तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

भूगोल
Geography

कक्षा / Class XI

2025-26

विद्यार्थी सहायक सामग्री
Student Support Material

केन्द्रीय विद्यालय संगठन~Kendriya Vidyalaya Sangathan

संदेश

विद्यालयी शिक्षा में शैक्षिक उत्कृष्टता प्राप्त करना एवं नवाचार द्वारा उच्च - नवीन मानक स्थापित करना केन्द्रीय विद्यालय संगठन की नियमित कार्यप्रणाली का अविभाज्य अंग है। राष्ट्रीय शिक्षा नीति 2020 एवं पी. एम. श्री विद्यालयों के निर्देशों का पालन करते हुए गतिविधि आधारित पठन-पाठन, अनुभवजन्य शिक्षण एवं कौशल विकास को समाहित कर, अपने विद्यालयों को हमने ज्ञान एवं खोज की अद्‌भुत प्रयोगशाला बना दिया है। माध्यमिक स्तर तक पहुँच कर हमारे विद्यार्थी सैद्धांतिक समझ के साथ-साथ, रचनात्मक, विश्लेषणात्मक एवं आलोचनात्मक चिंतन भी विकसित कर लेते हैं। यही कारण है कि वह बोर्ड कक्षाओं के दौरान विभिन्न प्रकार के मूल्यांकनों के लिए सहजता से तैयार रहते हैं। उनकी इस यात्रा में हमारा सतत योगदान एवं सहयोग आवश्यक है - केन्द्रीय विद्यालय संगठन के पांचों आंचलिक शिक्षा एवं प्रशिक्षण संस्थान द्वारा संकलित यह विद्यार्थी सहायक-सामग्री इसी दिशा में एक आवश्यक कदम है । यह सहायक सामाग्री कक्षा 9 से 12 के विद्यार्थियों के लिए सभी महत्वपूर्ण विषयों पर तैयार की गयी है। केन्द्रीय विद्यालय संगठन की विद्यार्थी सहायक- सामग्री अपनी गुणवत्ता एवं परीक्षा संबंधी सामग्री संकलन की विशेषज्ञता के लिए जानी जाती है और शिक्षा से जुड़े विभिन्न मंचों पर इसकी सराहना होती रही है। मुझे विश्वास है कि यह सहायक सामग्री विद्यार्थियों की सहयोगी बनकर निरंतर मार्गदर्शन करते हुए उन्हें सफलता के लक्ष्य तक पहुँचाएगी।

शुभाकांक्षा सहित ।

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INDEX

CLASS XI
COURSE STRUCTURE
Book- Fundamentals of Physical Geography

Chapter No.	Chapter name	Weightage
Unit- I Geography as a Discipline		
1	Geography as a Discipline	3
Unit II The Earth		
2	The Origin and Evolution of the Earth	9
3	Interior of the Earth	
4	Distribution of oceans and continents	
Unit- III Landforms		
5	Geomorphic Processes	6
6	Landform and their Evolution	
Unit-IV Climate		
7	Composition and Structure of Atmosphere	8
8	Solar Radiation, Heat balance and Temperature	
9	Atmospheric Circulations and Weather Systems	
10	Water in the Atmosphere	
11	World Climate and Climate Change (To be tested through internal assessments in the form of project and presentation)	

Unit-V Water (Oceans)		
12	Water (Oceans)	4
13	Movements of Ocean Water	

Unit VI Life on the Earth		
14	Biodiversity and Conservation (To be tested through internal assessments in the form of project and presentation)	_
	Map Work	5
Total		**35**

Book-India Physical Environment

Chapter No.	Chapter Name	Weightage
Unit-I Introduction		
1	India- Location	5
Unit II Physiography		
2	Structure and Physiography	13
3	Drainage System	
Unit III Climate Vegetation and Soil		
4	Climate	12
5	Natural Vegetation	
Unit-IV Natural Hazards and Disasters: Causes Consequences and Management		
6	Natural Hazards and Disasters (To be tested through internal assessment in the form of Projects and presentation)	_
	Map	5
Total		**35**

