Ans. (c) Rotation of the Earth

Q.2. Who were the propounder of plate tectonic theory?

- (a) Arthur Holmes
(b) McKenzie, Parker and Morgan
(c) Admans Heinz
(d) Alfred Wegener.

Ans. (b) McKenzie, Parker and Morgan

Q.3. Tillite is formed due to

- (a) deposits on mountains (b) deposits of volcanoes
(c) deposits of glaciers (d) deposits of gold

Ans. (c) deposits of glacier

Q.4. Pacific Ocean zone is also called:

- (a) Ring of Fire (b) Ball of Fire
(c) Fire rain area (d) Volcanic area

Ans. (a) Ring of Fire

Q.5. Which method has facilitated correlating the rock formation from different continents across oceans?

- (a) The radiometric dating methods (b) Carbon 14 method
(c) Radioactive method (d) Fling Method.

Ans. (a) The radiometric dating methods

Q.6. Consider the following statements:

Assertion : Lemurs are found in India, Madagascar and Africa, this led some to consider a contiguous landmass Lemuria linking these three landmasses.

Reason: Continents were joined together and have shifted their place in geological past. Choose the correct option:

- (a) Only A is correct
(b) Both A and R are correct and R explains A
(c) Only R is correct
(d) Both are incorrect

Ans. (b) Both A and R are correct and R explains A

Q.7. Which one of the following is the plate boundary of the Indian plate along the Himalayan Mountains?

- (a) Ocean -continent convergence
(b) Divergent boundary
(c) Transform boundary
(d) Continent convergence

Ans. (d) Continent convergence

Q.8. What was the name given by Alfred Wegener to a large continent surrounded with water?

- (a) Pangaea (b) Panthalassa
(c) Angaraland (d) Gondwanaland.

Ans. (a) Pangaea

Q.9. Which one of the following is not a minor plate?

- (a) Nazca
- (b) Arabia
- (c) Philippines
- (d) Antarctica

Ans. (d) Antarctica

Q.10. What was the name given to massive ocean by Wegener?

- (a) Pangaea
- (b) Panthalassa
- (c) Angara land
- (d) Gondwanaland.

Ans. (b) Panthalassa

Q.11. According to Wegener, Pangaea was divided into two big continents namely:

- (a) Panthalassa and Angara Land
- (b) Lurasia and Gondwanaland
- (c) Livasa and Continent
- (d) Oceans and Continents.

Ans. (b) Lurasia and Gondwanaland.

Q.12. Which of the following statements prove the drifting of the continents as per Alfred Wegener.

1. Coastline of continents across oceans match remarkably
 2. Placer deposits of Ghana coast has source in Brazil
 3. fossils of identical plants and animals are found in different continents.
- (a) Only 1 is correct
 - (b) 1, 2, 3 all are correct
 - (c) Only 1 and 3 are correct
 - (d) 1,2,3 all are incorrect

Ans. (b) 1, 2, 3 all are correct

Q.13. Which is the fastest moving plate?

- (a) Nazca plate (b) Pacific plate
(c) North American plate (d) Australian plate

Ans. (b) Pacific plate is the fastest plate with a rate of movement of over 10cm/year

Source Based Questions

Q.14. A detailed analysis of magnetic properties of the rocks on either sides of the mid-oceanic ridge led Hess (1961) to propose his hypothesis, known as the sea floor spreading". Hess argued that constant eruptions at the crest of oceanic ridges cause the rupture of the oceanic crust and the new lava wedges into it, pushing the oceanic crust on either side. The ocean floor, thus spreads. The younger age of the oceanic crust as well as the fact that the spreading of one ocean does not cause the shrinking of the other, made Hess think about the consumption of the oceanic crust. He further maintained that the ocean floor that gets pushed due to volcanic eruptions at the crest, sinks down at the oceanic trenches and gets consumed.

(A) As the sea floor widen out and get separated from mid- oceanic ridge, it carries a record of

- (a) Magnetic reversal (b) Electric Reversal
(c) Thermal reversal (d) Static

Ans. (a) Magnetic reversal

B) The process by Which magma rises forming new oceanic lithosphere layers is called

- (a) Sea reversal (b) Sea flooring
(c) Sea floor spreading (d) Sea bed spreading

Ans. (c) Sea floor spreading

- (C) The place where sea-floor spreading occurs is termed as
- (a) Ditches (b) Mid- ocean ridges
- (c) Ocean basin (d) Craters

Ans. (b) Mid- ocean ridges

Very Short Answer Questions

Q.1. According to Wegener what are the causes of drifting of continents?

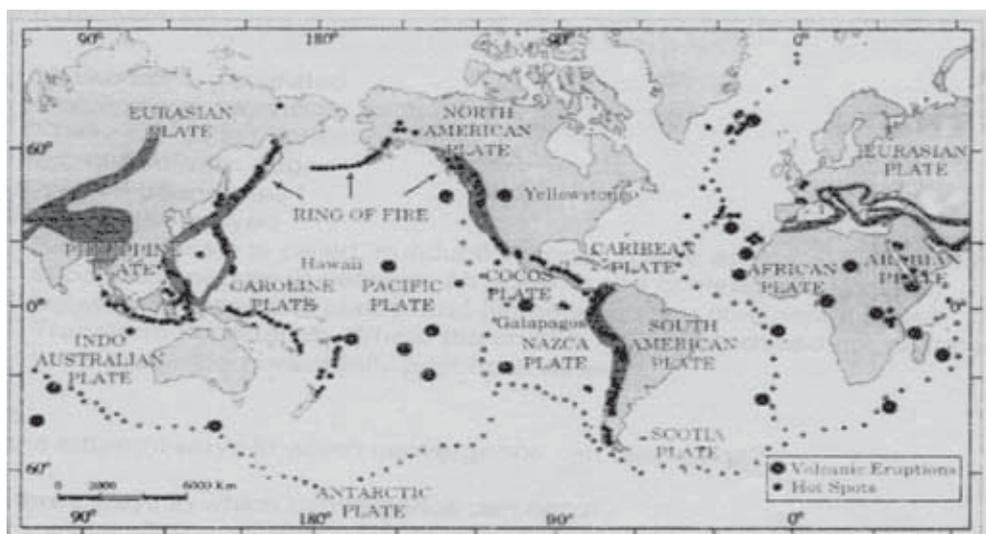
Ans. Two forces were responsible for the drifting of the continents:

- Polar-fleeing force and
- Tidal force.

Q.2. Explain the distribution of earthquake and volcanic plate on the earth,

Ans. There are three major belts as follows:

1. One which stretches along Atlantic Ocean almost parallel to the coastlines. It further extends into the Indian Ocean.
2. Another area of concentration coincides with the Alpine-Himalayan system and the rim of the Pacific Ocean.



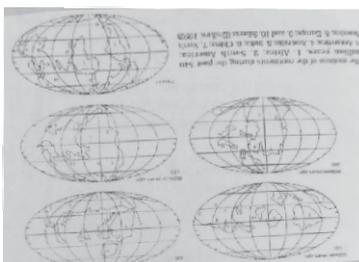
3. The rim of the Pacific is also called ring of fire due to the existence of active volcanoes in this area.

Q.3. Explain the basic concept of continental drift theory.

Ans. Alfred Wegener, a German meteorologist, put forth a comprehensive argument in the form of “the continental drift theory” in 1912.

According to Wegener, all the continents formed a single continental mass and mega ocean surrounded the same. He called the super continent as PANGAEA and mega ocean as PANTHALASSA.

Around 200 million years ago, the super continent, Pangaea, began to split. Pangaea first broke into two large continental masses named as Laurasia and Gondwanaland forming the northern and southern components respectively.



Subsequently, Laurasia and Gondwanaland continued to break into various smaller continents that exist today.

Q.4. Differentiate between divergent and convergent plate boundaries.

Ansr. Divergent boundaries

- New crust is generated
- Plates move away from each other
- These are called spreading sites
- Ex. Mid Atlantic ridge

Convergent boundaries

- Crust is destroyed
- Sinking of plate is called “subduction zone”. There are three ways in which subduction occurs (i) between an oceanic and continental plates; (ii) between two oceanic plates; and (iii) between two continental plates. Zones where earth’s tectonic plate dive back into mantle is called subduction zone

- Transform boundaries: Where the crust is neither produced nor destroyed as the plates slide horizontally past each other.

Q.5. What are the different ways in which convergence can take place?

Ans. There are three ways in which convergence can occur. between an oceanic and continental plate:
between two oceanic plates; and
between two continental plates.

Q.6. What are mid-oceanic ridges?

Ans. Interconnected chain of mountain system within the ocean. It is the longest mountain-chain on the surface of the earth though submerged under the oceanic water. It is characterized by a central rift system at the crest, a fractionated plateau and flank zone all along its length. The rift system at the crest is the zone of intense volcanic activity.

Q7. Convectional current theory has revived continental drift theory. Justify.

Ans. Continental drift theory was strong in terms of the evidences of the drift. But forces responsible for drift could not be well explained and supported by Wegener. It was considered the weakest part of his theory. Scholars considered polar fleeing and tidal force inadequate for the movement thus discarded the theory.

Later, when Arthur Holmes came up with Convectional current theory which states that strong convectional currents are present in the mantle which could even move crustal blocks. This explained force responsible for drifting of the continents. Thus reviving continental drift theory once again.

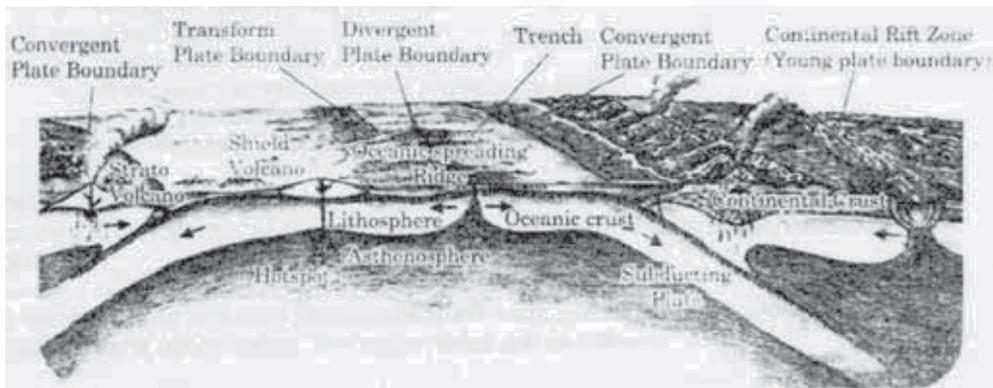
Long answer questions

Q.1. “Oceans are still expanding” In the view of the statement explain the theory of sea floor spreading.

Ans. Hess argued that constant eruptions at the crest of oceanic ridges cause the rupture of the oceanic crust forces and the new lava wedges into it, pushing the oceanic crust on either side. The ocean floor, thus spreads. Two facts made Hess think about the consumption of the oceanic crust.

- The younger age of the oceanic crust
- The spreading of one ocean does not cause the shrinking of the other.

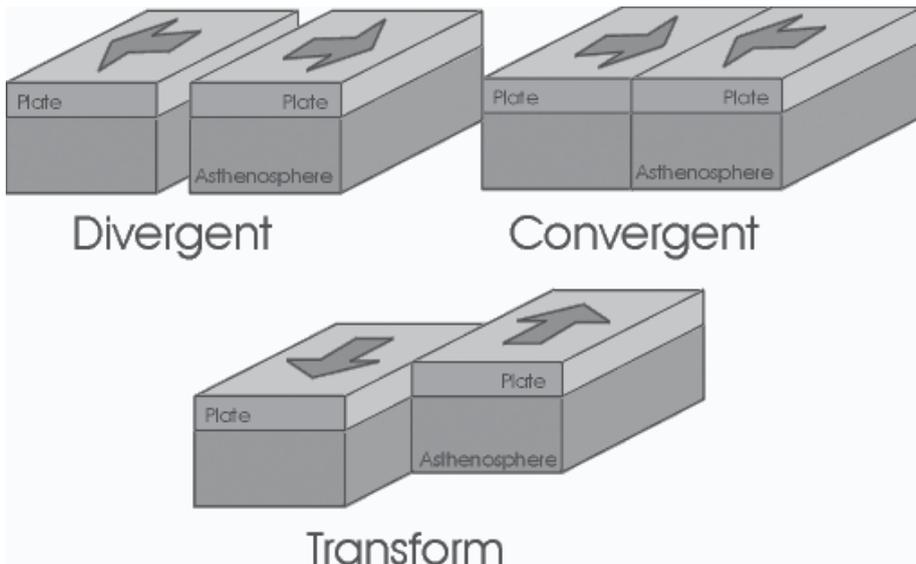
He further maintained that the ocean floor that gets pushed due to volcanic eruptions at the crest sinks down at the oceanic trenches and gets consumed. The basic concept of sea floor spreading has been depicted in the given figure:



Q.2. Discuss different types of boundaries that form as a result of tectonic plates.

Ans. Three types of boundaries are formed as a result of tectonic plates:

- **Convergent Boundaries:** Where the crust is destroyed as one plate dived under another, it is called convergent boundaries.



- **Divergent Boundaries:** Where new crust is generated as the plates pull away from each other, these are called divergent boundaries.
- **Transform Boundaries:** Where the crust is neither produced nor destroyed as the plates slide horizontally past each other.

Q.3. The ocean floor may be segmented into how many divisions based on the depth as well as the forms of relief?

Ans. The ocean floor may be segmented into three major divisions based on the depth as well as the forms of relief. These divisions are:

- (i) Continental margins,
- (ii) Abyssal plains and
- (iii) Mid-oceanic ridges.

1. Continental margins

- Form transitional zone between continental shore and deep sea basins

- They include continental slope , shelf, continental rise and deep oceanic trenches
2. Abyssal Plains
 - Extensive Plains
 - Found between continental margin and mid oceanic ridge
 - Continental sediments get deposited
 3. Mid-Oceanic Ridges
 - Distribution of volcanoes and earthquakes
 - All volcanoes and earthquakes are parallel to the coast
 - This line also co-incides with mid- Atlantic ridge and Alpine Himalayan system
 - Around the Pacific Ocean it is called ring of fire mid oceanic ridges.

Q.4. According to tectonic plates theory in how many plates has the earth been divided?

Ans. The theory of plate tectonics proposes that the earth's lithosphere is divided into seven major and some minor plates. The major plates are as follows:

- Antarctica and the surrounding oceanic plate
- North American plate
- South American plate
- Pacific plate
- India-Australia-New Zealand plate
- Africa with the eastern Atlantic floor plate
- Eurasia and the adjacent oceanic plate.

Some important minor plates are:

- Cocos plate: It is between Central America and Pacific plate
- Nazca plate: It is between South America and Pacific plate
- Arabian plate: It includes mostly the Saudi Arabian landmass
- Philippine plate: It is between the Asiatic and Pacific plate
- Caroline plate: It is between the Philippine and Indian plate (North of New Guinea)
- Fuji plate: It includes North-east of Australia.

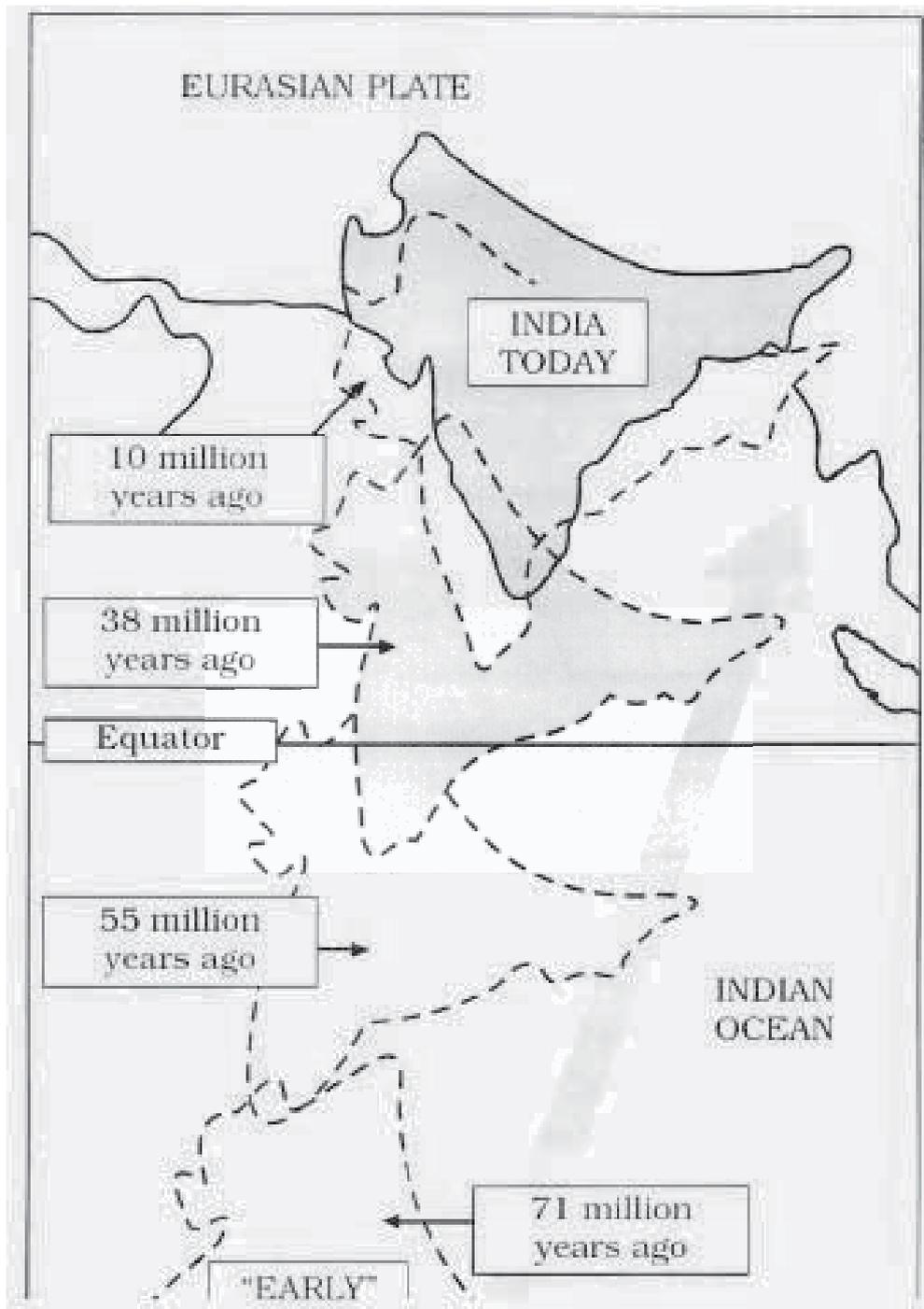
Pacific plate is largely an oceanic plate whereas the Eurasian plate may be called a continental plate. Plates are not static. Plates may converge or diverge. Plates may break as well.

Q.5. Explain the movement of Indian plate.

Or

The movement of Indian tectonic plate is still in continuation. Justify

Ans. The Indian plate includes Peninsular India and the Australian continental portions. The Tethys Sea separated it from the Asian continent till about 225 million years ago. India is supposed to have started her northward journey about 200 million years ago at the time when Pangaea broke. India collided with Asia about 40-50 million years ago causing rapid uplift of the Himalayas. About 140 million years before the present, the subcontinent was located at south at 50°S. latitude.



The two major plates were separated by the Tethys Sea and the Tibetan block was closer to the Asiatic landmass. During the movement of the Indian plate towards the Asiatic plate, a major event that occurred was the outpouring of lava and formation of the Deccan Traps. This started somewhere around 60 million years ago and continued for a long period of time. The subcontinent was still close to the equator. From 40 million years ago and thereafter, the event of formation of the Himalayas took place. Scientists believe that the process is still continuing and the height of the Himalayas is rising even to this date.

Q.6. What information do we get from the mapping of the ocean floor and palaeomagnetic studies of rocks from oceanic regions?

Ans. The mapping of the ocean floor and palaeomagnetic studies of rocks from oceanic regions gave following information:

- Along the mid-oceanic ridges, volcanic eruptions are common and they bring huge amounts of lava to the surface in this area.
- The rocks equidistant on either sides of the crest of mid-oceanic ridges show remarkable similarities in terms of period of formation, chemical compositions: and magnetic properties.
- The ocean crust rocks are much younger than the continental rocks. The age of rocks in the oceanic crust is nowhere more than 200 million years old. Some of the continental rock formations are as old as 3,200 million years.
- The sediments on the ocean floor are unexpectedly very thin. Scientists expected that if the ocean floors were as old as the continent, to have a complete sequence of sediments for a period of much longer duration. However, nowhere was the sediment column found to be older than 200 million years.

- The deep trenches have deep-seated earthquake occurrences while in the mid-oceanic ridge areas, the quake foci have shallow' depths.

Q.7. Give a broad comparative outlook of continental drift theory, sea floor spreading and plate tectonic theory.

Ans. Comparison: continental drift, sea floor spreading and plate-tectonics

	Continental Drift	Sea Floor Spreading	Plate Tectonics
1. Propounder	1. Put forward by Alfred Wegener in 1920s	1. Arthur Holmes explained Convecti-onal Current Theory in the 1930s. Based on convection current theory, Harry Hess explained Sea Floor Spreading in the 1940s	1. In 1967, McKenzie and Parker suggested the theory of plate tectonics. Morgan later outlined the theory in 1968
2. Theory	2. Explains the Movement of Continents only	2. Explains the Movement of Oceanic Plates only plates that include both	2. Explains the Movement of Lithospheric continents and oceans.
3. Forces leading movement	3. Buoyancy, gravity, pole-fleeing force, tidal currents force	3. Convection currents in the mantle drag crustal plates	3. Convection current in the mantle drags crustal plates

4. Evidence	4. Apparent affinity of physical features, botanical evidence, fossil evidence, Tillite deposits, placer deposits, rocks of same age across different continents etc.	4. Ocean bottom relief, Paleomagnetic rocks, distribution of earthquakes and volcanoes etc. and gravitational anomalies at trenches etc.	4. Ocean bottom relief, Paleomagnetic rocks, distribution of earthquakes
5. Criticism	5. Too general with illogical evidence	5. Doesn't explain the movement of continental plates.	
6. Usefulness	6. Helped in the evolution of Convection current theory and seafloor spreading theory	6. Helped in the evolution of plate tectonics theory features.	6. Helped us understand various geographical features.

Q.8. What evidences can be given in support of continental drift theory? Explain.

Ans. Evidences supporting the Continental Drift Theory are discussed below-

1. The matching of Continents (Jig-Saw-Fit)

- The coastlines of South America and Africa fronting each other have a remarkable and unique match.

2. Rocks of the Same Age across the Oceans

- The radiometric dating methods have helped in correlating the formation of rocks present in different continents across the ocean.

- The ancient rocks belts on the coast of Brazil match with those found in Western Africa.

3. Tillite

- It is the sedimentary rock made from glacier deposits.
- The Gondwana system of sediments from India is recognized as having its counterparts in 6 different landmasses in the Southern Hemisphere.

4. Placer Deposits

- The presence of abundant placer deposits of gold along the Ghana coast and the complete lack of its source rocks in the area is a phenomenal fact.
- The gold-bearing veins are present in Brazil and it is evident that the gold deposits of Ghana in Africa are obtained from the Brazil plateau from the time when the two continents were beside each other.

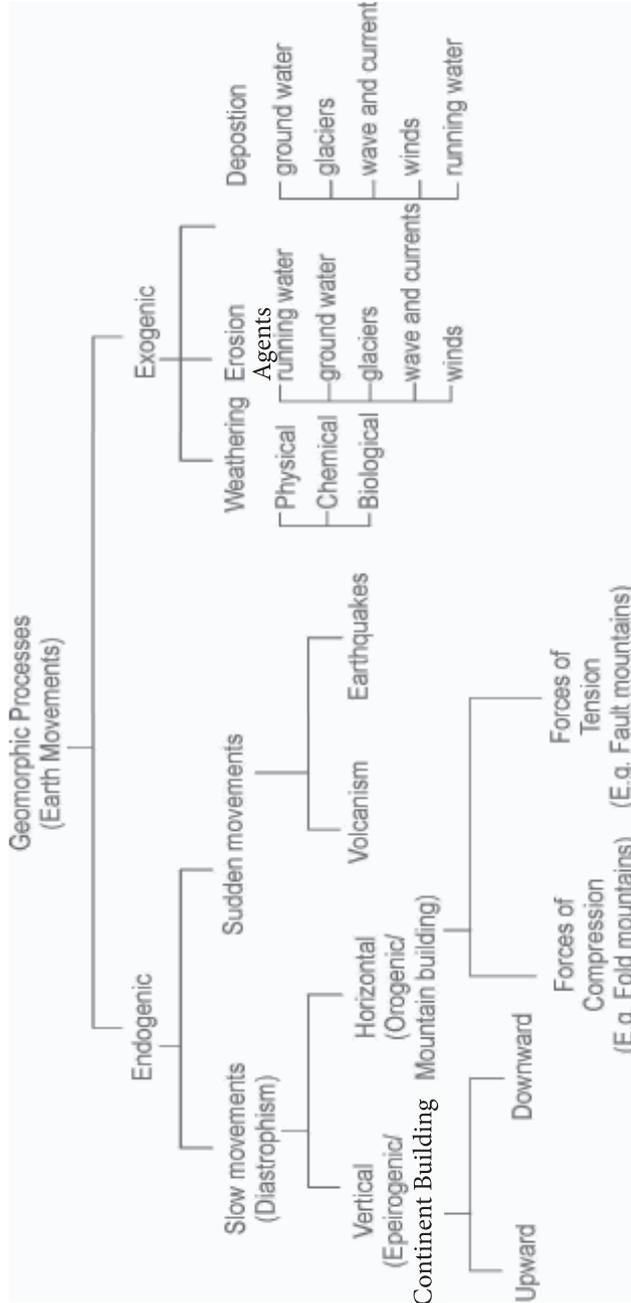
5. Distribution of Fossils

- The interpretations that Lemurs occur in India, Africa, and Madagascar led to the theory of a landmass named “Lemuria” connecting these 3 landmasses.

For video -@coreacadmicunitdocdelhici7787classXI

Chapter – 5

Geomorphic Processes



Multiple-Choice Questions

Q.1. The earth's surface is uneven due to:

- (a) Gravity
- (b) Thermal energy
- (c) Endogenic and exogenic processes
- (d) All of the above

Ans. (c) Due to endogenic and exogenic processes

Q.2. The branch of science which studies about soil in depth is:

- (a) Pedology
- (b) Geology
- (c) Meteorology
- (d) None of these

Ans. (a) Pedology

Q.3. The capacity of rocks to allow water to pass through is called.....

- (a) Porosity/Permeability
- (b) Wedging
- (c) Exfoliation
- (d) Hydration

Ans. (a) Porosity/permeability

Q.4. The force that continuously elevates or builds up parts of the earth's surface is known as:

- (a) Exogenic forces
- (b) Endogenic Forces
- (c) Gradation
- (d) Degradation

Ans. (b) Endogenetic Forces

Q.5. Which type of weathering occurs due to ice within pores and cracks of rocks during repeated cycles of freezing and melting?

- (a) Frost weathering
- (b) Landslides
- (c) Water weathering
- (d) Crystallisation.

Ans. (a) Frost weathering

Q.6. Which of the following is an example of endogenic forces?

- (a) Erosion
- (b) Volcanism
- (c) Weathering
- (d) Deposition

Ans. (b) Volcanism

Q.7. Weathering is an important process for which of the following?

- (a) Formation of clouds
- (b) Formation of soil
- (c) Formation of water
- (d) All of the above

Ans. (b) Formation of soil

Q.8. Where' does oxidation take place?

- (a) Where there is ready access to the atmosphere and oxygenated waters.
- (b) Where there are plants.
- (c) Where there is moisture in air.
- (d) In mountainous regions.

Ans. (a) Where there is ready access to the atmosphere and oxygenated waters.

Q.9. Which of the following process is not associated with physical weathering?

- (a) Frost wedging
- (b) Expansion
- (c) Carbonation
- (d) Thawing

Ans. (c) Carbonation

Q.10. Which of the following factor is not associated with soil formation?

- (a) Parent rock
- (b) Climate
- (c) Time
- (d) Exfoliation

Ans. (d) Exfoliation

Q.11. The main driving force behind mass wasting is:

- (a) Molecular Stress
- (b) Gravitational Force
- (c) Kinetic Energy
- (d) Chemical Action

Ans. (b) Gravitational Force

Q.12. Carbonation is a type of:

- (a) Mechanical Weathering
- (b) Biological Weathering
- (c) Chemical Weathering
- (d) Physical Weathering

Ans. (c) Chemical Weathering

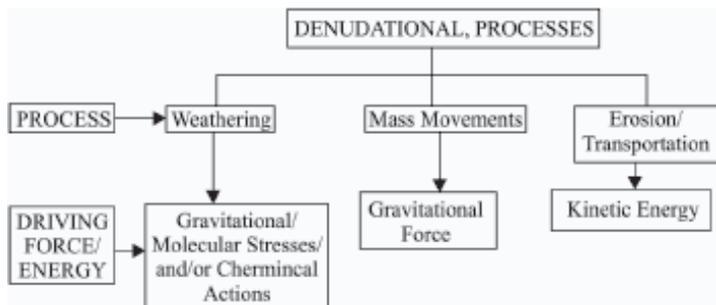
Q.13. Which of the following is a passive agent of soil formation?

- (a) Topography
- (b) Climate
- (c) Biological Activity
- (d) Time

Ans. (a) Topography

SOURCE BASED QUESTION

Q.14.



(A) Denudation process is the sum total of:

- (a) Weathering
- (b) Mass movement
- (c) Erosion or transportation
- (d) All of the above

Ans. (d) All of the above

(B) Which driving force is responsible for mass movement?

- (a) Exogenic Forces
- (b) gravitational Force
- (c) Kinetic energy
- (d) All of the above

Ans. (b) gravitational Force

(C) Denudation process happens in which order?

- (a) Weathering, Erosion, Transportation, Deposition
- (b) Erosion, Weathering, transportation, deposition
- (c) Erosion, Transportation, Weathering, Deposition
- (d) Transportation, Weathering, Erosion, Deposition

Ans. (a) Weathering, Erosion, Transportation, Deposition

Short Answer Type Questions (3 Marks Questions)

Q.1. What is weathering? Explain its three types

Ans. Weathering is defined as mechanical disintegration and chemical decomposition of rocks through the actions of various elements of weather and climate

A group of weathering processes via: solution, carbonation, hydration, oxidation and reduction act on the rocks to decompose, dissolve or reduce them to a fine classic state through chemical reactions by oxygen, surface and/or soil water and other acids.

There are three major groups of weathering processes:

- (i) chemical;
- (ii) physical or mechanical;
- (iii) Biological weathering processes.

Q.2. List the physical forces that affect physical weathering.

Ans. Physical or mechanical weathering processes depend on some applied forces. The applied forces could be:

- Gravitational forces such as overburden pressure, load and shearing stress.
- Expansion forces due to temperature changes, crystal growth or animal activity.
- Water pressures controlled by wetting and drying cycles.

Q.3. Define the following terms:

1. Denudation
2. Enrichment
3. Gradation
4. geomorphic process
5. Geomorphic agents
6. Tors
7. Stress

Ans. 1. The term “denude’ means to strip off or to uncover. Weathering, mass wasting’ movements, erosion and transportation are included in denudation.

2. When rocks undergo weathering, some materials are removed through chemical or physical leaching by groundwater and thereby the concentration of valuable materials increases. It makes the concentration of the same valuable material sufficient and economically viable to be exploited, processed and refined. This is called enrichment.

3. The phenomenon of wearing down of relief variation of the surface of the earth through erosion is known as gradation.

4. The endogenic and exogenic forces causing physical stresses and chemical actions on earth material and bringing about changes in the configuration of the surface of the earth is known as geomorphic process.

5. Any exogenic elements of nature (like water, ice, wind, etc.) capable of acquiring and transporting earth materials-can be called geomorphic agents. An agent is a mobile medium (like running water, moving ice. etc.) which removes, transports and deposits earth materials. Examples: Running water, glacier, wind waves and currents, etc. can be called geomorphic agents.
6. In rocks like granites, smooth surfaced and rounded small to big boulders form due to such exfoliation. It is called tors.
7. Gravitational force acts upon all earth materials having a sloping surface and tend to produce movement of matter in down slope direction. Force applied per unit area is called stress.

Q.4. What are the two main ways in which organisms contribute in soil formation? What would happen to the fertility of a soil if all decomposers were removed? Explain.

Ans. Living organisms are responsible for forming humus and mixing the soil. Decomposers like: fungi, worms, and bacteria breakdown organic matter into humus which is enriched with the nutrients needed by the plants.

Other animals add nitrogen to the soil in the form of metabolic waste.

Without the help of decomposers, humus would not form. In addition, the remains of living organisms will not be decomposed and nitrogen would not be returned back to the soil. Hence the soil will have a poor, infertile quality and it will become infertile.

Q.5 . Describe the process causing diastrophism?

Ans. All processes that move, elevate or build up portions of the earth's crust come under diastrophism. They include:

- **Orogenic processes:** It involves mountain building through severe folding and affecting long and narrow belts of the earth's crust:

- **Epeirogenic processes:** It involves continental building through uplift or warping of large parts of the earth's crust.
- **Earthquakes:** It involves local relatively minor movements;
- **Plate tectonics:** It involves horizontal movements of crustal plates.

All these processes-cause pressure, volume and temperature (PVT) changes which in turn induce metamorphism of rocks.

Q.6. List the factors that activate the process of mass movement.

Ans. Following factors activate the process of mass movement.

- Removal of support from below to materials above through natural or artificial means:
- Increase in gradient and height of slopes;
- Overloading through addition of materials naturally or by artificial filling:
- Overloading due to heavy rainfall, saturation and lubrication of slope materials;
- Removal of material or load from over the original slope surfaces:
- Occurrence of earthquakes, explosions or machinery;
- Excessive natural seepage:
- Heavy drawdown of water from lakes, reservoirs and rivers leading to slow outflow of water from under the slopes or river banks;
- Indiscriminate removal of natural vegetation.

Q.7. Deposition is the result of erosion. Explain.

Ans. Deposition is a consequence of erosion. The erosional agents loose their velocity and hence energy on gentler slopes and the materials carried by them start to settle themselves. In other words, deposition is not actually the work of any agent. The coarser materials get deposited first and finer ones later. By

deposition depressions get filled up. The same erosional agents viz., running water, glaciers, wind, waves and groundwater act as aggradational or depositional agents also.

Q.8. Without gravity and gradient will there be no erosion? justify.

Ans. Gravity besides being a directional force activates down slope movement of matters and also causes stresses on earth material.

- Without gravity and gradients there would be no mobility and hence no erosion, no transportation and no deposits as gravitation stresses are as important as the other geomorphic process.
- Gravity is force that is keeping us in contact with the surface and it is the force that switches on the movement of all surface material on earth.
- All the movement either within the earth or on the surface of the earth occurs due to gradients from higher levels to lower levels and from high pressure to low pressure areas.

Q.9. What is the importance of weathering?

Ans. Importance of weathering:

- Weathering processes are responsible for breaking down the rocks into smaller fragments and preparing the way for formation of not only regolith and soils but also erosion and mass movement. Biomes and bio-diversity is basically a result of forests depend upon the depth of weathering mantles.
- Weathering aids mass movement and deposits helps in the enrichment and concentrations of certain valuables like ores of iron, manganese, aluminium, etc. which are of great importance for the national economy.
- Weathering is an important process in the formation of soils.

Q.10. Describe the process of enrichment.

Ans. When rocks undergo weathering, some materials are removed through chemical or physical leaching by groundwater and thereby the concentration of remaining materials increases. Without such a weathering taking place, the concentration of the same valuable material may not be sufficient and economically viable to exploit, process and refine This process is described as enrichment.

Long Answer Type Questions

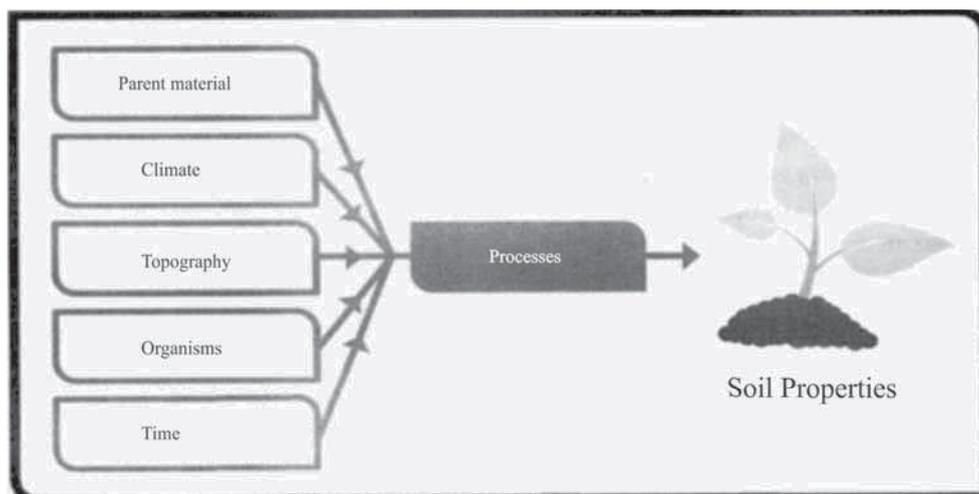
Q.1. What are the main factors affecting soil formation? How these factors are helpful in soil formation?

Ans. The main factors affecting soil formation are;

Climate is a direct factor in soil formation. It determines how temperature and moisture vary and determines the intensity of the weathering processes Indirectly, climatic factors also govern vegetation growth at the interface of soil, atmosphere and biosphere

- Organisms, including flora and fauna, are not an independent factor in soil formation. Both continuously interact with climate, relief and soil parent material over time. Vegetation delivers organic material for humus formation and a forest regulates the climate of its surrounding.
- Relief and topography define the micro-climatic conditions under which soil formation takes place, as well as the proximity of soil to the ground water table. Soils on steep, barren terrain are more prone to erosion than those on plains, or on plant-covered surfaces.
- Parent material in the form of rock and sediment builds the initial substrata for soil formation. It defines a soil's chemical and mineralogical composition and influences soil texture and structure.

- Time describes an ongoing factor of soil formation. The intensity and combination of different factors leading to soil formation change over time. Time, therefore, is not always an indicator of the exact age of a soil or the stage of a soil's development.



Q.2. What is the sole driving force behind all the exogenic processes? Explain how?

Ans. Solar energy is the sole driving force behind all exogenic processes. Exogenic processes derive their energy from atmosphere determined by the ultimate energy from the sun and also the gradients created by tectonic factors.

1. Various minerals in rocks possess their own limits of expansion and contraction.
2. With rise in temperature, every mineral expands and pushes against its neighbour and as temperature falls, a corresponding contraction takes place. Because of diurnal changes in the cause splitting of individual grains within rocks, which eventually fall off. This process of falling off of individual grains may result in granular disintegration or granular foliation. Salt crystallisation is most effective of all salt-weathering processes.

3. In areas with alternating wetting and drying conditions salt crystal growth is favored and the neighboring grains are pushed aside.

Sodium chloride and gypsum crystals in desert areas heave up overlying layers of materials and with the result polygonal cracks develop all over the heaved surface. With salt crystal growth, chalk breaks down most readily, followed by limestone, sandstone, shale, gneiss and granite etc.

Q.3. Why Exogenic geomorphic processes differ from region to region?

Ans. Factors Controlling Exogenic Geomorphic Processes

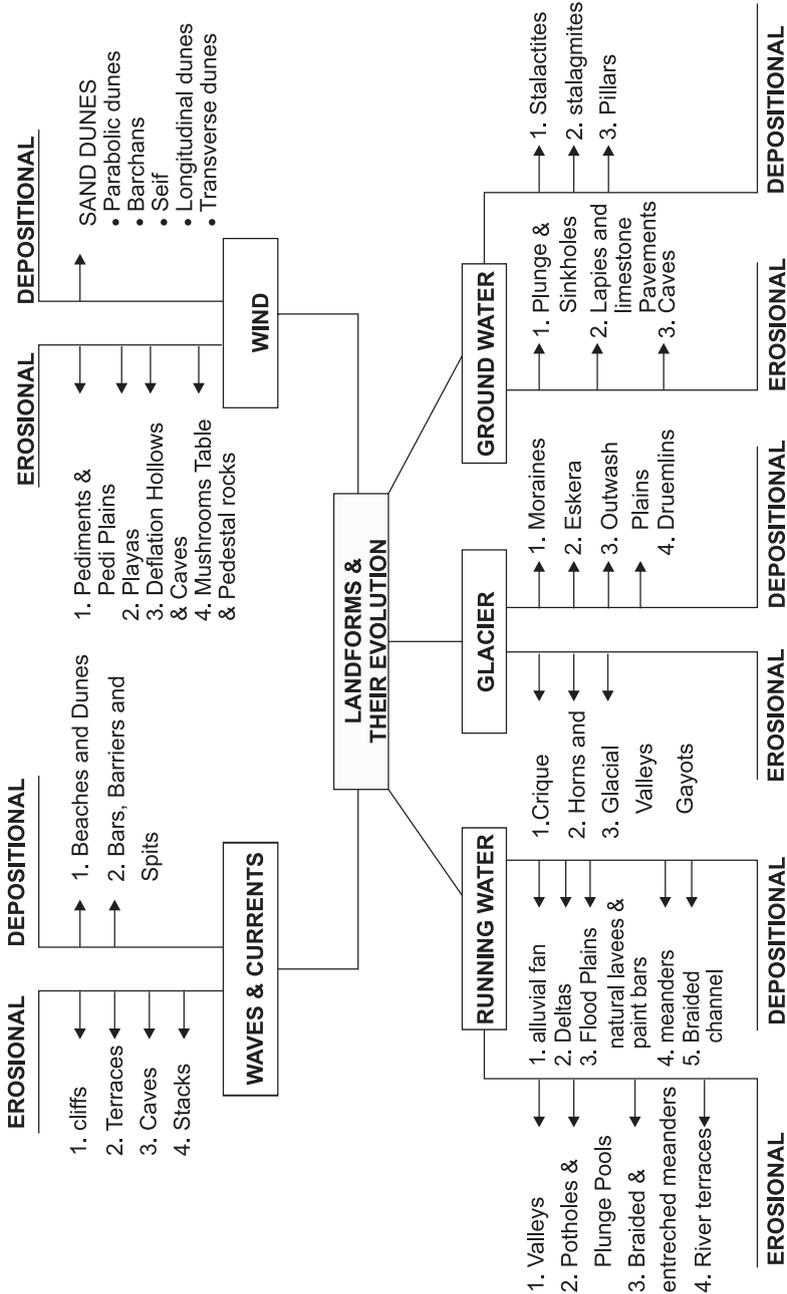
1. The earth has different climatic regions with different thermal gradients created due to variations in latitude season and distribution of land and water.
2. The density, type and distribution of vegetation which largely depend upon precipitation and temperature indirectly influence exogenic geomorphic processes.
3. Within broad climatic regions local variations are caused by altitude and other aspect for example, south facing slopes in the northern hemisphere receive more sunlight than north facing slopes.
4. Further differences arise due to variations in wind velocity and direction, due to differences in wind velocities and directions, amount intensity and the precipitation and its relationship with evaporation, daily range of temperature, depth of frost penetration and frequency of freeze and thaw.
5. Climatic factors being equal, the intensity of exogenic geomorphic processes depends upon type and structure of rocks.
6. Depending on their structure rocks offer varying resistance to various geomorphic processes. A particular rock may be resistant to one process and non resistant to another.

Q.4. Elaborate the process Biological weathering.

Ans. Biological weathering is contribution to or removal of minerals and ions from the weathering environment and physical changes due growth or movement of organisms. like earthworms, termites, rodents etc. help in exposing the new surfaces to chemical attack and assists in the penetration of moisture and outs. Decaying plant and animal matter help in the production of humic carbonic and other acids which enhance decay and solubility of elements. Plant roots exert a tremendous pressure on the earth materials mechanically breaking them about.

Chapter – 6

Landform & Their Evolution



Objective/Multiple Type Questions

Q.1. A Barchan is a landform made by _____ work of _____.