Book-Geography Practical Part I

Chapter No.	Chapter Name	Weightage
1	Introduction to Maps	3
2	Map Scale	4
3	Latitude Longitude and Time	4
4	Map Projections	4
5	Topographical Maps	4
6	Introduction to Remote Sensing	6
	Practical file and Viva	5
	Total	**30**

COURSE CONTENT – XI

Book- Fundamentals of Physical Geography

Unit 1: Geography as a Discipline	**Chapter 1 Geography as a Discipline** • Introduction to Geography as a discipline • Geography as an integrating discipline: Spatial and Temporal synthesis • Approaches to study Geography: Systematic and Regional • Branches of Geography: Physical Geography, Human Geography and Bio Geography • Physical Geography and its importance.
Unit 2: The Earth	**Chapter 2 The Origin and Evolution of The Earth** ● Origin and evolution of the earth ● Early theories: Origin of the Earth ● Modern Theories: Origin of the universe ● Formation of Stars and Planets ● Evolution of the Earth: Lithosphere, Atmosphere and Hydrosphere ● Origin of Life **Chapter 3 Interior of the Earth** ● Sources of Information about the Interior of the Earth (Direct and Indirect) ● Earthquakes: Earthquake Waves, Shadow zones, Types, Scales to measure earthquake intensity, effects, frequency of earthquake occurrences ● Structure of the Earth

	● Volcanoes and Volcanic landforms

	Chapter 4 Distribution of Oceans and Continents ● Continental Drift Theory, and Evidence in support of Continental Drift and Force for Drift ● Post Drift Studies ● Ocean Floor Configuration ● Distribution of Earthquakes and Volcanoes ● Concept of Seafloor Spreading ● Plate Tectonics: Types of Plate boundaries, Rate and forces for the Plate Movement ● Movement of the Indian Plate
Unit 3: Landforms	**Chapter 5 Geomorphic processes** • Geomorphic processes: Exogenic and Endogenic • Endogenic Process: Diastrophism, Volcanism • Exogenic Processes Weathering, landslides. • Soil: Processes and factors of Soil Formation **Chapter 6 Landforms and their Evolution** ● **Running water:** Erosional and Depositional Landforms ● **Wind:** Erosional and Depositional Landforms

Unit 4: Climate	**Chapter 7 Composition and Structure of Atmosphere** • Atmosphere- composition and structure; elements of weather and climate **Chapter 8 Solar Radiation, Heat Balance and Temperature** • Solar radiation: Variability of Insolation. • Processes of Heating and Cooling of Atmosphere • Terrestrial Radiation • Heat budget of the earth • Temperature- Factors controlling temperature; Horizontal distribution of temperature; Inversion of temperature **Chapter 9 Atmospheric Circulation and Weather Systems** ● Atmospheric Pressure: Horizontal and Vertical Variation of Pressure ● Forces affecting velocity and direction of Wind ● General Circulation of the atmosphere: Pressure belts; Winds: Planetary, Seasonal and Local; Air masses and Fronts; Tropical and Extratropical cyclones; Thunderstorms and Tornadoes **Chapter 10 Water in the Atmosphere** • Humidity-Absolute and Relative humidity • Evaporation and condensation- • Different Forms of Condensation: dew, frost, fog, mist and cloud;

	• Precipitation • Types of Rainfall and world distribution of rainfall **Chapter 11 World Climate and Climate Change** **(To be tested through internal assessments in the form of project and presentation)**
Unit 5: Water (Oceans)	**Chapter 12 Water (Oceans)** • Hydrological Cycle • Major and Minor Relief Features of the Ocean Floor • Temperature and Salinity of Ocean Waters: Factors, Horizontal and Vertical distribution of temperature and Salinity **Chapter 13 Movements of Ocean Water** • Movements of ocean water- Waves, Tides and Currents.
Unit 6: Life on the Earth	**Chapter 14 Biodiversity and Conservation** **(To be tested through internal assessments in the form of project and presentation)**

Book- India- Physical Environment	
Unit 1: Introduction	**Chapter 1** India — Location, Size, Latitudinal and Longitudinal extent, Indian Standard time, India and its neighbours
Unit 2: Physiography	**Chapter 2 Structure and Physiography** • 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. **Chapter 3 Drainage System** • Drainage patterns • Concepts of River basin, Catchment Area, Watershed • Drainage and River systems of India: the Himalayan and the Peninsular • Extent of Usability of River Water- linking of rivers, problems in using river water and water pollution
Unit 3: Climate, Vegetation and Soil	**Chapter 4 Climate** ● Weather and climate ● Unity and diversity in the Monsoon Climate ● Factors determining the climate of India ● The Nature and characteristics on Indian Monsoon ● The Rhythm of Seasons ● Distribution of Rainfall

	● Monsoon and the Economic Life in India ● Global Warming **Chapter 5 Natural Vegetation** ● Natural vegetation - Introduction ● Forest types and distribution ● Conservation of forests ● Wildlife; conservation; biosphere reserves
Unit 4: Hazards and Disasters: Causes, Consequences and Management	Chapter 6 Natural Hazards and Disasters (To be tested through internal assessment in the form of Projects and presentation)
Book- Geography Practical Part I	

Chapter 1 Introduction to Maps
Chapter 2 Map Scale
Chapter 3 Latitude, Longitude and Time
Chapter 4 Map Projections
Chapter 5 Topographical Maps
Chapter 6 Introduction to Remote Sensing

<table>
<tr><td colspan="2">Map Work
Book- Fundamentals of Physical Geography
(Map items for locating and labelling only on the outline political world map)</td></tr>
<tr><td>Chapter</td><td>Map item (Map present on official website of Govt. of India should be used)</td></tr>
<tr><td>Chapter 4 Distribution of oceans and continents</td><td>• Political Map of all Continents of the world.
• Major Oceans of the world: Indian Ocean, Pacific Ocean, Atlantic Ocean, Arctic Ocean, Southern Ocean · Major lithospheric plates and Minor lithospheric plates, Ring of fire (Pacific Ocean), Mid-Atlantic Ridge.</td></tr>
<tr><td>Chapter 9 Atmospheric Circulations and Weather Systems</td><td>Major Hot Deserts of the world:
• Mojave Desert- Nevada, US
• Patagonian Desert- Argentina
• Sahara- Africa
• Gobi Desert- Mongolia, Asia
• Thar desert- India
• Great Victoria Desert- Australia</td></tr>
<tr><td>Chapter 12 Water (Oceans)</td><td>• Major Seas
• Black sea
• Baltic sea
• Caspian Sea
• Mediterranean Sea
• North Sea
• Red sea
Bay of Fundy (Canada)-Famous for the highest tides in the world</td></tr>
<tr><td>Chapter 13 Movements of</td><td>Ocean Currents
<table><tr><td>Cold currents</td><td>Warm currents</td></tr></table></td></tr>
</table>

Ocean Water	• Humboldt c. • California c. • Falkland c. • Canaries c. • West Australian c. • Oyashio c. • Labrador c	• Alaska c. • Brazilian c. • Agulhas c. • Kuroshio c. • Gulf stream c.
Chapter 14 Biodiversity and Conservation	**Ecological hotspots** • Eastern Himalaya, India • Western ghats, India • Indonesia, Asia • Eastern Madagascar, Africa • Upper Guinean forests, Africa • Atlantic forest, Brazil Tropical Andes	

Map Work **Book- India Physical Environment** **(Map items for locating and labelling only on the outline political map of India)**	
Chapter	**Map item (Map present on official website of Govt. of India should be used)**
Chapter 1 **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 mainland of India (Kanya Kumari)
Chapter 2 Structure and Physiography	• Mountains: Karakoram Range, Garo- Khasi- Jaintia hills, Aravalli Range, Vindhyan Range, Satpura Range, Western ghats & Eastern ghats • 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. • Coastal Plains: Saurashtra, Konkan, North and South Kanara, Malabar, Coromandel and Northern Circars • Islands: Andaman & Nicobar Islands and Lakshadweep Islands