Ans. depositional, wind.

Q.2. _____ includes lifting and removal of dust and smaller particles from the surface of rocks.

Ans. Deflation.

Q.3. In which of the following stage of landform development, most of the landscape is at or slightly above sea level?

- (a) Mature stage
- (b) Old stage
- (c) Youth stage
- (d) Early mature stage

Ans. (b) Old stage

Q.4. Which of the following is not a type of valley?

- (a) Gorge
- (b) V-shaped valley
- (c) Rapids
- (d) Canyon

Ans. (c) Rapids

Q.5. Which one of the following is not associated with wind work?

- (a) Sand dunes
- (b) Mushroom
- (c) Lapies
- (d) Playa

Ans. (c) Lapies

Q.6. When very deep and wide meanders are found in hard rocks, they are called.....

Ans. Incised or entrenched meanders.

Q.7. A lowland of faint relief with some low resistant remnants is called:

- (a) Terrace
- (b) Monadnocks
- (c) Valley
- (d) Gorges

Ans. (b) Monadnocks

Q.8. Large and deep holes at the base of waterfall is Known as:

- (a) Rapids
- (b) Pot holes.
- (c) sink holes
- (d) Plunge Pools

Ans. (d) Plunge pools

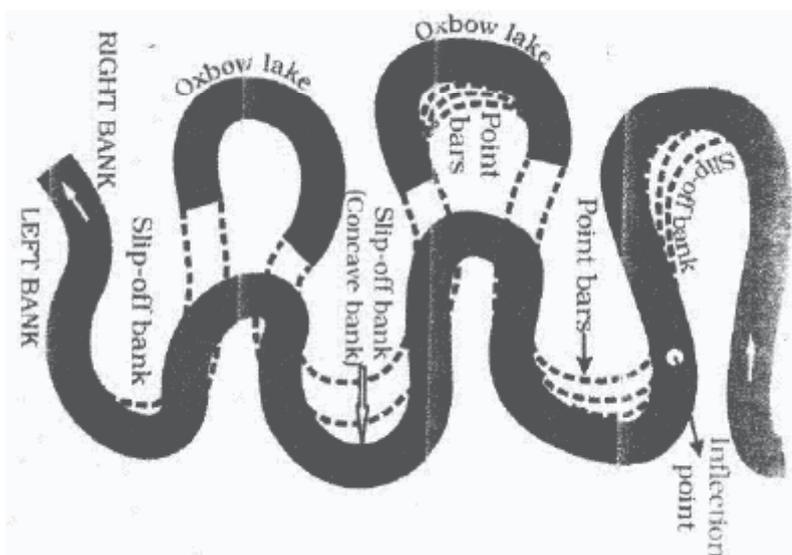
Q.9. Which of the following landforms is almost equal in width at its top as well as its bottom?

- (a) Canyon
- (b) v-shaped Valley
- (c) Gorge
- (d) Esker

Ans. (c) Gorge

Diagram/Source Based Questions.

Q. I. Study the given diagram and answer the following questions.



1. **Loop like channel pattern called meanders develop over _____ .**
- (a) Valley sides (b) Flood plain & valley sides
(c) Delta plain (d) Delta and flood plain

Ans. (d) Delta and flood plain

2. **If there is no deposition and no erosion, the tendency to meander is _____ .**
- (a) Enlarge (b) Put up
(c) Reduced (d) Stable

Ans. (c) Reduced

3. **Ox bow lakes are formed due to _____ .**
- (a) Flooding
(b) Wave erosion
(c) Intense meandering
(d) None of these

Ans. (c) Intense meandering

4. **Point bars are deposited _____ .**
- (a) On the outside of a meander bend
(b) At the base of waterfall
(c) On the inside of meander bend
(d) By turbidity currents.

Ans. (c) On the inside of meander bend

Short Answer Questions (3 Marks Question)

Q.1. Explain the reasons for the formation of meanders.

- Ans.** (i) Propensity of water flowing over very gentle gradients to work laterally on the banks.
- (ii) Unconsolidated nature of alluvial deposits making up the banks with many irregularities which exert pressure laterally.
- (iii) Coriolis force acting on the fluid water deflecting it like it deflects the wind.

Q.2. Describe the process of delta formation.

- Ans.** (i) The load carried by the rivers is dumped & spread into sea.
- (ii) If the load is not carried away far into the sea or distributed along the coast, it spreads and accumulates as a low cone.
- (iii) The deposits making up deltas are very well sorted with clear stratification. The coarsest materials settle out first and the finer fractions like silts and clay are carried out into the sea.

Q.3. How do waterfall and rapids form?

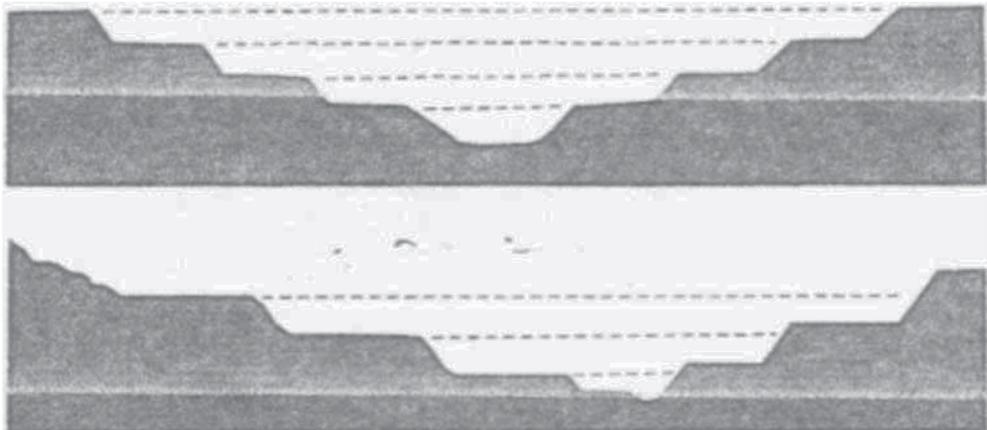
Ans. Water fall- When the river water fall down from a sufficient height along the course of the river, its forms water fall. Hard and soft rocks are found at several places in the course of the river. The soft rocks are eroded easily and quickly and the river bed is lower at the place of soft rock. Thus, the water falls from a height and water fall is created.

Rapids– The areas of shallow and fast flowing water in the river course with many standing hard rocks above water surface are called rapids. This happens due to differential erosion in which soft rocks are eroded rapidly than hard rocks.

Q.4. What are paired and unpaired terraces? Explain with diagram.

Ans. River terraces are surfaces marking old valley or flood plain levels. River terraces are products of vertical erosion in flood plain. There can be a number of such terraces at different heights indicating former river bed levels.

The river terraces may occur at the same elevation on either side of the rivers in which case they are called paired terraces.



When a terrace is present only on one the side of the stream and with none on the other side or one at quite a different elevation on the other side, the terraces are called non paired/unpaired terraces.

Q.5. Give reasons for the formation of terraces?

Ans. The terraces result due to—

- (i) Receding water after a peak flow.
- (ii) Change in hydrological regime due to climate changes.
- (iii) Tectonic up lift of land
- (iv) Sea level changes in case of river closer to the sea.

Q.6. Explain the process of mushroom formation.

Ans. Many rocks in the desert easily susceptible to wind deflation and abrasion are worn out quickly leaving some remnants of resistant rock polished beautifully in the shape of mushroom with slender stalk & a broad and rounded pear shaped cap above.

Q.7. Discuss the main features associated with playas Lakes.

- Ans.**
- (i) They are nearly level plain in desert areas surrounded by hills around and along.
 - (ii) They are covered up by shallow water body when there is availability of water. Such type of shallow lakes are called "Playas".
 - (iii) The playa plain when covered up by salts are called "alkali flats".

Long Answer Questions

Q.1. Explain or describe deflation hollows and caves erosional landform of wind.

Ans. Weathered mantle from over the rocks or bare soil, gets blown out by persistent movement of wind currents in one direction. This process may create shallow depressions called deflation hollows. Deflation creates numerous small pits or cavities over rock surfaces. The rock faces suffer impact and abrasion of wind borne sand and first shallow depressions called blow outs are created, & some of the blow outs become deeper and wider fit to be called caves.

Q.2. Meander is not a landform but is only a type of channel pattern. Explain the statement.

Ans. Meander is not a landform but is channel pattern. This is because of

- (i) Propensity of water flowing over very gentle gradients to work laterally on the banks;
- ii) Unconsolidated nature of alluvial deposits making up the banks with many irregularities which can be used by water exerting pressure laterally,
- iii) Coriolis force acting on the like it deflects the wind.

When the gradient of the channel becomes extremely low water flows, Leisurely and starts working laterally. Slight irregularity is along the banks slowly gets transformed into a small curvature in the banks, the curvature deepens due to deposition on the inside of the curve and cross on along the bank on the outside. If there is no deposition and no erosion or undercutting the tendency to meander as is reduced.

Q.3. Elucidate the different types of sand dunes formed in Deserts.

Ans. Dry hot deserts are good places for sand dune obstacles to initiate dune formation are Some Variety of sand dunes formed in deserts are:

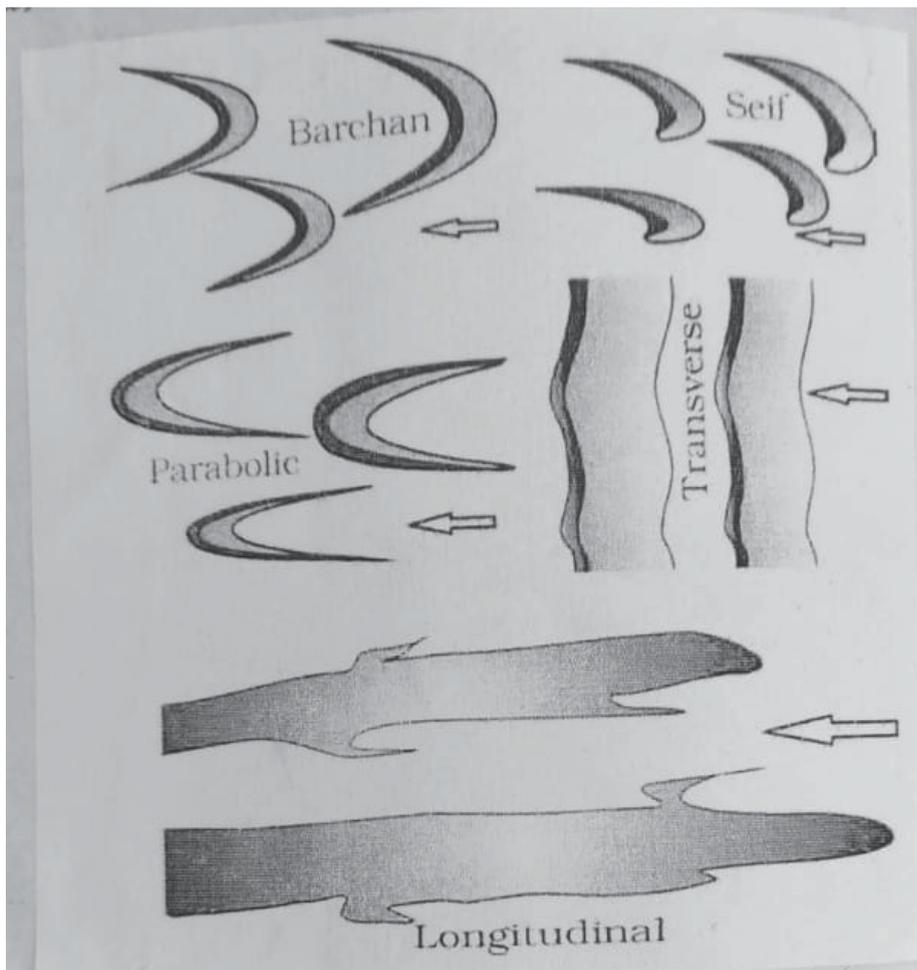
Barchans: Crescent shaped dunes are called barchans with the points Wings directed away from wind direction.

Parabolic dunes: when Sandy surfaces are scanty Vegetation. Parabolic dunes are reversed. Barchans with wind direction being the same.

Seif: seif similar to arch with a small difference seif has only one wing or point.

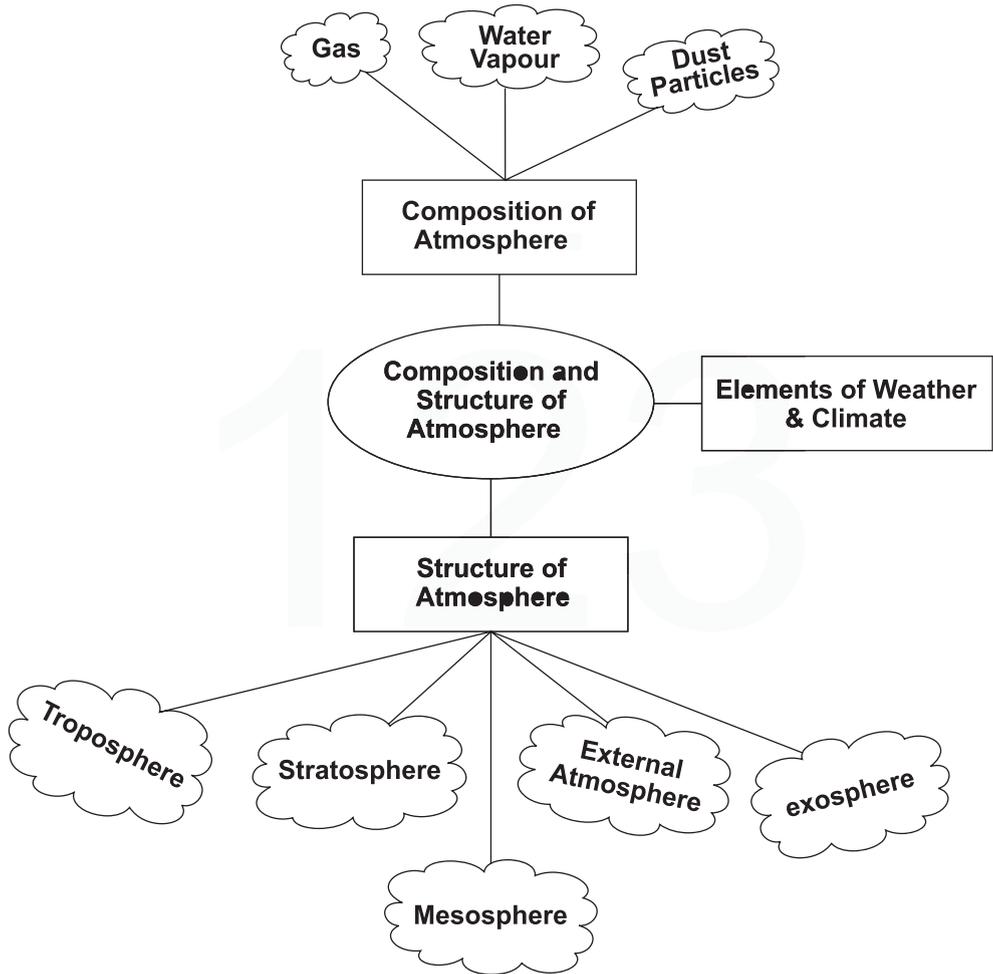
Longitudinal dunes: Longitudinal dunes form when supply of sand is poor and wind direction is constant.

Transverse dunes: are aligned perpendicular to wind direction. These dunes form when the direction is constant and the source of sand is also constant. It is an elongated feature formed at right angles to the wind direction.



Chapter – 7

Composition and Structure of Atmosphere



Objective/Multiple Type Questions

Q.1. Which of the following atmospheric layer reflects radio waves?

- (a) Exosphere
- (b) Ionosphere
- (c) Stratosphere
- (d) Troposphere

Ans. (b) Ionosphere

Q.2. The layer of the atmosphere which contains dust particles and water vapour is called _____

- (a) Stratosphere
- (b) Troposphere
- (c) Ionosphere
- (d) Mesosphere

Ans. (b) Troposphere

Q.3. Tropopause separates which of the following?

- (a) Troposphere and ozonosphere
- (b) Stratosphere and Troposphere
- (c) Stratosphere and Ionosphere
- (d) Troposphere and Ionosphere

Ans. (b) Stratosphere and Troposphere

Q.4. Which layer of atmosphere is vital for telecommunications?

- (a) Troposphere
- (b) Thermosphere
- (c) Stratosphere
- (d) Ionosphere

Ans. (d) Ionosphere

Q.5. Arrange the correct sequence of different layers of the atmosphere from the surface of the Earth to upwards.

- (a) Troposphere, Stratosphere, Ionosphere, Mesosphere
- (b) Stratosphere, Troposphere, Ionosphere, Mesosphere

(c) Troposphere, Stratosphere, Mesosphere, Ionosphere

(d) Stratosphere, Troposphere, Mesosphere, Ionosphere

Ans. (c) Troposphere, Stratosphere, Mesosphere, Ionosphere

Q.6. Match the following

Column I (Agent)

Column II (Landform)

A. Temperature falls with height

1. Ionosphere

B. Reflects radio waves back to earth

2. Stratosphere

C. Contains most of ozone

3. Tropopause

D. Fall in temperature gradient

4. Troposphere

(a) A-4, B-2, C-1, D-3

(b) A-3, B-2, C-4, D-1

(c) A-4, B-1, C-2, D-3

(d) A-4, B-3, C-1, D-2

Ans. (c) A-4, B-1, C-2, D-3

Q.7. Which of the following gas absorbs the ultra-violet rays radiating from the sun?

(a) Carbon-dioxide

(b) Ozone

(c) Nitrogen

(d) Oxygen

Ans. (b) Ozone

Q.8. Which of the following gas is transparent to the incoming solar radiation but opaque to the outgoing terrestrial radiation?

(a) Nitrogen

(b) Neon

(c) Oxygen

(d) Carbondioxide

Ans. (d) Carbondioxide

Q.9. Sea salt, pollen, ash, smoke-soot these are associated with which of the following.

- (a) Gases
- (b) Water vapour
- (c) Dust particles
- (d) Meteors

Ans. (c) Dust particles

Q.10. Which of the following layer is important for biological activity?

- (a) Tropopause
- (b) Troposphere
- (c) Stratosphere
- (d) Ionosphere

Ans. (b) Troposphere

Q.11. The higher concentration of dust particles found in which of the following regions?

- (a) polar region
- (b) equatorial
- (c) Subtropical and temperate regions
- (d) Polar and equatorial regions

Ans. (c) Subtropical and temperate regions

Q.12. Why thickness of the troposphere is greatest at the equator?

- (a) Most important layer for biological activity
- (b) Heat is transported to great heights by convectional currents
- (c) The temperature is nearly constant
- (d) It contains ozone layer.

Ans. (b) Heat is transported to great heights by convectional currents

Short Answer Questions

Q.1. "The Atmosphere is composed of many gases." Justify the statement.

or

Highlight the features of atmospheric gases.

- Ans.** (i) The proportion of gases changes in the higher layers of the atmosphere.
- (ii) Atmosphere contains life giving gases like oxygen for humans and animals and carbon dioxide for plants.
- (iii) Carbon dioxide absorbs a part of terrestrial radiation and is largely responsible for green house effect.
- (iv) Ozone gas is found between 10 to 50 km above the earth's surface and acts as a filter and absorbs ultra-violet rays.

Q.2. Briefly describe the composition of atmosphere.

Ans. Atmosphere is composed of gases, water vapor and dust particles.

Gases: There are several gases in the atmosphere of which nitrogen (78.08%) and oxygen (21%) constitute the major portion. Next to this carbon dioxide, Argon and Ozone are important gases.

Water vapor: The amount of watervapor depends on the climate of the place. It absorbs parts of the insolation from the sun and preserves the earth's radiated heat. It thus allows the earth neither to become too cold nor too hot.

Dust particules: Dust particles act as hygroscopic nuclei and helps in producing clouds due to condensation.

Q.3. What is the importance of dust particles in atmosphere?

or

Describe the importance of dust particles in atmosphere.

- Ans.** (i) Dust particles blow in atmosphere due to wind speed. They are derived from different sources and include sea salts, fine soil, smoke soot, ash, pollen, dust and disintegrated particles of meteors.
- (ii) Dust particles help in cloud formation which causes rainfall.
- (iii) They also intercept and reflect insolation.
- (iv) They scatter solar radiation and produce charming orange and red colour at dawn and dusk. The Blue colour of Sky is also because of scattering done by dust particles.

Q.4. Why troposphere is considered an important layer of the atmosphere?

Or

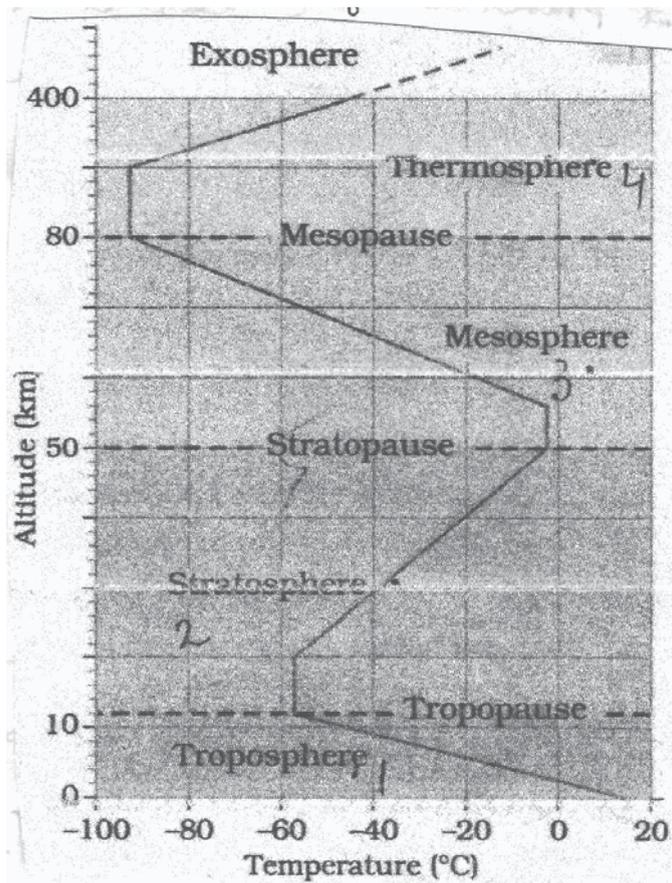
**“Troposphere is important layer for biological activity.”
Justify**

- Ans.** (i) This layer contains dust particles and water vapour.
- (ii) All changes in climate and weather take place in this layer.
- (iii) Temperature decreases with altitude. So makes balance on earth.

Long Answer Questions

Q.1. Describe the structure of atmosphere with diagram.

Ans. The column of atmosphere is divided into five layers depending upon the temperature condition. On the basis of chemical composition the atmospheric layer is divided into broad layers homosphere and heterosphere. The atmospheric layers on basis of temperature condition are-

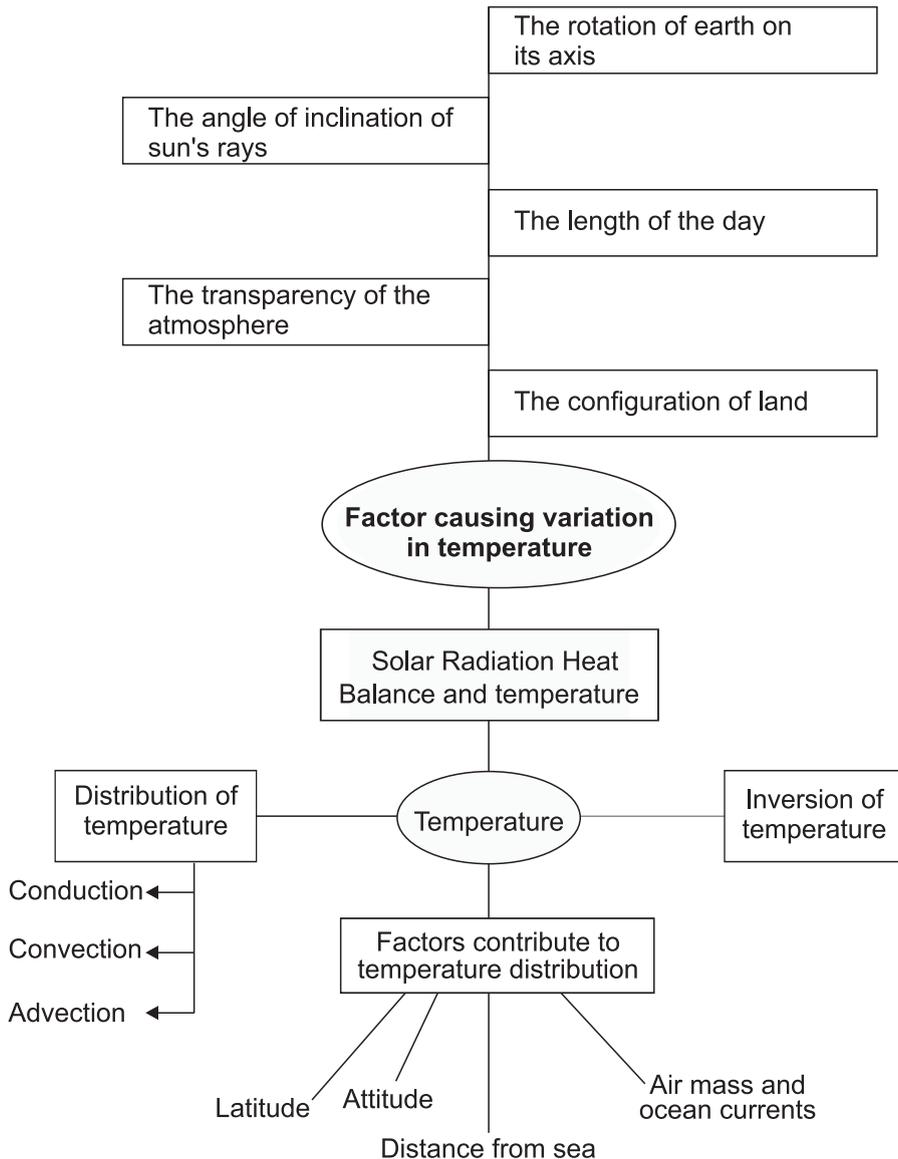


1. **Troposphere-** It is the lower most layer of the atmosphere. Its average height is 13 km. Its height is 8 km near poles and about 18 km at the equator. All changes in climate and weather take place in this layer. This is the most important layer for mankind.
2. **Stratosphere-**It extends upto a height of 50 km. The temperature remains almost constant in its lower portion upto a height of 20 km. Consequently, it is known as stratosphere. Temperature increases upto a height of 50 km and this layer contains the ozone gas which absorbs ultra violet radiation.
3. **Mesosphere-** It lies between to 50 to 80 km. In this layer, temperature starts decreasing with increase in altitude.

4. **Ionosphere-** It is located between 80 and 400 km. It contains electrically charged particles known as ions. Radio waves transmitted from the earth are reflected back to the earth by this layer.
5. **Exosphere-** The upper most layer of the atmosphere above ionosphere is exosphere. Whatever contents are there, these are extremely rarefied in this layer and merges with outer space.

Chapter – 8

Solar Radiation, Heat Balance and Temperature



Objective/Multiple Type Questions

Q.1. Which one of the following area receives maximum insolation?

- (a) Equator
- (b) Tropical areas
- (c) Sub-tropical deserts
- (d) Poles

Ans. (c) Sub-tropical deserts

Q.2. The earth radiates energy to the atmosphere in

- (a) Long wave length
- (b) Insulation
- (c) Radiation
- (d) Short wave length

Ans. (a) Long wave length

Q.3. Which of the following is responsible for maximum transfer of heat in atmosphere?

- (a) Advection
- (b) Evaporation
- (c) Terrestrial radiation
- (d) Conduction

Ans. (c) Terrestrial radiation

Q.4. With reference to heating and cooling of earth, which of the following is true?

- (a) Lower layers of atmosphere are heated by the process of conduction.
- (b) Atmosphere is heated by shortwave radiation reflected from the surface of earth.
- (c) Transfer of heat through horizontal movement of air is called convection.
- (d) Transfer of heat through vertical movement of air is called advection.

Ans. (a) Lower layers of atmosphere are heated by the process of conduction.

Q.5. Which of the following is the result of advection process?

- (a) Loo winds in Northern India
- (b) Air currents
- (c) Lower layers of atmosphere get heated
- (d) Cold waves.

Ans. (a) Loo winds in Northern India

Q.6. Albedo of the earth refers to

- (a) Amount of radiation reflected by clouds
- (b) Amount of radiation reflected by earth
- (c) Amount of radiation absorbed by earth
- (d) Amount of radiation absorbed by snow

Ans. (b) Amount of radiation reflected by earth

Q.7. The minimum distance between the sun and the earth occurs on

- (a) December 21
- (b) September 21
- (c) July 4
- (d) 3 January

Ans. (d) 3 January

Q.8. When the Earth is farthest from the Sun. This position is called

- (a) Perihelion
- (b) Aphelion
- (c) Perigee
- (d) Apogee

Ans. (b) Aphelion

Q.9. Which of the following defines temperature inversion?

- (a) Air temperature increases with increasing height
- (b) Air temperature decreases with increasing height
- (c) Air temperature remains constant with increasing height
- (d) It is warmer at night than during the day

Ans. (a) Air temperature increases with increasing height

Q.10. The normal lapse rate is _____

Ans. 6.5°C per 1000 meter.

Q.11. The energy received by the earth is known as _____

Ans. insolation

Short Answer Questions

Q.1. Why is the atmosphere mainly heated by terrestrial radiation rather than insolation?

Ans.

1. The insolation received by earth is in short waves forms and heats up its surface.
2. The energy heats up the atmosphere from below. This process is terrestrial radiation.
3. The long wave radiation is absorbed by the atmospheric gases particularly by carbon dioxide and the other greenhouse gases. Thus, the atmosphere is heated mainly by terrestrial radiation.

Q.2. Which zone receives maximum heat and why?

Ans. Subtropical deserts receive maximum heat because

- (i) Cloudiness is least here.
- (ii) In winter, the middle and higher latitudes receive less radiation than in summer.

Q.3. There are different ways of heating and cooling of the atmosphere. Describe any 3 ways.

Or

Differentiate between advection and convection.

Ans. There are different ways of heating and cooling of the atmosphere.

1. **Conduction-** Conduction takes place when two bodies of unequal temperature are in contact with one another, there is a flow of energy from the warmer to cooler body. The transfer of heat continues until both the bodies attain the same temperature or the contact is broken. Lower layers of atmosphere are heated in this way.
2. **Convection-** The air in contact with the earth rises vertically on heating in the form of currents and further transmits the heat of the atmosphere. This process of vertical heating of the atmosphere is known as convection.
3. **Advection-** The transfer of heat through horizontal movement of air is called advection. Horizontal movement of the air is relatively more important than the vertical movement. In middle latitudes, most of diurnal variation in daily weather are caused by advection alone.

Q.4. What are the effects of ocean on temperature in Southern hemisphere?

- Ans.**
- (i) Isotherms are more or less parallel to the latitudes.
 - (ii) The variation in temperature is more gradual than in the northern hemisphere.
 - (iii) The isotherms of 20°C, 10°C and 0°C runs parallel to 35°S, 45°S and 60°S latitudes respectively.

Q.5. Describe the factors that cause variations in insolation?

- Ans.**
- (i) The rotation of earth on its axis
 - (ii) The angle of inclination of the sun's rays.
 - (iii) The length of the day.
 - (iv) The transparency of the atmosphere.
 - (v) The configuration of land in terms of its aspect.

Q. 6. Explain terrestrial radiation.

Ans. The earth receives insolation in the form of short waves, which heats the up earth's surface. The earth after being heated up becomes a radiating body and it radiates energy to the atmosphere in long wave form. This energy heats up the atmosphere from below. This process is known as terrestrial radiation.

Long Answer Questions

Q.1. Describe the factors affecting distribution of temperature on the Earth?

Ans. (i) The latitude- The temperature of a place depends on the insolation received. The insolation varies according to the latitude hence the temperature also varies accordingly.

(ii) The altitude- The atmosphere is indirectly heated by terrestrial radiation from below. Therefore, the place near the sea level record higher temperature than the places situated at higher elevations.

(iii) Distance from the sea- Compared to land, the sea gets heated slowly and loses heat slowly. Land heats up and cools down quickly. Therefore the variation in temperature over the sea is less compared to land. Therefore, places near sea have moderate climate.

(iv) Air mass and ocean currents- Like the land and sea breezes, the passage of air masses also affects the temperature. The places, which come under the influence of warm air-masses experience higher temperature. The ocean currents do the same.

Q.2. What is inversion of temperature? Explain the geographical conditions for temperature inversion?

Ans. The rise of temperature with height is known as inversion of temperature. In case of inversion of temperature, the air near the

earth's surface is cold while higher above it is warm. Following favour the inversion of temperature-

- (i) **Long nights-** Insolation is received during day time and it is radiated during night. The earth's surface cools down at night due to radiation. The air of the lower layer touching the earth's surface is sufficiently cooled while the air of upper layer is still warm.
- (ii) **Clear sky-** The cooling of the earth by terrestrial radiation needs clear sky because cloud cover obstructs this outgoing radiation and hampers the occurrence of inversion of temperature.
- (iii) **Stable weather-** Continuous radiation of heat is possible in a stable weather. Wind movement distributes the heat and vertical mixing at lower level occurs.
- (iv) **Dry air-** Dry air near the surface does not absorb the outgoing radiation thereby creating perfect condition for inversion.
- (v) **Ice cover-** Areas covered with ice reflect most of the heat radiation and the layer of air touching it becomes cold while the upper layer remains warm. This leads to temperature inversion.

Source Based Questions

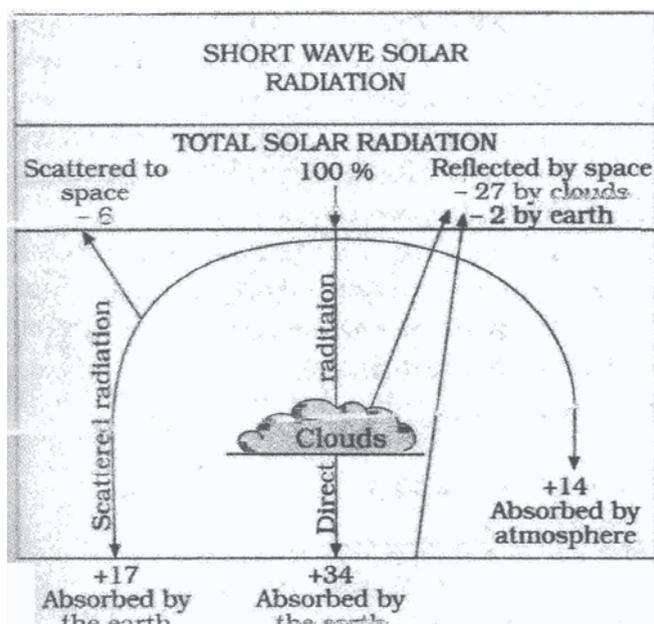
Q.3. Explain the heat budget of the earth with appropriate illustration.

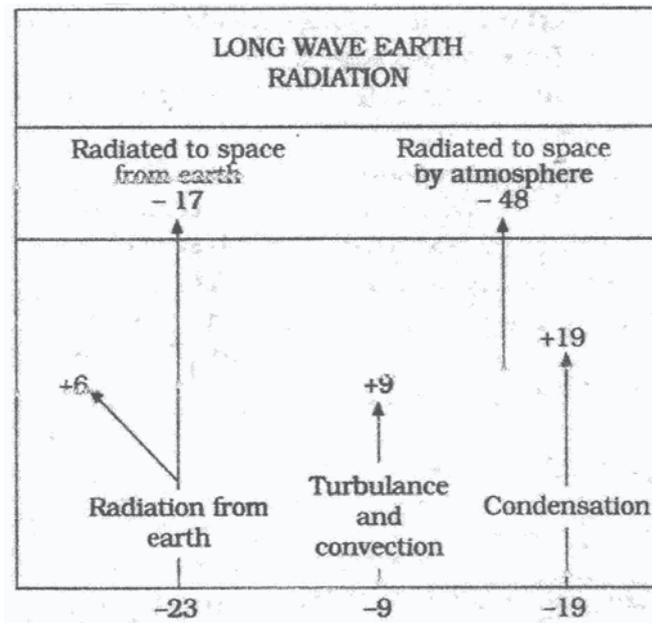
Ans. Consider that the insolation received at the top of the atmosphere is 100 percent. Roughly 35 units are reflected back to space before reaching the earth's surface.

The reflected amount of radiation is called Albedo of the earth.

The remaining 65 units are absorbed, 14 units within the atmosphere and 51 units by earth's surface. The earth radiates back 51 units in the form of terrestrial radiation. Of these, 17

unit are radiated to space directly and the remainly 34 units are absorbed by the atmosphere. 6 units absorbed directly by the atmosphere, 9 units through latent heat of condensation) 48 with absorbed by the atmosphere (14 units from insolation +34 units from terrestrial radiation) are also radiated back into space. Thus the total radiation retrieving from the earth and the atmosphere respectively is 17+48=65 units which balance the total of 65 units received from the sun. This is termed as the heat budget on heat balance of the earth.





Q.1. What amount of solar radiation is reflected by clouds?

- (a) 24%
- (b) 27%
- (c) 35%
- (d) 14%

Ans. (b) 27%

Q.2. The total radiation (Long wave) returning from the earth and the atmosphere is

- (a) 75
- (b) 48
- (c) 65
- (d) 29

Ans. (b) 65

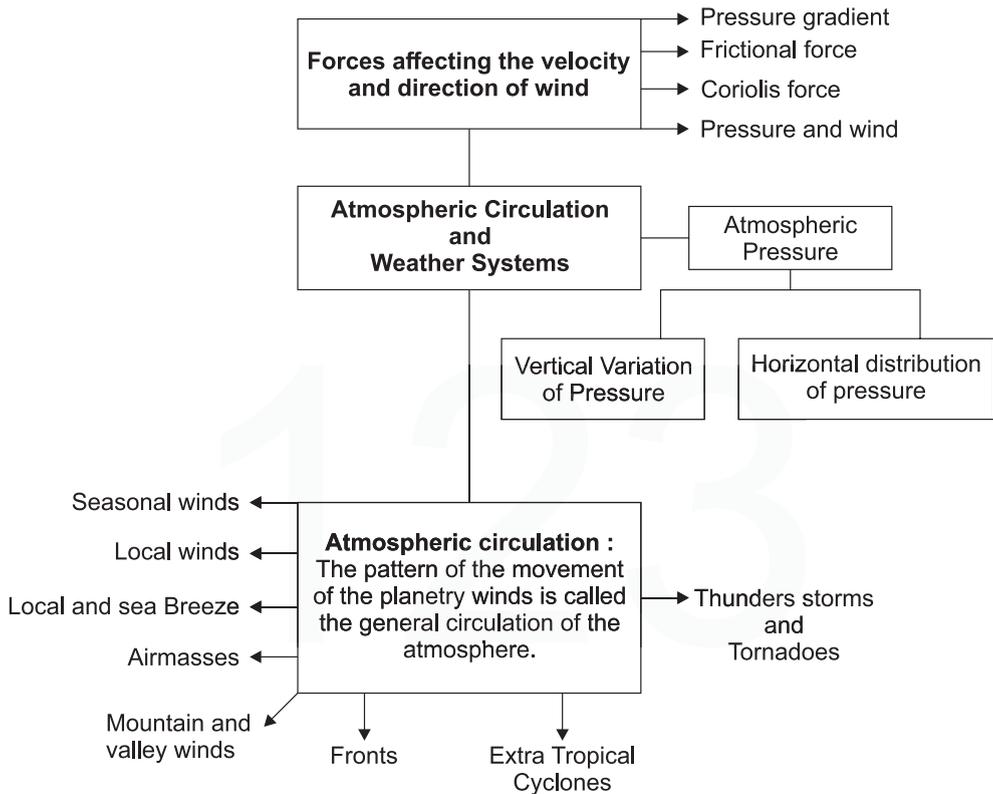
Q.3. How the heat budget works?

- (a) Scattering of solar radiation in atmosphere
- (b) Transfer of heat
- (c) Absorbtion by earth
- (d) Terrestrial radiation

Ans. (b) Transfer of heat

Chapter – 9

Atmospheric Circulation and Weather Systems



Objective/Multiple choice questions

Q.1. The large body of air whose physical properties and moisture is relatively uniform is known as -

- (a) Atmospheric pressure (b) air mass
(c) pressure gradient (d) None of these

Ans. (b) Air mass

Q.2. Name the hot winds which blows in USA

- (a) chinook (b) Foehn
(c) mistral (d) Loo

Ans. (a) chinook

Q.3. Which of the following is/are correct?

- (A) Coriolis force causes tropical cyclones near the equator
(B) The Coriolis force acts perpendicular to the Pressure gradient force.
(C) Coriolis force deflects the wind to the right direction in the Northern hemisphere and to the left in the southern hemisphere.
(a) A and B (b) B and C (c) A and C (d) A, B, C

Ans. (b) B and C

Q.4. Which of the following type of wind is "Monsoon wind".

- (a) Local wind (b) Seasonal wind
(c) Planetary wind (d) Periodic wind

Ans. (b) Seasonal wind

Q.5. Air pressure is measured by which of the following instrument ?

- (a) Thermometer
- (b) Hygrometer
- (c) Barometer
- (d) Isotherm

Ans. (c) Barometer

Q.6. Which of the following is found along 30°N and 30° South?

- (a) High pressure areas known as polar high
- (b) High pressure areas known as equatorial high
- (c) High pressure areas known as subtropical high
- (d) Low pressure areas known as subtropical low

Ans. (c) High pressure areas known as subtropical high

Q.7. Which of the following ocean is related to southern oscillation?

- (a) Atlantic ocean
- (b) Indian ocean
- (c) Pacific ocean
- (d) Arctic ocean

Ans. (c) Pacific ocean

Q.8. Which of the following is known as “landfall of the cyclone” with reference to tropical cyclones?

- (a) The place where a tropical cyclone crosses the coast
- (b) get energy from condensation process in cumulo-nimbus clouds
- (c) destruction of cyclone
- (d) lack of moisture in cyclone

Ans. (a) The place where a tropical cyclone crosses the coast

Q.9. Match Item I with Item II.

Column I (Cyclone)

- A. Cyclone
- B. Hurricane
- C. Typhoon
- D. Willy willies

Column II (Place)

- 1. Atlantic ocean
- 2. Australia
- 3. Indian ocean
- 4. South china sea

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

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

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

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

Ans. (c) A-3 B-1 C-4 D-2

Q.10. At the equator, coriolis force is _____

(a) maximum

(b) minimum

(c) zero

(d) highest

Ans. (c) zero

Q.11. Which wind flows in ferrel cell?

(a) Westerlies

(b) Polar easterlies

(c) Trade winds

(d) Polar westerlies

Ans. (a) Westerlies

Short Answer Questions

Q.1. Coriolis force affects directions of wind. Explain.

Or

How coriolis force affects the direction of wind? Justify.

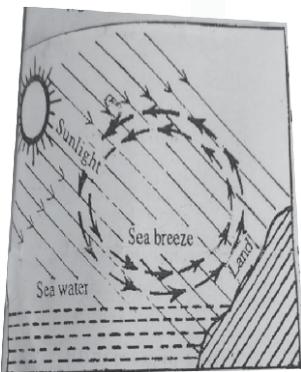
Ans. The earth's rotation about its axis creates a force which affects the direction of winds in both hemispheres. This is called coriolis force.

- Coriolis force deflects the wind to right direction in the northern hemisphere and left in the southern hemisphere.
- It is maximum at the poles and is absent at the equator.
- The coriolis force is directly proportional to the angle of latitude.

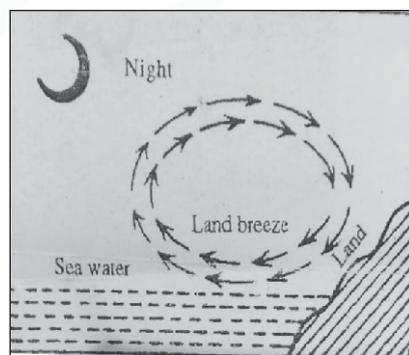
Q.2. Differentiate between land and sea Breeze.

Ans. Land Breeze- At night, land becomes cooler than sea due to rapid radiation. This results in high pressure over the land and low pressure over the sea. Wind starts blowing from land to sea and it is known as land breeze.

Sea Breeze- During day time when the sun shines, land gets more heated than the adjoining sea and develops low pressure. The adjoining sea is still cooler and develops a comparatively high pressure. Cool breeze called sea breeze starts blowing from high pressure area of sea to low pressure area of land.



Sea Breeze



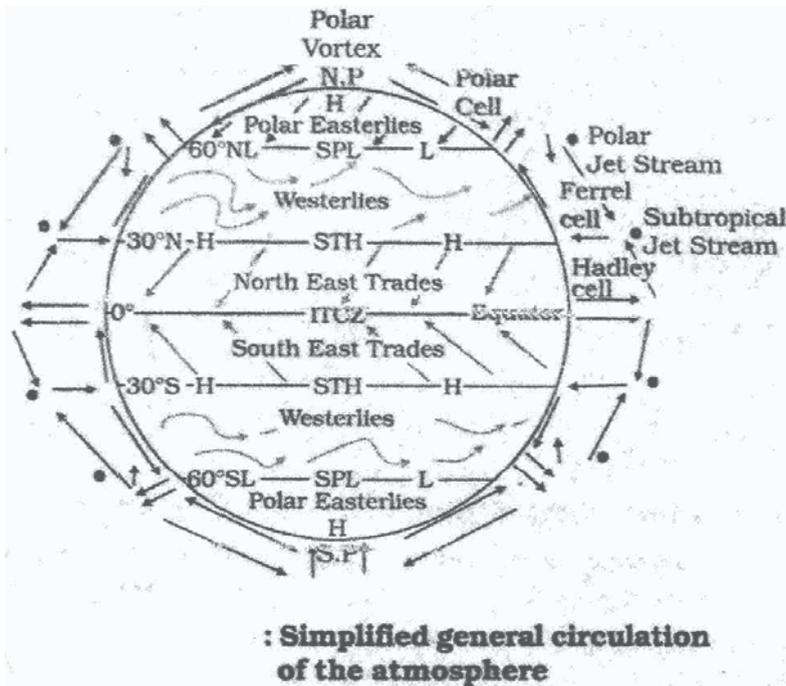
Land Breeze

Q.3. Explain the different type of winds

Ans. There are three type of winds

- (i) **Planetary winds-** These are also known as permanent or prevailing winds. Planetary winds blow over vast areas of continents and oceans throughout the year in a particular direction. They blow regularly from high pressure belts to

low pressure belts. Planetary winds are divided into three categories according to pressure belts as trade winds, westerlies and polar winds.



- (ii) **Seasonal Winds-** The winds which change their direction with the change in season are known as seasonal or periodic winds. Example - Monsoon winds.
- (iii) **Local Winds-** These winds are caused by differential heating and cooling of the earth's surface and affect local areas. Example - Loo, foehn and Mistral.

Q.4. Differentiate between Mountain and Valley Breeze?

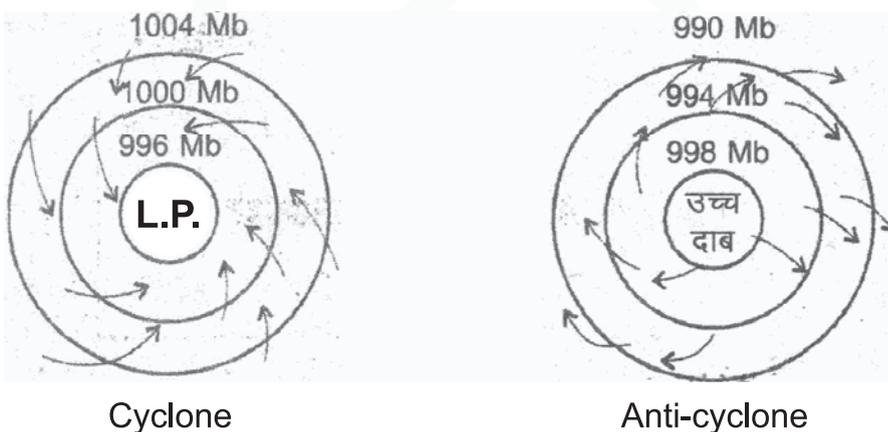
Ans. Valley Breeze- During day, the mountain slope is heated more than the valley floor. The air from the valley blows up the slope in the form of valley breeze.

Mountain Breeze- Rapid loss of heat through terrestrial radiation along the mountain slopes results in sliding of cold dense air from higher elevation to valleys. This is called mountain breeze.

Q.5. Differentiate between Cyclone and Anticyclone.

Ans. Cyclone- A cyclone is a low pressure area surrounded by high pressure areas from all sides. It is circular or elliptical in shape. Winds move from all sides to the central low. They assume anticlockwise direction in the Northern hemisphere and clockwise direction in the Southern hemisphere due to coriolis effect.

Anticyclone- An anti cyclone is a high pressure area surrounded by low pressure areas from all sides. Winds move to all sides from centre. They assume clockwise direction in the northern hemisphere and anticlockwise direction in the southern hemisphere due to coriolis effect.



Q.6. Explain the conditions favourable for the formation of tropical storm.

Ans. (i) Large sea surface with temperature higher than 27°C.
(ii) Presence of the coriolis force.

- (iii) Small variations in the vertical wind speed.
- (iv) A pre existing weak low pressure area or low level cyclonic circulation.
- (v) Upper divergence above the sea level system.

Q.7. What are the factors on which pattern of planetary winds depends?

- Ans.**
- (i) Latitudinal variation of atmospheric heating.
 - (ii) Emergence of pressure belts.
 - (iii) The migration of belts following apparent path of the sun.
 - (iv) The distribution of continents and oceans.
 - (v) The rotation of earth.

The pattern of the movement of the planetary winds is called the general circulation of the atmosphere.

Q.8. What are the names of the tropical cyclones in different regions?

- (i) "Cyclones" in the Indian ocean.
- (ii) "Hurricanes" in the Atlantic ocean
- (iii) "Typhoons" in Western Pacific and China
- (iv) "Willy-willies" in West Australia

Long Answer Questions

Q.1. Explain the horizontal distribution of air pressure of the world?

Ans. The distribution of atmospheric pressure across the latitudes is known as horizontal distribution of atmospheric pressure. There are seven pressure belts over the globe along certain specific latitudes. They are as follows :

(i) Equatorial low pressure belts-

- This is a low pressure belt which extends up to 5°N and 5° South of equator.

- Due to intense heating, air gets warm and rises over the equatorial region and produces the equatorial low pressure belt.
- There is extremely low pressure with calm conditions in this belt. Surface winds are generally absent since winds approaching this belt begun to rise near its margin. Thus, only vertical currents are found.

(ii) Sub Tropical High Pressure Belts

- Found between 30° and 35° in Both hemispheres.
- Winds descends in these belts making it a high pressure area.
- Calm wind conditions with feeble and variable winds.
- Presence of hot deserts on western margins of continents.

(iii) Sub-Polar low pressure Belts- The sub polar lows are located between 60° to 60° in both hemispheres. Cyclones occurs in this belt, in winter.

(iv) Polar High Pressure belts- From 80° N & S poles, there exist high pressure belt known as polar high pressure belts.

These high pressure belts are caused by extremely low temperature at the poles which remain below freezing point even during the summer season.

Q.2. Explain the factors affecting the velocity and direction of winds?

Ans. The air is set in motion due to the differences in atmospheric pressure. The horizontal winds near the earth surface respond to combine effects of three forces-

(i) Pressure Gradient- The rate of change of pressure with respect to distance is the pressure gradient. The pressure

gradient is strong where the isobars are close to each other and is weak where the isobars are far away from one another.

- (ii) **Frictional Force-** It is greatest at the surface and its influence generally extends up to an elevation of 1 to 3 km. Over the sea surface the friction is minimal.
- (iii) **Coriolis Force-** This force deflects the wind to the right direction in the northern hemisphere and to the left in the southern hemisphere. The coriolis force is directly proportional to the angle of latitude. It is maximum at the poles and is absent at the equator.

Q.3. “The extra tropical cyclone differs from the tropical cyclone in number of ways.” Analyse it.

- Ans.**
- (i) The extra tropical cyclones have a clear frontal system which is not present in the tropical cyclones.
 - (ii) They cover a larger area and can originate over the land and sea. Whereas the tropical cyclones originate only over the seas and on reaching the land they dissipate.
 - (iii) The extra tropical cyclone affects a much larger area as compared to the tropical cyclone.
 - (iv) The wind velocity in a tropical cyclone is much higher and it is more destructive.
 - (v) The extra tropical cyclones move from West to East but tropical cyclones, move from East to West.

Q.4. What are Fronts? Describe the different type of fronts.

- Ans.** The “boundary zone” of two different airmasses is called a Front. They are of following types.
- (i) Cold front - when the cold air moves towards the warm airmass and up lift it. It is called cold front
 - (ii) Warm front- When warm air mass move towards the cold front.

- (iii) Occluded- When an airmass is fully lifted.
- (iv) Stationary- When the fronts remain stationary.

Conclusion- Fronts occur in middle latitudes and are known for steep gradient in temperature and pressure.

Q.5. What is air mass? In how many categories are air masses categorized on the basis of their source regions?

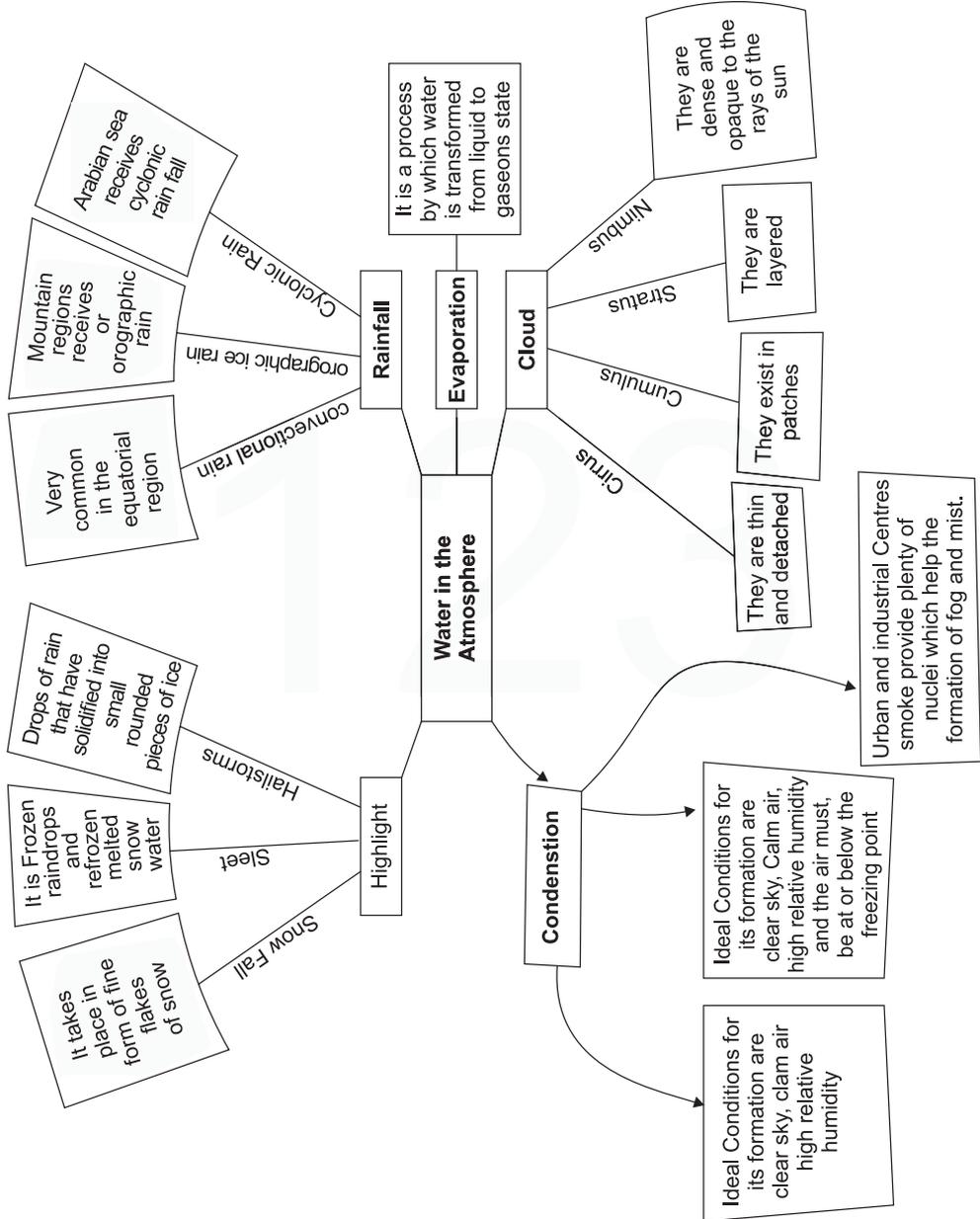
Ans. The air with distinctive characteristics in terms of temperature and humidity is called an air mass. The air masses are classified according to the Source regions into five major source regions.

These are:

- (i) Warm Tropical and subtropical oceans: maritime tropical (MT)
- (ii) The subtropical hot deserts: Continental tropical (CT)
- (iii) The very cold snow covered continents in high latitudes Continental Polar (CP)
- (iv) The Relatively cold high latitude oceans: maritime Polar (mp)
- (v) Permanently ice covered continents in Arctic and Antarctica: Continental arctic (CA)

Chapter – 10

Water in atmopsphere



Objective/Multiple Type Questions

Q.1. What are the ideal conditions for dew formation?

- (a) Calm air, short and hot nights.
- (b) Clam air, clouded sky.
- (c) Stormy wind, short night.
- (d) Clam air, cold and long nights.

Ans. (d) Clam air, cold and long nights.

Q.2. The transformation of water vapor into water is called _____

- (a) Evaporation
- (b) Condensation
- (c) Precipitation
- (d) Saturation

Ans. (b) Condensation

Q.3. The ability of the air to hold water vapor depends entirely on _____.

- (a) Air pressure
- (b) Humidity
- (c) Temperature
- (d) Dew point

Ans. (c) Temperature

Q.4. Which of the following is true about relative humidity?

- (a) It is least over the continents.
- (b) It is greater over the continents.
- (c) It is least over the oceans
- (d) It is equal over oceans and continents.

Ans. (a) It is least over the continents.

Q.5. Which of the following statement does not describe the feature of convectional rainfall?

- (a) With thunder and lightening heavy rainfall takes place.
- (b) It is common during day.
- (c) Cirrus clouds are formed.
- (d) Cumulous clouds are formed.

Ans. (c) Cirrus clouds are formed

Q.6. Relative humidity is measured in which unit?

- (a) Kilogram
- (b) Percentage
- (c) Milibar
- (d) Meter

Ans. (b) Percentage

Q.7. Dew point is

- (a) Percentage
- (b) Cube
- (c) Temperature
- (d) Gram

Ans. (c) Temperature

Q.8. Which area receives maximum convectional rainfall?

- (a) Polar Region
- (b) Equatorial Region
- (c) Oceans
- (d) Oceans in polar Region

Ans. (b) Equatorial Region

Q.9. Why do western margins of the continents between 45° and 65°N and S of equator receives rainfall first?

- (a) Due to shadow zone
- (b) Due to westerlies
- (c) Due to easterlies
- (d) Due to wind ward slope

Ans. (b) Due to westerlies

Q.10. The percentage of moisture present in the atmosphere as compared to its full capacity at a given temperature is known as—

- (a) Specific humidity (b) Absolute humidity
(c) Relative humidity (d) Saturated air

Ans. (c) Relative humidity

Q.11. Orographic rainfall is more on—

- (a) Plains (b) Nalleys
(c) Wind ward slopes (d) Leeward Slopes

Ans. (c) Wind ward slopes

Short Answer Questions

Q.1. How clouds are formed?

Ans. Clouds are formed by the condensation of water vapor around nuclei minute dust particles in the air. In most cases, clouds consist of tiny droplets of water, but they may also consist of ice particles if the temperature is below freezing point.

Q.2. What is Evaporation? Explain the factors affecting Evaporation.

Ans. Evaporation is a process by which water is transformed from liquid to gaseous state. Approximately 600 calories of energy is required to convert one gram of water into water vapor without any change in the temperature. Heat stored in the water vapor is known as latent heat. Temperature. Dryness of air, size of water, area & movement of air affects evaporation.

Q.3. What is Humidity? Explain the types of humidity.

Ans. The amount of water vapor present in the air is called humidity. It is measured in cubic meter/gm. At any specific temperature,

the quantity of moisture that can be held by the air has a definite limit. This limit is known as saturation point. Types of humidity are-

- (i) **Absolute humidity-** The weight of actual amount of water vapor present in a unit volume of air is called the absolute humidity. It is usually expressed as grams per cubic metre of air.
- (ii) **Specific humidity-** It is the weight of water vapor per unit weight of air. Since it is measured in units of weight (usually grams per kilogram), specific humidity is not affected by changes in pressure or temperature.
- (iii) **Relative humidity-** It is the ratio of water vapor present in the air at particular temperature to the amount of water vapor required to saturate the same air at the same temperature. It is always expressed in percentages. It is important for the weather forecast.

Q.4. What is Dew? Explain the favourable conditions for the formation of Dew.

Ans. Earth's surface is heated during day time and it cools down at night. Some times the cooling is so much that the temperature of the air touching earth's surface falls below dew points. Water vapor present in the air condenses and is deposited in the form of droplets on cooler surface of solid objects such as stones, grass blades and plant leaves. This is known as Dew.

Following are the conditions for dew formation-

- (i) Long nights
- (ii) Clear sky
- (iii) Calm Air
- (iv) High relative humidity.
- (v) Dew point should be higher than freezing point.

Q.5. What is Frost?

Ans. Frost forms on cold surfaces when condensation takes place below freezing point (0°C) i.e. the dew point is at or below the freezing point.

Q.6. Differentiate between evaporation and condensation.

Ans. Evaporation:

- (i) Evaporation is a process by which water is transformed from liquid to gaseous state.
- (ii) Heat is the main cause of evaporation.

Condensation:

- (i) The transformation of water vapor into water is called condensation.
- (ii) Condensation is caused by the loss of heat.

Long Answer Questions

Q.1. How rainfall occurs? Explain the types of rainfall.

Ans. When the humid air rises up, it cools and condensation of water vapor takes place. The water vapor is deposited on hygroscopic particles and turned into water particles. These are known as cloud particles. The cloud particles float in the air and clouds are formed. If these particles come close to one another, they may coalesce into bigger particles. When their size becomes so large that their weight is more than the upthrust of air, the particles will fall down in the form of rain.

Types of Rainfall

- (i) **Convictional Rainfall-** When the earth's surface is heated up, the air touching it is also heated. On being heated, it expands and become lighter. Consequently, it rises to great heights and convection currents are formed. When the moist air cools at sufficient height, condensation of the

water vapor takes place and convectional rainfall occurs. It occurs almost daily in the equatorial region.

(ii) Orographic Rainfall- When humid air is forced to rise along the slope of a mountain or a plateau, cooling is caused and it gets saturated. Clouds are formed due to condensation and rainfall occurs. This is called orographic rainfall.

(iii) Cyclonic Rainfall- Rainfall associated with a cyclone is known as cyclonic or frontal rainfall.

Q.2. “On the basis of total amount of annual precipitation, major precipitation regimes of the world are identified.” Examine the statement.

Ans. (i) The equatorial belt, the windward slopes of the mountain along the western coasts in the cool temperate zone receives heavy rainfall.

(ii) Coastal areas of monsoon land receive heavy rainfall over 200 cm per annum.

(iii) Interior continental areas receive moderate rainfall.

(iv) The coastal areas of the continents receive moderate amount of rainfall.

(v) The central parts of the tropical land and the eastern and interior parts of the temperate land receive rainfall varying between 50-100 cm per annum.

(vi) Areas lying in the rain shadow zone of the interior of the continent and high latitudes receive very less rainfall.

Q.3. Classify the clouds according to their height, expanse, density and transparency?

Ans. (i) Cirrus- They formed at high altitudes (8000 – 1200 m). They are thin and detached clouds having a feathery appearance. They are always white in color.

- (ii) **Cumulus-** Cumulus clouds look like cotton wool. They are generally formed at a height of 4000 – 7000 meter. They exist in patches and can be seen scattered here & there.
- (iii) **Stratus-** These are layered clouds covering large portions of the sky. These clouds are generally formed either due to loss of heat.
- (iv) **Nimbus-** Nimbus clouds are black or dark gray, they form at middle levels or very near to the surface of the earth. These are extremely dense & opaque to the rays of the sun. They can be classified as-
 - (i) High clouds
 - (ii) Middle clouds
 - (iii) low clouds
 - (iv) clouds with extensive vertical development

Q.4. “Different places on the earth’s surface receive different amount of rainfall in a year.” Analyse the statement.

- Ans.**
- (i) As proceeding from the equator towards the poles, rainfall goes on decreasing steadily.
 - (ii) The coastal areas of the world receive greater amounts of rainfall than the interior of the continents.
 - (iii) The rainfall is more over the oceans than on the land masses of the world because of being great sources of water.
 - (iv) Between the latitudes 35° & 40°N & South of the equator, the rain is heavier on the eastern coasts and goes on decreasing towards the west.
 - (v) Between 45° and 65° N and S of equator, due to the westerlies, the rainfall is first received on the western margins of the continents and it goes on decreasing towards the east.

Q.5. What is condensation? Mention the conditions for condensation.

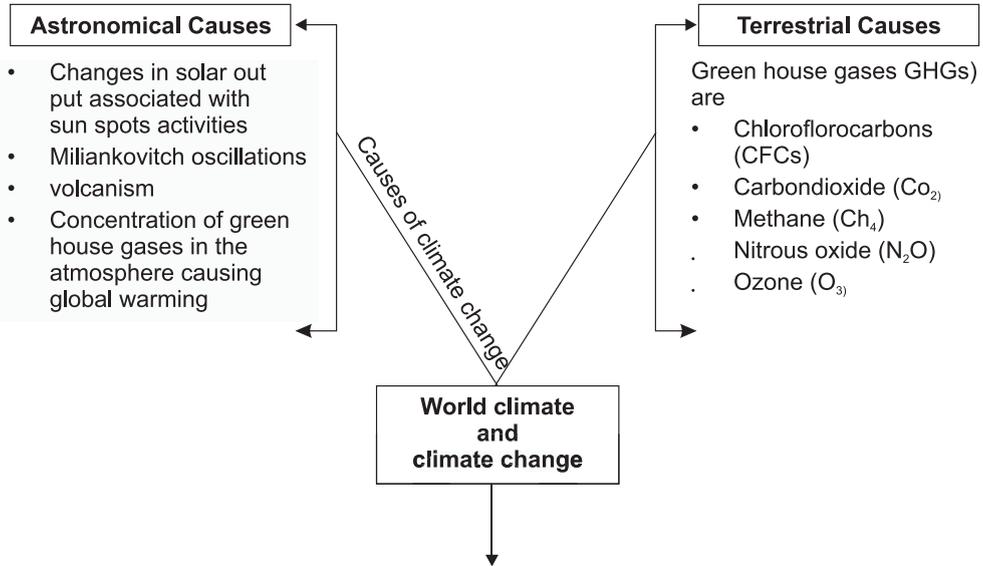
Ans. Condensation is the transformation of water vapor into water.

Conditions-

- (i) When the temperature of the air is reduced to dew point with its volume remaining constant.
- (ii) When both the volume and the temperature are reduced.
- (iii) When moisture is added to the air through evaporation.
- (iv) Decrease in air temperature is the most ideal condition for condensation.

Chapter – 11

To be tested through internal awessment.



Koeppen's Classification

S. No.	Chief Climatic Groups	Climatic Types
A	Tropical humid climate (without cold season)	1. Tropical rain forest type climate 2. Savanna type climate 3. Monsoon type climate
B	Dry climate (Evaporation is more than precipitation. There is always scarcity of water)	4. Desert climate 5. Steppe (Semi-desert) climate
C	Humid temperate climate (with light cold and winter season)	6. Mediterranean climate 7. China type climate 8. West European type climate
D	Humid temperate climate (very cold winter season)	9. Taiga climate 10. Eastern coastal cold climate 11. Continental climate
E	Polar climate (without summer season)	12. Tundra climate 13. Snowcapped region type climate
F	High moutain type climate	

Objective/Multiple Type Questions

Q.1. Which of the following is the feature of 'AW' type of climate?

- (a) No summer season
- (b) Dry winter season
- (c) Low temperature whole year
- (d) Winter with rain

Ans. (b) Dry winter season

Q.2. _____ climate occurs along the west coast of continents between 30°–40° latitudes.

- (a) Subtropical steppe
- (b) Warm temperate climate
- (c) Mediterranean climate
- (d) Tropical monsoon climate

Ans. (c) Mediterranean climate

Q.3. Cold climate with Humid winters is _____.

- (a) Df
- (b) Ef
- (c) Dw
- (d) ET

Ans. (a) Df

Q.4. Which of the following type of climate have feature of "Average temperature for all months in below 10°C"?

- (a) Cold
- (b) Dry
- (c) Cold snow forest
- (d) Warm temperate

Ans. (a) Cold Climate

Q.5. Match Column I with Column II.

Column I (Letter Code) Column II (Feature)

- | | |
|--------|--------------------------------|
| A. Aw | 1. Winter dry and severe |
| B. Dw | 2. No dry season, sever winter |
| C. Bwh | 3. Winter dry season |
| D. Df | 4. Low latitude dry. |

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

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

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

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

Ans. (c) A-3 B-1 C-4 D-2

Q.6. “Cwa” types of climate is found in _____

- (a) North east Argentina
- (b) North west Europe
- (c) Amazone basin of south America
- (d) North Indian Plains

Ans. (d) North Indian Plains

Q.7. Which of the following gases has the largest concentration in Green house gases?

- | | |
|---------------------|-------------------|
| (a) Carbon monoxide | (b) Carbondioxide |
| (c) Methane | (d) CFC. |

Ans. (b) Carbondioxide

Q.8. “Dry hot Summer” is related to which of the climatic group?

- | | |
|---------|---------|
| (a) Cs | (b) Cfa |
| (d) Cfb | (d) Am |

Ans. (a) Cs

Q.9. According to Koppen's classification what type of climate is found in most parts of India :

- (a) Ab (b) Am
(c) Aw (d) Cw

Ans. (b) Am

Q.10. _____ classification attempts to organize climates according to their causes.

- (a) Hydrological (b) Empirical
(c) Genetic (d) None of above

Ans. (c) Genetic

Short Answer Questions

Q.1. Differentiate between Am and Aw type of climate?

Ans. (Am) Tropical monsoon climate-

- (i) This climate is dominated by monsoon winds which bring heavy rainfall in summer.
- (ii) Winter is practically dry.
- (iii) This type of climate is found in the Indian Sub-Continent, North Eastern parts of south America and Northern Australia.

Aw (Tropical wet and dry climate)

- (i) The rainfall is variable and is much less than that in Af and Am climates.
- (ii) It borders with dry climate on the western part of the continent.
- (iii) This type of climate is found in the Indian subcontinent, North Eastern parts of south America and Northern Australia.

Q.2. Describe the types of climate according to Koeppen classification.

Ans. Climatic Types According to Koeppen

Group	Type	Letter Code	Characteristics
A-Tropical Humid Climate	Tropical wet	Af	No dry season
	Tropical monsoon	Am	Monsoonal, short dry season
	Tropical wet and dry	Aw	Winter dry season
B-Dry Climate	Subtropical steppe	BSh	Low-latitude semi arid or dry
	Subtropical desert	BWh	Low-latitude arid or dry
	Mid-latitude desert	Bsk	Mid-Latitude semi arid or dry
	Mid-latitude desert	BWk	Mid-latitude arid or dry
C-Warm temperate (Mid-latitude) Climates	Humid subtropical	Cfa	No dry season, warm summer
	Mediterranean	Cs	Dry hot summer
	Marine west Coast	Cfb	No dry season, warm and cool summer
D-cold Snow forest Climates	Humid continental	Df	No dry season, severe winter
	Subarctic	Dw	Winter dry and very severe
E-Cold Climates	Tundra	ET	No true summer
	Polar ice cap	EF	Perennial ice
H-Highland	Highland	H	Highland with snow cover

Q.3. Differentiate between Tundra and Taiga type of Climate?

Ans. Tundra and taiga are both cold climate regions found in the Northern Hemisphere but they differ in several ways.

Tundra	Tiaga
1. Near the Arctic Circle	1. South of the tundra (Sub-Arctic vegion)
2. Extremely cold with shorty, cool summer and long harsh winters,	2. Cold, out slightly warmer than tundra with longer summers.

Q.4. Change in climate is a continuous process. Explain with Evidences.

Ans. Change in climate is a natural and continuous process because Earth's climate has changed over millions of years.

Evidences

- (i) Ice ages and warm Periods - The earth has experienced several ice ages followed by warmer interglacial periods showing long-term climate change.
- (ii) Volcanic Eruptions - Large eruptions release gases and ash that can cool the Earth's temperatures temporarily.
- (iii) Changes in Earth's Orbit - Milankovitch cycles affect solar energy received, influencing long-term climate.

Q.5. Differentiate between empirical classification and genetic classification?

Ans. Empirical classificaiton is based on observed data, particularly on temperature and precipitation. Genetic classification attempts to organize climates according to their causes.

Long Answer Questions

Q.1. What is global warming? Describe the effects of global warming

Ans. Global warming is the slow increase in world temperature caused by the green house effects. It is taking place due to the presence of green house gases (GHGs) in the atmosphere.

Effects of global warming are-

- (i) It will affect life supporting system.
- (ii) Rise in the sea level due to melting of glaciers & ice caps.
- (iii) Thermal expansion of the sea may inundate large parts of coastal area and islands.
- (iv) It will change the rainfall patterns, create new plant diseases and lead to enlarged ozone hole.

Q.2. Describe the causes of climate change in the world?

Ans. The causes for climate change are many. The main causes are-

- (i) **Astronomical causes-** These causes are concerned with solar output associated with sunspot activities. Sun spots are dark and cooler patches on the sun's surface. Their number increases and decreases in a cyclic order. Decrease in the number of sunspots results in warm and drier conditions. Milankovitch oscillations infer cycles in the variations in the earth's orbital characteristics around the sun, the wobbling of the earth and the changes in the earth axial tilt.
- (ii) **Terrestrial Causes-** Among the terrestrial causes volcanism is one of the important cause of climate change. When a volcano erupts, it throws lots of aerosols into the atmosphere. These aerosols obstruct the sun's rays and reduce the amount of solar radiation reaching the earth surface, thereby causing cool weather.

- (iii) **Anthropogenic Causes-** It may include introduction of carbondioxide as well as some other green house gases, like methane and chlorofluro carbon into the atmosphere.

Q.3. Differentiate between cfa and cff type of climate.

Ans. cfa-

- (i) Humid subtropical climate lies on the eastern parts of the continent in subtropical latitudes.
- (ii) In this region the air masses are generally unstable.
- (iii) They occur in eastern United States of America, Southern and Eastern China, North eastern Argentina.
- (iv) The annual averages of precipitation vary from 75-150 cm.
- (v) Thunder storms in summer and frontal precipitation in winter are common.

cfb-

- (i) Marine west coast climate is located ward from the mediterranean climate on the west coast of continents.
- (ii) The main area are 'North western Europe, west coast of North America, north of California and Newzealand.
- (iii) The temperature is moderate and in winter, it is warmer than for its latitude.
- (iv) Precipitation varies greatly from 50-250 cm.
- (v) The annual and daily ranges of temperature are small.

Source Based Question

Read the source given carefully and answer the questions that follow.

The primary GHGs of concern today are carbon dioxide (CO₂), Chlorofluorocarbons (CFCs), methane (CH₄), nitrous oxide (N₂O) and ozone (O₃). Some other gases such as nitric oxide (NO) and carbon monoxide (CO) easily react with GHGs and affect their concentration in the atmosphere.

The effectiveness of any given GHG molecule will depend on the magnitude of the increase in its concentration, its life time in the

atmosphere and the wavelength of radiation that it absorbs. The chlorofluorocarbons (CFCs) are highly effective. Ozone which absorbs ultra violet radiation in the stratosphere is very effective in absorbing terrestrial radiation when it is present in the lower troposphere. Another important point to be noted is that the more time the GHG molecule remains in the atmosphere, the longer it will take for earth's atmosphere system to recover from any change brought about by the latter.

The largest concentration of GHGs in the atmosphere is carbon dioxide. The emission of CO₂ comes mainly from fossil fuel combustion (oil, gas and coal). Forests and oceans are the sinks for the carbon dioxide. Forests use CO₂ in their growth. So, deforestation due to changes in land use, also increases the concentration of CO₂. The time taken for atmospheric CO₂ to adjust to changes in sources to sinks is 20-50 years. It is rising at about 0.5 per cent annually. Doubling of concentration of CO₂ over pre-industrial level is used as an index for estimating the changes in climate in climatic models.

Chlorofluorocarbons (CFCs) are products of human activity. Ozone occurs in the stratosphere where ultra-violet rays convert oxygen into ozone. Thus, ultra violet rays do not reach the earth's surface. The CFCs which drift into the stratosphere destroy the ozone. Large depletion of ozone occurs over Antarctica. The depletion of ozone concentration in the stratosphere is called the ozone hole. This allows the ultra violet rays to pass through the troposphere.

Answer the following questions-

Q.1. Which gas has the largest concentration of GHGs in the atmosphere?

Ans. (d) Carbon dioxide

Q.2. In which layer of the atmosphere is ozone situated?

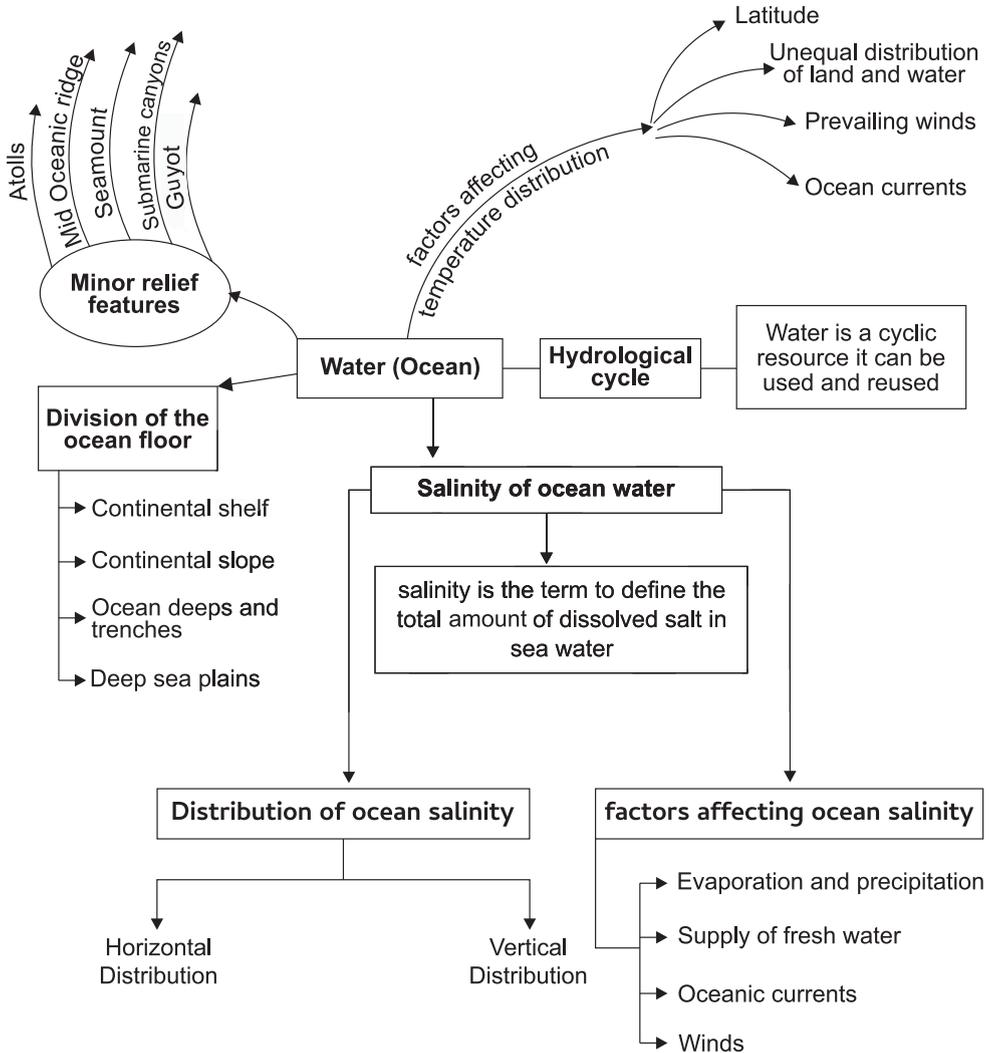
Ans. (a) Stratosphere

Q.3. What will be the effect of the concentration of greenhouse gases?

Ans. (b) Increase in temperature of earth

Chapter – 12

Ocean water



The features found on the oceanic floor can be divided into two classes.

Major relief features	Minor relief features
The continental Shelf	Ridges
The continental Slope	Hills
The Deep sea plain	Sea mounts
The Oceanic Deeps	Guyots
	Trenches
	Canyons
	Atoll etc.

Objective Questions

Q.1. Identify the salt that is found in excess in sea water.

- (a) Borate (b) Chlorine
(c) Sodium chloride (d) Sulphate

Ans. (c) Sodium chloride

Q.2. refers to the boundary area between surface water and deep layers of the ocean, where temperature tends to change.

Ans. Thermocline

Q.3. Which of the following represents the average temperature of the surface water of oceans?

- (a) 27.5 degree Celsius
(b) 28 degree Celsius
(c) 26 degree Celsius
(d) 27 degree Celsius

Ans. (d) 27 degree Celsius

Q.4 Which of the following features is part of the ocean floor relief and includes canyon-like formations?

- (a) The continental Slope (b) Atoll
(c) Deep sea plain (d) Oceanic deeps

Ans. (a) The continental Slope

Q.5. Which of the following factors does not affect ocean water temperature?

- (a) Prevailing wind (b) Ocean currents
(c) Salinity (d) Latitude

Ans. (c) Salinity

Q.6. is the shallowest part of the ocean that is formed on average slope by 1 degree or less.

Ans. Continental Shelf

Q.7. I. Assertion- The temperature of surface water decreases from the equator towards the poles.

II. Reason-The amount of insolation decreases pole ward.

Which of the following is correct.

- (a) Only I is correct
(b) Only II is correct
(c) Both are correct and II explains statement I correctly
(d) Both are correct but II is not explaining I statement

Q.8. Which of the following statement is/are correct?

I. Gulf stream raises the temperature near the western coast of Europe.

II. Labrador current lowers the temperature near the north-east of North America

- (a) Only I is correct (b) I and II both are correct
(c) Only II is correct (d) I & II both are incorrect

Ans. (b) I and II both are correct

Q.9. Salinity generally _____ with depth.

- (a) Decreases (b) Increase
(c) Remain same (d) None of above

Ans. (b) Increases

Short answer questions

Q.1. What does the salinity of ocean water mean?

Ans. Salinity is the term used to define the total amount of dissolved salts in seawater. It is calculated as the amount of salt in gram dissolved in 1000 gram (1kg) of seawater. It is usually expressed as parts per thousand or PPT.

Q.2. Highlight the features of Continental shelf

- Ans.**
- The continental shelf is the extended margin of each continent occupied by relatively shallow seas and gulfs.
 - It is the shallowest part of the ocean showing an average gradient of 1° degree or even less.
 - Its depth varies from 30m to 600m
 - The shelf typically ends at a very steep slope, called the shelf break.
 - The width of the continental shelves vary from one ocean to another. The average width is about 80 km.
 - It is the source of fossil fuels.

Q.3. What is deep sea plain?

Ans. Deep sea plains are gently sloping areas of the ocean basins. These are the flattest and smoothest regions of the world. The depths vary between 3,000 and 6,000m. These plains are covered with fine-grained sediments like clay and silt.

Q.4. How is seamount different from Guyots?

Ans. Seamount is a mountain with pointed summits rising from the sea floor that doesn't reach the surface of the ocean while Guyots is a flat topped seamount and show the evidence of gradual subsidence through stages to become flat topped submerged mountains.

Q.5. What are submarine Canyons?

Ans. These are deep valleys, some comparable to the Grand Canyon of the Colorado river. They are sometimes found cutting across the continental shelves and slopes, often extending from the mouths of large rivers. The Hudson Canyon is the best known canyon in the world.

Q.6. Explain the main features of continental slope?

Ans.

- The continental slope connects the continental shelf and the ocean basins.
- The gradient of the slope region varies between 2-5 degrees.
- The depth of the slope region varies between 200 and 3,000 m.
- The slope boundary indicates the end of the continents.
- Canyons and trenches are observed in this region.

Q.7. Explain any three features of Atoll.

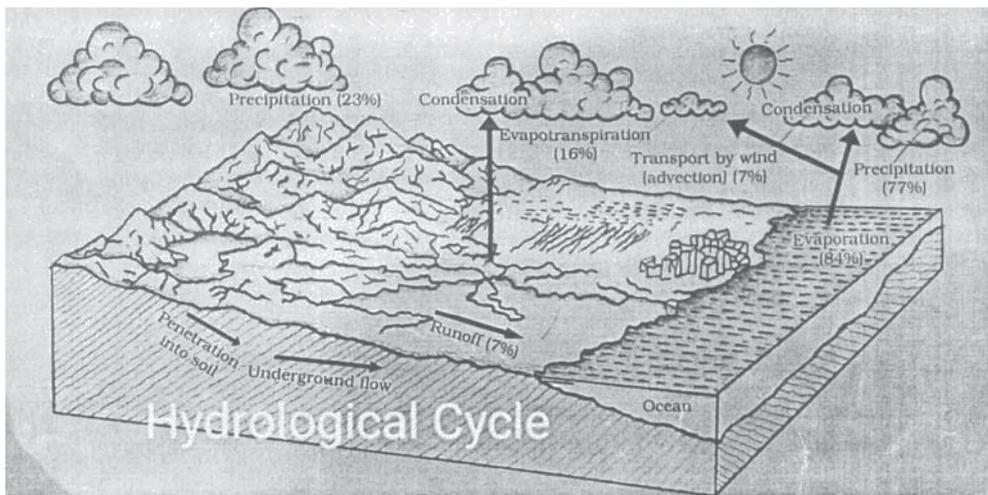
Ans.

- (i) These are low islands found in the tropical oceans consisting of coral reefs surrounding a central depression.
- (ii) It may be a part of sea.
- (iii) It may form enclosing a body of fresh, brackish or highly saline water.

Long answer questions

Q.1. Explain the water cycle.

Ans. Water cycle is a cycle working on earth for millions of years. In this, water changes its position and location continuously and reaches the surface of the ocean in the form of a cycle and from the ground back to the ocean. Water evaporates from the bottom of the oceans, forming clouds. The water vapour in the atmosphere condenses and comes to the Earth as precipitation. This water reaches back into the ocean via rivers. This cycle of water is called the water cycle. In this way, the water cycle keeps the terrain, the water system and the atmosphere connected to each other.



Q.2. What factors affect the salinity of ocean water.

Ans. Different amounts of salinity are found at different places. Factors affecting it are:-

1. **Water supply:** Low salinity in cold water compared to hot water it occurs. Salinity is reduced at the estuaries of rivers.
2. **The amount of evaporation:** less at the poles and higher latitudes, while more evaporation occurs at Cancer and Capricorn circles. Where evaporation is high salinity will be high.

3. Ocean currents: Salinity is less in cold streams and more in hot streams.

Q.3. “Salinity of oceans ranges differently”. Justify the statement.