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	• 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	(Identification on an outline map of India) Tropical evergreen, Tropical deciduous, Tropical thorn, Montane 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,

FUNDAMENTALS OF PHYSICAL GEOGRAPHY
CHAPTER 1
GEOGRAPHY AS A DISCIPLINE

GIST OF THE LESSON

1. Geography can be said that Geography is the description of the earth.
2. The term geography was first coined by Eratosthenes, a Greek scholar (276-194 BC.).
3. Geography as a discipline is concerned with three sets of questions: WHAT, WHERE and WHY?
4. Geography attempts SPATIAL synthesis and history attempts TEMPORAL synthesis.
5. The major approaches to study geography have been (i) Systematic and (ii) Regional.
6. The Systematic geography approach is the same as that of general geography. This approach was introduced by Alexander Von Humboldt, a German geographer (1769-1859).
7. In systematic approach, to study geography a phenomenon is studied world over as a whole, and then the identification of typologies or spatial patterns is done.
8. The Regional approach to study geography was developed by another German geographer, Karl Ritter (1779-1859).
9. 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.
10. Dualism finally leads to 'dichotomy' which means the bifurcation of any subject into branches of knowledge.
11. Branches of Geography (based on Systematic approach)

A. Physical Geography.

a) Geomorphology b) Climatology c) Hydrology d) Soil Geography

B. Human Geography

a) Social/Cultural Geography b) Population and settlement Geography

c) Economic Geography d) Historical Geography e) Political Geography

C. Biogeography

a) Plant Geography b) Zoo Geography c) Ecology/Ecosystem d) Environmental Geography

12. Branches of Geography (based on Regional approach)

A. Regional Studies B. Regional Planning C. Regional Development D. Regional Analysis

13. Pedogenesis: the process by which soil is formed
14. Definition by Richard Hartshorne: Geography is concerned with the description and explanation of the areal differentiation of the earth's surface.
15. Definition by Hettner: Geography studies the differences of phenomena usually related with different parts of the earth's surface.

MULTIPLE TYPE QUESTIONS

Q.1 Which of the following is not correctly matched?

(A) Geomorphology - Study of landforms
(B) Cartography - Science of map making
(C) Economic Geography- Studies spatial dynamics
(D) Demography- Study of population

Ans. (C) Economic Geography- Studies Spatial dynamics.

Q.2 Assertion (A): Climate does not influence life of human beings.
Reason (R): Temperature and precipitation affects density of forests and quality of grassland.

(A) A and R are true and R is the correct explanation of A.
(B) A and R true but R is not the correct explanation of A.
(C) A is false but R is true.
(D) A is true but R is false.
Ans: (C) A is false but R is true.
Q.3 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. (A) Systematic approach.
Q.4. 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.5 Geography studies the differences of phenomena usually related with 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: (D) Hettner.

SHORT ANSWER QUESTIONS (3 MARKS)

Q.1 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 and human phenomena with reference to space.
(a) Geography recognizes that the world is a system of interdependencies.
(b) Geography as an integrating discipline has interface with numerous natural and social sciences.
(c) Geography attempts to comprehend the associations of phenomena as related in sections of reality in a holistic way.
Q.2 "Physical Geography is the part of many disciplines" justify this statement.
Ans. Physical Geography includes study of Lithosphere, Atmosphere,
Hydrosphere and Biosphere. Each element is very important for human beings.
(a) 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.
(b) 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.
(c) 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.3. "Systematic approach and Regional approach of geography has many differences"
Give your suggestions.
Ans. Main differences between systematic and regional approach are summarized below:

Systematic Approach

- Introduced by Alexander Von Humboldt, a German geographer.
-Systematic approach follows the theme
In systematic approach, , the world is divided phenomenon is studied worldover as a whole, and then the identification of typologies or spatial patterns are done.

Regional Approach

-Regional geography approach was developed by another German geographer and a contemporary of Humboldt, Karl Ritter
-In the regional approach, the world is divided phenomenon is studied world over as a whole, and then the identification of typologies or spatial patterns are done
-Regional approach follows the area as an unit.
Q.4 Geography is concerned with other social sciences. How?
Explain with suitable examples.
Ans. One of the branches 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.

LONG ANSWER QUESTION (5 MARKS)

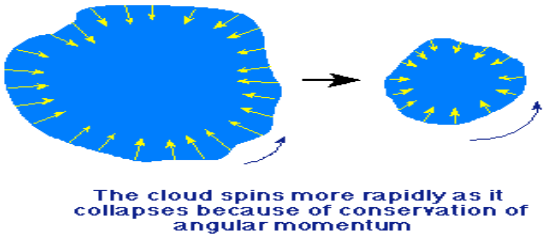
Q.1 “Physical Geography is closer to natural sciences.” Comment.
Ans: Yes, this is true that physical geography is closer to natural sciences as it shares its content with Physics, Biology, Chemistry, Botany, Mathematics etc. For example:
(a) Geographers use knowledge of Mathematics for various calculations and data interpretation in practical geography like mean, median, mode etc.
(b) The cartography and quantitative techniques require proficiency in Mathematics for accurate calculations and results.
(c) To understand basic physical laws of climate knowledge of Physics is needed. The study of solar system and formation of universe is also included in Geography.
(d) Geomorphology derives its base from Geology.
(e) Bio Geography as much in common with Botany, Zoology etc.

CHAPTER 2
THE ORIGIN AND EVOLUTION OF THE EARTH

GIST OF THE LESSON

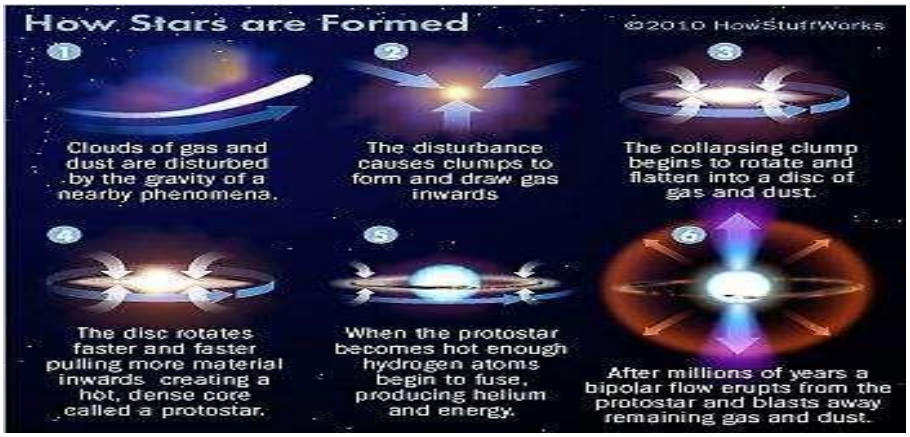
*Theories of the Origin of the Earth:
*Nebular Hypothesis (Kant and Laplace): Suggests the solar system developed from a large rotating cloud of gas and dust called a nebula.
*Big Bang Theory: Proposes that the universe began as a singularity that exploded about 13.8 billion years ago, leading to the formation of the universe.

*Modern Theory (Solar Nebula Disk Model) States that the solar system formed from a disk- shaped nebular cloud of gas and dust, which condensed and collapsed under gravity to form the sun and planets.



.**Nebular Hypothesis**

- Proposed by Immanuel Kant and later modified by Pierre-Simon Laplace.
- Suggests that the Solar System formed from a large cloud of gas and dust, known as a nebula.
- Gravity caused the nebula to collapse and spin, forming the Sun at the center, with planets forming from the surrounding material.



*__Formation of Planets:__

*Accretion- Process where particles in the nebula collided and stuck together to form planetesimals, which further coalesced into planets.

*Differentiation- Heavy elements sank to the center, and lighter ones floated to the surface, leading to the formation of core, mantle, and crust.