Ans. Horizontal distribution of salinity

The distribution of salinity in the water of different seas of the world is of a different type, it can be described as follows:

Salinity of open seas

1. The amount of salinity is highest on Cancer and Capricorn (Due to excess of evaporation).
2. The amount of salinity near the equator is less because of the excess rainfall.
3. Low salinity levels are found near the poles, (due to ice joining the sea).

Q.4. Explain the factors affecting the temperature distribution of oceans?

Ans. Like all other objects on the earth, ocean water receives heat from the sun. Sea water is heated by receiving heat from solar radiation which increases its temperature. The temperature of seawater is not always the same. It varies according to time and place.

The following factors affect the temperature:

1. Latitude
2. Prevailing Winds
3. Ocean Currents
4. Effect of Adjacent Land Masses
5. Salinity
6. Ice Flows and Icebergs

Q.5. Which layers of temperature will you face when going down to sea? Why does temperature vary with depth in ocean?

Ans. The sea contains thousands of types of fauna and other elements which are affected by the sea temperature, as the depth of the ocean and the sea increases the temperature varies. The following layers are encountered when we goes down in sea or ocean

First Layer- It represents the top layer of warm oceanic water and it is about 500m thick with temperature ranging between 20 degree and 25 degree Celsius.

Second Layer- This is called thermocline layer lies below the first layer and is characterised by rapid decrease in temperature with increasing depth. The temperature decreases at a rapid rate as its depth increases. Its thickness varies from 500-1000 m.

Third Layer- This layer is very cold and extends up to the deep ocean floor, in the Arctic and Antarctic circles the surface water temperatures are close to zero degree Celsius and so the temperature change with the depth is very slight. In such regions only one layer of cold water exists.

Q.6. What is the difference between temperature gradient (thermocline) and salinity gradient (halocline)?

Ans. The temperature gradient and salinity gradient represent the level at which temperature and salinity rapidly decline or increase, respectively. Both these layers are found in the sea at a depth of 500-1000 meters.

The temperature gradient layer shows a rapidly falling temperature while the salinity gradient shows a rapidly increasing salinity. Both temperature and salinity affect the density of seawater. This leads to stratification of ocean water. High density water moves below low density and causes the birth of water currents in the oceans.

Source based Question

Oceans in the northern hemisphere record relatively higher temperature than in southern hemisphere. The highest temperature is not recorded at the equator but slightly towards north of it. The average annual temperatures for the northern and southern hemisphere are around 19°C and 16° C respectively. This variation is due to the unequal distribution of land and water in the northern and southern hemisphere.

Answer the following questions

Q.1. Which hemisphere have higher temperature?

Ans. Northern hemisphere.

Q.2. Why is there variation in temperature of both hemisphere?

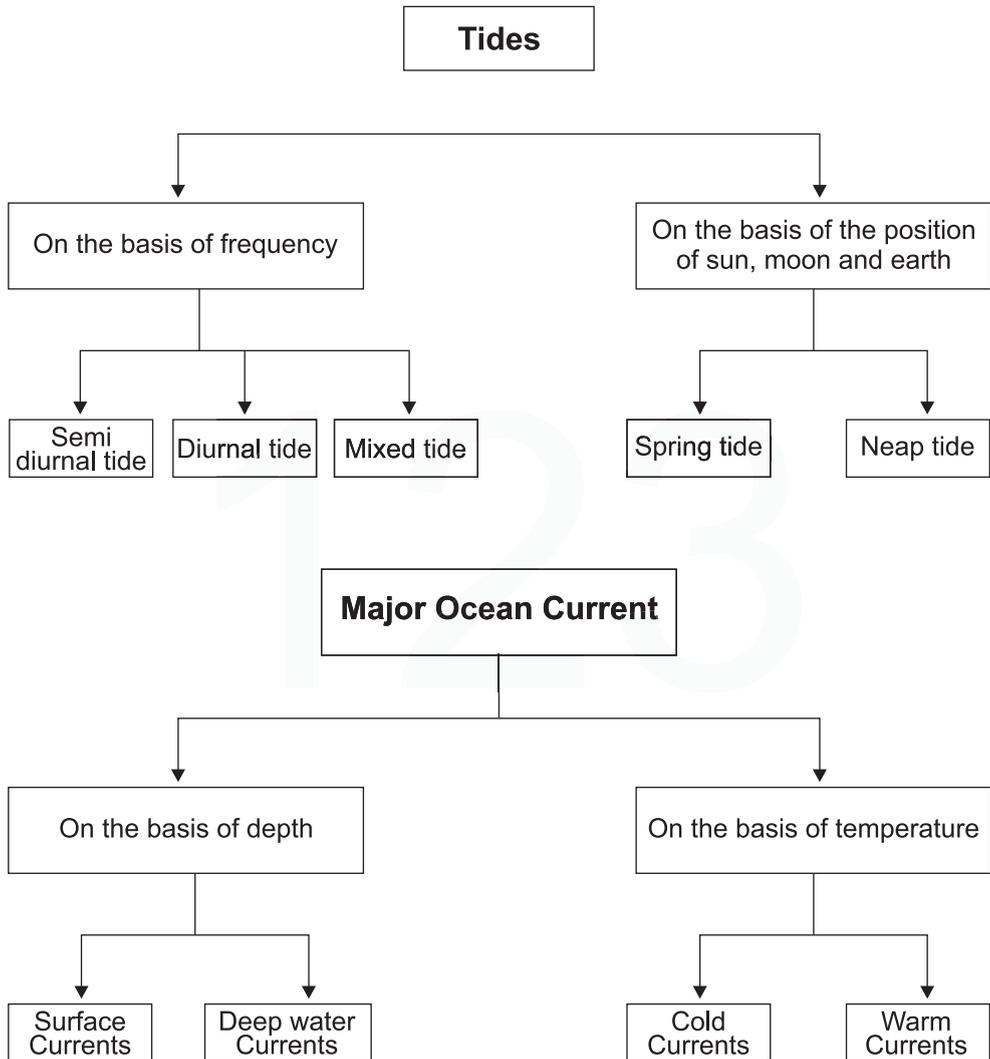
Ans. Due to unequal distribution of land and water.

Q.3. Where higher temperature are recorded?

Ans. Slightly towards north of the equator.

Chapter – 13

MOVEMENTS OF OCEAN WATER



Objective Questions

Q.1. are actually the energy, not water, which moves across the ocean surface.

Ans. Waves

Q.2. Which of the following oceans has the Aughas current?

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

Ans. (b) Indian Ocean

Q.3. The tides that falls on full moon and new moon is called

- (a) Neap Tides (b) Spring Tides
(c) Diurnal Tides (d) Mixed Tides

Ans. (b) Spring Tides

Q.4. What causes tide?

- (a) Winds (b) Curious force
(c) Solar energy (d) Gravitational force

Ans. (d) Gravitational force

Q.5. The horizontal distance between two successive crest is called.

Ans. wavelength

Q.6. Which of the following shows the speed of water caused by climatic effects ?

- (a) Surges (b) Ebbs
(c) Drift (d) Gyres

Ans. (a) Surges

Q.7. The highest part of water is _____

- (a) Amplitude (b) Crest
(c) Trough (d) Frequency

Ans. (c) Crest

Q.8. Wave amplitude is :

- (a) Half of the wave height (b) The height of the wave
(c) The breadth of the wave (d) Highest part of wave

Ans. (a) Half of the wave height

Q.9. The most common tidal pattern, featuring two high tides and two low tides each day is called—

- (a) Mixed tide (b) Semi-diurnal
(c) Diurnal tide (d) Neap

Ans. (b) Semi-diurnal

Q.10. The earth reaches its perihelion in:

- (a) July (b) January
(c) December (d) March

Ans. (b) January

Short Answer Questions (3 Marks Questions)

Q.1. Explain the difference between waves and currents

Ans.:

Waves	Currents
Water in the waves does not move ahead.	Water moves ahead from one place to another.
The motion of the surface water seldom affects stagnant deep bottom water of the oceans.	Currents are sufficiently deep to impact.
Wind provides energy to the waves.	Currents moves due to the impact of permanent winds.
The size of the waves depends on the depth of the water.	The streams are always of huge size, their areas are filled with fish.
The waves are permanent, destruction and construction is an ongoing process.	The currents are the continuous flow of water in a definite direction.

Q.2. What is meant by tidal current?

Ans. When the tide is channelled between islands or into bays and estuaries, they are called tidal currents.

Q.3. How does tides affect navigation?

Or

How is tides related to navigation?

Ans. Tidal flows are of great importance in navigation. Tidal Heights are very important especially harbours near rivers and within estuaries having shallow bars at the entrance, which prevent ships and boats from entering into the harbour. Kolkata and London ports are the examples of benefiting due to tides.

Q.4. Differentiate between perihelion and aphelion.

Ans. When the earth is closest to the sun is known as perihelion, around 3rd January each year where as aphelion occurs on 4th July when the earth is farthest from the sun.

Long answer Questions (5 Marks Questions)

Q.1. Describe the major types of Tides and their importance.

Ans. The periodical rise and fall of the sea level, once or twice a day, mainly due to the attraction of the sun and the moon, is called a tide.

Types of Tides

(a) Tides based on Frequency

1. Semi-diurnal tide
2. Diurnal tide
3. Mixed tide

(b) Tides based on heights

1. Spring Tides
2. Neap Tides

Importance of the Tides

1. Tides help the ships and boats to enter into harbours situated near rivers and estuaries having shallow bars at the entrance.
2. Tides are also helpful in desilting the sediments and in removing polluted water from river estuaries.
3. Tides are used to generate electricity.
4. Tides help, the navigators and fisherman to plan their activities.
5. Due to tides seawater remains dynamic in result water does not freeze in the colder areas.

Q.2. Mention the characteristics of waves

Ans. Wave crest and trough: The highest and lowest points of a wave are called the crest and trough respectively.

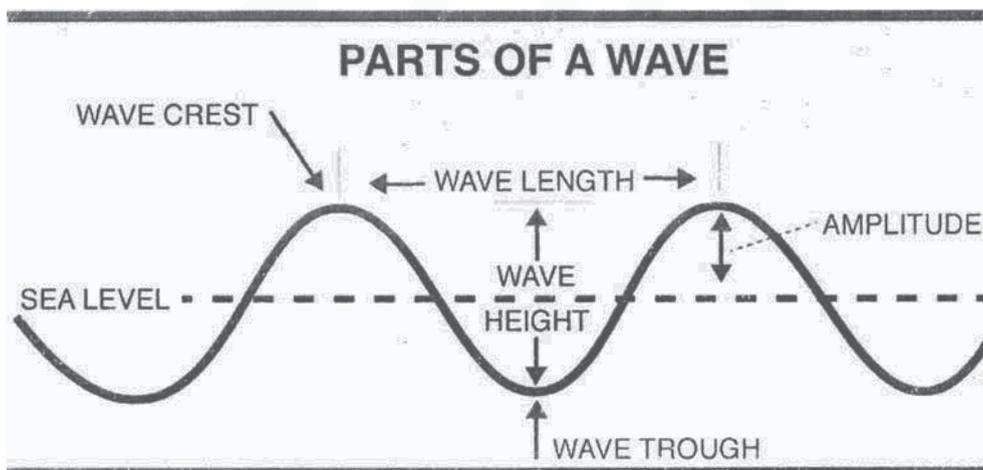
Wave height: It is the vertical distance from the bottom of a trough to the top of a crest of a wave.

Wave amplitude: It is one half of the wave height.

Wave period: It is merely the time interval between two successive wave crests or troughs as they pass a fixed point.

Wavelength: It is the horizontal distance between two successive crests. **Wave speed:** It is the rate at which the wave moves through the water, and is measured in knots.

Wave frequency: It is the number of waves passing a given point during a one second time interval.



Q.3. What are ocean currents called? Give reasons for their origin.

Ans. Ocean currents are the continuous flow of huge amount of water in a definite direction.

Causes of Origin of Currents

Ocean currents are influenced by two types of forces namely:

1. Primary forces - that initiate the movement of water.
2. Secondary forces- that influence the currents to flow

Primary forces include the following

1. Heating by solar energy
2. Wind
3. Gravity
4. Coriolis force

Secondary forces include the following

1. Temperature difference
2. Salinity difference
3. Density difference

Q.4. Classify the ocean currents based on depth and temperature.

Ans. Classification of ocean currents based on their depth

1. Surface currents- constitutes about 10% of all the water in the ocean. These waters are the upper 400 metre of the ocean.
2. Deep water currents- make up the other 90% of the ocean water, these waters move around the ocean basins due to the variations in the density and gravity.

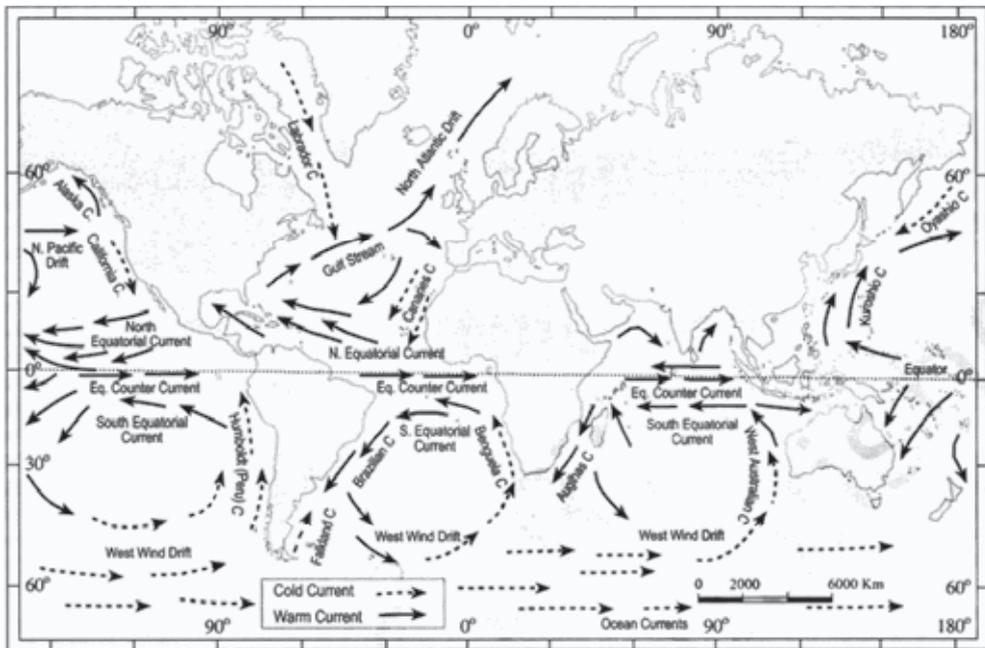
Classification of ocean currents based on temperature

1. Cold currents-bring cold water into warm water areas These currents are usually found on the west coast of the continents in the low and middle latitudes and on the east coast in the higher latitudes in the northern hemisphere.
2. Warm currents- bring warm water into cold water areas and are usually observed on the east coast of continents in the low and Middle latitudes, in the Northern hemisphere they are found on the West Coast of continents in high latitudes

Q.5. What are the effects of ocean currents?

Ans. Ocean currents have the following effects:

1. The currents affect the temperature and narrows down the Diurnal and annual range of temperature of the visiting and surrounding area. Warm currents increase the temperature of colder areas and vice versa.
2. Ocean currents can also cause other climate changes, such as increased fog humidity etc.



3. The mixing of warm and cold currents help to replanish the oxygen and favour the growth of planktons, the primary food for fish population, the best fishing Grounds of the world exist mainly in the mixing zones.

Source Based Question

1. Currents are referred to by their “drift”. Usually the currents are strongest near the surface and may attain speeds over five knots. At depths, currents are generally slow with speeds less than 0.5 knots. We refer to the speed of a current as its drifts. Drift is measured in terms of knots. The strength of a current refers to the speed of the current. A fast current is considered strong. A current is healthiest strongest at the surface and decreases in strength with depth. Most currents have speeds less than or equal to 5 knots.

Answer the following questions:

1. **Where currents are more strong?**

Ans. Knots.

2. **Where currents are more strong?**

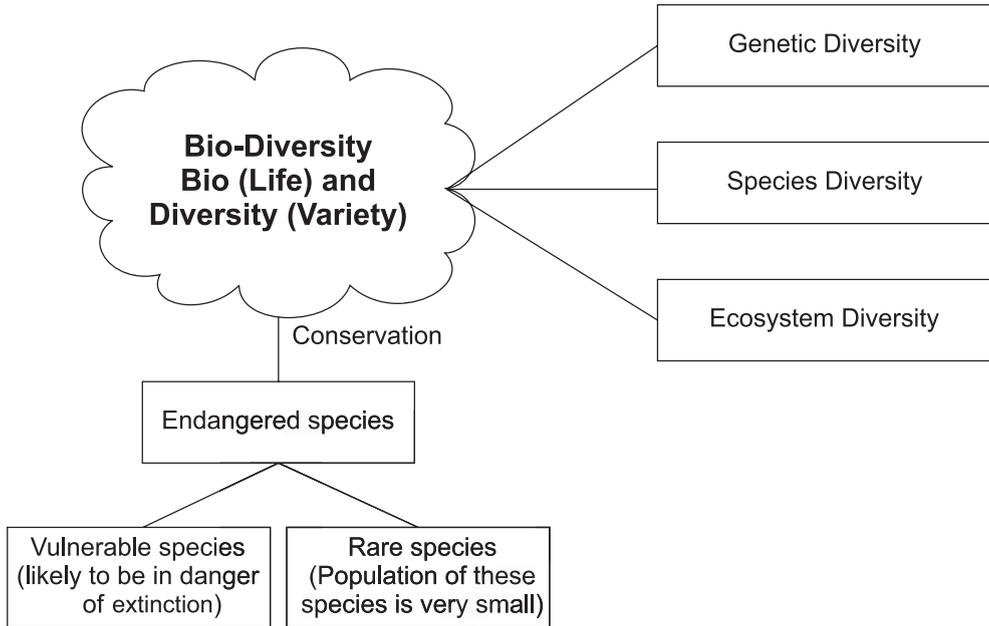
Ans. At the surface.

3. **Where currents are slow?**

Ans. At depths.

Chapter – 14

BIODIVERSITY AND CONSERVATION



Objective Questions

Q.1. Which of the following is related to biodiversity?

- (a) Types of plants (b) Animals
(c) Micro-organisms (d) All of the above

Ans. (d) All of the above

Q.2. Which of the following diversity is difficult and complex to delimit ?

- (a) Genetic diversity (b) Ecosystem diversity
(c) Species diversity (d) Scientific diversity

Ans. (b) Ecosystem diversity

Q.3. Areas rich in _____ diversity are called Hotspot of diversity.

Ans. Species

Q.4. What is called the list published by IUCN about all the endangered species in the world?

- (a) Green list (b) Blacklist
(c) Red list (d) Blue list

Ans. (c) Red list

Q.5. Government of India passed Wildlife Protection Act in 1972 and _____ in 1973.

Ans. Project Tiger

Q.6. Out of the following, where does three fourth of the world's population live?

- (a) Tropical regions (b) Temperate regions
(c) Mountainous regions (d) Coastal desert regions

Ans. (a) Tropical regions

Q.7. Which of the following has caused the biodiversity loss the most?

- (a) Natural Calamities (b) Toxic heavy metals
(c) Increasing human Population (d) Deforestation

Ans. (c) Increasing human population

Q.8. Species which are not the natural inhabitants of the local habitat are called Species.

Ans. Exotic

Q.9. The main reason for the tiger reaching on the verge of extinction is ?

- (a) Deforestation
- (b) illegal Poaching
- (c) Floods
- (d) Pandemic

Ans. (b) illegal Poaching

Q.10. Which one is not correctly matched?

Continents	Hot-Spots
(a) Africa	Upper Guinean Forests
(b) Australia	Queen stard
(c) Asia	Philippines
(d) Asia	Melanesia

Ans. (d) Asia - Melanesia

Source Based Questions

Loss of Bio Diversity

Natural calamities such as earthquakes, floods, volcanic eruptions, forest fires, droughts, etc. cause damage to the flora and fauna of the earth, bringing change the biodiversity of respective affected regions. Pesticides and other pollutants such as hydrocarbons and toxic heavy metals destroy the weak and sensitive species. Species which are not the natural inhabitants of the local habitat but are introduced into the system, are called exotic species. There are many examples when a natural biotic community of the ecosystem suffered extensive damage because of the introduction of exotic species. During the last few decades, some animals like tigers, elephants, rhinoceros, crocodiles, minks and birds were hunted mercilessly by poachers for their horn, tusks, hides, etc. It has resulted in the rendering of certain types of organisms as endangered category.

11.1 What is the main reason for the decline in the number of Elephants?

Ans. illegal Poaching/Hunting

11.2 What threatens sensitive and vulnerable species?

Ans. Use of pesticides and other pollutants.

11.3 Which Natural disasters are responsible for the loss of biodiversity?

Ans. Earthquakes, floods, volcanic eruptions, forest fires droughts.

Long answer type Questions (5 Marks Questions)

Q.1. Explain, what are the three levels at which Biodiversity can be understood?

Ans. Biodiversity can be understood at three levels :

1. Genetic Diversity- Genes are the basic building blocks of various life forms, genetic biodiversity refers to the variation of genes within species, groups of individual organisms having certain similarities in their physical characteristics are called species.
2. Species Diversity - this refers to the variety of species, it relates to the number of species in a defined area, areas rich in species diversity are called hotspots of diversity.
3. Ecosystem Diversity- Ecosystem diversity deals with the variations in ecosystems within a geographical location and its overall impact on human existence and the environment. The demarcation of ecosystem boundaries is difficult and complex.

Q.2. What are the three categories of the threatened species of plants and animals classified by IUCN for the purpose of their conservation?

Ans. The International Union of Conservation (IUCN) has classified the threatened species of plants and animals into the following three categories :

- (1) **Endangered Species-** it includes those species which are in danger of extinction, the IUCN publishes information about endangered species worldwide as the Red list of threatened species.
- (2) **Vulnerable Species-** this includes the species which are likely to be in danger of extinction in the in near future if the factors threatening to their extinction continue. Survival of the species is not as good as their population has reduced greatly.
- (3) **Rare Species-** population of the species is very small in the world; they are confined to Limited areas of thinly scattered over a wider area.

Q.3. “Resolutions taken at the convention on Biodiversity helps in its conservation” Examine the statement.

- Ans.**
- (i) Efforts should be made to preserve the species that are endangered.
 - (ii) Prevention of extinction requires proper planning and management.
 - (iii) Varieties of food crops, forage plants, timber trees, livestock, animals and their wild relatives should be preserved;
 - (iv) Each country should identify habitats of wild relatives and ensure their protection.
 - (v) Habitats where species feed, breed, rest and nurse their young should be safeguarded and protected.
 - (vi) International trade in wild plants and animals be regulated.

Q.4. Evaluate the Importance of Biodiversity.

Ans. Biodiversity plays the following important roles :

1. **Ecological Importance-** species of many kinds perform some function or the other in an ecosystem. Species capture and store energy, produce and decompose organic materials, help to cycle water and nutrients throughout the ecosystem, fix atmospheric gases and help regulate the climate. These functions are important for ecosystem function and human survival, in other words, the more the variety of species in an ecosystem, the more stable the ecosystem is likely to be.
2. **Economic Importance-** For all humans, biodiversity is an important resource in their day-to-day life. One important part of biodiversity is 'crop diversity, which is also called agro-biodiversity. Biodiversity is seen as a reservoir of resources to be drawn upon for the manufacture of food, pharmaceutical, and cosmetic products. This concept of biological resources is responsible for the deterioration of biodiversity. At the same time, it is also the origin of new conflicts dealing with rules of division and appropriation of natural resources. Some of the important economic commodities that biodiversity supplies to humankind are: food crops, livestock, forestry, fish, medicinal resources, etc.
3. **Scientific Importance-** biodiversity is important because each species can give us some clue as to how life evolve and will continue to evolve. Biodiversity also helps in understanding how life functions and the role of each species in sustaining ecosystem of which we are also species.

Q.5. What is Mega diversity centres? Explain.

Ans. There are some countries which are situated in the tropical region ; they possess a large number of the world's species

diversity. They are called megadiversity centres, there are 12 such countries namely Mexico, Colombia, Ecuador, Peru, Brazil, Zaire, Madagascar, China, India, Malaysia, Indonesia and Australia in which these centres are located.

Q.6. What measures has been taken by the Government of India to protect and propagate different type of species?

Ans. To protect preserve and propagate the variety of species within natural boundaries, the government of India passed the wild life (protection) Act, 1972, under which national parks and sanctuaries were established and biosphere reserves declared.

Q.7. What are the factors responsible for the loss of Biodiversity?

Ans. The following factors are responsible for the loss of Biodiversity:

1. Loss of habitat
2. Exponential Population Growth
3. Exotic species
4. Pollution
5. Deforestation
6. Poaching
7. Natural Calamities

Q.8. Classify the ecological hotspots located in different continents.

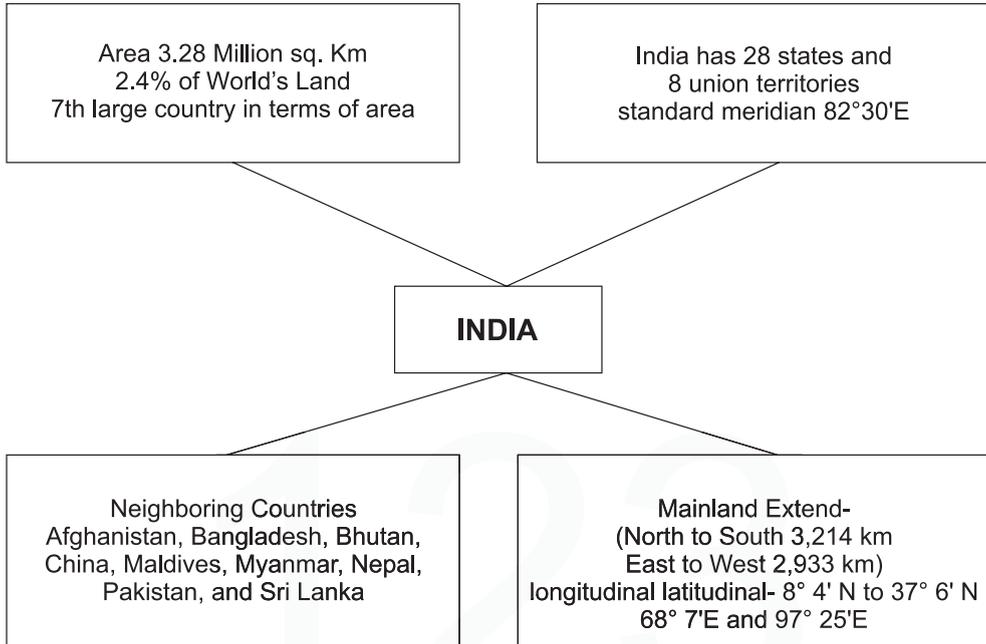
Continents	Hotspots
South and Central America	I. Central America highland Forests II. Western Ecuador and Colombian choco III. Atlantic forest, Brazil IV. Tropical Anderson V. Central American lowland forests
Africa	I. Eastern Madagascar II. Upper Guinean Forests III. Eastern Arc mountains, Tanzania
Asia	I. Western Ghats, Eastern Himalaya, India II. Sinharaja Forest. Sri Lanka III. Indonesia IV. Peninsular Malaysia V. Philippines VI. Northern Borneo
Australia	I. Queensland II. Melanesia (New Caledonia)

Part - B

S.No.	Chapter Name
Unit I : Introduction	
1.	India — Location
Unit II : Physiography	
2.	Structure and Physiography
3.	Drainage System
Unit III : Climate, Vegetation and Son	
4.	Climate
5.	Natural Vegetation
6.	Natural Hazards and Disasters - (to be tested through internal assessment in the form of project and presentation.)
• Important Maps	

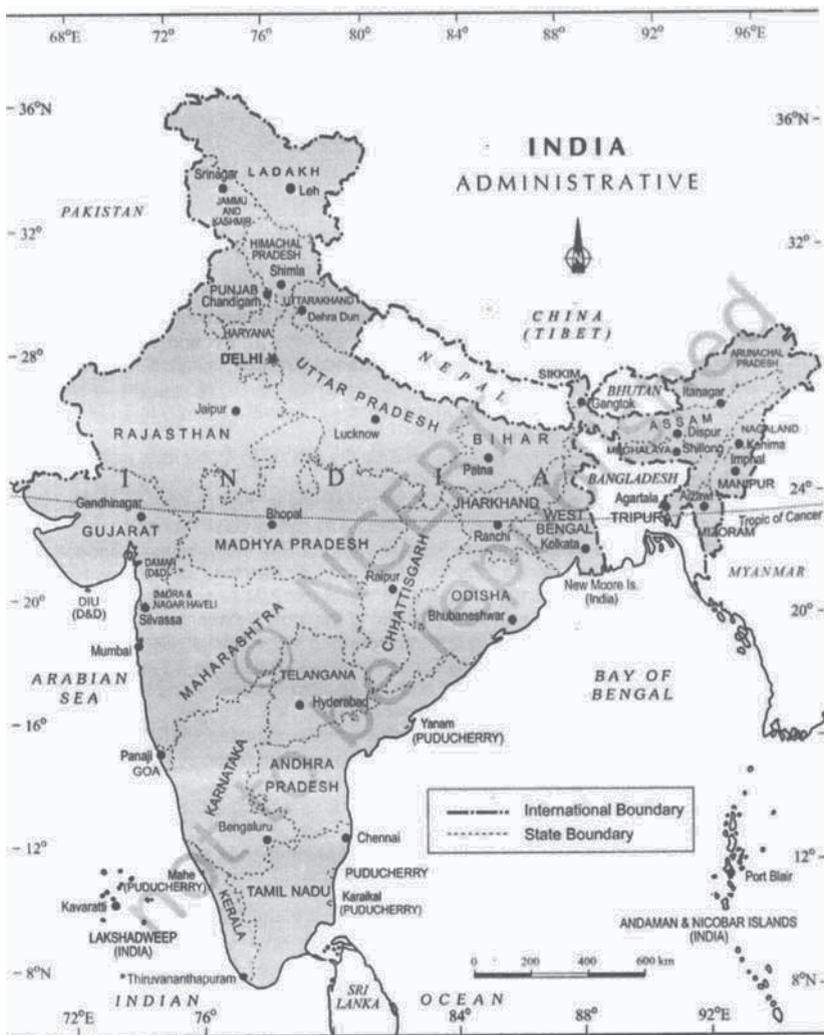
Chapter – 1

INDIA : LOCATION



- India has area of 3.28 million sq. km.
- India accounts for 2.4 per cent of the world's land surface area and stands as the seventh largest country in the world.
- India is located in the south-central part of the continent of Asia, bordering the Indian ocean and its two arms extending in the form of Bay of Bengal and the Arabian Sea.
- The latitudinal and longitudinal extent of India is 8°4'N - 37°6'N and 68°7'E - 97°25'E respectively. There is about 30 degrees, difference between its latitudinal and longitudinal extent.
- The actual distance of India measured from north to south extremity is 3,214 km, and that from east to west is only 2,933 km.
- India's territorial limit further extends towards the sea up to 12 nautical miles (about 21.9 km) from the coast.

- Our southern boundary extends up to 6°45' N latitude in the Bay of Bengal. This was represented by Indira point which was submerged during 2004 Tsunami.
- 82°30" E has been selected as the 'standard meridian' of India. Indian Standard Time is ahead of Greenwich Mean Time by 5 hours and 30 minutes.
- India has a coastline of 6,100 km in the mainland and 7,517 km in the entire geographical coast of the mainland plus the island groups Andaman and Nicobar located in the Bay of Bengal and the Lakshadweep in the Arabian Sea.



- Currently India has 28 states and 8 Union Territories, Rajasthan is the largest and Goa is the smallest state in terms of area, while Uttar Pradesh is the largest and Sikkim is the smallest state in terms of population.
- Terrestrial border of India touches 7 countries, these countries are Pakistan, Afghanistan, China, Nepal, Bhutan, Bangladesh and Myanmar.
- India has longest terrestrial border with Bangladesh.
- Sri Lanka and Maldives are the two island countries located in the Indian Ocean, which are our neighbours.
- Sri Lanka is separated from India by the Gulf of Mannar and Palk Strait.

Objective type Questions

Q.1. Which of the following hemispheres is India located in?

- (a) Eastern hemisphere
- (b) Northern hemisphere
- (c) Eastern and Northern hemisphere
- (d) Southern hemisphere

Ans. (c) Eastern and Northern hemisphere

Q.2. Which latitude line divides India into two parts?

- (a) Equator
- (b) Tropic of cancer
- (c) Tropic of Capricorn
- (d) Arctic circle

Ans. (b) Tropic of Cancer

Q.3. The total geographical area of India is (Lakh square kilometer)

- (a) 32.80
- (b) 22.80
- (c) 42.08
- (d) 30.80

Ans. (a) 32.80 Lakh square kilometer

Q.4. Which of the following countries does not touch India's borders?

- (a) China (b) Bangladesh
(c) Myanmar (d) Kyrgyzstan

Ans. (d) Kyrgyzstan

Q.5. Which one is the largest state of India (in terms of area)?

- (a) Maharashtra (b) Uttar Pradesh
(c) Rajasthan (d) Madhya Pradesh

Ans. (c) Rajasthan

Q.6. Currently there are total states in India is

- (a) 28 (b) 29
(c) 30 (d) 27

Ans. (a) 28

Q.7. India is ranked in the world by geographical area

- (a) 5 (b) 6
(c) 7 (d) 8

Ans. (c) 7

Q.8. The southernmost point of the Indian Union was

- (a) Kanyakumari (b) Indira point
(c) Rameshwaram (d) Barren Island

Ans. (b) Indira point

Q.9. Which of the following countries is not bigger than India in terms of area

- (a) Canada (b) Australia
(c) France (d) Brazil

Ans. (c) France

Q.10. Which of the following is the latest union territory of India?

- (a) Jammu and Kashmir
- (b) Ladakh
- (c) Dadra and Nagar Haveli and Daman and Diu
- (d) All of the above

Ans. (c) All of the above

Q.11. Telangana state is separated from which of the following state?

- (a) Kerala
- (b) Jammu and Kashmir
- (c) Andhra Pradesh
- (d) Tamilnadu

Ans. (c) Andhra Pradesh

Q.12. The Shape of India is

Ans. Quadrilateral

Q.13. Indian Standard Time is ahead of Greenwich Mean Time by

Ans. 5 hours and 30 minutes.

Q.14. India is situated at the upper end of the

Ans. Indian Ocean.

Q.15. The is a saline swamp located in the western part of India.

Ans. Rann of Kutchh.

Q.16. The total length of India's coastline is kms.

- (a) 10500
- (b) 7516.6
- (c) 3500
- (d) 7500

Ans. (b) 7516.6 Kms.

Q.17. Which of the following states the Tropic of Cancer does not pass through?

- (a) Rajasthan (b) Odisha
(c) Chhattisgarh (d) Tripura

Ans. (b) Odisha

Q.18. The time difference between eastern and western part of India is

- (a) 30 Minute (b) 2 Hours
(c) 4 Minute (d) 15 Hours

Ans. (b) 2 Hours

Short answer type Questions (3 Marks Questions)

Q.1. Why Indian Ocean is named after India?

- (1) India is also known as Hind i.e. Hindustan. This is the only ocean named after a country called the Indian Ocean.
- (2) On the coast of the Indian Ocean between West Asia and East Asia India's position is very important.
- (3) The coastline of India located at the northern end of this ocean is also longer than the country's coastline.

Q.2. Why is India's central position at the top of the Indian Ocean important?

- Ans. (1) The Indian peninsula is about 1600 km extended into the Indian Ocean.
- (2) South-central Arabian Sea in the west and Bay of Bengal in the east. The central position of India at the top of the Indian Ocean in Asia helps establish relations with the developed nations of Europe in the west.

- (3) Africa and West Asia, South East Asia, Japan, Business relations with countries like Australia, Newzealand and America etc. are helpful in establishing.

Thus we can say that the Indian Ocean is actually a boon for the country.

Q.3. What are the benefits of India's long coastline?

Ans. The long coastline of India has many benefits:

1. Provides favorable conditions for the development of ports and helps in employment generation.
2. Provide useful waterways for trade.
3. The cross-ocean waterways connecting Africa, industrially developed Europe and prosperous West Asia to the south-east Asian countries, China, Japan with developed industries, Australia and the west coast of the United States pass through India.

Q.4. "The abundant sunshine and monsoonal rainfall from the tropical sun determines the destiny of millions of Indians" Analyse.

Ans. Temperature and rainfall are the two main elements of climate. These have a direct impact on the soil, fauna and human activities here. The fate of agriculture-based industries and the people associated with them is linked to these two climatic elements, so it is perfectly appropriate to say that abundant sunlight and monsoonal rain from the tropical sun sets the fate of millions of Indians.

Q.5. What is a subcontinent called? Write the names of the countries included in the Indian subcontinent.

Ans. A large part of a continent, which is geographically, culturally and economically different from other parts of the continent and has uniformity in its terrain, is called a subcontinent. The Indian

subcontinent includes Pakistan in the northwest, Nepal, Bhutan in the north, Bangladesh in the east and India in the middle.

Q.6. Why is there a time variation of 2 hours between the easternmost and westernmost part of the country? Explain the statement.

Ans. Longitudinal extent of India has the difference of 30° . There is time variation of 2 hours between easternmost and the westernmost parts of our country. The sun rises two hours earlier in Arunachal Pradesh as compared to Gujarat. This is because the earth is tilted and also it rotates in east to west direction. So while rotation, the eastern parts of the world experiences the sun rays earlier as compared to the western parts of the world.
 $1 \text{ degree} = 4 \text{ minutes}$
 $30 \text{ degree} = 4 \times 30 = 120 \text{ minutes}$
 $120 \text{ minutes} = 2 \text{ hours}$

Q.7. Name the countries larger in area than India?

Ans. India is the seventh largest country in the world. The following countries are larger in area than India: Russia, China, Canada, U.S.A., Brazil and Australia.

Map items for locating and labelling on outline political map of India.

India Physical Environment

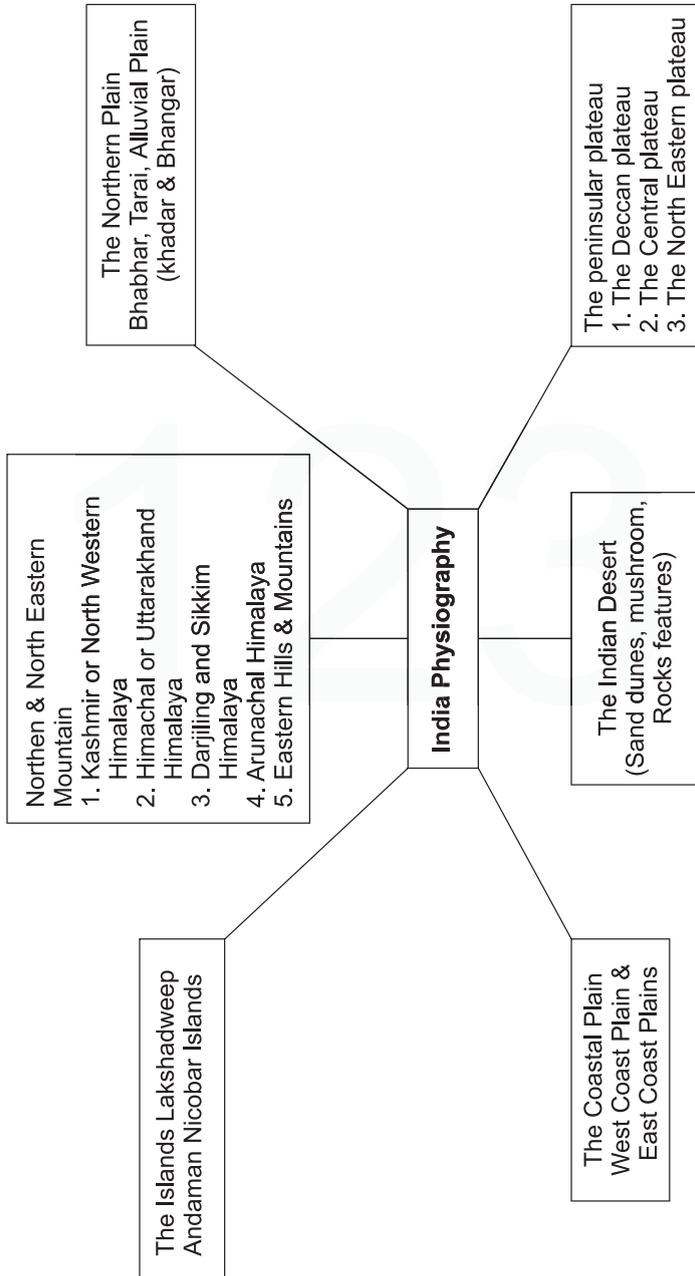
Chapter I - India- Location

- Latitudinal extent of India
- Longitudinal extent of India
- Standard Meridian of India
- Important latitude passing through India (Tropic of Cancer)
- Southern Most Point of main land of India (Kanyakumari)

State	Capital
Andhra Pradesh	Amaravati
Arunachal Pradesh	Itanagar
Assam	Dispur
Bihar	Patna
Chhattisgarh	RAipur
Goa	Panaji
Gujrat	Gandhinagar
Haryana	Chandigarh
Himachal Pradesh	Shimla
Jammu and Kashmir	Srinagar (Summer), Jammu (Winter)
Jharkhand	Ranchi
Karnataka	Bengaluru
Kerala	Thiruvananthapuram
Madhya Pradesh	Bhopal
Maharashtra	Mumbai
Manipur	Imphal
Meghalaya	Shillong
Mizoram	Aizawl
Nagaland	Kohima
Odisha	Bhubaneswar
Punjab	Chandigarh
Rajasthan	Jaipur
Sikkim	Gangtok
Tamil Nadu	Chennai
Telangana	Hyderabad
Tripura	Agartala
Uttar Pradesh	Lucknow
Uttarakhand	Dehradun
West Bengal	Kolkata

Chapter – 2

STRUCTURE AND PHYSIOGRAPHY



- The earth and its landforms that we see today have evolved over a very long time.
- Current estimation shows that the earth is approximately 460 million years old. Over these long years, it has undergone many changes brought about primarily by the endogenic and exogenic forces.
- Indian plate was to the south of the equator millions of years ago.
- Over millions of years, this plate broke into many parts and the Australian plate moved towards the south-eastern direction and the Indian plate to the north.
- Based on the variations in its geological structure and formations, India can be divided into three geological divisions. These geological regions broadly follow the physical features: The Peninsular Block, The Himalayas and other Peninsular Mountains, Indo-Ganga-Brahmaputra Plain.
- The Peninsula is formed essentially by a great complex of very ancient gneisses and granites, which constitutes a major part of it. Since the Cambrian period, the Peninsula has been standing like a rigid block with the exception of some of its western coast which is submerged beneath the sea and some other parts changed due to tectonic activity without affecting the original basement.
- The Himalayas along with other Peninsular mountains are young, weak and flexible in their geological structure.
- INDO-GANGA-BRAHMAPUTRA PLAIN Originally, it was a geosynclinal depression which attained its maximum development during the third phase of the Himalayan mountain formation approximately about 64 million years ago.

- Based on these macro variations, India can be divided into the following physiographic divisions:
 - (1) The Northern and North-eastern Mountains
 - (2) The Northern Plain
 - (3) The Peninsular Plateau
 - (4) The Indian Desert
 - (5) The Coastal Plains
 - (6) The Islands.

Objective type Questions

Q.1. In which part of the Himalayas Karewas are found?

- (a) Kashmir Himalayas
- (b) North-East Himalayas
- (c) Eastern Himalayas
- (d) Himachal-Uttarakhand Himalayas

Ans. (a) Kashmir Himalayas

Q.2. Which of the following is the oldest landmass of India?

- (a) Northern Plains
- (b) Peninsular Plateau
- (c) Himalayas
- (d) Aravalli

Ans. (b) Peninsular Plateau

Q.3. The following is called the latest alluvial deposit

- (a) Khadar
- (b) Bhangar
- (c) Bhabar
- (d) Tarai

Ans. (a) Khadar

Q.4. Which ancient sea was in place of Himalayan mountain?