- Heavier elements (iron, nickel) sank to form the core, while lighter elements (silicon, oxygen) roseto form the mantle and crust.

*__Formation of the Atmosphere and Oceans__

- Volcanic outgassing released water vapor, carbon dioxide, and other gases to form the early atmosphere.
- As the Earth cooled, water vapor condensed to form oceans.

*Development of the Lithosphere

- The outer shell of the Earth cooled to form a solid crust known as the lithosphere.
- The lithosphere is divided into tectonic plates that move due to mantle convection.

Plate Tectonics

- The theory that explains the movement of Earth's tectonic plates.
- Responsible for the formation of mountains, earthquakes, and volcanic activity.
- Continents have drifted over geological time, leading to the current configuration.

*Early Earth:
- Initially, Earth was in a molten state due to intense heat from gravitational compression, radioactive decay, and frequent collisions.
- As it cooled, the outer layer solidified to form a crust.
*__Atmosphere and Hydrosphere__:
*Primitive Atmosphere: Composed of hydrogen and helium, which were lost due to solar winds.
*Secondary Atmosphere: Formed from volcanic outgassing, consisting of water vapor, carbon dioxide, nitrogen, and other gases.
*Hydrosphere Formation: Water vapor condensed to form liquid water, leading to the creation of oceans.
*__Life on Earth:__
*Chemical Evolution: Simple organic molecules formed in the primordial soup, eventually leading to complex molecules.
*Biological Evolution: First simple life forms (prokaryotes) appeared around 3.8 billion years ago.
Oxygen production began with the advent of photosynthetic organisms, leading to the development of the ozone layer.

MULTIPLE CHOICE QUESTIONS

1. Which of the following is not related to the formation or modification of the present atmosphere?
(A) Solar winds (B) Differentiation (C) Degassing (D) Photosynthesis
Ans (B) Differentiation
2. Which one of the following has the longest duration?
(A) Eons (B) Period (C) Era (D) Epoch
Ans (A) Eons.
3. the Expansion of the universe is related to what?
(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.
4. Which of the following concerning the big bang theory is not true?
(A) There was a tiny ball which has infinite temperature and density.
(B) Explosion led to huge expansion which continues even to the present day.
(C) This expansion continues till the present day, and at a very rapid speed.
(D) Within a few minutes of the explosion first atom was formed.
Ans. C).This expansion continues till the present day, and at a very rapid speed.
5. Assertion (A): The Nebular Hypothesis suggests that planets formed from a rotating cloud of gas and dust.
Reason (R): Gravitational forces did not cause the materials in the cloud to collide and form larger bodies.
A. Both A and R are true, and R explains A.
B. Both A and R are true, but R does not explain A.
C. A is true, but R is false. D. A is false, but R is true.
Ans C) A is true, R is false
6. Assertion (A): The Big Bang Theory explains the origin of the universe as a massive expansion of a singularity.

Reason (R): The universe has been expanding since the Big Bang, which occurred approximately 13.7 billion years ago.

A. Both A and R are true, and R explains A.

B. Both A and R are true, but R does not explain A.

C. A is true, but R is false. D. A is false, but R is true.

Ans A. Both A and R are true, and R explains A.

SHORT ANSWER QUESTIONS (3 MARKS)

1. Read the passage given below and answer the following questions:

A large number of hypotheses were put forth by different philosophers and scientists regarding the origin of the earth. One of the earlier and popular arguments was by German philosopher Immanuel Kant. Mathematician Laplace revised it in 1796. It is known as the Nebular Hypothesis. The hypothesis considered that the planets were formed out of a cloud of material associated with a youthful sun, which was slowly rotating.

1.1. Which philosopher first put forth the Nebular Hypothesis regarding the origin of the Earth?

(A) Sir James Jeans (B) Immanuel Kant (C) Pierre-Simon Laplace (D) Harold Jeffrey

Ans (B) Immanuel Kant

1.2 When was nebular hypothesis proposed?

(A) 1796 (B) 1786 (C) 1780 (D) 1790

Ans A. 1796

Q1.Which concept introduced in picture?