- (a) Tethys sea (b) Southern Ocean
(c) Arabian Sea (d) Indian Ocean

Ans. (a) Tethys sea

Q.5. Which of the following is an example of the youngest mountain range of India?

- (a) Aravalli (b) Satpura
(c) Vindhya (d) Himalayas

Ans. (d) Himalayas

Q.6. Luni River flows in _____.

Ans. Rajasthan

Q.7. Pass is situated between the Nilgiri and Annamalai hills.

Ans. The Palghat

Q.8. Which of the following lakes is an example of a saline lake?

- (a) Dal Lake (b) Wularlake
(c) Tso Moriri Lake (d) None of the above

Ans. (c) Tso Moriri Lake

Q. 9. Which of the following peaks is not located in India?

- (a) Nanda Devi (b) K2
(c) Mount Everest (d) Kamet

Ans. (c) Mount Everest

Q.10. The Highest peak of penin soular plateau is _____

Ans. Anaimudi (2695 m)

Q.11. Western Ghat is known as _____ in Maharashtra.

Ans. Sahyadri

Source based Questions

These extend from the east of the Bhutan Himalayas up to the Diphu pass in the east. The general direction of the mountain range is from southwest to northeast. Some of the important mountain peaks of the region are Kangtu and Namcha Barwa. These ranges are dissected by fast-flowing rivers from the north to the south, forming deep gorges. Bhrmaputra flows through a deep gorge after crossing Namcha Barwa. Some of the important rivers are the Kameng, the Subansiri, the Dihang, the Dibang and the Lohit. These are perennial with the high rate of fall, thus, having the highest hydro-electric power potential in the country. An important aspect of the Arunachal Himalayas is the numerous ethnic tribal community inhabiting in these areas. Some of the prominent ones from west to east are the Monpa, Abor, Mishmi, Nyishi and the Nagas. Most of these communities practise Jhumming. It is also known as shifting or slash and burn cultivation. This region is rich in biodiversity which has been preserved by the indigenous communities. Due to rugged topography, the inter-valley transportation linkages are nominal. Hence, most of the interactions are carried through the duar region along the Arunachal-Assam border.

Q.1. Which of the following subdivision of Himalayan Mountains is described in the above paragraph?

- (a) Himachal and Uttarakhand Himalayas
- (b) Kashmir Himalayas
- (c) Arunachal Himalayas
- (d) Darjiling Himalayas

Ans. (c) Arunachal Himalayas

Q.2. This subdivision of Himalaya Mountains is rich in?

- (a) tribal community
- (b) biodiversity
- (c) Trade
- (d) Perennial Rivers

Ans. (b) Biodiversity

Q.3. Mishmi and Nyishi communities practise for livelihood.

Ans. Jhumming cultivation

Q.4. Which of the following pass is related to this subdivision of Himalayas?

- (a) Diphu pass
- (b) Zojila pass
- (c) Bara Lacha pass
- (d) All of the above

Ans. (a) Diphu pass

Short Questions (3 Marks)

Q.1. Write the differences between Bhabar and Terai.

Ans

Bhabar	Terai
This region extends from the Indus River to the Teesta River.	South of the Bhabar is the Terai belt.
Bhabar is a narrow belt ranging between 8-10 km.	Terai has the width of 10-20 km.
It is unsuitable for Agriculture	It is suitable for Agriculture
The streams and rivers coming from the mountains deposit heavy materials of rocks and boulders here.	It is formed from the finer boulders, thereby, creating marshy and swampy conditions known as the Terai.
The rivers coming from the mountains disappear in this zone.	Most of the streams and rivers re-emerge here which disappeared in Bhabar.

Q.2. Explain the difference between Bhangar and Khadar.

Ans.

Bhangar	Khadar
Bhangar pradesh is higher than the flood level.	Floods occur every year in Khadar region.
It is not useful for Agriculture.	Intensive farming is done here.
It is a high state made of old alluvial soil.	It is a lowland state made of fine alluvial soil.
These soils are coarser in texture.	These soils are finer in texture.
In punjab it is called chhaya.	In punjab it is called bet.

Q.3. Where is the cold desert located in India? Name the main ranges of this region?

Ans. The north-eastern part of the Kashmir Himalayas is a cold desert, which lies between the Greater Himalayas and the Karakoram ranges. It comprise a series of ranges such as the

1. Karakoram
2. Ladakh
3. Zaskar
4. Pir Panjal.

Q.4. State the three features of the eastern hills of the Himalayan ranges?

Ans. 1. These are parts of the Himalayan mountain system having their general alignment from the north to the south direction.

2. They are known by different local names. In the north, they are known as Patkai Bum, Naga hills, the Manipur hills and in the south as Mizo or Lushai hills.

3. These are low hills, inhabited by numerous tribal groups practising Jhum cultivation.

Q.5. Analyse the difference between Arabian Sea and Bay of Bengal Islands group.

Ans.	Islands group of Arabian Sea	Islands group of Bay of Bengal
	There are approximately 36 islands of which 11 are inhabited.	The Bay of Bengal Islands groups consist of about 572 Islands/islets.
	These are situated roughly between 8°N-12°N and 71°E-74°E.	These are scattered between 6°N-14°N and 92°E-94°E.
	They are separated by a water body which is called the 11° channel.	They are separated by the 10° channel.

Minicoy is the largest island with an area of 453sq.km.	This group of islands is divided into two broad categories the Andaman in the north and the Nicobar in the south.
This group of island is built of coral deposits.	This group of island are volcanic in origin.

Q.6. Make a comparative study of the western and the eastern coastal plains?

Ans. The western Coastal plains

1. The western coastal plains are an example of submerged coastal plain.
2. The western coastal plains are narrow in the middle and get broader towards north and south.
3. The rivers flowing through this coastal plain do not form any delta.

The Eastern Coastal Plains

1. It is an example of an emergent coast
2. This coastal plain has less number of ports and harbours because of its emergent nature.
3. There are well developed deltas, formed by the rivers flowing eastward into the Bay of Bengal.

Q.7. Why there is no delta on the western Coastal Plain?

Ans. The rivers flowing through this coastal plain do not form any delta due to their shorter path.hard rocks and have low sediments for deposition.

Q.8. Examine the statement “the Indian Desert was once part of the sea”.

Ans. To the northwest of the Aravalli hills lies the Great Indian Desert. It is believed that during the Mesozoic Era, this region was under the sea. This can be corroborated by the following evidences :

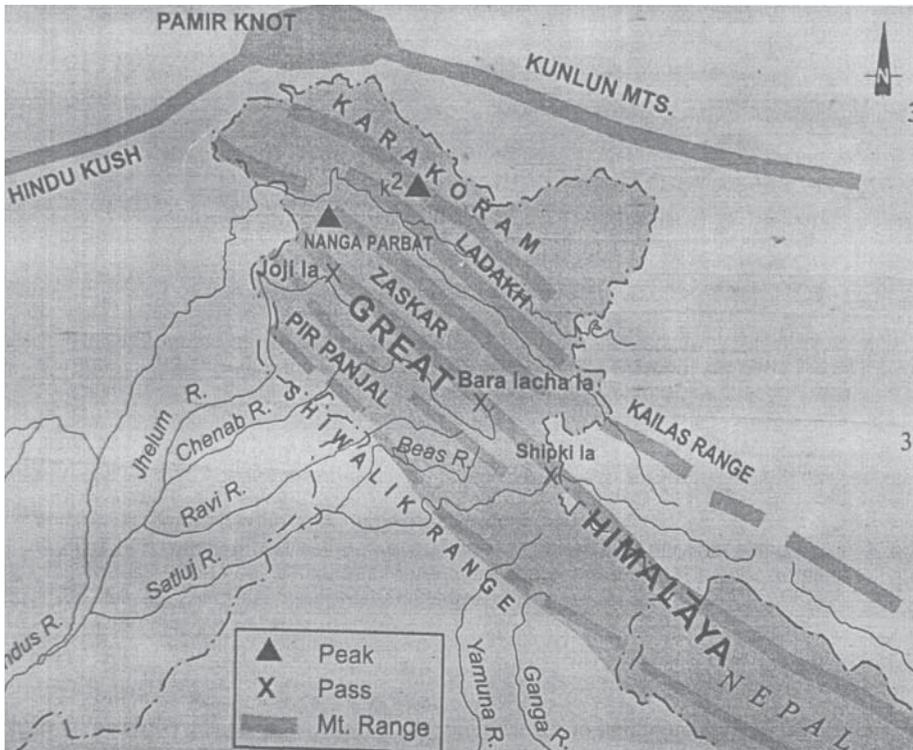
1. Wood fossils park at Aakal
2. Marine deposits around Brahmsar.near Jaisalmer.

Long Question (5 Marks)

Q.9. Analyse the north and north eastern mountains ranges of India in five points.

- Ans.**
- I. The north and Northeastern mountains consist of the Himalayas and the Northeastern hills.
 - II. The Himalayas consist of a series of parallel mountain ranges. Some of the important ranges are the Greater Himalayan range, which includes the Great Himalayas and the Trans Himalayan range, the middle Himalayas and the Shiwalik.
 - III. The approximate length of the Great Himalayan range, also known as the central axial range, is 2500km from east to west, and their width varies between 160-400km from north to south.
 - IV. The general orientation of these ranges is from northwest to the southeast direction in the northwestern part of India.
 - V. In Arunachal Pradesh they are from southwest to the northwest direction while in Nagaland, Manipur and Mizoram, they are in the north-south direction.

VI. Himalayas are not only the physical barrier. they are also a climatic drainage and cultural divide.



Q.10. Explain the major characteristics of the Peninsular Plateau?

- Ans.**
1. Rising from the height of 150 m and above the river plains up to an elevation of 600-900m is the irregular triangle known as the Peninsular Plateau.
 2. Delhi ridge in the northwest, the Rajmahal hills in the east. Gir range in the west and the Cardamom hills in the south constitute the outer extent of the Peninsular Plateau.
 3. This is one of the oldest and the most stable landmass of India.
 4. The general elevation of the Plateau is from the west to the east. which is also proved by the pattern of the flow of rivers.

5. This is formed by gneiss and granite rocks.
6. The northwestern part of the Plateau has a complex relief of ravines and gorges. The ravines of Chambal, Bhind and Morena are some of the well known examples.

Q.11. Differentiate between Western and Eastern Ghats.

Ans. Western Ghats

1. Western Ghats are locally known by different names such as Sahyadri in Maharashtra, Nilgiri hills in Karnataka and Tamilnadu and Anaimalai hills and Cardamom hills in Kerala.
2. Western Ghats are comparatively higher in elevation and more continuous.
3. Their average elevation is about 1500m with the height increasing from north to south.
4. Anaimudi (2695m) is the highest peak of the western ghats.
5. Most of the Peninsular rivers have their origin in the western Ghats.

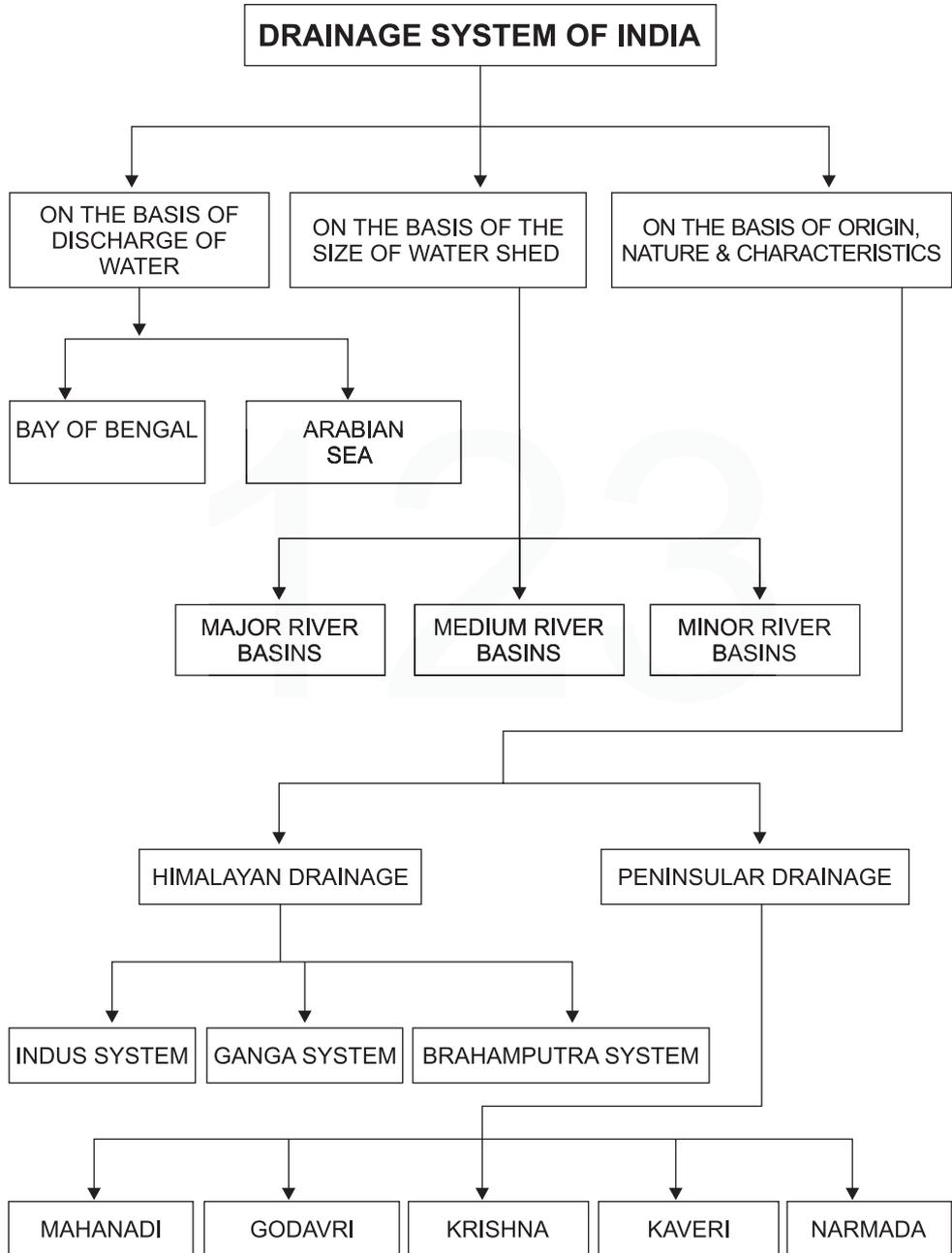
Mapwork:

Chapter 2 - Structure and Physiography

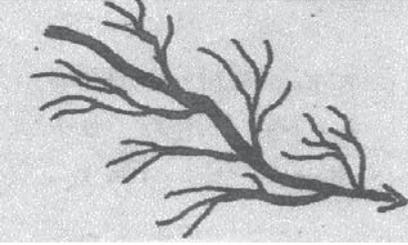
- Mountains Karakoram Range, Garo-Khasi-Jaintia hills, Aravalli Range, Vindhyan Range, Satpura Range, Western ghats & Eastern ghat
- Peaks: K2, Kanchenjunga, Nandadevi, Nanga Parvat, Namcha Barwa and Anaimudi
- Passes: Shipkila, Nathula, Palghat, Bhor ghat and Thal ghat, Plateaus: Malwa, Chhotnagpur, Meghalaya and Deccan Plateau
- Costal Plains: Saurashtra, kmkan, North and South Kannad, Malabar, Coromandel and Northern Circars
- Islands: Andaman & Nicobar Islands and Lakshadweep Islands

Chapter – 3

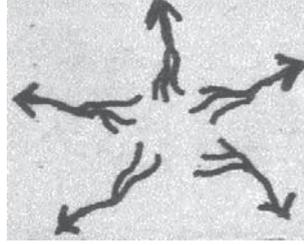
DRAINAGE SYSTEM



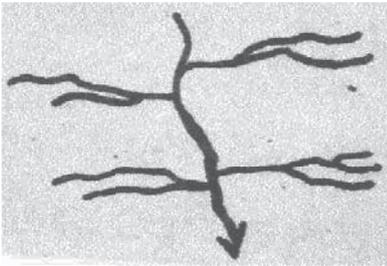
Important Drainage Patterns



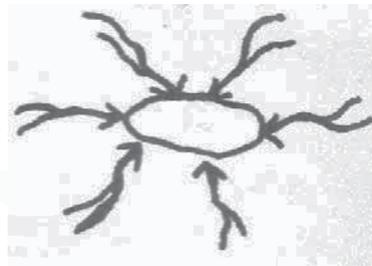
Dendritic



Radial



Trellis



Centripetal

MCQS objective type question

Q.1. Luni river system is the example of which of the following river systems?

- (a) Ephemeral (b) Enduring
(c) Antecedent (d) Perennial

Ans. Ephemeral

Q.2. Arrange the correct sequence of column II against the states in column I.

Column I (River)	Column II (Origin)
I. River Ganga	1. Mapchachungo glacier
II. River Brahmaputra	2. Nasik
III. River Godavari	3. Gangotri Glacier
IV. River Ghaghara	4. Chemayungdung Glacier

- (a) I-3, II- 4, III-2, IV-1 (b) II-2, III-3, IV-1, I-4
(c) IV-3, III-2, II-1, I-4 (d) III-1, II-4, I-3, IV-2

Ans. (a) I-3, II- 4, III-2, IV-1

Q.3. Which of the the following river does not rise in the Himalayas?

- (a) Ghaghra (b) Kosi
(c) Chambal (d) Ganga

Ans- (c) Chambal

Q.4. Examine which of the following is not in part of Indo-Brahma river?

- (a) The Indus and its five tributaries in western part.
- (b) The Ganga and Himalayan tributaries in the central part.
- (c) The stretch of the Brahmaputra in Assam and its Himalayan tributaries.
- (d) River Godavari and its tributaries in South.

Ans. (d) River Godavari and its tributaries in South.

Q.5. Which is not associated with the characteristics of peninsula rivers?

- (a) These are perennial
- (b) These are non-perennial
- (c) Follow fixed course
- (d) Absence of meanders

Ans. (a) These are perennial

Q.6. Which of the following is not associated with river Godavari?

- (a) The largest peninsular river system
- (b) It is called the Dakshin Ganga
- (c) Discharges its water into the Bay of Bengal
- (d) It does not form the delta

Ans. (d) It does not form the delta

Q.7. Fill in the blanks:

- (a) The origin of big rivers of peninsular drainage is _____ .
- (b) The origin of major rivers of north India is in _____ .
- (c) River Brahmaputra is known as _____ in Tibet.
- (d) River originates from Multai in the Betul district of Madhya Pradesh _____ .

- Ans. (a) Western Ghats (b) Himalayas
(c) Tsangpo (d) Tapi

Q.8. Match column A with column B.

Column A	Column B
I. Panjnad	a. The largest river system of Rajasthan
II. Pir Panjal	b. Major tributaries of river Krishna
III. Satopanth	c. Important rivers of Goa
IV. Yamunotri	d. The name given to the five rivers of Punjab
V. River Damodar	e. A mountain range
VI. Koyna, Tungbhadra, Bhima	f. A glacier source of Alaknanda
VII. Luni	g. Sorrow of Bengal
VIII. Mandovi and Juari	h. A glacier source of river Yamuna

Ans (a) I-d, II- e, III-f, IV-h, V-g, VI-b, VII-a, VIII-c

Q.9. Given below are two statements, one labeled as Assertion I and the other labelled as Reason II. Select your answer from the codes given below:

Assertion I : Himalayan river are perennial

Reason II : The region gets rainfall from the South west monsoon season only.

(A) I and II are correct and II explains I

(B) I and II are correct, but II does not explain I

- (C) I is correct, but II is false
- (D) I is false, but II is correct

Ans. (B) I and II are correct but II does not explain I

Short answer Type Questions

Q.1. Why are the rivers of India polluted? Write any three reasons.

- Ans.**
- (a) The dirty waters of cities enters into the rivers.
 - (b) Industrial effluents and wastes get disposed of into the rivers.
 - (c) Most of the cremation grounds are on the banks of rivers and the dead bodies are thrown in the rivers.
 - (d) The flowers and statues are immersed in the rivers on the occasion of some festivals.
 - (e) Large scale bathing and washing of clothes.

Q.2. Which river of Himalayan drainage system is well known for floods, channel shifting and bank erosion. Why?

- Ans.**
- (i) River Brahmaputra is well known for floods, channel shifting and bank erosion.
 - (ii) This is due to the fact that most of its tributaries are large bring large quantity of sediments.
 - (iii) They owing to heavy rainfall in its catchment area.

Q.3. In how many categories on the basis of the size of the watershed, the drainage basins are grouped?

- Ans.**
- (a) Major river basins with more than 20,000 sq km of catchment area. It includes 14 drainage basins as the Ganga, the Brahmaputra etc.
 - (b) Medium river basins with catchment area between 2000-20,000 sq km in incorporating, 44 river basins such as the Kalinadi, the periyar etc.

- (c) Minor river basins with catchment area of less than 2000 sq km include fairly good number of rivers flowing in the area of low rainfall.

Q.4. What are the problems in using river water?

- Ans.** (a) No availability in sufficient quantity
(b) River water pollution
(c) Load of silt in the river water
(d) Uneven seasonal flow of water
(e) River water disputes between states.
(f) Shrinking of channels due to the extension of settlements towards the thalweg.

Q.5. Evaluate the extent of usability of river water.

- Ans.** (i) The rivers of India carry huge volumes of water per year but it is unevenly distributed both in time and space.
(ii) There are perennial rivers carrying water throughout the year whereas the no perennial rivers have very little work, during the dry season.
(iii) During the rainy season, much of the water is wasted in floods and flows down to the sea. As there is a flood in one part of the country whereas the other area suffers from drought.

Long Answer type Questions

Q.1. What is river regimes? Substantiate with examples.

- Ans.** (i) The pattern of flow of water in a river channel over a year is known as its regime. The north Indian rivers originating from the Himalayas are perennial as they are fed by glaciers through snow- melt and receive rainfall water during rainy season.

- (ii) The rivers of South India do not originate from glaciers and their flow pattern witness fluctuations.
- (iii) The flow increases considerably during monsoon rains. The regime of the rivers in South India is controlled by rainfall. It varies from one part of the peninsular plateau to the other
- (iv) The discharge is the volume of water flowing in a river measured over time. It is measured either in cubic feet per second or cumecs (cubic metres per second)
- (v) The Ganga has its minimum flow during the January - June and maximum flow is attained either in August or in September, after it has a steady fall in the flow.
- (vi) There are striking differences in the river regimes in the eastern and western parts of the Ganga basin.

Q.2. Make a comparative study between the Himalayan and peninsular rivers.

Ans. The Himalayan Rivers

- (1) It mainly includes the Ganga, the Indus and the Brahmaputra river basins.
- (2) These are fed both by melting of snow and precipitation.
- (3) All rivers pass through the giant gorges carved out by erosional activity carried on simultaneously with the uplift of the Himalayas.
- (4) All these rivers form deep gorges, v-shaped valleys, rapids and waterfalls in their mountainous course.
- (5) In the Himalayan reaches, the course of these rivers is highly tortuous, but over the plains they display a strong meandering tendency & shift their courses frequently.

The Peninsular River System

- (1) The peninsular river system is older than Himalayan one. This is evident from the broad, largely graded shallow valleys, and the maturity of the rivers.

- (2) The western ghats running close to western coast act as the water divide between the major peninsular rivers, discharging their water in the Bay of Bengal and as small rivulets joining the Arabian sea.
- (3) Most of the major peninsular rivers except Narmada and Tapi flow from west to east.
- (4) The Chambal, the Sind, the Betwa, the Ken, the Son, originating in the northern part of the peninsula belong to the Ganga river system.
- (5) Other major river system of the peninsular drainage are the Mahanandi, the Godavri, the Krishna. and the Kaveri. Peninsular rivers are characterised by fixed course absence of meanders and non-perennial flow of water. The Narmada and Tapi which flow through the rift valley are exception.

Q.3. (Evaluate the major features of river Ganga.)

- Ans.**
- (1) The Ganga is the most important river of India both the point of view of its basin of and cultural significance.
 - (2) It rises in the Gangotri glacier near gaumukh in the uttarkashi district of Uttarakhand.
 - (3) It is known as the Bhagirathi. It cuts through the central and the lesser Himalayas in narrow gorges. At Devprayag, the Bhagirathi meets the Alaknanda, thereafter, it is known as the Ganga.
 - (4) The Ganga enters the plains at Haridwar from here, it flows first to the South, then to the South east and before splitting into distributaries, namely the Bhagirathi and the Hugli.
 - (5) The river has a length of 2525 km. It is shared by Uttarakhand and Uttar Pradesh, Bihar and West Bengal. The Ganga river system is the largest in India having a number of perennial and non-perennial rivers.

Q.4. Evaluate the major characteristics of river Brahmaputra.

- Ans.**
- (1) The Brahmaputra, one of the largest rivers of the world has its origin in the chemayung dung glacier of the Kailash range near the Mansarover lake.

- (2) It traverses eastward longitudinally for a distance of nearly 1200 km in a dry and flat region of southern Tibet, where it is known as the Tsangpo which means the purifier.
- (3) The river emerges from the foothills under the name of Siang or Dihang. It enters India west of Sadiya town in Arunanchal Pradesh flowing Southwest it receives its left bank tributaries, viz, Debang or Sikang and Lohit, there after it is known as Brahmaputra.
- (4) The Rango Tsangpo is the major right bank tributary of this river in Tibet.
- (5) The Brahmaputra receives numerous tributaries in its 750 km long journey through the Assam valley.

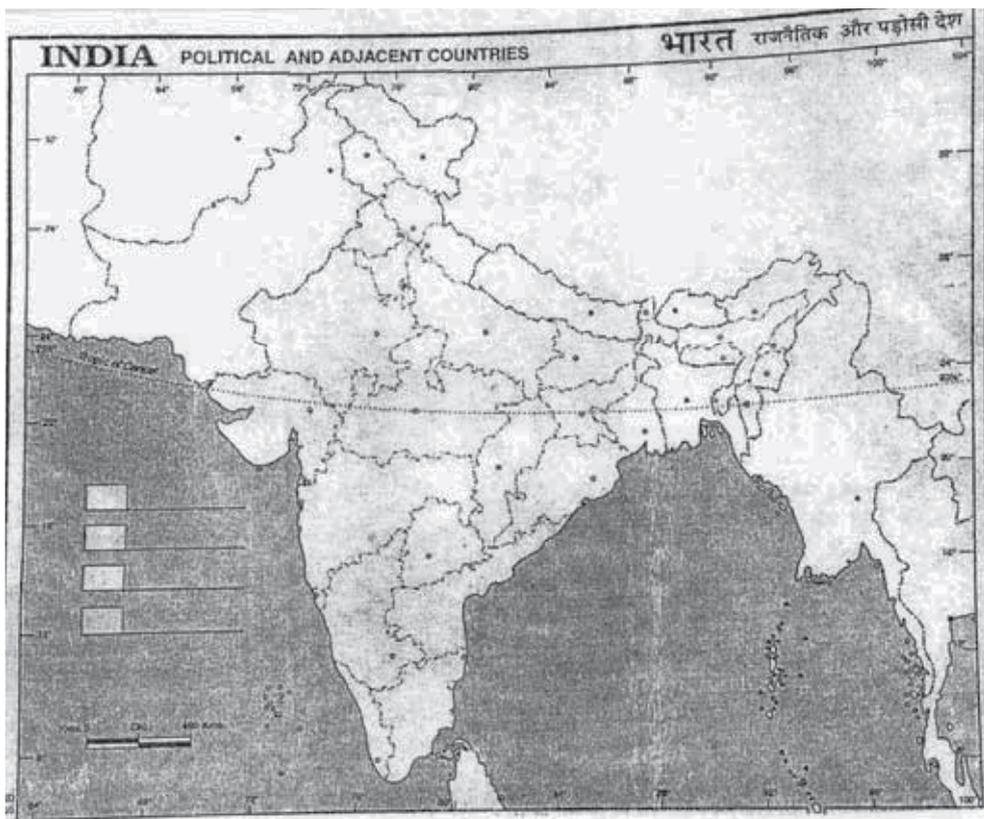
Q.5. Evaluate the Godavari river system.

- (1) The Godavari is the largest peninsular river system. It is also called the Dakshin Ganga.
- (2) It rises in the Nasik district of Maharashtra and discharges its water into the Bay of Bengal.
- (3) Its tributaries run through the states of Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha and Andhra Pradesh.
- (4) It is 1465 km long with catchment area spreading over 3.13 lakh sq. km 49% of this lies in Maharashtra, 20% in Madhya Pradesh and Chhatisgarh & rest in Andhra Pradesh.
- (5) The penganga, the Indravati, the Pranhita, and the Manjra are its principal tributaries.

Mapwork:

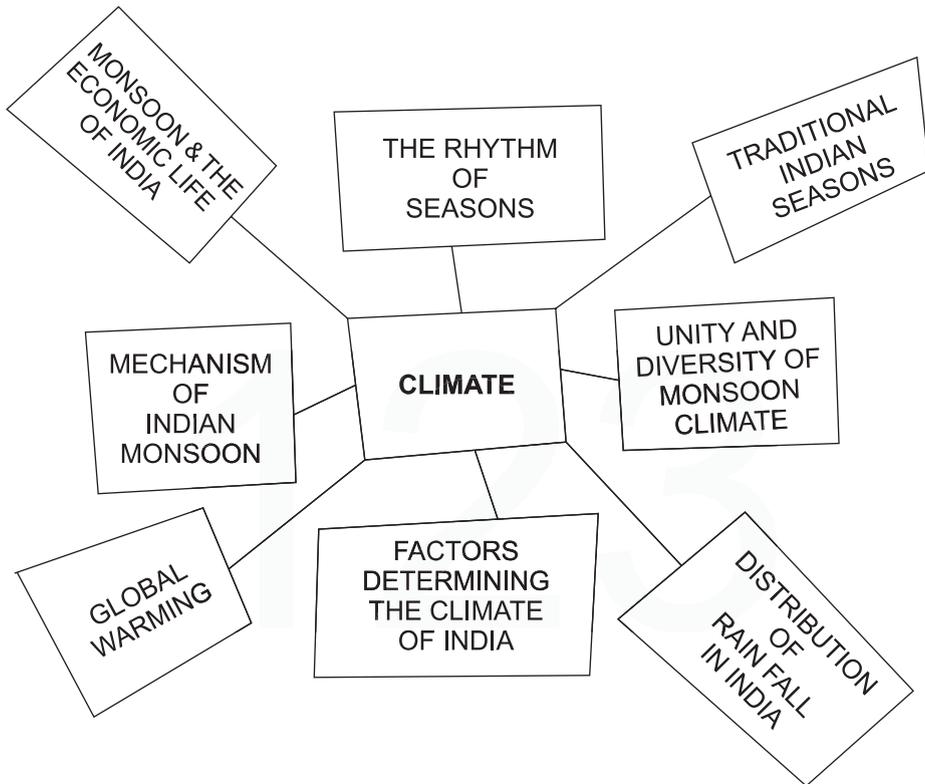
Chapter 3 - Drainage System

- Rivers: Brahmaputra, Indus, Satluj, Ganga, Yamuna, Chambal, Damodar Mahanadi, Krishna, Kaveri, Godavari, Narmada, Tapti and Luni
- Lakes: (Identification) Wular, Sambhar, Chilika, Kolleru, Pulicat & Vembanad
- Straits, Bays, Gulfs: Palk Strait, Rann of Kachch, Gulf of Kachch, Gulf of Mannar & Gulf of Khambat



Chapter – 4

CLIMATE



MCQS type question

Q.1. Churu (Rajasthan) is the example of which of the following place?

- (a) Coldest place
- (b) Hottest place
- (c) Place of very Scanty rainfall
- (d) Place receives large amount rainfall

Ans. (a) Coldest place

Q.2. Examine which of the following usually explains the feature of the weather.

- (a) A momentary state of the atmosphere
- (b) Average of the weather conditions over a longer period of time.
- (c) A change in climate after 50 years or more.
- (d) Climate changes quickly.

Ans. (a) A momentary state of the atmosphere

Q.3. Which of the following receives a huge amount of rainfall?

- (a) Shillong (b) Guwahati
- (c) Mawsynram (d) Jaisalmer

Ans. (c) Mawsynram

Q.4. Which season is not included in the season recognised by the meteorologists?

- (a) The cold weather season
- (b) The hot weather season
- (c) The South west monsoon season
- (d) Spring weather season

Ans. (d) Spring weather season

Q.5. 'Loo' is an example of which of the following local storms?

- (a) Hot dry and oppressing winds.
- (b) Dreaded evening thunder storms.
- (c) A calamity of the month of Baishakh.
- (d) They are known as Bardolli.

Ans. (a) Hot dry and oppressing winds.

Q.6. Arrange the correct sequence of column II against the states in column I.

Column I	Columnn II
-----------------	-------------------

- | | |
|------------------------------------|---------|
| I. Arunanchal Pradesh | 1. As |
| II. Extreme western Rajasthan | 2. Bshw |
| III. Coromondal coast of Tamilnadu | 3. Dfc |
| IV. North Western Gujarat | 4. Bwhw |

- | | |
|-----------------------------|----------------------------|
| (a) I-3, II- 4, III-1, IV-2 | (b) II-4, I-1, III-3, IV-2 |
| (c) III-3, II-2, IV-1, I-4 | (d) I-1, II-4, III-2, IV-3 |

Ans. (a) I-3, II- 4, III-1, IV-2

Q.7. The tropical zone being nearer to the equator which of the following is experience throughout the year.

- (A) High temperature with small daily and annual range
- (B) High temperature with high daily and annual range
- (C) Low temperature and high daily and annual range
- (D) Low temperature and small daily and annual range

Ans. (A) High temperature with small daily and annual range

Q.8. Which of the following steers the tropical depression into India?

- (A) Westerly jet stream
- (B) Eastern wind
- (C) Easterly jet stream
- (D) Western wind

Ans. (C) Easterly jet stream

Q.9. In which direction the winds 'start blowing due to the shift of I.T.C.Z to South ward?

- (A) From South-East to South west
- (B) From South-West to North East
- (C) North East to North-West
- (D) North West to South West

Ans. (B) From South-West to North East

Q.10. Which one of the following is not a fact regarding South India?

- (a) Diurnal range of temperature is less here
- (b) Annual range of temperature is less here.
- (c) Temperatures here are high through out the year
- (d) Extreme climate conditions are found here.

Ans. (d) Extreme climate conditions are found here.

Q.11. Which one of the following phenomenon happens when the sun shines vertically ove the Tropic of capricorn in the southern hemisphere?

- (a) High pressure develops over North-western India due to low temperature.
- (b) Low pressure develops over North western India due to high temperatures.
- (c) No changes in temperatures and pressure occur in north western India.
- (d) 'Loo' blows in the North western India.

Ans. (a) High pressure develops over North-western India due to low temperature.

Q.12. Examine which of the following is a cause of rainfall at coastal region of Tamil Nadu in the winter season?

- (a) South west monsoon
- (b) North east monsoon
- (c) Temperate cyclones
- (d) Local winds

Ans. (b) North east monsoon

Q.13. Which of the following gases, is not green house gas?

- (a) Carbon dioxide
- (b) Chlorofluoro carbons
- (c) Methane
- (d) Oxygen

Ans. (d) Oxygen

Q.14. Assertion (A) Agricultural prosperity of India depends very much on timely and adequately distributed rainfall.

Reason (R) If rain fails agriculture is adversely affected.

- (A) 'A' and 'R' both are correct, 'R' is correct explanation of 'A'
- (B) Both A and R are correct but 'R' is not correct explanation of 'A'
- (C) Only 'A' is correct
- (D) Only 'R' is correct

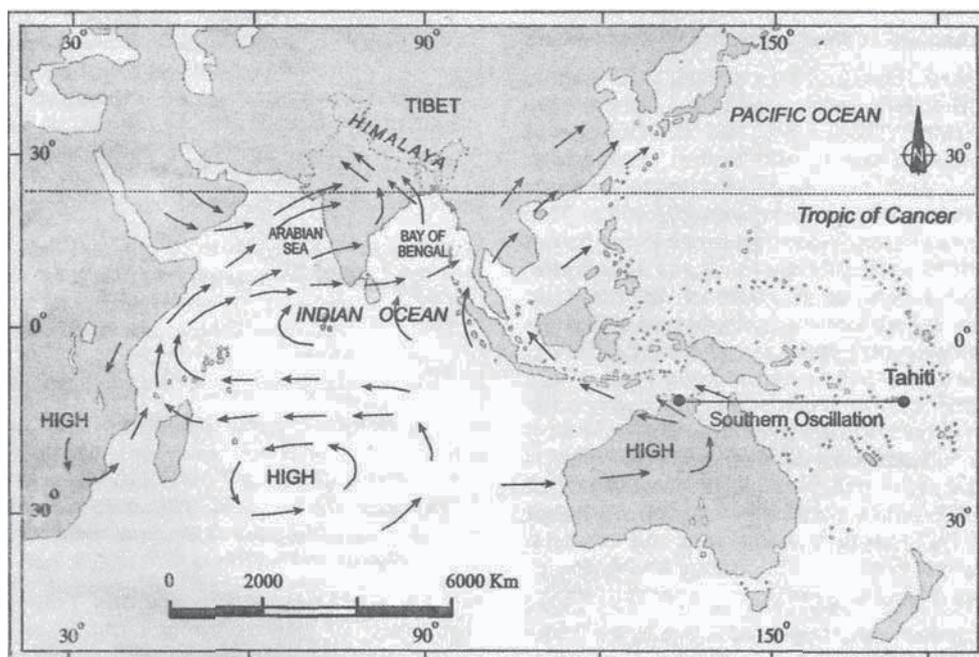
Ans. (A) 'A' and 'R' both are correct, 'R' is correct explanation of 'A'

Q.15. Which of the following is not responsible for global warming?

- (a) Thundering clouds
- (b) Industrialisation
- (c) Volcanic Activities
- (d) Polluting gases in atmosphere

Ans. (a) Thundering clouds

Summer Monsoon Winds : Surface Circulation



Short Answer Type Questions

Q.1. Analyse the factors related to air pressure and wind.

- Ans.** (i) Distribution of air pressure and winds on the surface of the earth.
- (ii) Upper air circulation caused by factors controlling global weather and the inflow a different air masses and jet streams.
- (iii) Inflow a western cyclones generally known as disturbances during the winter season and tropical depressions during the south-west monsoon period into India, creating weather conditions favourable to rainfall.

Q.2. What is break in the monsoon? Mention its causes and impacts.

- (a) During the South monsoon period after having rains for a few days, if rains fails to occur for one a more weeks.

- (b) (i) In northern India, rains are likely to fail if the rain-bearing storms are not very frequent along the monsoon through the I.T.C.Z. over this region.
- (ii) Over the west coast the dry spells are associated with days when winds blow parallel to the coast.

Q.3. Why does Mawsynram (Meghalaya) receive the highest amount of rainfall in the world?

- Ans.** (i) One branch of monsoon winds of the Bay of Bengal moves up the Brahmaputra valley in the north and the north east, causing wide spread rains.
- (ii) Its sub branch strikes the Garo and Khasi hills of Meghalayas mawsynram, located on the crest of khasi hills receives the highest average annual rainfall in the world.

Q.4. Why the Tamil Nadu coast remains dry during the monsoon season? In which season it receives rainfall?

- Ans.** (i) The Tamil Nadu coast is situated parallel to the Bay of Bengal branch of South west monsoon.
- (ii) It lies in the rain shadow area of the Arabian sea branch of the South-west monsoon.
- (iii) It receives rainfall in winter season, by north east monsoon when it crosses over Bay of Bengal, picks up moisture and causes torrential rainfall over the Tamilnadu coast.

Q.5. Mention the arrival process of South-west monsoon in Indian sub-continent?

- Ans.** (i) As a result of rapid increase of temperature in May over the northwestern plains the low pressure condition over there get further intensified, powerful enough to attract the trade winds of southern hemisphere coming from the Indian ocean.

- (ii) These South east trade winds cross the equator and enter the Bay Bengal and the Arabian sea, only to be caught up in the air circulation over India passing over the equatorial warm currents and bring with them moisture in abundance, follow a south westerly direction.
- (iii) The rain in the south west monsoon season begins rather abruptly, the first rain brings down the temperature. This sudden onset of the moisture laden winds associated with violent thunder and lightening is termed as the burst of monsoon.

Q.6. What are the main reasons for the excessive cold in north India during the season?

- Ans.** (i) States like Punjab, Haryana and Rajasthan being far away from the moderating influence of sea experience continental climate.
- (ii) The snow fall in the nearby Himalayan ranges creates cold wave situation and
- (iii) Around February the cold wind coming from the Caspian Sea and Turkmenistan brings cold wave along with frost and fog over the north Western parts of India.

Q.7. Explain the utility of rain-bearing systems and highlight the factors of intensity of rainfall over the west coast of India.

- Ans.** (A) (i) There seems to be two rain bearing systems in India, first originate in the Bay of Bengal causing rainfall over the plains of north India.
- (ii) Arabian Sea current of the south-west monsoon is the second which brings rain to the west coast of India, Much of the rainfall along the western ghats is orographic.

(B) Factors of the intensity of rainfall over the west coast of India.

- (i) The offshore meteorological conditions.
- (ii) The position of the equatorial jet stream along the eastern coast of Africa.

Q.8. What is mango shower? Explain its utility.

- Ans.**
- (i) Towards the end of summer there are premonsoon showers a common phenomena in Kerala and coastal areas of Karnataka. They are known as mango showers locally.
 - (ii) It is very useful in the early ripening of mangoes.

Q.9. Explain the nature and utility of nor westers.

- Ans.**
- (i) These are dreaded evening thunderstorms in Bengal and Assam.
 - (ii) Their notorious nature can be understood from the local nomenclature of Kalbai-Sakhi, a calamity of the month of Baisakh.
 - (iii) These showers are useful for tea, jute and rice cultivation.

Long Answer Type Questions

Q.2. Monsoon is a gamble for Indian farmers. Substantiate the statement.

or

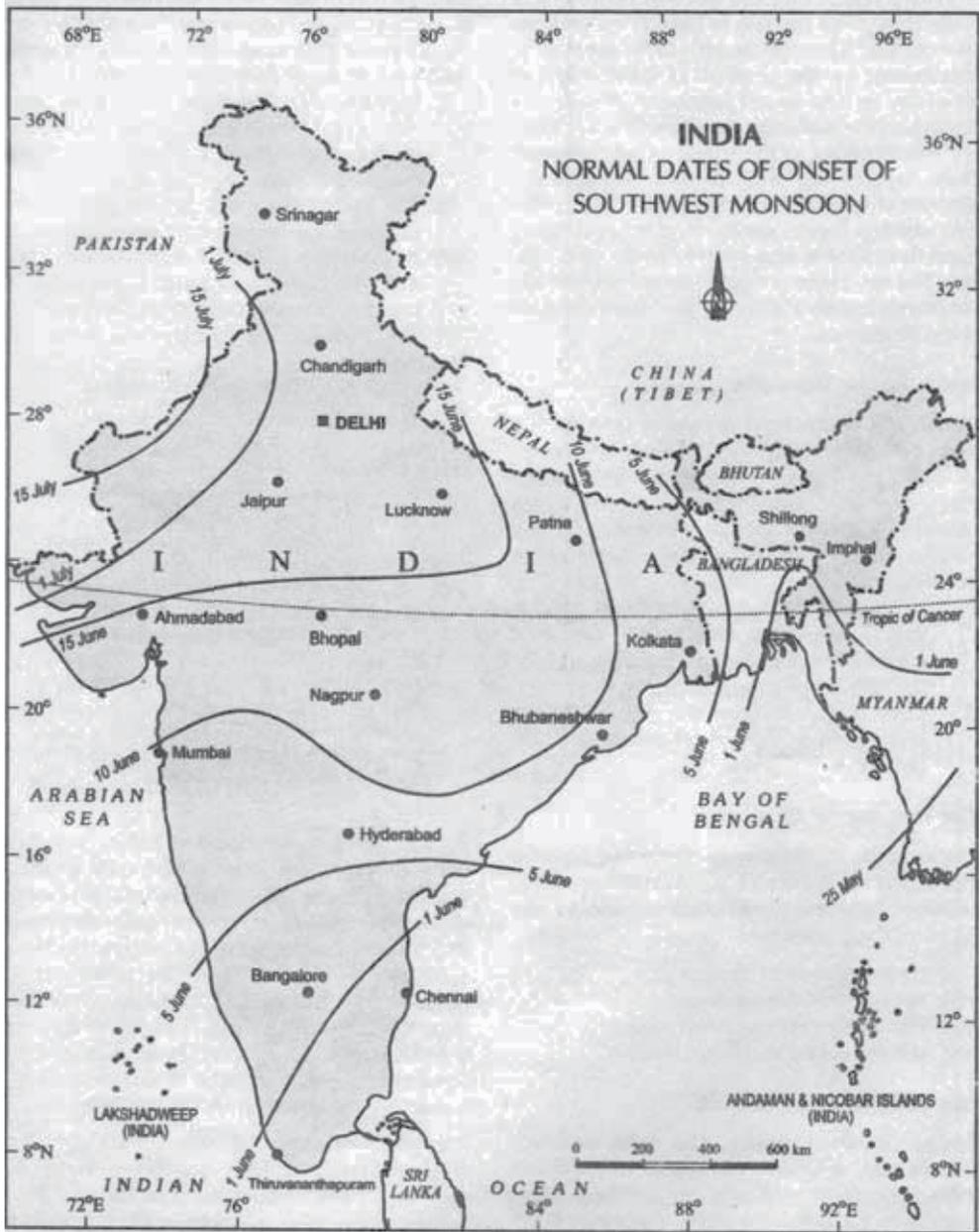
Ans. Monsoon is that axis around which revolves the entire agriculture cycle of India. Substantiate.

- (i) It is because about 64 percent people of India depend on agriculture their livelihood and agriculture itself is based on southwest monsoon.

- (ii) All the parts of the nation, except Himalayas have temperature above the threshold level to grow the crops or plants throughout the year.
- (iii) Regional variations in monsoon climate help in growing various types of crops.
- (iv) Variability of rainfall brings droughts or floods every year in some parts of the country.
- (v) Agricultural prosperity of India depends very much on timely and adequately distributed rainfall. If it fails agriculture is adversely affected specially in those regions where means of irrigation are not developed.
- (vi) Winter rainfall by temperate cyclones in north India is highly beneficial for rabi crops.
- (vii) Regional climate variation in India is reflected in the vast variety of food, clothes and house types.

Q.2. Mention the major features of monsoonal rainfall in India?

- Ans.**
- (i) Rainfall received from the southwest monsoons is reasonable in character, it occurs between June and September.
 - (ii) Monsoonal rainfall is governed by relief or topography, the windward side of the western ghats register a rainfall of over 250 cm. The heavy rainfall in the north eastern states can be attributed to their hill ranges and the eastern Himalayas.
 - (iii) It has a declining trend with increasing distance from the sea, Kolkata receives 119 cm during the South west monsoon Patna 105 cm, Allahabad 76 cm Delhi 56 cm.
 - (iv) The summer rainfall comes in a heavy down pour leading to considerable run off and soil erosion.
 - (v) Monsoons play a pivotal role in the agrarian economy of India because over three fourth of the total rain in the country is received during the South west monsoon seasons.
 - (vi) Its spatial distribution is also uneven ranges from 12 cm to more than 250cm.



Q.3. Explain with example. The effects of relief on the distribution of rainfall.

Ans. Western ghats and western coastal plain

- (i) One branch of Arabian sea monsoon obstructed by the western ghats. These winds climb the slopes of western ghats, they become cool, the wind ward side of the Sahyadris and western coastal plain receive very heavy rainfall between 250 cm-400 cm.
- (ii) Rain shadow area after crossing the western ghats, these winds descend and get heated up, reduces humidity. In the winds result these winds, cause little rainfall east of the western ghats.
- (iii) Heavy rainfall in Meghalaya : A branch of Bay of Bengal strikes the Garo and Khasi hills of Meghalaya. It provides highest average annual rainfall in the world.
- (iv) Less amount of rainfall in Rajasthan : The third branch due to Aravalis of the Arabian monsoon wind strikes the Saurashtra peninsular and the Kachch, when it passes over west Rajasthan and along the Aravalis in result only a scanty rainfall.
- (v) Affect of Himalayas on the direction of monsoonal winds a branch monsoon winds of Bay of Bengal splits into two, under the influence of the Himalays and the thermal low is north-west India. It could not pass the Himalayan range and moves towards west and loses its humidity gradually.

Q.4. Evaluate the factors determining the climate of India related to location and relief.

Ans. (i) Latitude: the Tropic of Cancer passes through the central part of India in east west direction. Northern parts of the country lies in sub-tropical and temperate zone and the part lying south of the Tropic of Cancer falls in the tropical zone. It experiences high temperature through out the year.

North part experiences extreme climate with high daily and annual range of temperature.

- (ii) **The Himalayan Mountains:** The lofty Himalayan act as an influencive climate divide, it provides an invincible shield to protect the sub continent from the cold northern winds, which originate near the arctic circle and blow across central and eastern Asia. It traps the monsoon winds facing them to shed their moisture with the sub continent.
- (iii) **Distribution of Land and Water :** India is flanked by the Indian ocean on three sides in the south and girdled by a high and continuous mountain wall in the north. Water heats up or cools down slowly as compared to the land mass which creates different air pressure zones in different seasons in and the Indian subcontinent.
- (iv) **Distance from the Sea :** Large coastal areas have an equable climate interior parts are far away from the moderating influence of the sea these have extremes of climate. The people of Mumbai and the konkan coast have hardly any idea of extremes of temperature and the season rhythm of weather whereas the seasonal contrast in weather at Delhi, Kanpur etc.
- (v) **Altitude :** Temperature decreases with height Due to thin air, places in the mountain are cooler then places on the plains, as Agra and Darjiling are located on the same latitude but trempérature of January in Agra is 16°C whereas it is only 4°C in Darjiling.
- (vi) **Relief :** The physiography or relief of India affects the temperature air pressure, direction and speed of wind and the amount and distribution of rainfall and Assam receive high rainfall dur ing June-September. Whereas the southern plateau remains dry due to its leeward situation along the westenghats.

Q.5. Analyse the climatic types identified by Koeppen in India.

Ans. Koeppen identified five major climatic types, names as under:

- (i) Tropical climates, where mean monthly temperature throughout the year is over 18°C.
- (ii) Dry climates, where precipitation is very low in comparison to temperature, and hence, dry. If dryness is less, it is semi-arid (S); if it is more, the climate is arid (W).
- (iii) Warm temperate climates, where mean temperature of the coldest month is between 18°C and minus 3°C.
- (iv) Cool temperate climates, where mean temperature of the warmest month is over 10°C, and mean temperature of the coldest month is under minus 3°C.
- (v) Ice climates, where mean temperature of the warmest month is under 10°C.

Q.6. Which gases are called green house gases? Analyse their effects–

Ans. Carbon-dioxide, released to the atmosphere in large quantities by burning of fossil fuel. Others, methane, chloro-fluoro-carbons, nitrous oxide are known as green house gases.

Effects:

- (i) These gases are better absorbers of long wave radiation than carbon-dioxide are more effective at enhancing the green house effect.
- (ii) These gases have been contributing to global warming.
- (iii) The polar ice caps and mountain glaciers world melt and the amount of water in the oceans would increase.
- (iv) Global temperature will increase by about 2°C, which cause many other changes – rise in sea level, as result of melting of glaciers and sea-ice due to warming.

Q.7. What is El-Nino? Mention its impacts on Indian Monsoon System.

Ans. (A) El-Nino is a complex weather system that appears once every three to seven years, bringing drought, floods and other weather extremes to different parts of the world.

(B) Results:

- (i) the distortion of equatorial atmospheric circulation;
- (ii) irregularities in the evaporation of sea water;
- (iii) reduction in the amount of planktons which further reduces the number of fish in the sea.

(C) El-Nino and the Indian Monsoon: El-Nino is used in India for forecasting long range monsoon rainfall. In 1990-91, there was a wild El-Nino event and the onset of southwest monsoon was delayed over most parts of the country ranging from five to twelve days.

Q.8. “Most parts of India do not have rainfall in the winter season, however there are some exceptions to it”. Explain the statement with example.

Ans. (i) In north western India, some weak temperate cyclones from the mediterranean sea cause rainfall in Punjab, Haryana, Delhi and western Uttar Pradesh.

(ii) The amount is meagre but highly useful for Rabi crops.

(ii) The precipitation is in the form of snowfall in the lower Himalayas, this snow that sustains the flow of water in the Himalyan rivers during the summer months.

(iv) The precipitation goes on decreasing from west to east in the plains and from north to south in the mountains.

(v) Central parts of India and northern parts of Southern Peninsula get winter rainfall occasionally.

(vi) Arunachal Pradesh and Assam in the north eastern parts of India have rains.

(vii) During october and november, north east monsoon whenever crossing over the Bay of Bengal, picks up moisture and causes torrential rainfall over the Tamilnadu coast, Southern Andhra Pradesh, South East Karnataka and South East Kerala.

Source Based Questions (MCQ)

Q.1. Read the source given below carefully and answer the questions that follow:

Inter Tropical Convergence Zone (ITCZ)

The Inter Tropical Convergence Zone (ITCZ) is a low pressure zone located at the equator where trade winds converge, and so, it is a zone where air tends to ascend. In July, the ITCZ is located around 20°N–25°N latitudes (over the Gangetic plain), sometimes called the monsoon trough. This monsoon trough encourages the development of thermal low over north and northwest India. Due to the shift of ITCZ, the trade winds of the southern hemisphere cross the equator between 40° and 60°E longitudes and start blowing from southwest to northeast due to the coriolis force. It becomes southwest monsoon. In winter, the ITCZ moves southward, and so the reversal of winds from northeast to south and southwest, takes place. They are called northeast monsoons.

(A) What is ITCZ?

- (i) A region of low pressure
- (ii) A region of high pressure
- (iii) A region develops at tropic of cancer
- (iv) A region develop as tropic of capricorn

Ans. (i) A region of low pressure

(B) Which winds are found here?

- (i) Westerlies are found here
- (ii) Easterlies are found here
- (iii) Trade winds
- (iv) None of the above

Ans.(iii) Trade winds

(C) What is encouraged by the monsoon trough over north, north west India?

- (i) Thermal low (ii) Thermal high
- (iii) High pressure belt (iv) None of these

Ans. (i) Thermal low

(D) Which force is mentioned here?

- (i) Centrifugal force (ii) Coriolis force
- (iii) Centripetal force (iv) None of these

Ans.(ii) Coriolis force

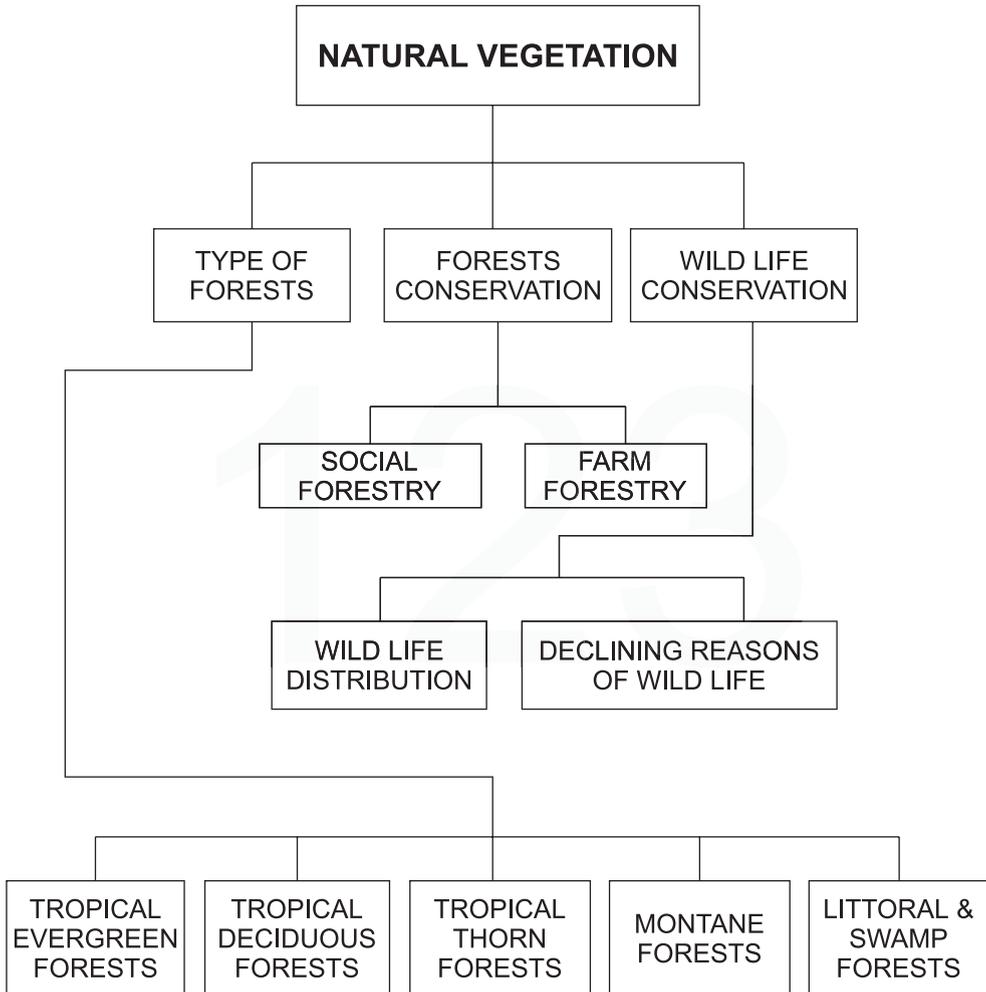
Mapwork:

Chapter 4 - Climate

- Area with highest temperature in India
Area with lowest temperature in India
- Area with highest rainfall in India
- Area with lowest rainfall in India

Chapter – 5

NATURAL VEGETATION



MCQ OBJECTIVE TYPE QUESTION

Q.1. Which one of the following is not a type of forest?

- (a) Tropical deciduous forests
- (b) Islands forests
- (c) Montane forests
- (d) Littoral and swamp forests

Ans. (b) Islands forests

Q.2. Which one of the following is not a type of social forestry?

- (a) Green forestry
- (b) Farm forestry
- (c) Urban forestry
- (d) Rural forestry

Ans. (a) Green forestry

Q.3. With which forest the teak tree is associated?

- (a) Tropical thorn forests
- (b) Montane forests
- (c) The moist deciduous forests
- (d) Dry deciduous forests

Ans. (c) The moist deciduous forests

Q.4. The southern mountain forests are not found in:

- (a) Western ghats
- (b) Vindhya mountain range
- (c) Nilgiris
- (d) Rajmahal hills

Ans. (c) Nilgiris

Q.5. Tendu, Palas, Bel and axlewood trees are the examples of which of the following forests?

- (a) Tropical thorn forests
- (b) Montane forests
- (c) Tropical deciduous forests
- (d) Tropical evergreen and semi evergreen forests

Ans. (c) Tropical deciduous forests

Q.6. In do tropical thorn forests, what type of vegetation plants typically exhibit?

- (a) Very long trees
- (b) Evergreen trees
- (c) Like scrub vegetations
- (d) Grass land type

Ans. (c) Like scrub vegetations

Q.7. Which of the following forests from a part of the landscape in northern Indian plains?

- (a) Mountain forests
- (b) Tropical thorn forests
- (c) Tropical Deciduous forests
- (d) Littoral and sulamp forests

Ans. (c) Tropical Deciduous forests

Q.8. What is the main cause of scanty vegetation cover found in the western and Rajasthan?

- (a) Low rainfall and overgrazing
- (b) Rainfall more than 200 cm
- (c) Annual rainfall more than 22 cm
- (d) Rainfall more than 70 cm

Ans. (a) Low rainfall and overgrazing

Q.9. Arrange the correct sequence of column II against the states of column I.

Column I

Column II

- | | |
|---------------------------------|-------------------------|
| (i) Andaman and Nicobar Islands | 1. Dry Deciduous forest |
| (ii) Odisha | 2. Mountain forests |

- (iii) Bihar 3. The most deciduous forests
- (iv) Kerala 4. Tropical evergreen forests

- (a) (i) - 4, (ii) - 3, (iii) - 1, (iv) - 2
- (b) (ii) - 2, (iii) - 3, (iv) - 4, (i) - 1
- (c) (iv) - 1, (iii) - 2, (ii) - 3, (i) - 4
- (d) (i) - 3, (ii) - 4, (iii) - 1, (iv) - 2

Ans. (a) (i) - 4, (ii) - 3, (iii) - 1, (iv) - 2

Q.10. Which of the following project has been launched by govt. of India to conserve the national animal?

- (a) Elephant project (b) Project tiger
- (c) Crocodile breeding project (d) Project hangul

Ans. (b) Project tiger

Q.11. The positive impact of wildlife conservation on wildlife will be:

- (a) Wildlife will become independent
- (b) Habitat of wildlife be extended
- (c) The number of wildlife will increase
- (d) Wild life get protection

Ans. (c) The number of wildlife will increase

Q.12. Which one the following is the first biosphere reserve in India?

- (a) Nilgiri Biosphere reserve
- (b) Nanda Devi Biosphere reserve
- (c) Sundarban Biosphere reserve
- (d) Gulf of Mannar Biosphere reserve

Ans. (a) Nilgiri Biosphere reserve

Q.13. Assertion (A) Forest provide numerous direct and indirect advantages to our economy and society.

Reason (R) Conservation of forest is of the vital importance to the survival and prosperity of human kind.

- (A) A and R both are correct 'R' is correct explanation of 'A'
- (B) Both 'A' and 'R' correct but 'R' is not correct explanation of 'A'
- (C) Only 'A' is correct
- (D) Only 'R' is correct

Ans. (A) A and R both are correct 'R' is correct explanation of 'A'

Short Answer Type Question

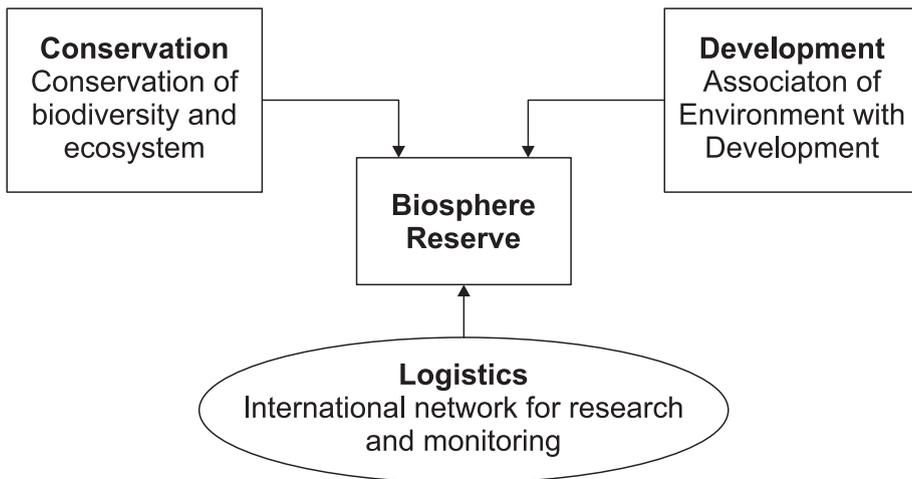
Q.1. What is natural vegetation? under what climatic conditions tropical evergreen forests develop?

Ans. Natural vegetation refers to a plant community that has been left undisturbed over a long time, so as to allow its individual species to adjust themselves to climate and soil conditions as fully as possible.

- (i) These forest are found in warm and humid areas in these areas annual precipitation of over 200 cm and mean annual temperature above 22° C.
- (ii) These forests are found in the western slope of the western ghats, hills of the north eastern region and the Andaman and Nicobar Islands.

Q.2. What is biosphere reserve? Mention its objectives.

Ans. A biosphere reserve is a unique and representative ecosystem of terrestrial and coastal areas which are internationally recognised within the framework of UNESCO's Man and Biosphere Programme. (MAB)



Objectives : The biosphere reserve aims at achieving the three objectives.

- (a) Conservation : Conservation of biodiversity and ecosystem
- (b) Development: Association of environment with development.
- (c) Logistics : International network for research and monitoring.

Q.3. Mention tropical deciduous forests.

- (a) These forests are found in India in large scale. They spread over the regions which receive rainfall between 70-200 cm

Ans.

- (b) These are divided into moist and dry deciduous.
 - (i) The moist deciduous forests are found in the north eastern states along the foot hills of Himalayas, eastern slope of the western ghats and odisha. Teak, sal, shisham, hurra, mahua, amla, semul etc. are the main species of these forests, rainfall between 100-200 cm.
 - (ii) Dry deciduous forests covers large areas of the country rainfall ranges is 70-100cm. These forests are found in rainier areas of the peninsula and the plains of Uttar Pradesh and Bihar. Tendu, Palas, amaltas, bel, khair, axlewood are the common trees of these forests.

Q.4. What are littoral and swamp forests? Explain the importance of these forests in India.

Ans. These forests are grown in wetlands. India has a rich variety of wetland habitats thus the natural vegetation is called littoral and swamp forests.

Importance : In India, the total area of wetland is 3.9 million hect ares. Chilka and Keoladeo national park are the protected as water fowl habitats.

- These forests give shelter to a wide variety of birds and animals.
- In the Ganga Brahmaputra delta, the tidal forests are known as Sunderbans.

Q.5. When was the wildlife act enacted? What are its objectives?

Ans. (a) The wildlife act was enacted in 1972.

(b) Objectives:

- (i) To provide protection to the endangered species listed in the schedule of the act.
- (ii) To provide legal support to the conservation areas of the country classified as national parks, sanctuaries and closed lands.

Q.6. Mention any three features of tropical thorn forests.

Ans. (1) Tropical thorn forests occur in the areas which receive rainfall less than 50 cm.

(2) These consist of a variety of grasses and shrubs. It includes semi-arid areas of south west Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Uttar Pradesh.

(3) In these forests, plants remain leafless for most part of the year and give an expression of scrub vegetation. Important species found are babool, ber, wild date palm, kair, neem, khejri, palas. Tussocky grass grows upto a height of 2 m as the under growth.

Q.7. Evaluate the features of community forestry.

- Ans.** (1) Community forestry involves the raising of trees on public or community land such as village pasture and temple land, roadside, canal bank, strips along railway lines, and schools etc.
- (2) Community forestry programme aims at providing benefits to the community as a whole.
- (3) Community forestry provides a means under which the people of landless classes can associate themselves in tree- raising and thus, get those benefits which otherwise are restricted for land owners.

Long Answer Type Questions

Q.1. When was a forest policy adopted? What were its main aims?

- Ans.** (a) The Government of India adopted a forest policy in 1952 and further modified in 1988 emphasising the sustainable forest management in order to conserve and expand forest reserve on the one hand and to meet the needs of local people.

The forest policy aimed at:

- (i) Bringing 33 percent of the geographical areas under forest cover.
- (ii) Maintaining environmental stability and to restore forests where ecological balance was disturbed.
- (iii) Conserving the natural heritage of the country, its biological diversity and genetic pool.
- (iv) Checks soil erosion, extension of the desert lands and reduction of floods and droughts.
- (v) Increasing the forest cover through social forestry and afforestation on degraded level.

- (vi) Increasing the productivity of forests to make timber, fuel, fodder and food available to rural population dependant on forests and encourage the substitution of wood.
- (vii) Creating of massive peoples movement involving women to encourage planting of trees, stop felling of trees and thus, reduce pressure on the existing forest.

Q.2. What is social forestry? Explain its three categories with examples.

- Ans.**
- Social forestry means the management and protection of forests and afforestation on barren lands with the purpose of helping in the environmental, social and rural development.
 - The national commission on agriculture (1976) has classified social forestry into three categories. These are urban forestry, rural forestry and farm forestry.
 - Urban forestry pertains to the raising and management of trees on public and privately owned lands in and around urban centres such as green belts, parks, roadside avenues, industrial and commercial green belts etc.
 - Rural forestry lays emphasis on promotion of agro- forestry and community forestry.
 - Agro forestry is the raising of trees and agriculture crops on the same land inclusive of the waste patches.
 - It combines forestry with agriculture, altering the simultaneous production of food, fodder, fuel, timber and fruit.

Q.3. Analyse the important reasons of the declining of wildlife in India?

- Ans.** Some of the important reasons of the declining of wildlife are as follows:

1. Industrial and technological advancement brought about a rapid increase in the exploitation of forest resources.
2. More and more lands were cleared for agriculture, human settlement, roads, mining, reservoirs etc.
3. Pressure on forests mounted due to lopping for fodder and fuel wood and removal of small timber by the local people.
4. Grazing by domestic cattle caused an adverse effect on wildlife and its habitat.
5. Hunting was taken up as a sport by the elite and hundreds of wild animals were killed in a single hunt. Now commercial poaching is rampant.
6. Incidence of forest fire.

Q.4. Mention the major characteristics of tropical evergreen and deciduous forest.

Ans. (A) Tropical evergreen forests:

- Tropical evergreen forests are well stratified, with layers closer to the ground and are covered with shrubs and creepers with short structured trees followed by tall variety of trees.
- Trees in these forests reach great heights upto 60 m or above.
- There is no definite time for trees to shed their leaves, flowering and fruition. Rosewood, mahogany, aini, ebony are the main species.

(B) Deciduous forests:

- As the dry season begins, the trees shed their leaves completely and the forest appears like a vast grassland with naked trees all round.
- Tendu, palas, amaltas, bel etc are the common trees of these forests.

Q.5. Examine the fauna and flora of Nilgiri biosphere reserve.

- Ans.** (1) It embraces the sanctuary complex of Wyanad, Nagarhole, Bandipur and Mudumalai, the upper Nilgiri plateau, silent valley and the Siruvani hills.
- (2) The nilgiri biosphere reserve possesses different habitat types, unspoilt areas of natural vegetation types with several dry scrubs, dry and moist deciduous, semi-evergreen and wet evergreen forests, evergreen scholas, grasslands and swamps.
- (3) It includes the largest known population of two endangered animal species namely the Nilgiri tahr and the lion-tailed macaque.
- (4) The largest south Indian population of elephant, tiger, gaur, sambar, and chital as well as good number of endemic and endangered plants are also found in this reserve.
- (5) The habitat of a number of tribal groups remarkable for their traditional modes of harmonious use of the environment are also found here.

Q.6. Explain the importance of northern mountain forest.

- Ans.** (i) The Himalayan ranges show a succession of vegetation from the tropical to the Tundra which change in with the altitude.
- (ii) Between 1500-1750 m pine forests are well-developed with chir pine as a very useful commercial tree.
- (iii) Deodar a highly valued endemic species grows mainly in the western part of the Himalayan range. It is a durable wood used in construction activity.
- (iv) The Chinar and the walnut sustain the famous Kashmir handicrafts.
- (v) At the altitude of 2225-3048 mt at many places temperate grass lands are found.

- (vi) These pastures are used extensively for transhumance by tribes like the gujjars, the Bakarwala; the Bhotiyas and the Gaddis.

Q.7. Explain the Southern mountain forests with example and areas.

- Ans.** (i) These forest are found in three distinct areas of peninsular India-viz- the western Ghats, the Vindhyas and the Nilgiris.
- (ii) They are closer to the tropics and only 1500 m above the sea level, vegetation is temperate in the higher vegious and sub-tropical on the lower regions of the western ghats especially in Kerala, Tamilnadu and Karnataka.
- (iii) The temperate forests are called sholas in the Nilgiris, Anaimalai and Palani hills.
- (iv) Magnolia, laural, cinchona and wattle trees are of economic significance.
- (v) Such forests are also found in the Satpura and the Maikal ranges.

CASE-STUDY

Project Tiger

Project tiger has been implemented. Since 1973, the main objective of the scheme is to ensure maintenance of viable population of tigers in India for scientific, aesthetic, cultural and ecological values and to preserve areas of biological importance as natural heritage for the benefit, education and enjoyment of the people; the project tiger was lunched in Nine tiger reserves. Which has now increased to 41 tiger reserves.

Q.1. What is the main objective of project tiger?

Ans. To ensure maintance of viable population of tiger in India.

Q.2. In how many tiger reserves: The project tiger was lunched initially?

Ans. Nine

Q.3. How many tiger reserves are in India now?

Ans. 41

Source Based Questions

Read the source (forest and life) given below carefully and answer the questions that follow:

Forests and Life

To a vast number of tribal people, the forest is a home a livelihood, their very existence. it provides them food, fruits of all kinds, edible leaves, honey. nourishing roots and wild game. it provides them with material to build their houses and items for practising their arts. the importance of forests in tribal economy is well known. it is commonly believed that the tribal communities live in harmony with nature and protect forests. out of a total of 593 districts 188 have been identified as tribal districts. the tribal districts account for about 59.61 per cent of the total forest cover of the country whereas the geographical area of 188 tribal districts forms only 33.63 per cent of the total geographical area of the country. It demonstrates that tribal districts are generally rich in forest cover.

Forest and tribals are very closely related. The age-old knowledge of tribals regarding forestry can be used in the development of forests. rather than treating tribals as minor forest produce collectors they should be made growers of minor forest produce and encouraged to participate in conservation.

Answer The Following Question

Q.1. Life of tribals are closely related to Forest. Explain it .

Ans. (i) Forest Provided foods fruits and building material.
(ii) Forest is a Home of Trible People.

Q.2. How many tribal Districts are Identified in India?

Ans. 188

Q.3. Explain any Two measure to Protect Forest.

- (i) The age old knowledge of Tribles regarding forestry can be used.
- (ii) Encouraged to Participate in Forest Conservation of Tribles.

Mapwork:

Chapter 5 - Natural Vegetation

(Identification on an outline map of India)

- Tropical evergreen, Tropical deciduous, Tropical thorn, Montance and Littoral/Swamp forests. Wildlife reserves:

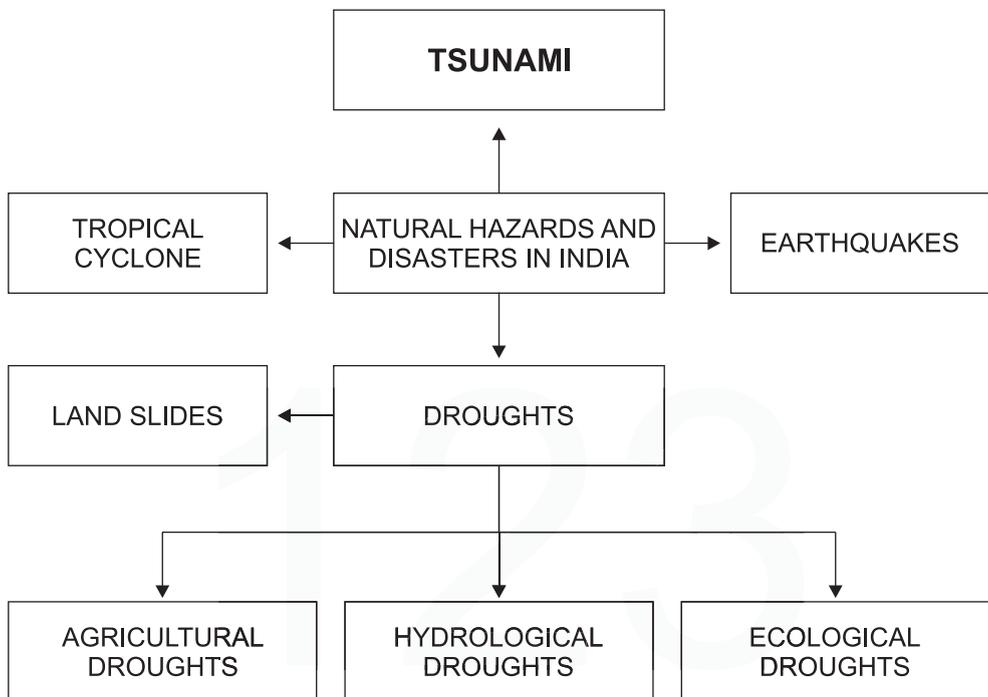
(locating and labeling)

- National Parks: Corbett, Kaziranga, Ranthambore, Shivpuri, Simlipal
- Bird Sanctuaries: Keoladev Ghana and Ranganathitto
- Wild Life SAnctuaries: Periyar, Rajaji, Mudumalai, Dachigam

Chapter – 6

NATURAL, HAZARDS AND DISASTERS

Note - (To be assessed through internal assessment in the form of projects/Presentations)



Source Based Question

In our country, debris avalanches and landslides occur very frequently in the Himalayas. There are many reasons for this. One, the Himalayas are tectonically active. They are mostly made up of sedimentary rocks and unconsolidated and semi-consolidated deposits. The slopes are very steep. Compared to the Himalayas, the Nilgiris bordering Tamilnadu, Karnataka, Kerala and the Western Ghats along the west coast are relatively tectonically stable and are mostly made up of very hard rocks; but, still, debris avalanches and landslides occur though not as frequently as in the Himalayas, in these hills. Why? Many slopes are steeper with almost vertical cliffs and escarpments in the Western Ghats and Nilgiris. Mechanical weathering due to temperature changes and ranges is pronounced. They receive heavy amounts of rainfall over short periods. So, there is almost direct rock fall quite frequently in these places along with landslides and debris avalanches.

Q.1. In which part of our country debris avalanches and landslides are frequent.

Ans. Himalayas

Q.2. which type of Rocks are found in Himalayas?

Ans. Sedimentary & unconsolidated rocks.

Q.3. which type of weathering is most prominent in western Ghats and Nilgiri hills?

Ans. Mechanical | Physical weathering.

Source based Question

Read the given case study carefully and answer the questions:

warming and cooling of the Pacific Ocean is most important in terms of general atmospheric circulation. The warm water of the central Pacific Ocean slowly drifts towards the South American coast and replaces the cool Peruvian current. Such appearance of warm water off the coast of Peru is known as the El Niño. The El Niño event is closely associated with the pressure over the central Pacific and Australia. This change in pressure condition over the Pacific is known as the Southern Oscillation. The combined phenomenon of Southern Oscillation and El Niño is known as ENSO. In the years when the ENSO is strong, large-scale variations in weather occur over the world. The arid west coast of South America receives heavy rainfall, drought occurs in Australia and some times in India and floods in China. This phenomenon is closely monitored and is used for long range forecasting in major parts of the world.

Answer the following assertions :-

Q.1. The warm water of the Central Pacific Ocean slowly drifted towards

- a) East African coast
- b) North American coast
- c) South American coast
- d) None of the above

Ans: c) South American Coast

Q.2. Appearance of warm water off the coast of Peru is known as

- a) ENSO
- b) El Niño
- c) La Niña
- d) None of these

Ans. a) ENSO EL Niño

Q.3. The combined phenomenon of Southern oscillation and El Nino is known as.

- a) ENSO B) EL Nino
- c) La Nino d) None of these

Ans. a) ENSO

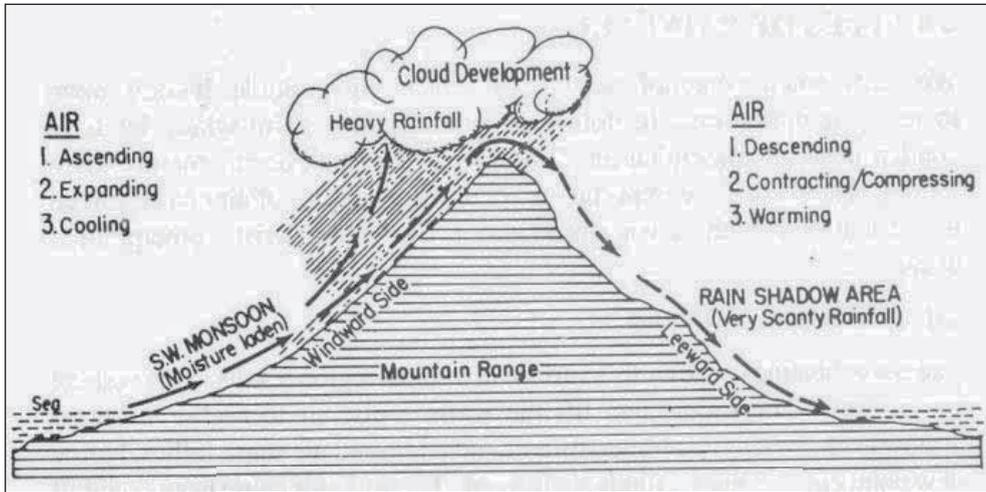
Q.4. The El Nino event is closely associated with the

- a) Central Atlantic and Australia
- b) Central pacific and Australia
- c) Southern pacific and Australia
- d) None of these

Ans. (b) Central pacific and Australia

Diagram Based Question

Study the following diagram and answer the following questions.



Q.1. Identify the type of Rainfall

Ans. Orographic or Relief Rainfall.

Q.2. How is orographic rain caused?.

And. It is caused when masses of air pushed by wind are forced up the side of elevated land forms.

Q.3. What is rain shadow area?.

Ans. The dry area on one side of a mount air range where less rain falls.

Source Based Questions

Major Ocean Currents are the stresses exerted by the generally influenced by prevailing winds and Coriolis force. The Oceanic circulation pattern roughly corresponds to the earth's atmosphere Circulation pattern. The air circulation over the ocean in the middle latitudes in The oceanic circulation pattern also co 1 mainly anticyclonic with the same. At higher latitudes, where the wind flow is the mostly cyclonic corresponds The organic circulation flows this pattern. In regions of pronounced monsoonal flow, the monsoon winds influence the current movements. Due to the Coriolis fore, the warm currents from low latitude tends to move the tight in the North- ern hemisphere and to their left in the Southern hemisphere. The oceanic circulation transports heat from one latitude belt to another in manner similar to the heat a transported by the general circulation of the atmosphere.

Q.1. Which are the major factors affecting Ocean Current.

Ans. winds and cosiolis force

Q.2. In which latitude does Warm currents originates

Ans. Low latitudes

Q.3. Where is the air circulation anticyclonic?

Ans. Mid latitudes

Biodiversity as we have today is the result of 2.5-3.5 billion years of evolution. Before the advent of humans, our earth supported more biodiversity than in any other period. Since the emergence of humans, however, biodiversity has begun a steady decline with one species after another being lost due to overuse. The number of species globally varies from 2 million to 10 million, with 10 million being the best estimate. New species are regularly discovered, most of which are yet to be classified (an estimate states that about 40 percent of fresh water fishes from South America are not classified yet). Tropical forests are very rich in bio-diversity.

Q.1. How many years of evolution is the result of today's biodiversity?

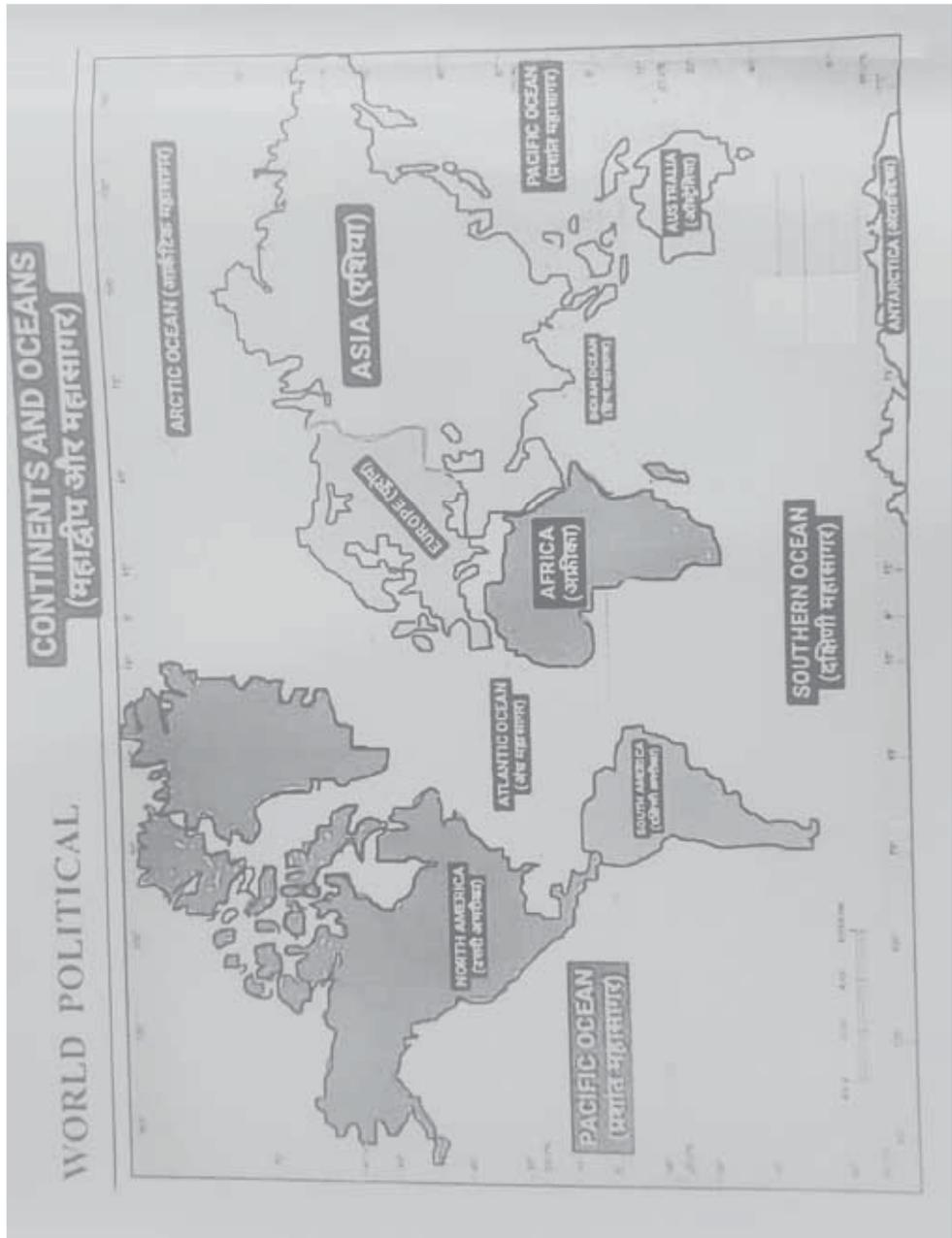
Ans. The biodiversity seen in today of 2.5-3.5 billion years of evolution

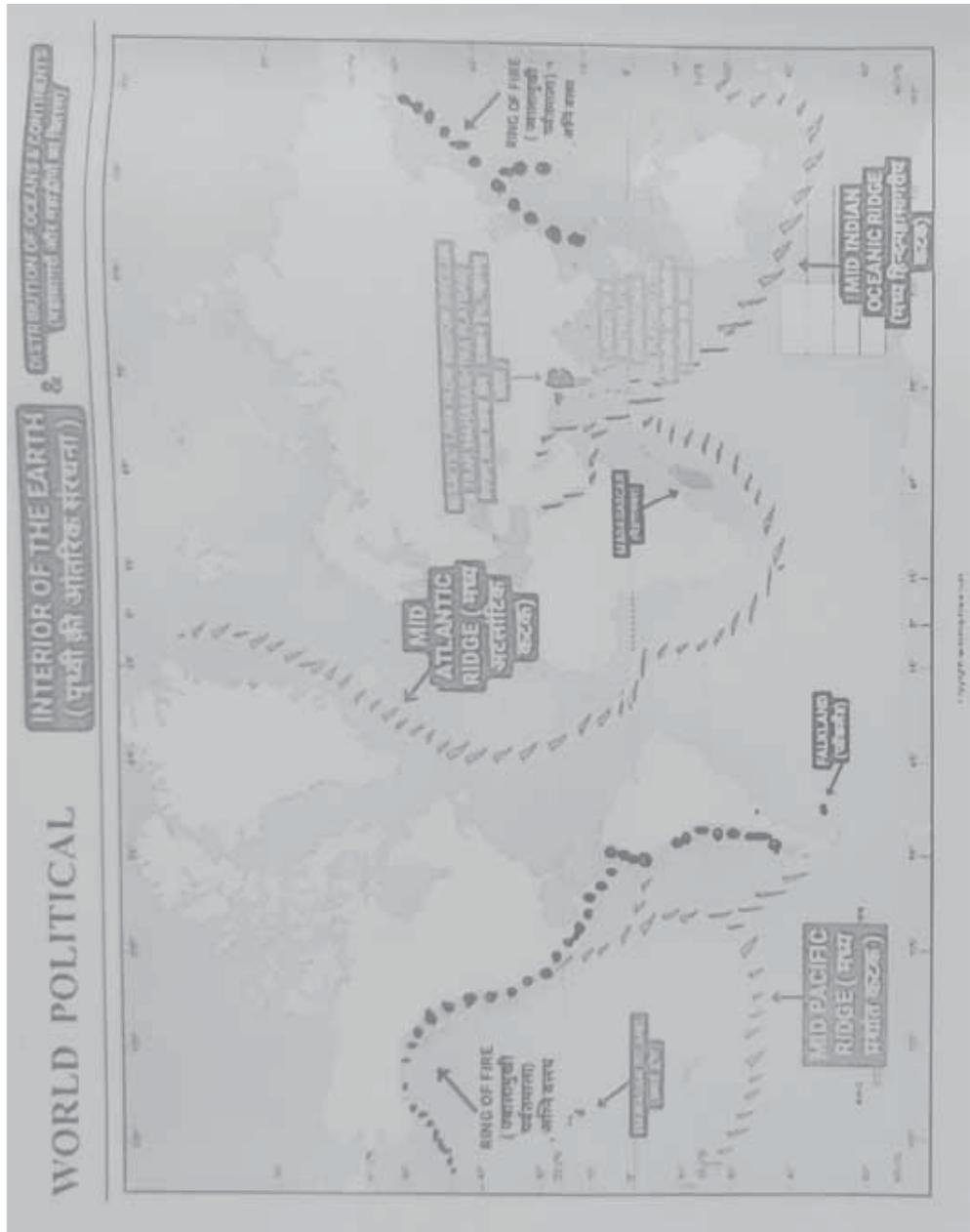
Q.2. What is biodiversity?

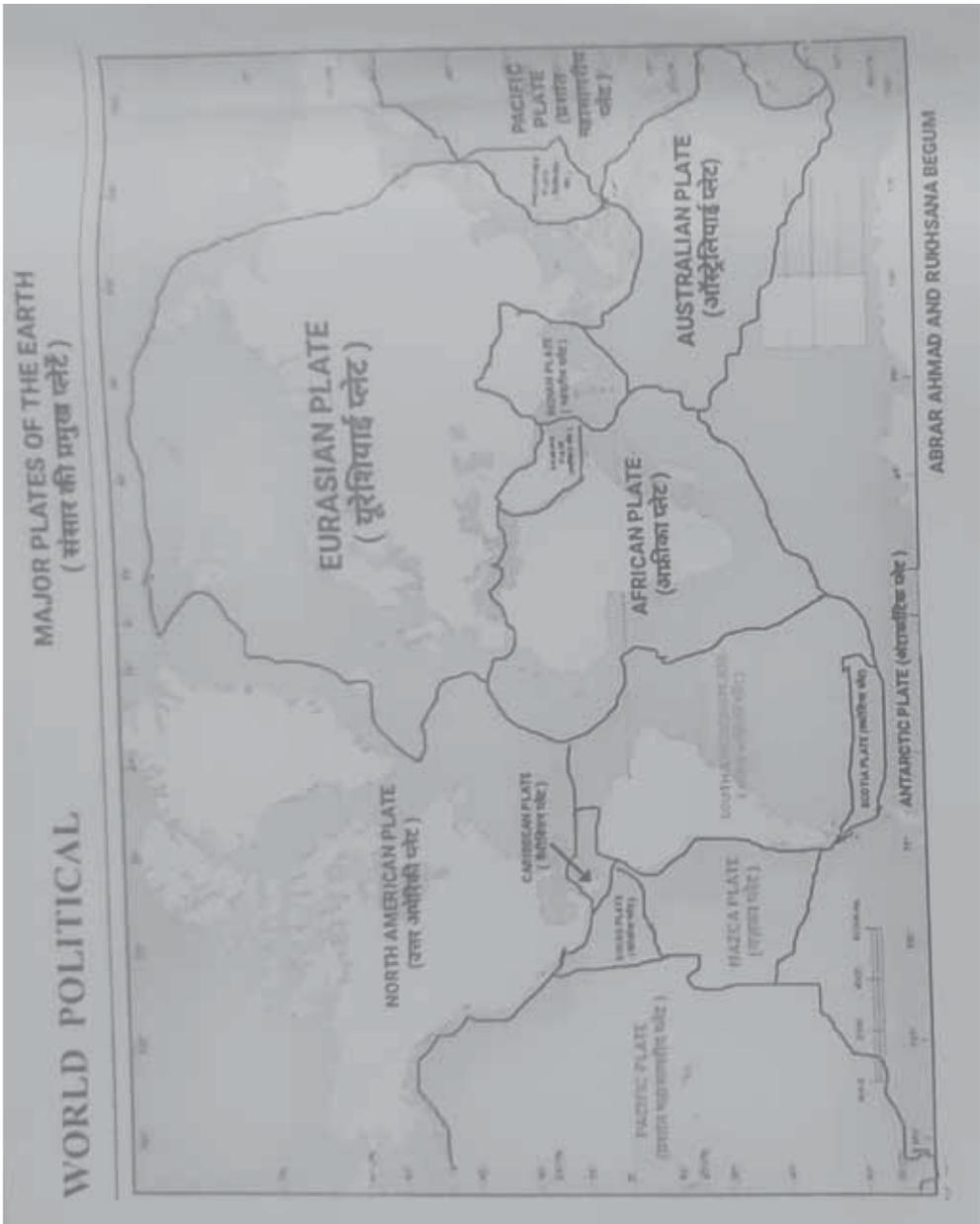
Ans. Biodiversity refers to the varieties of Plants, animals and micro-organisms the genes they contain and the ecosystems they form. It also includes the variability among living organisms of the earth.

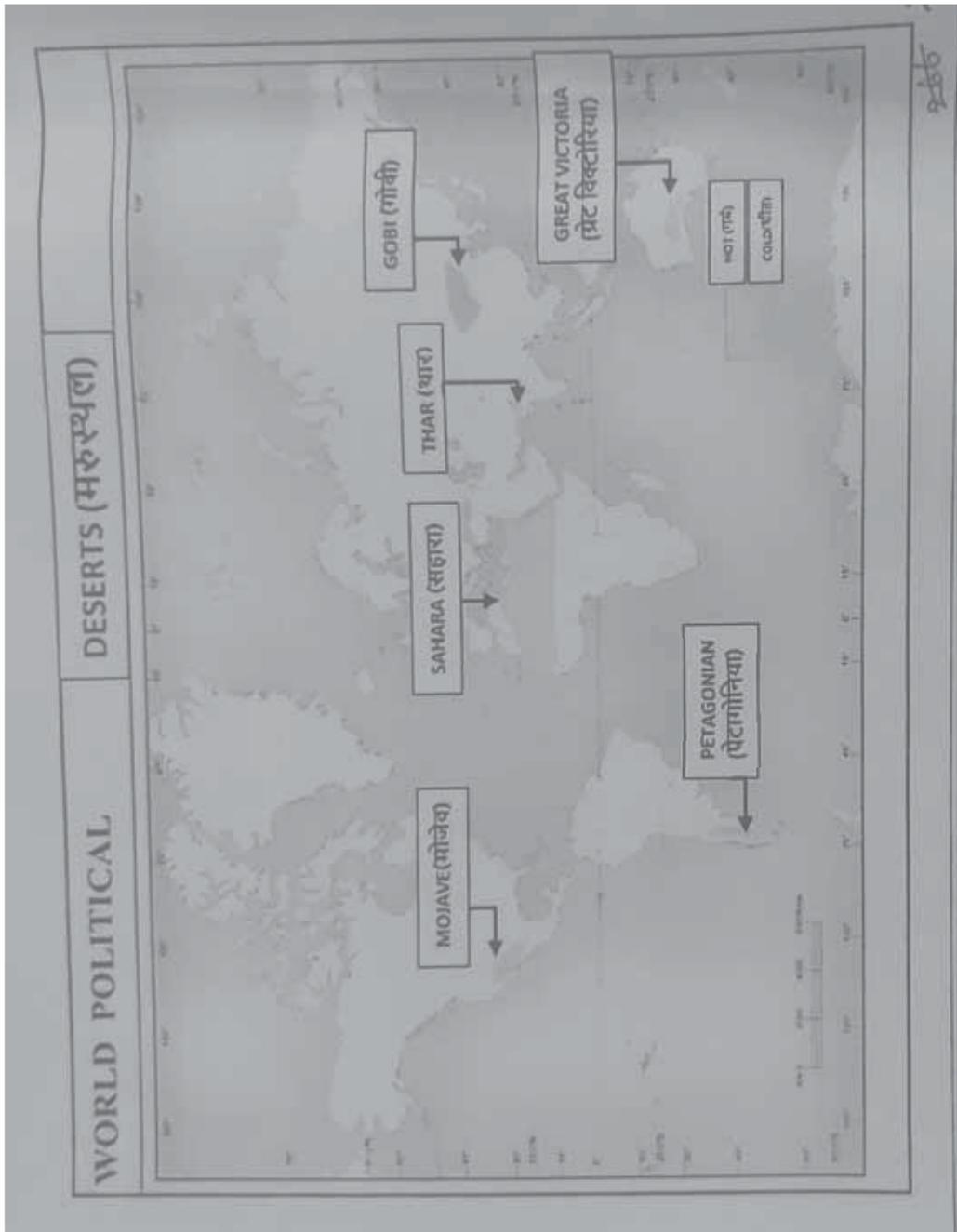
Q.3. What are the reasons of rapid decline of biodiversity?

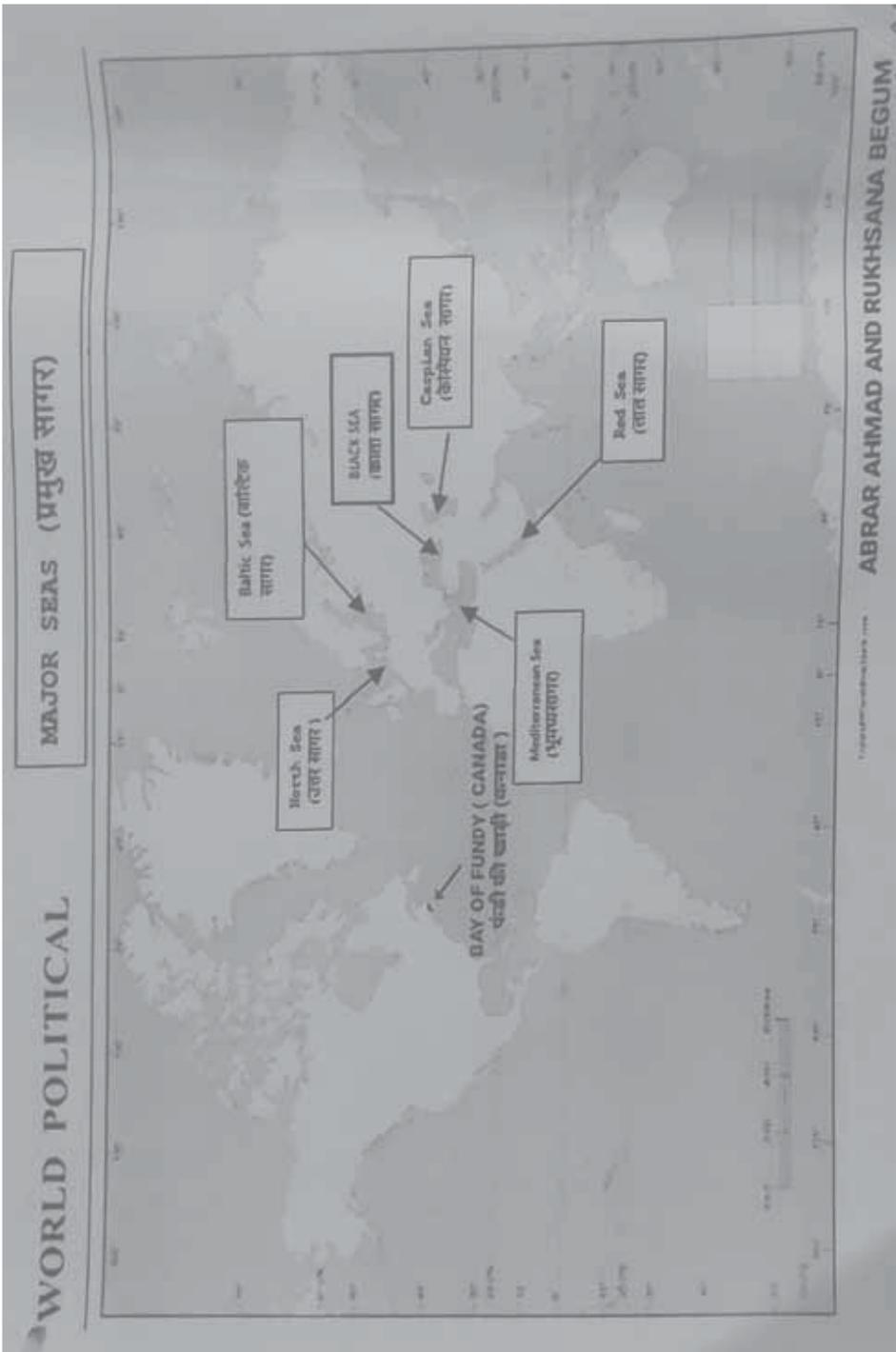
Ans. overexploitation, Deforestation, climate change are the main reasons of rapid decline of biodiversity.

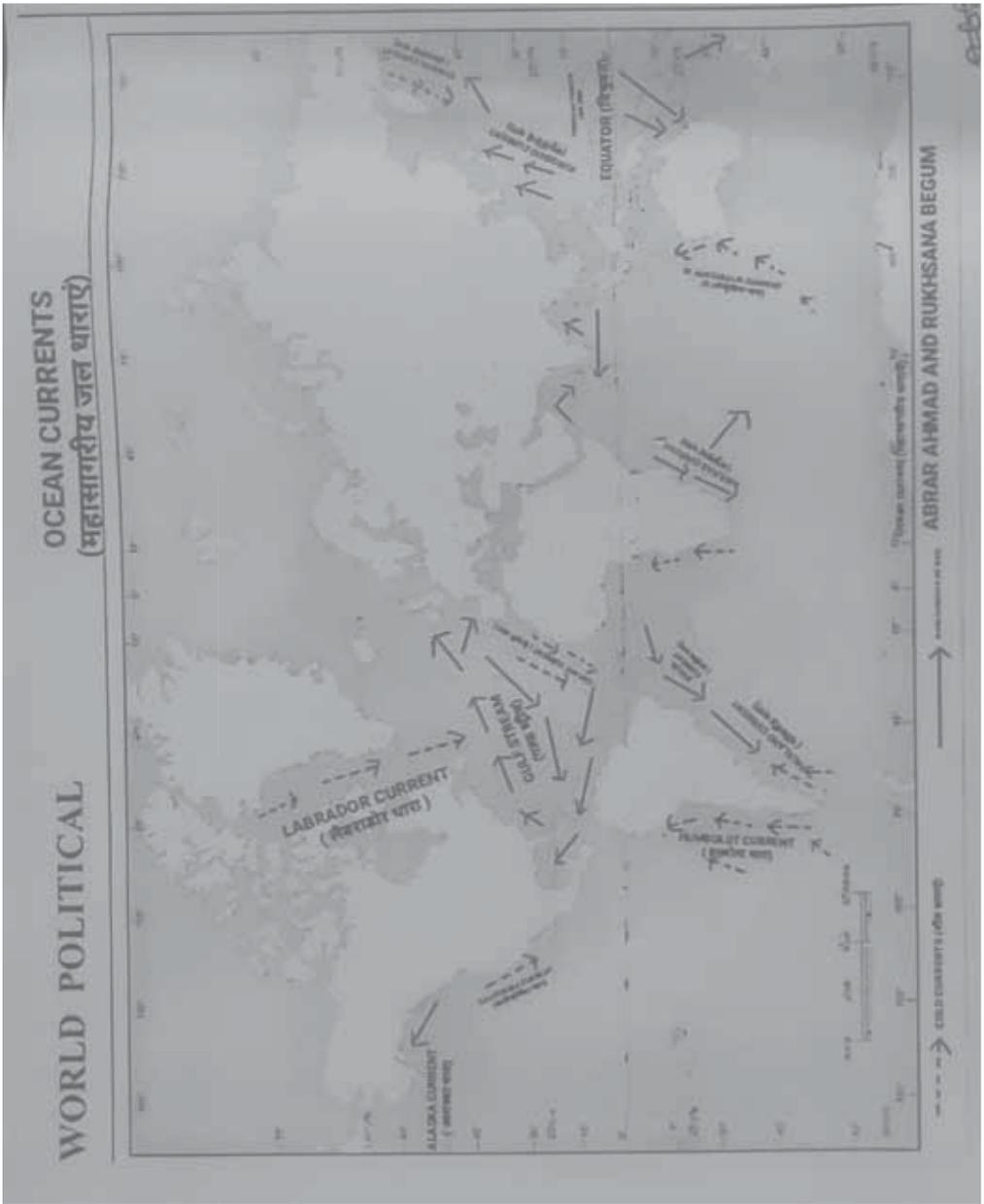


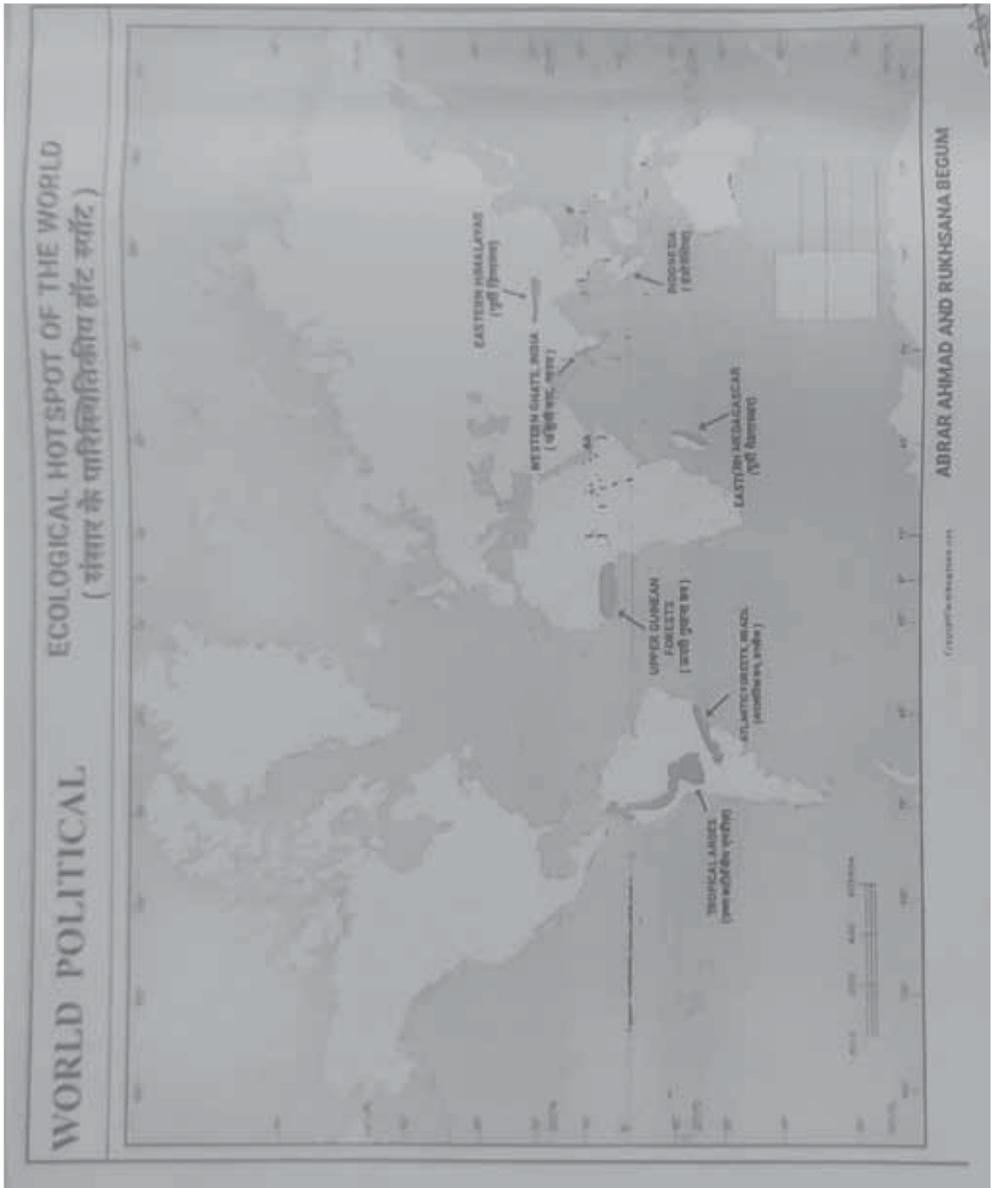


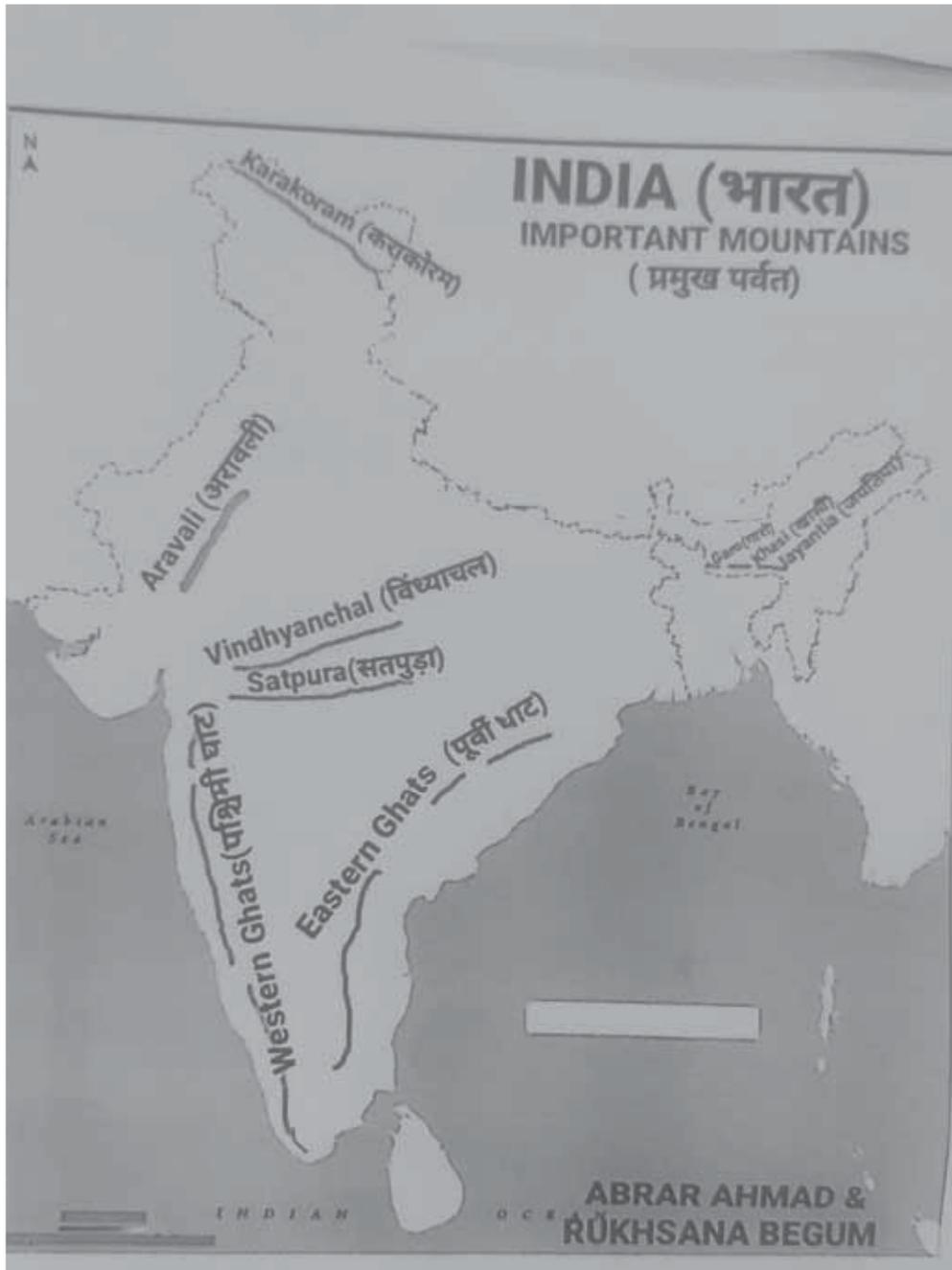












COMMON ANNUAL SCHOOL EXAMINATION (2024-25)

CLASS: XI

SUBJECT : GEOGRAPHY (029)

Time Allowed: 3 hours

Maximum Marks: 70
MORNING

SECTION - A

Question number 1 to 17 are multiple choice questions.

1. Arrange the following stages of the evolution of the earth's atmosphere in chronological order- 1
1. Release of gases and water vapor from the interior of the earth.
 2. Process of photosynthesis.
 3. Loss of primordial atmosphere.
- Codes:
- (A) 1,2,3 (B) 2,3,1
(C) 3,1,2 (D) 2,1,3
2. Arrange the following facts of the development of the universe in order. 1
1. Rise of atomic matter.
 2. All matter exist in one place in the form of Singular atom.
 3. Rapid expansion.
- (A) 2,3,1 (B) 2,1,3
(C) 1,2,3 (D) 1,3,2
3. Which one of the following is a direct Source of the information about the interior of ti Earth? 1
- (A) Gravitational force (B) Seismic activity
C. Volcanic eruption (D) Magnetic field
4. Which one of the following pairs is **NOT** correct. 1
- | (Plate) | (Location) |
|----------------|--|
| (A) Nazca | - Between South America and Pacific Plate. |
| (B) Philippine | - North East of Australia. |
| (C) Arabian | - Mostly the Saudi Arabian landmass. |
| (D) Cocos | - Between central America and Pacific Plate. |

5. Identify, which of the following Statement is NOT true regarding the chemical weathering processes?
- I. These processes depend on some applied forces
 - II. Most of these are caused by thermal expansion and pressure release
 - III. Solution, carbonation, hydration and oxidation are important processes.
 - IV. Oxygen, surface water, soil water and other acids reduce rocks.

Options:

- (A) Only 1 and 111
 - (B) Only IV
 - (C) Only 1 and II
 - (D) Only t
6. Mechanical disintegration and chemical decomposition of rocks through the action various elements of weather and climate is called
- (A) Erosion
 - (B) Deposition
 - (C) Weathering
 - (D) Mass movements
7. Stalactites and Stalagmites are formed_____.
- (A) Due to wind erosion.
 - (B) Due to deposition of calcium carbonates.
 - (C) By Erosion at mountainous our slopes.
 - (D) Due to weathering.
8. Identify the type of tide from the given description.
- The position of both the sun and the moon in relation to the earth has direct bearing on tide height. When the sun, the moon and the earth are in a straight line, the height of the tide will be higher. They occur twice a month, one on full moon period and another during new moon period.
- (A) Spring tides
 - (B) Mixed tides
 - (C) Neap tides
 - (D) Diurnal tides
9. Which of the following is the capital of Lakshadweep?
- (A) Silvassa
 - (B) Port Blair
 - (C) Imphal
 - (D) Kavarati

10. Which one of the following is the southern most latitude of India?
- (A) 8°45' N (B) 8°60 N
(C) 6°45' N (D) 6°82' N
11. Some students go to Verinag Spring for an excursion, which river will they see flowing there?
- (A) Kabul (B) Satluj
(C) Ravi (D) Jhelum
12. The Himalayan drainage consists of several river systems. Choose the Correct river system of Himalayan Drainage.
1. The Ganga system.
 2. The Dakshin Ganga.
 3. The Brahmaputra.
 4. The Sind.

Codes:

- (A) Only 1 (B) Only 4
(C) Both 2 and 4 (D) Both 1 and 3
13. There are two statements marked as Assertion (A) and Reason (R). Mark your answer per the codes provided below.

1. **Assertion (A):** Winter monsoons do not cause rainfall.
- II. **Reason (R):** These winds move from land to the sea.

Option:

- (A) Both the Statements are true, Statement II does not explain Statement I correctly
- (B) Both the Statements are true, Statement II Correctly explains the Statement I.
- (C) Both Statements I and II are wrong.
- (D) Statement I is true and Statement II is incorrect.

14. Consider the following statements and choose the correct answer with the help of option:

I. **Assertion:** Tropical Evergreen forests are found in western slope of the weste ghats and hills of the north eastern region.

II. **Reason:** These areas receive rainfall between 70 to 200 cm.

Options:

(A) Both Statements I and II are wrong.

(B) Statement I is true and Statement II is incorrect.

(C) Both the Statements are true. Statement II does not explain Statement I correctly.

(D) Both the Statements are true, Statement II Correctly explains the Statement I.

Read the following passage and answer the questions number 15 to 17.

HORIZONTAL DISTRIBUTION OF SALINITY

1x3

The salinity for normal open ocean ranges between 33 deg⁰/00 and 37⁰/00. In the land lock Red Sea, it is as 41⁰/00 while in the estuaries and the Arctic, the salinity fluctuates from -35⁰ /00, seasonally. In hot and dry regions, where evaporation is high, the salini sometimes reaches to 70⁰/00.

The salinity variation in the Pacific Ocean is mainly due to its shape and larger are extent. Salinity decreases from 35⁰/00 - 31⁰/00 on the western parts of the northe hemisphere because of the influx of melted water from the Arctic region. In the sat way, after 15-20 south, it decreases to 33⁰/00.

The average salinity of the Atlantic Ocean is around 36 deg⁰/00. The highest salinity recorded between 15 and 20 latitudes. Maximum salinity (37⁰/00.) is observed between 20 N and 30 N and 20 W-60 W. It gradually decreases towards the north.

The North Sea, in spite of its location in higher latitudes, records higher salinity due more saline water brought by the North Atlantic Drift. Baltic Sea records low salinity due to influx of river waters in large quantity. The Mediterranean Sea records higher salini due to high evaporation. Salinity is, however, very low in Black Sea due to enormo fresh water influx by rivers.

The average salinity of the Indian Ocean is 35 deg⁰/00. The low salinity trend is observed the Bay of Bengal due to influx of river water. On the contrary, the Arabian Sea show higher salinity due to high evaporation and low influx of fresh water.

15. Which of the following oceans has the highest average salinity?
(A) Atlantic ocean (B) Southern ocean
(C) Arctic ocean (D) Indian ocean
16. Which of the following factor contributes to the high salinity of the Mediterranean Sea?
(A) Due to land locked.
(B) High Evaporation rate.
(C) Influx of river water in large quantity.
(D) influx of melted water.
17. Identify the factor that does not affect the salinity of ocean water.
(A) Evaporation (B) Wind
(C) Amount of aquatic life (D) Precipitation

SECTION-B

Question number 18 and 19 are source based questions.

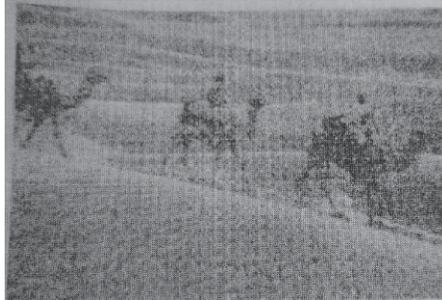
18. Read the passage given below and answer the questions that follow.

SIZE OF INDIA

The size of India has endowed her with great physical diversity. Thus, you make appreciate the presence of lofty mountains in the north; large rivers such as **Ganga Brahmaputra. Mahanadn, Krishna, Godavari and Kaveri;** **green forested hills** | northeast and south India, and the vast sandy expanse of Marusthali. You may further appreciate that bounded by the Himalayas in the north, Hindukush and Sulaiman range in the north-west, Purvachal hills in the north east and by the large expanse of the India ocean in the south, it forms a great geographic entity known as the Indian subcontinent. includes the countries Pakistan. Nepal, Bhutan, Bangladesh and India. The Himalaya together with other ranges, have acted as a formidable physical barrier in the past. Excet for a few mountain passes such as the Khyber, the Bolan, the Shipkila, the Nathula, the Bomdila, etc. it was difficult to cross it. It has contributed towards the evolving of unique regional identity of the Indian subcontinent.

Peninsular part of India extends towards the Indian Ocean. This has provided the country with a coastline of 6,100 km in the mainland and 7.517 km in the entire geographical: coast of the mainland plus the Island groups Andaman and Nicobar located in the Bay of Bengal and the Lakshadweep in the Arabian Sea. Thus India, as a country, is a physically diverse land providing occurrence of varied resources.

- 18.1 Name the physical feature of India which is known as security barrier.
- 18.2 "India is a subcontinent". Explain.
- 18.3 Which mountain ranges are located in North West India? 1/2+1/2=1
19. Observe the given image and answer the following questions.



- 19.1 Which Physiographic division of India is shown in the above picture?
- 19.2 Write the name of the river flow through the displayed physiographic division. /2+1/2=1
- 19.3 Classify the displayed physiographic division on the basis of orientation.

Note: These questions are for Visually Impaired Students only in lieu of Q.No.19.

- 19.1 Name the highest peak of Peninsular Plateau.
- 19.2 Where do the western and Eastern Ghats meet?
- 19.3 By which name the Western Ghats are known in Maharashtra?

SECTION-C

Question number 20 to 23 are Short Answer type questions.

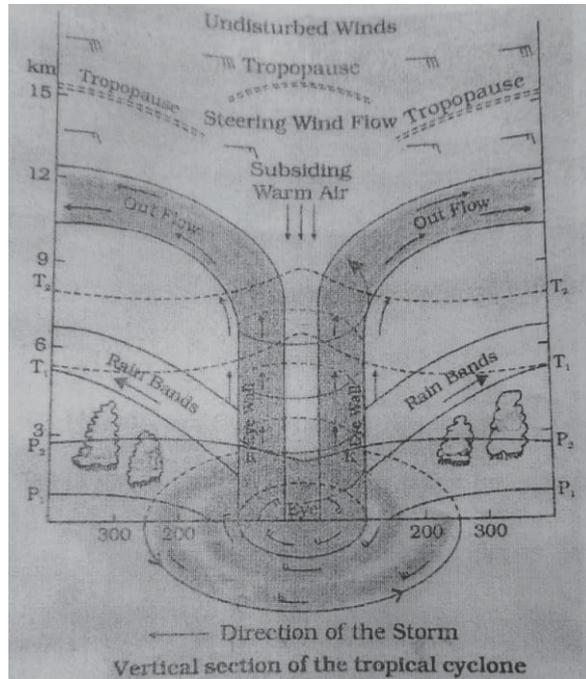
20. "Human is an integral part of nature and nature has the imprints of 'human'." Analyse the statement.
21. (A) "Deltas are like alluvial fans, but develop at different location." Explain the process of delta formation. 3x1=3

OR

- (B) Differentiate between Endogenic and Exogenic processes.

11/2+11/2=3

22. "There are many problems in using river water in India." Substantiate the statement.
23. Observe the given diagram and answer the following questions. 1x3=3



- 23.1 By what name is the calm area in the centre of a tropical cyclone known as? 1
- 23.2. Which cloud is responsible for rainfall in tropical cyclones? 1
- 23.3 In which part/area of tropical cyclone the speed of winds is maximum and torrential rainfall occurs? 1

Note: These questions are for visually impaired students only, in lieu

Q.No. 23.

- 23.1 By what name is the calm area in the centre of a tropical cyclone known as? 1
- 23.2 Which cloud is responsible for rainfall in tropical cyclones? 1
- 23.3 In which part/area of tropical cyclone the speed of wind is maximum and torrential rainfall occurs? 1

SECTION-D

Q.No. 24 to 28 are long Answer type questions.

24. (A) Examine the features of the crust. 5x1=5

OR

(B) Mention the basic concept of continental drift theory.

25. (A) "Different places on the earth's Surface receive different amounts of rainfall in year". Examine the statement. 5x1=5

OR

(B) The amount and the intensity of insolation vary during a day, in a season and year. Examine the factors that cause these variations in insolation at the surface of the earth.

26. (A) Evaluate the major features of the Kaveri river system. 5x1=5

OR

(B) Compare western coastal plain and Eastern Coastal plains. $2\frac{1}{2}+2\frac{1}{2}=5$

27. Forest provide numerous direct and indirect advantages to the economy and society Explain the importance of the role of forests conservation of forests in human development. 5x1=5

28. (A) "Monsoon affect, the economic life in India." Substantiate the statement. 5x1=5

OR

(B) Substantiate the spatial variations of rainfall in India.

SECTION-E

Q.29 and 30 are map Based questions.

29. Five Geographical features are shown on the given Physical outline map of the world as A, B, C, D, E, F and G. Identify these features with the help of information given below and write their correct names on the lines marked near them. 1x5=5

- (A) A Desert
- (B) A Plate
- (C) A sea
- (D) A Warm Current
- (E) An Ecological Hot Spot
- (F) A Cold current
- (G) A Hot Spot

Note: The following questions are for the Visually Impaired Candidates

only in lieu of Q.No. 29. (Any 5). 1x5=5

- 29.1 Write the name of cold desert located in South America.
- 29.2 Name the plate which is located between South America and Pacific plate.
- 29.3 Write the name of world's largest inland body of water.
- 29.4 Name the warm current flowing in the Western boundary of Indian Ocean.
- 29.5 Name the ecological hot spot of South India.
- 29.6 Name the current which flows along the western coast of South America.
- 29.7 Name the ecological hot spot of Brazil.

30. Locate and label the following on the given physical outline map of India appropriate symbols. (Any five). 5x1=5

30.1 Place with highest temperature in India

30.2 Raja Ji Wild Life Sanctuary

30.3 Area of Tropical Evergreen forests

30.4 Kolleru Lake

30.5 Kaziranga National Park

30.6 Coromandel Coast

30.7 Garo Hills

Note: The following questions are for the Visually Impaired Candidates

only in lieu of Q.No. 30. (Any 5).

5x1=5

30.1 By which name the northern part of East Coast is known?

30.2 Write the name of plateau lies between Aravali and the Vindhya range.

30.3 In which state is Rajaji wild life sanctuary located?

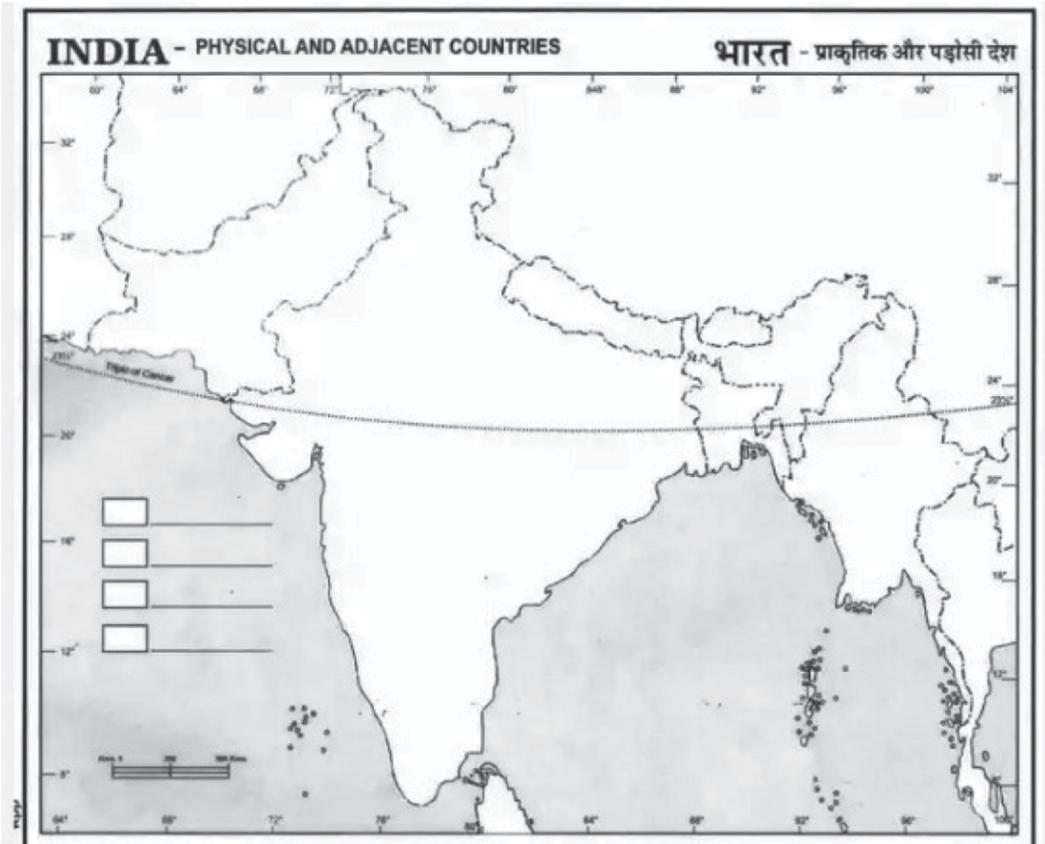
30.4 In which state is Ghana, bird Sanctuary located.

30.5 In which state is Kaziranga National park located?

30.6 In which state is Kolleru lake located?

30.7 Name the place with highest temperature in India.

प्रश्न 30



COMMON ANNUAL SCHOOL EXAMINATION (2024-25)

CLASS: XI

SUBJECT : GEOGRAPHY (029)

(Evening)

Time Allowed: 3 hours

Maximum Marks: 70

समय : 3 घंटे

अधिकतम अंक : 70

सामान्य निर्देश:

निम्नलिखित निर्देशों को ध्यानपूर्वक पढ़िए और उनका पालन कीजिए :

1. इस प्रश्न पत्र में कुल 30 प्रश्न हैं। सभी प्रश्न अनिवार्य हैं।
2. प्रश्न-पत्र पाँच खण्डों में विभाजित किया गया है - क, ख, ग, घ एवं ङ।
3. खण्ड 'क' - प्रश्न संख्या 1 से 17 तक बहुविकल्पीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 1 अंक का है।
4. खण्ड 'ख' - प्रश्न संख्या 18 एवं 19 स्रोत-आधारित प्रश्न हैं। प्रत्येक प्रश्न 3 अंकों का है।
5. खण्ड 'ग' - प्रश्न संख्या 20 से 23 तक लघु-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 3 अंकों का है। इन प्रश्नों का उत्तर 120 से 150 शब्दों में लिखा जाना चाहिए।
6. खण्ड 'घ' - प्रश्न संख्या 24 से 28 तक दीर्घ-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 5 अंकों का है। इन प्रश्नों का उत्तर 120 से 150 शब्दों में लिखा जाना चाहिए।
7. खण्ड 'ङ' - प्रश्न संख्या 29 एवं 30 मानचित्र-आधारित प्रश्न हैं। प्रत्येक प्रश्न 5 अंकों का है।
8. इसके अतिरिक्त ध्यान दें कि दृष्टिबाधित परीक्षार्थियों के लिए फोटो तथा मानचित्र आदि आधारित प्रश्नों के स्थान पर एक अन्य प्रश्न दिया गया है। इन प्रश्नों के उत्तर केवल दृष्टिबाधित परीक्षार्थी ही लिखें।
9. प्रश्न-पत्र में समग्र विकल्प नहीं दिया गया है। यद्यपि, खण्ड क के अतिरिक्त अन्य खण्डों के कुछ प्रश्नों में आंतरिक विकल्प का चयन दिया गया है।

General Instructions:

Read the following instruction carefully and follow them :

1. This questions paper contains 30 questions. All questions are compulsory.
2. The question paper is divided into five sections - A, B, C, D and E.
3. Section A - Questions No. 1 to 17 are Multiple Choice type questions. Each question carries 1 mark.
4. Section B - Questions No. 18 and 19 are Source-based questions. Each question carries 3 mark.
5. Section C - Questions No. 20 to 23 are short answer type questions. Each question carries 3 marks. Answer to these questions shall be written in 80 to 100 words.
6. Section D - Questions No. 24 to 28 are long answer type questions. Each question carries 5 marks. Answer to these questions shall be written in 120 to 150 words.
7. Section E - Questions No. 29 and 31 are Map-based questions. Each question carries 5 marks.
8. In addition to this, NOTE that a separate question has been provided for Visually Impaired candidates in lieu of questions having visual inputs, map etc. Such questions are to be attempted by Visually Impaired candidates only.
9. There is no overall choice given in the question paper. However, an internal choice has been provided in a few questions in all sections other than Section A.

SECTION-A

Question number 1 to 17 are multiple choice questions.

1. Arrange the following stages of the evolution of the earth in chronological order. 1

1. Evolution of hydrosphere
2. Evolution of Lithosphere,
3. Evolution of Atmosphere
4. Origin of life.

Codes:

- (A) 1,2,3,4 (B) 2,3,4,1
(C) 1,4,2,3 (D) 2, 3, 4, 4

2. Arrange the following facts of stages in the development of planets in order - 1
1. Gravitational force leads to the formation of a core to the gas cloud.
 2. Large number of Small Planetesimals accrete to form a fewer large bodies.
 3. Gas cloud starts getting condensed and Planetesimals developed.

Codes:

- (A) 1.3.2 (B) 1.2.3
(C) 2,1,3 (D) 3,2,1

3. Which one of the following is an indirect Source of the information about the interior on the earth? 1

- A. Meteors B. Volcanic eruption
C. Mining D. Drilling.

4. Which one of the following pair is **NOT** correct. 1

(Plate)

(Location)

- (A) Fuji - North East of Australia.
(B) Caroline - Between the Philippine and Indian Plate.
(C) Philippine - Between the Asiatic and Pacific Plate.
(D) Nazca - Between central America and Pacific Plate.

5. Identify, which of the following Statement is **NOT** true regarding the chemical weathering processes? 1

- I. These processes depend on gravitational forces, temperature changes and water pressures Controlled by wetting and drying cycles.
- II. Water and air along with heat must be present.
- III. These processes are small and slow.
- IV. Most of these processes are caused by thermal expansion and pressure release.

Options:

- (A) Only I and II
- (B) Only II
- (C) Only IV
- (D) Only III and IV

6. Acquisition and transportation of rock debris is called_____. 1

- (A) Deposition
- (B) Mass movement
- (C) Erosion
- (D) Diastrophism

7. Alluvial fans are formed by_____. 1

- (A) By erosion of running water
- (B) By erosion of underground water
- (C) By deposition of running water
- (D) By deposition of underground water

8. Identify the type of tide from the given description. 1

At this time the sun and moon are at right angles to each other and the forces of the sun and moon tend to counteract one another. The Moon's attraction, though more than twice as strong as the sun's, is diminished by the counteracting force of the sun's gravitational pull.

- (A) Neap tides
- (B) Semi diurnal tides
- (C) Spring tides
- (D) Diurnal tides.

9. Which of the following is the capital of Tripura? 1
 (A) Shillong (B) Kohima
 (C) Aizawl (D) Agartala
10. Which one of the following is the easternmost longitude of India? 1
 (A) 97°25' E (B) 82°30' E
 (C) 68°25' E (D) 97°30' E
11. Some students go to Rakastal for an excursion, which river will they see flowing there? 1
 (A) Indus (B) Satluj
 (C) Chenab (D) Beas
12. Choose the correct river System of Peninsular Drainage. 1
 1. Tapi 2. Dakshin Ganga
 3. Ganga 4. Indus

Codes:

- (A) Only 2 (B) Both 1 and 2
 (C) Both 2 and 3 (D) Only 1
13. There are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below. 1
- I. **Assertion (A):** The Peninsular region of India does not have any well-defined cold weather season.
- II. **Reason (R):** This region is near to equator and have moderating influence of the sea.

Option:

- (A) Both Statements I and II are wrong.
 (B) Both the Statements are true, Statement II does not explain Statement I correctly.
 (C) Both the Statements are true, Statement II Correctly explains the Statement I.
 (D) Statement I is true and Statement II is incorrect.

14. Consider the following statements and choose the correct answer with the help on given option:

I. **Assertion:** Tropical thorn forest are found in semi arid areas of South West Punjab, Haryana, Rajasthan, Gujarat and Uttar Pradesh.

II. **Reason:** Important species found are babool, ber, wild date, Khair, Neem and Palas etc.

Options:

- (A) Both Statements I and II are wrong.
- (B) Statement I is true and Statement II is incorrect.
- (C) Both the Statements are true, Statement II correctly explains Statement I.
- (D) Both the Statements are true, Statement II does not explain the Statement correctly.

Read the following passage and answer the questions number 15 to 17.

VERTICAL DISTRIBUTION OF SALINITY

1x3=3

Salinity changes with depth, but the way it changes depends upon the location of the sea. Salinity at the surface increases by the loss of water to ice or evaporation, or decreased by the input of fresh waters, such as from the rivers. Salinity at depth is very much fixed because there is no way that water is 'lost', or the salt is 'added'. There is a marked difference in the salinity between the surface zones and the deep zones of the oceans. The lower salinity water rests above the higher salinity dense water. Salinity, generally increases with depth and there is a distinct zone called the halocline, where salinity increases sharply. Other factors being constant, increasing salinity of seawater causes its density to increase. High salinity seawater, generally, sinks below the lower salinity water. This leads to stratification by salinity.

15. Identify the characteristics of the halocline zone.
- (A) Steady increase in salinity with depth.
 - (B) Salinity decrease with depth.
 - (C) No change in salinity with depth.
 - (D) Rapid increase in Salinity with depth
16. In which of the following layers of the ocean has constant salinity? 1
- (A) Thermocline
 - (B) Deep zones
 - (C) Halocline
 - (D) Surface zones
17. Which of the following layers of the ocean is characterized by low salinity? 1
- (A) Deep water
 - (B) Surface layer
 - (C) Halocline
 - (D) Isohaline

SECTION-B

Question number 18 and 19 are source based questions.

18. Read the passage given below and answer the questions that follow. 3x1=3

INDIA: LOCATION

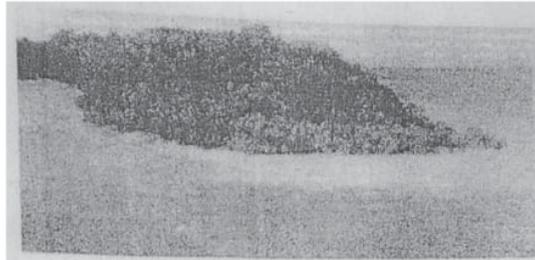
The mainland of India, extends from Kashmir in the north to Kanniyakumari in the south and Arunachal Pradesh in the east to Gujarat in the west. India's territorial limit further extends towards the sea upto 12 nautical miles (about 21.9 km) from the coast.

Our southern boundary extends upto 6°45' N latitude in the Bay of Bengal.

If you work out the latitudinal and longitudinal extent of India, they are roughly about 30 degrees, whereas the actual distance measured from north to south extremity is 3,214 km. and that from east to west is only 2,933 km.

This difference is based on the fact that the distance between two longitudes decreases towards the poles whereas the distance between two latitudes remains the same everywhere.

- 18.1 Name the state located at the easternmost longitude of India.
- 18.2 "India's distance from North-South is greater than that from east-west, while latitudinal and longitudinal extent are roughly same". State the reason.
- 18.3 How far does the territorial limit of India extends?
19. Observe the given image and answer the following questions. 1x3=3



- 19.1 Which physiographic division of India is shown in the above picture?
- 19.2 Write the name of the two major groups of displayed physiographic division. $\frac{1}{2} + \frac{1}{2} = 1$
- 19.3 Write the name of two land forms found in this physiographic division. $\frac{1}{2} + \frac{1}{2} = 1$

Note: These questions are for visually impaired students only in lieu of Q.No.19.

- 19.1 What is the extension of western coastal plains?
- 19.2 Name any two natural ports located along west coast. $\frac{1}{2} + \frac{1}{2} = 1$
- 19.3 The Malabar Coast has a certain feature which is used for fishing. Name the feature. 1

SECTION-C

Question number 20 to 23 are Short Answer type questions.

20. "With the gradual development of technology, human beings were able to loosen the shackles of their physical environment". Analyse the statement. 3

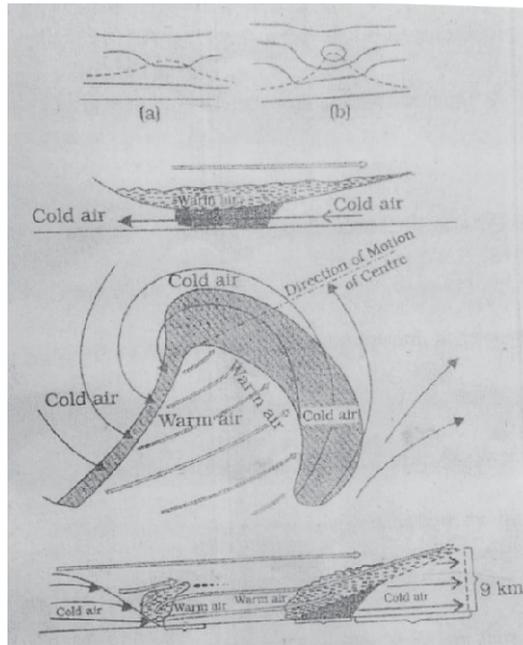
21. (A) Describe the processes come under diastrophism. 3x1=3

OR

(B) Mention the causes for the formation of Meanders. 3

22. "Rivers are polluted in India". Explain the causes. 3

23. Study the given diagram and answer the following questions. 3x1=3



23.1 Identify the above image and write the name. 1

23.2 At which latitudes do the wind systems shown in the picture develop? 1

23.3 Write any two features of air circulation process depicted in the image.

$\frac{1}{2} + \frac{1}{2} = 1$

Note: These questions are for visually impaired students only, in lieu Q.No.

23.

23.1 What is EL-NINO. 1

23.2 What effect does El-Nino have on the world's weather? State two examples. 1

23.3 El-Nino phenomenon is related to which ocean?

SECTION-D

Q.No. 24 to 28 are long Answer type questions.

24. (A) Examine the features of the "Mantle". 5x1=5

OR

(B) Mention the evidences given in support of continental drift theory.

25. (A) Describe the important factors controlling the distribution of temperature. 5x1=5

OR

(B) Analyse the major precipitation regimes of the world on the basis of the total amount of annual precipitation.

26. (A) Describe the distinct land features of the peninsular plateau. 5x1=5

OR

(B) Evaluate the major features of Krishna River System,

27. Mention the reasons for the decline of wild life in India? 5x1=5

28. (A) "There are seasonal variations in temperature from place to place in India". the statement with relevant examples. 5x1=5

OR

(B) Elucidate the factors determining the climate of India.

SECTION-E

Q.29 and 30 are map Based questions.

29. Five Geographical features are shown on the given Physical outline map of the world A, B, C, D, E, F and G. Identify these features with the help of information given below and write their correct names on the lines marked near them. 1x5=5

- (A) A Desert
- (B) A Sea
- (C) A Plate
- (D) A Cold current
- (E) An Ecological Hot Spot
- (F) A Current
- (G) An Ecological Hot Spot

Note: The following questions are for the Visually Impaired Candidates only in lieu of Q.No. 29. (Any 5). 1x5=5

29.1 Write the name of hot desert in the world.

29.2 Write the name of sea which is part of the Atlantic Ocean in Northern Europe.

29.3 Name the plate which is located between Philippine and Indian plate.

29.4 Name the cold current flowing in the Western Coast of Greenland.

29.5 Name the ecological hot spot of North India.

29.6 Name the warm Atlantic Ocean current which originates in Gulf of Mexico.

29.7 Write the name of desert which lies in India.

30. Locate and label the following on the given physical outline map of India with appropriate symbols. (Any five). 5x1=5

30.1 Place with lowest temperature in India.

30.2 Mudumalai wild life Sanctuary

30.3 Area of Swamp forest

30.4 Sambhar lake

30.5 Simlipal National Park

30.6 Konkan Coast

30.7 Khasi Hills

Note: The following questions are for the Visually Impaired Candidates only in lieu of Q.No. 30. (Any 5). **5x1=5**

30.1 In which state Bhor Ghat is located?

30.2 Name the highest mountain peak of Darjeeling and Sikkim Himalayas.

30.3 In which state Mudumalai wild life sanctuary is located?

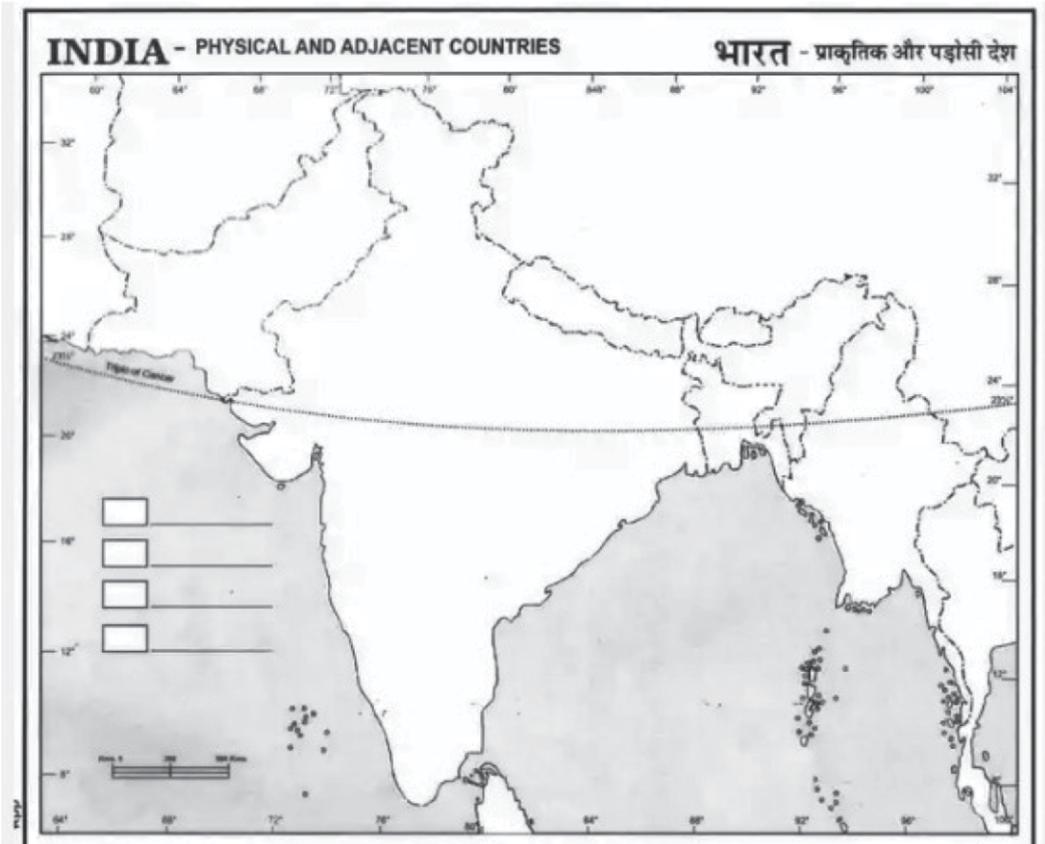
30.4 In which state is Corbett national park located?

30.5 In which state is Sambhar Lake located?

30.6 In which state is Simlipal national Park located?

30.7 Name the place with lowest temperature in India.

प्रश्न 30



COMMON ANNUAL SCHOOL EXAMINATION (2023-24)

CLASS: XI

SUBJECT : GEOGRAPHY (029)

(Morning)

Time Allowed: 3 hours

Maximum Marks: 70

समय : 3 घंटे

अधिकतम अंक : 70

सामान्य निर्देश:

निम्नलिखित निर्देशों को ध्यानपूर्वक पढ़िए और उनका पालन कीजिए :

1. इस प्रश्न पत्र में कुल 30 प्रश्न हैं। सभी प्रश्न अनिवार्य हैं।
2. प्रश्न-पत्र पाँच खण्डों में विभाजित किया गया है - क, ख, ग, घ एवं ङ।
3. खण्ड 'क' - प्रश्न संख्या 1 से 17 तक बहुविकल्पीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 1 अंक का है।
4. खण्ड 'ख' - प्रश्न संख्या 18 एवं 19 स्रोत-आधारित प्रश्न हैं।
5. खण्ड 'ग' - प्रश्न संख्या 20 से 23 तक लघु-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 3 अंकों का है। इन प्रश्नों का उत्तर 80 से 100 शब्दों में लिखा जाना चाहिए।
6. खण्ड 'घ' - प्रश्न संख्या 24 से 28 तक दीर्घ-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 5 अंकों का है। इन प्रश्नों का उत्तर 120 से 150 शब्दों में लिखा जाना चाहिए।
7. खण्ड 'ङ' - प्रश्न संख्या 29 एवं 30 मानचित्र सम्बन्धित हैं जो कि क्रमशः भौगोलिक विशेषताओं क्रमशः पहचान तथा स्थान निर्धारण करने और उनके नाम लिखने से सम्बन्धित हैं। प्रत्येक प्रश्न 5 अंक का है।
8. दिए गए भारत और विश्व के रेखा मानचित्रों का भरकर उत्तर पुस्तिका में नत्थी कीजिए।
9. रूपरेखा मानचित्रों को खींचने के लिए टेम्पलेट या स्टेन्सिल का उपयोग करने की अनुमति है।

General Instructions:

Read the following instruction carefully and follow them :

1. This questions paper contains 30 questions. All questions are compulsory.
2. The question paper is divided into five sections - A, B, C, D and E.
3. Section A - Questions No. 1 to 17 are Multiple Choice questions (MCQs) carrying 1 mark each.
4. Section B - Questions No. 18 and 19 are Source-based answer type questions carrying 3 mark each.
5. Section C - Questions No. 20 to 23 are short answer type questions carrying 3 marks each. Answer to each of them should be 80 to 100 words.
6. Section D - Questions No. 24 to 28 are long answer type questions carrying 5 marks each. Answer to each of them should be 120 to 150 words..
7. Section E - Questions No. 29 and 30 Map-based questions related to identification and locating and labelling of geographical features respectively carrying 5 marks each.
8. The outline map of India and World provided to you must be attached within your answer sheet.
9. Use of template or stencils for drawing Outline map is allowed.

1. Given below is a list of components and processes of the water cycle. Which of the following pair is correctly matched? (1)

Components	Processes
(A) Water in the atmosphere	- Condensation, Precipitation
(B) Surface run off	- Snowmelt run off to streams
(C) Water storage in oceans	- Stream flow fresh water storage infiltration
(D) Ground water storage	- Evaporation, Evapotranspiration Sublimation

2. Consider the following statements and choose the correct answer with the help of given options. (1)

- I. **Assertion:** The temperature of surface water decreases from the equator towards the poles.
- II. **Reason:** The amount of insolation decreases pole ward.

Options:

- (A) Both the Statements are true, Statement II does not explain Statement I correctly.
- (B) Both the Statements are true, Statement II Correctly explains the Statement I.
- (C) Both Statements I and II are wrong.
- (D) Statement I is true and Statement II is incorrect. (D)
3. Which of the following current is an example of warm ocean current? (1)
- (A) California (B) Labrador
- (C) West Australia (D) Kuroshio
4. In which of the following units wave speed is measured? (1)
- (A) Knots (B) Meter/second
- (C) Mach (D) RPM

5. Read the given statement and answer the question. (1)
- "The planets were formed out of a cloud of material associated with a youthful sun. which was slowly rotating."
- The above statement is related to which hypothesis?
- (A) Sea floor spreading (B) Nebular
(C) Expanding universe (D) Steady State
6. Arrange the following States from North to South direction. (1)
- (i) Madhya Pradesh (ii) Uttar Pradesh
(iii) Maharashtra (iv) Uttarakhand
- (A) (iii), (6), (iv), (ii) (B) (iv), (ii), (iii), (0)
(C) (ii), (i). (i), (iv) (D) (iv), (ii), (i), (iii)
7. Which of the following state is land locked State? (1)
- (A) Andhra Pradesh (B) Tamil Nadu
(C) Telangana (D) Odisha
8. Observe the given picture and answer the question. (1)



Which physiographic division is shown in above picture?

- (A) The Coastal plains (B) The Northern plain
(C) The Islands (D) The Peninsular plateau

Note: This question is for visually impaired, Students only, in lieu of Q.No. 8.

Which of the following physiographic division is situated to the northwest of the Aravali hills?

- (A) The Indian Desert (B) The Northern plains
(C) The Peninsular plateau (D) The Northern and North-eastern Mountains

9. At which of the following place does the Indus River flow out of the hills? (1)

- (A) Attock (B) Mithankot
(C) Dras (D) Gilgit

10. Consider the following statements and choose the correct answer with the help of given option. (1)

- I. The Satluj originates in the Rakas tal near Mansarovar.
II. The sardar sarovar project has been constructed on this river.

Options:

- (A) Both the Statements are true.
(B) Only Statement I is true.
(C) Only Statement II is true.
(D) Both the Statements are wrong.

11. Consider the following and choose the correct answer with the help of given code: (1)

Forests	Trees species
I. Tropical Deciduous forests	1. Khejri
II. Tropical Thorn forests	2. Ebony
III. Montane forests	3. Teak
IV. Tropical Evergreen forests	4. Spruce

Options:

- (A) 1-3, II-1, I-4, IV-2 (B) 1-3, 11-1, III-2, IV-4
(C) 1-1, 1-3, III-4, IV-2 (D) 1-3, 11-2, III-1, IV-4

12. If you have to lay a railway track in any area then which tree will you use? (1)
- (A) Pine (B) Oak
(C) Hollock (D) Semul
13. Which of the following statement is related to "Blossom shower". (1)
- (A) With this shower, coffee flowers blossom in coffee producing areas.
(B) It rains in Assam.
(C) These are useful for tea and jute.
(D) It is due to north-eastern monsoon.
14. Which of the following is the main reason for not having well defined cold weather season in peninsular region of India? (1)
- (A) Due to being located away from moderation influence of the sea.
(B) Due to more rainfall.
(C) Due to more air pressure.
(D) Proximity to equator.

Read the following case study and answer the questions No. 15 to 17.

General Atmospheric Circulation and its Effects on Oceans

Warming and cooling of the Pacific Ocean is most important in terms of general atmospheric circulation. The warm water of the central Pacific Ocean slowly drifts towards South American coast and replaces the cool Peruvian current. Such appearance of warm water off the coast of Peru is known as the El Nino. The El Nino event is closely associated with the pressure changes in the Central Pacific and Australia. This change in pressure condition over Pacific is known as the southern oscillation.

The combined phenomenon of southern oscillation and El Nino is known as

ENSO. In the years when the ENSO strong, large-scale variations in weather occur over the world. The arid west coast of South America receives heavy rainfall, drought occurs in Australia and sometimes in India and floods in China. This phenomenon is closely monitored and is used for long range forecasting in major parts of the world.

15. What is meant by El Nino? (1)
- (A) Appearance of cold water current off the coast of Peru.
 - (B) Appearance of warm water current off the coast of Peru.
 - (C) Anomaly in the temperature of the Atlantic ocean.
 - (D) Heavy rainfall in North America.
16. What weather change is observed in the world due to the strength of ENSO? (1)
- (A) Floods in china and Drought in Arnd west Coast of South America
 - (B) Drought in India
 - (C) Absence of Rain in China.
 - (D) Flood in North America.
17. If you are a farmer in India, then in which year will you produce more crops keeping in mind the weather forecast? (1)
- (A) Year in which El Nino is weak
 - (B) Year in which El Nino is strong
 - (C) Stable & Southern oscillation
 - (D) Prediction will be ignored

SECTION-B

Question number 18 and 19 are source based questions.

18. Observe the given anage and answer the following questions : (1+1+1-3)



- (A) Identify the given picture and write its name. (1)
- (B) By which type of volcano the displayed shape is formed? (1)
- (C) How this shape is formed? (1)

Note: These questions are for visually impaired. Students only, in lieu Q.No.

18.

Mention any three features of Batholiths. (1x3=3)

19. Read the Case Study given below and answer the questions that follow: (3)

Onset of the Monsoon

Towards the end of the nineteenth century, it was believed that the differential being o land and sea during the summer months is the mechanism which sets the stage for th monsoon winds to drift towards the subcontinent. During April and May when the su shines vertically over the Tropic of Cancer, the large landmass in the north of India ocean gets intensely heated. This causes the formation of an intense low pressure in northwestern part of the subcontinent. Since the pressure in the Indian Ocean in the of the landmass is high as water gets heated slowly,

the low pressure cell attract with southeast trades across the Equator. These conditions help in the northward sh position of the ITCZ. The southwest monsoon may thus, be seen as a continuation southeast trades deflected towards the Indian subcontinent after crossing the Equator These winds cross the Equator between 40° E and 60° E longitudes.

The shift in the position of the ITCZ is also related to the phenomenon of the withdrawn of the westerly stream from its position over the north Indian plain, south of the Himalayas. The easterly jet stream sets in along 15° N latitude only after the western jet stream has withdrawn itself from the region. This easterly jet stream is held responsible for the burst of the monsoon in India.

- (A) What is the main reason for monsoon winds entering India? (1)
- (B) "A low pressure area develops in the north western part of India in the months of May". State Reason. (1)
- (C) What is the consequence of shift in the position of ITCZ? (1)

SECTION-C

Question number 20 to 23 are Short Answer type questions.

20. (A) How are Stalagmite different from Stalactite? Explain. (1x3=3)

OR

- (B) Mention any three characteristics of River Terraces?

21. (A) "Time is a basic control factor of soil formation". Explain the statement. (1x3=3)

OR

- (B) Mention the applied forces affecting mechanical weathering:

22. "The present society has passed the stage of primitive societies." Justify the statement. (3)
23. How is the location of India is useful to increase trade and commerce? Explain with example. (1x3=3)

SECTION-D

Q.No. 24 to 28 are long Answer type questions.

24. Mention the basic concept of continental drift theory. (1x5=5)
25. (A) Analyse the factors responsible for variations in insolation. (1x5=5)
- OR
- (B) What is Dew? Explain the ideal conditions for the formation of dew. (1+4=5)
26. (A) Explain with examples the changes occurring on Earth due to increase in global warming. (1x5=5)

OR

- (B) Mention the objectives of forest conservation policy.
27. (A) Analyse the main pillars of the Namami Gange Programme. (1x5=5)
- OR
- (B) Mention the major features of the Himalayan Drainage system.
28. Examine the major characteristics of Eastern coastal plains. (1x5=5)

SECTION-E

Q.29 and 30 are map Based questions.

29. Seven Geographical features are shown on the given Physical outline map of the world as A, B, C, D, E, F and G. Identify any five features from them with the help of information given below and write their correct names on the lines marked near them. (1x5=5)
- (A) A Desert

- (B) A sea
- (C) A warm current
- (D) An Ecological hot spot
- (E) A tectonic plate
- (F) A continent
- (G) A Cold current

Note: The following questions are for the visually impaired Candidates

only in lieu of Q.No. 29. (Any 5).

(1x5=5)

- 29.1 Write the name of largest desert of Asia
- 29.2 Name the Sea located between Eastern Europe and western Asia.
- 29.3 Write the name of a warm ocean current flows in the south-west Indian ocean.
- 29.4 Name the ecological hot spot of north India.
- 29.5 Name the plate which is located between Philippine and Indian plate
- 29.6 Write the name of a continental country.
- 29.7 Name a cold current flows along the western coast of North America.
- 30. Locate and label the following on the given physical outline map of India with appropriate symbols. (Any five). (1x5=5)
 - (A) Place with highest rainfall in India.
 - (B) Shivpuri National Park.
 - (C) Area of Tropical Thorn forests.

- (D) Chilka Lake.
- (E) Ghana bird sanctuary.
- (F) Anai Mudi peak
- (G) Andaman and Nicobar Islands

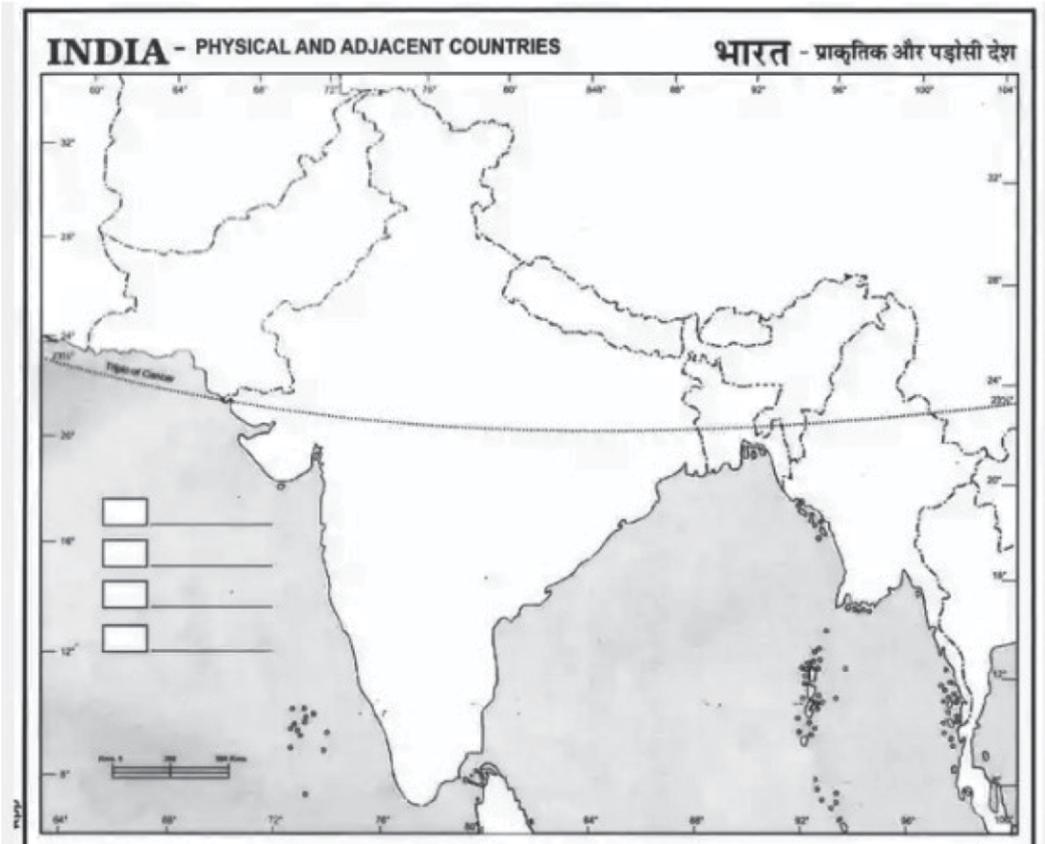
Note: The following questions are for the visually impaired Candidates

only in lieu of Q.No. 30. (Any 5).

(1x5-5)

- 30.1 Name the place with highest rainfall in India.
- 30.2 In which state is Shivpuri National park located?
- 30.3 In which state is Panchmarhi Biosphere reserve located?
- 30.4 In which state is Chilka Lake located?
- 30.5 In which state is Ghana Bird Sanctuary located?
- 30.6 In which hills is Anaimudi peak located?
- 30.7 Name the Capital of Andaman and Nicobar Island?

प्रश्न 30



COMMON ANNUAL SCHOOL EXAMINATION (2023-24)

CLASS: XI

SUBJECT : GEOGRAPHY (029)

(Evening)

Time Allowed: 3 hours

Maximum Marks: 70

समय : 3 घंटे

अधिकतम अंक : 70

सामान्य निर्देश:

निम्नलिखित निर्देशों को ध्यानपूर्वक पढ़िए और उनका पालन कीजिए :

1. इस प्रश्न पत्र में कुल 30 प्रश्न हैं। सभी प्रश्न अनिवार्य हैं।
2. प्रश्न-पत्र पाँच खण्डों में विभाजित किया गया है - क, ख, ग, घ एवं ङ।
3. खण्ड 'क' - प्रश्न संख्या 1 से 17 तक बहुविकल्पीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 1 अंक का है।
4. खण्ड 'ख' - प्रश्न संख्या 18 एवं 19 स्रोत-आधारित प्रश्न हैं।
5. खण्ड 'ग' - प्रश्न संख्या 20 से 23 तक लघु-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 3 अंकों का है। इन प्रश्नों का उत्तर 80 से 100 शब्दों में लिखा जाना चाहिए।
6. खण्ड 'घ' - प्रश्न संख्या 24 से 28 तक दीर्घ-उत्तरीय प्रकार के प्रश्न हैं। प्रत्येक प्रश्न 5 अंकों का है। इन प्रश्नों का उत्तर 120 से 150 शब्दों में लिखा जाना चाहिए।
7. खण्ड 'ङ' - प्रश्न संख्या 29 एवं 30 मानचित्र सम्बन्धित हैं जो कि क्रमशः भौगोलिक विशेषताओं क्रमशः पहचान तथा स्थान निर्धारण करने और उनके नाम लिखने से सम्बन्धित हैं। प्रत्येक प्रश्न 5 अंक का है।
8. दिए गए भारत और विश्व के रेखा मानचित्रों का भरकर उत्तर पुस्तिका में नत्थी कीजिए।
9. रूपरेखा मानचित्रों को खींचने के लिए टेम्पलेट या स्टेन्सिल का उपयोग करने की अनुमति है।

General Instructions:

Read the following instruction carefully and follow them :

1. This questions paper contains 30 questions. All questions are compulsory.
2. The question paper is divided into five sections - A, B, C, D and E.
3. Section A - Questions No. 1 to 17 are Multiple Choice questions (MCQs) carrying 1 mark each.
4. Section B - Questions No. 18 and 19 are Source-based answer type questions carrying 3 mark each.
5. Section C - Questions No. 20 to 23 are short answer type questions carrying 3 marks each. Answer to each of them should be 80 to 100 words.
6. Section D - Questions No. 24 to 28 are long answer type questions carrying 5 marks each. Answer to each of them should be 120 to 150 words..
7. Section E - Questions No. 29 and 30 Map-based questions related to identification and locating and labelling of geographical at features respectively carrying 5 marks each.
8. The outline map of India and World provided to you must be attached within your answer sheet.
9. Use of template or stencils for drawing Outline map is allowed.

SECTION-A

1. Given below is a list of descriptors of wave and their meaning Which of the Pair is correctly matched? (1)

Components	Meaning
(A) Wave speed	- Highest and lowest points of wave
(B) Wave amplitude	- One half of the wave height,
(C) Wave frequency	- Rate at which the wave moves through the water.
(D) Wave length	- Number of waves passing a given point during a one second time interval.

2. Consider the following statements and choose the correct answer with the help of given options. (1)

I. **Assertion** : The oceans in the northern hemisphere receive more heat than oceans in Southern hemisphere.

II. **Reason**: The oceans in the northern hemisphere have contact with larger extent of land than the oceans in the southern hemisphere

Options

- (A) Both the Statements are true, Statement II does not explain Statement I correctly
- (B) Both the Statements are true. Statement II Correctly explains the Statement I
- (C) Both Statements I and II are wrong
- (D) Statement I is true and Statement II is incorrect.
3. Which of the following current is an example of cold ocean current? (1)
- (A) Alaska (B) Agulhas
- (C) Canaries (D) Kuroshio

4. In which of the following forms the amount of Salt dissolved in sea water is expressed? (1)

- (A) CGS (B) PPT
(C) RPM (D) FPS

5. Read the given statement and answer the question. (1)

"The universe is roughly the same at any Point of time"

The above statement is related to which concept?

- (A) Steady state (B) Expanding universe
(C) Nebular (D) Sea floor spreading

6. Arrange the following States from North to South direction. (1)

- (1) Jharkhand (ii) Madhya Pradesh
(iii) Chhatisgarh (iv) West Bengal
(A) (ii), (iii), (i), (iv) (B) (iii), (ii), (i), (iv)
(C) (i), (ii), (iii), (iv) (D) (iv), (iii), (i), (ii)

7. Which of the following state is a coastal State! (1)

- (A) Tripura (B) Goa
(C) Chhatisgarh (D) Meghalaya

8. Observe the given picture and answer the question. (1)



Which physiographic division is shown in above picture?

- (A) The Indian desert (B) The Islands
(C) The Northern plain (D) The Coastal plains

Note: This question is for visually impaired, Students only, in lieu of Q.No. 8.

Which of the following physiographic division is irregular triangle!

- (A) The Northern plains (B) The Coastal plains
(C) The Peninsular plateau (D) The Indian Desert
9. At which place the Indus river receives "Panjnad"? (1)
(A) Attock (B) Mithankot
(C) Kala kot (D) Srinagar
10. Consider the following statements and choose the correct answer with the help of given option. (1)

- I. The Narmada originates from Brahmagiri hills
II. The Bhakra Nangal project has been constructed on this river

Options:

- (A) Both the Statements are true.
(B) Only Statement I is true
(C) Only Statement II is true.
(D) Both the Statements are wrong
11. Consider the following and choose the correct answer with the help of given code : (1)

Forest	Species
I. Tropical Evergreen forests	1. Kail
II. Tropical Semi Evergreen forests	2. Khair
III. Tropical Thorn forests	3. Birch
IV. Montane forests	4. Aim

Options:

- (A) I-4, II-1, III-3, IV-2 (B) I-1, II-4, III-3, IV-2
(C) I-4, II-1, III-2, IV-3 (D) I-1, II-2, III-4, IV-3

12. If there is construction work to be done in any area then which tree will you use? (1)
- (A) Chinar (B) Dendar
(C) Blue Pine (D) Oak
13. Which of the following statement is related to "Mango Shower"? (1)
- (A) It rains in Assam and West Bengal
(B) These showers are common Phenomena in Kerala and Coastal area of Karnataka.
(C) It is known as Bardoli Chheerha.
(D) These are post South West monsoon showers.
14. Which of the following is the main reason for Tamil Nadu being dry during the amny season? (1)
- (A) This is a high pressure Area
(B) It is situated on wind ward slope
(C) It lies in the rain shadow area of the Arabian Sea branch of North-east monsoon.
(D) It is situated parallel to the Bay of Bengal brunch.

Read the following case study and answer the questions No. 15 to 17.

Coriolis Force

The rotation of the earth about its axis affect the direction of the wind. This force is called the Coriolis force after the French physicist who described it in 1844. It deflects the wind to the right direction in the northern hemisphere and to the left in the southern hemisphere. The deflection is more when the wind velocity is high. The Coriolis force is directly proportional to the angle of latitude. It is maximum at the poles and is absent at the equator.

The Coriolis force acts perpendicular to the pressure gradient force. The pressure gradient force is perpendicular to an isobar. The higher the pressure gradient force, the more is the velocity of the wind and the larger is the deflection in the direction of wind. As a result of these two forces operating perpendicular to each other, in the low-pressure areas the wind blows around it. At the equator, the Coriolis force is zero and the wind blows perpendicular to the isobars. The low pressure gets filled instead of getting intensified. That is the reason why tropical cyclones are not formed near the equator.

15. Where the Coriolis force is maximum? (1)
- (A) At the Poles
 (B) At the Equator
 (C) Equally distributed all over the earth's Surface
 (D) More near the surface of Earth and lesser above.
16. Which of the following is responsible for Coriolis force? (1)
- (A) Pressure gradient (B) Earth's axis of inclination
 (C) Earth's rotation (D) Earth's revolution
17. With reference to Coriolis force, which of the following statement is correct? (1)
- (A) The Coriolis force is directly proportional to longitudes
 (B) It deflects the wind to the left direction in northern hemisphere
 (C) It acts Parallel to the pressure gradient force
 (D) It is directly proportional in the Angle of latitude.

SECTION-B

Question number 18 and 19 are source based questions.

18. Observe the given image and answer the following questions: (1+1+1=3)



- (A) Identify the given diagram and write its name. (1)
(B) Mention any two features of the diagram. (1)
(C) How the shape shown in the diagram formed. (1)

Note: These questions are for visually impaired. Students only, in lieu Q.No.

18.

Mention any three features of Lacoliths. (1x3=3)

19. Read the Case Study given below and answer the questions that follow. (3)

THE SOUTHWEST MONSOON SEASON

As a result of rapid increase of temperature in May over the northwestern plains, the low pressure conditions over there get further Intensified. By early June, they powerful enough to attract the trade winds of Southern Hemisphere coming from the Indian Ocean These southeast trade winds cross the equator and enter the Bay of Bengal and the Arabian Sea, only to be caught up in the air circulation over India. Passing over the equatorial warm currents, they bring with them moisture In abundance. After crossing the equator, they follow a southwesterly direction. That is why they are known as southwest monsoons.

The rain in the southwest monsoon season begins rather abruptly. One result of the first rain is that it brings down the temperature substantially. This sudden onset of the moisture-laden winds associated with violent thunder and lightening, is often termed as the "break" or "burst" of the monsoons. The monsoon may burst in the first week of June in the coastal areas of Kerala, Karnataka, Goa and Maharashtra while in the interior parts of the country, it may be delayed to the first week of July. The day temperature registers a decline 5° C to 8° C between mid-June and mid-July.

- (A) The winds that blow during the rainy season in India are known as southwest monsoons. State reason. (1)
- (B) Which planetary winds to be attracted by the low pressure conditions in India? (1)
- (C) "Monsoon winds reach different regions of India at different times". Justify. (1)

SECTION-C

Question number 20 to 23 are Short Answer type questions.

20. (A) How are Gorge different from canyons. Explain. (1x3=3)

OR

(B) Mention the reasons for the formation of Meanders.

21. (A) Explain the importance of weathering. (1x3=3)

OR

(B) Explain the processes under Diastrophism.

22. Landforms provide the base for human activities. Justify the statement. (3)

23. What is the importance of India's long coastline? (3)

SECTION-D

Q.No. 24 to 28 are long Answer type questions

24. Mention the Plate Tectonics concept. (1x5=5)
25. (A) What is the ideal conditions for the humation of white frost. (1+4=5)

OR

- (B) Analyse the "Altitude of the place and distance from sea" as the factors affecting the temperature of air of any place.
26. (A) "Human activities on large scale are responsible for global warming." Explain this statement with examples. (1x5=5)

OR

- (B) Mention the important measures for the Wildlife Conservation in India
27. (A) Mention the major characteristics of the river Kaveri. (1x5=5)
- (B) Mention the major characteristics of the Indian Desert.
28. Examine the major characteristics of the Indian Desert. (1x5=5)

SECTION-E

Q.29 and 30 are map Based questions.

29. Seven Geographical features are shown on the given Physical outline map of the world as A, B, C, D, E, F and G. Identify any five from these features with the help of information given below and write their correct names on the lines marked near them. (1x5=5)
- (A) A Plate
- (B) A Desert

- (C) A Continent
- (D) A Sea
- (E) An Ecological hot spot
- (F) A Cold cur
- (G) A warm ocean current

Note: The following questions are for the visually impaired Candidates only in lieu of No. 29. (Any 5) (1x5=5)

- 291 Write the name of the smallest continent of the world.
- 29:2 Write the name of largest desert of Australia.
- 293 Name the largest lake of the world.
- 29.4. Name the ecological fict spot of South India
- 29.5 Name the plate which is located at North-East of Australis
- 29.6 Name a cold current in the North Atlantic ocean flows along the eastern coast of Canada.
- 29.7 Write the name of warm current flows along the eastern coast of Japan in North Pacific Ocean.
- 31. Locate and label the following on the given physical outline map of sudia with appropriate symbols (Any five). (1x5=5)
 - (A) Ranthambore National Park
 - (B) Area of montane forest

- (C) Place with lowest rainfall in India
- (D) Pulicat Lake
- (E) Lakshadweep
- (F) Nanda Devi Peak
- (G) Ranganatittu Bird Sanctuary

Note: The following questions are for the visually, Impaired Candidates

only in lieu of Q.No. 3. (Ans 5).

(1x5=5)

30.1 In which state is Ranthambore National Park Situated?

30.2. Name the biosphere reserve situated in Odisha.

30.1 Name the place with lowest rainfall in India.

30.4 In which state is Pulicat Lake Situated?

30.5 Name the capital of Lakshadweep.

30. In which state are Northern Circar Coastal Plains located.

30.7 In which state is Ranganatittu bird sanctuary situated.

प्रश्न 29