Answer: nebular hypothesis

Q1.2Who introduced the nebular hypothesis?

Ans: Proposed by Immanuel Kant

Q1.3:Give any two charactristics of nebular hypothesis?

Ans. The nebular hypothesis considered that the planets were formed out of a cloud of material associated with a youthful sun, which was slowly rotating.

2. Read the passage given below and answer the following questions:

The last phase in the evolution of the earth relates to the origin and evolution of life. It is undoubtedly clear that initially the earth or even the atmosphere of the earth was not conducive for the development of life. Modern scientists refer to the origin of life as a kind of chemical reaction, which first generated complex organic molecules and assembled them.

This assemblage was such that they could duplicate themselves converting inanimate matter into living substance. The record of life that existed on this planet in different periods is found in rocks in the form of fossils. The microscopic structures closely related to the present form of blue algae have been found in geological formations much older than some 3,000 million years. It can be assumed that life began to evolve sometime 3,800 million years ago.

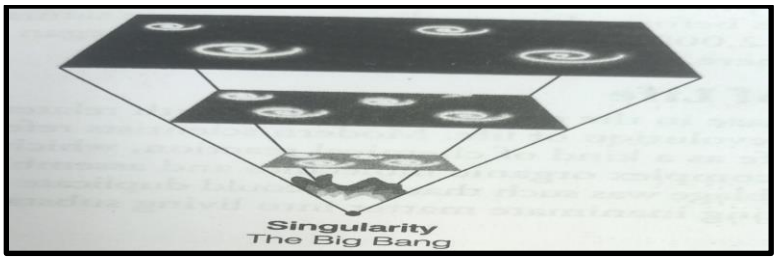
2.1.What do modern scientists refer to the origin of life as?
(A) A mystical event (B) A divine intervention
(C) A kind of chemical reaction (D) A physical transformation
Ans(C) A kind of chemical reaction
2.2: Where is the record of life that existed on Earth in different periods found?
(A) In the atmosphere (B) In rocks in the form of fossils
(C) In ocean water (D) In ancient manuscripts
Ans (B) In rocks in the form of fossils.
2.3 Microscopic structures closely related to the present form of blue algae have been found in geological formations much older than how many million years?
(A) 1,000 million years (B) 2,000 million years
(C) 3,000 million years (D) 4,000 million years
Ans(C) 3,000 million years
Q.3. At the time of earths origin which were the elements that made up the earth?
Ans: The nature of the earth's surface initially was a barren, rocky and hot having a thin atmosphere of hydrogen and helium. This is far from the present day picture of the earth.
Q.4 Earth's atmosphere was made of what type of primordial gases ?
Ans- Hydrogen' and helium were the gases that initially formed the earth's surface. The early atmosphere with hydrogen and helium is supposed to have been stripped off as a result of intense solar wind. This happened not only in the case of earth but also in all the terrestrial planets which were supposed to have lost their primordial atmosphere through the impact of solar winds. During the cooling of the earth, gases and water vapor were released from the interior solid earth. Continuous volcanic eruptions contribute to water vapour and gases in the atmosphere. It was the first stage of atmosphere development.

LONG ANSWER QUESTIONS (5 MARKS)

Q.1 "The 'Big Bang Theory is about expansion of the universe" explain with suitable diagram.
Ans. In 1920, the Big Bang Theory or Expanding Universe hypothesis tried to justify how the universe is expanding. With the expanding universe, the distance between galaxies and galaxies themselves is also expanding. This theory can be explained through the following developmental stages:

Stages of Big Bang theory:

(a) In the beginning, all matter was in the form of tiny balls (singular atoms).
(b) About 13.7 billion years ago the tiny ball exploded violently. The expansion continues even today.
(c) As a result, some energy was converted into matter.
(d) Within a fraction of a second there was rapid expansion.
(e) The expansion went slow down, but within the first three minutes of the Big Bang event, the first atom began to form.
(f) After 300000 years the temperature dropped down to 4,500 K and gave rise to atomic matter.
(g) The universe became transparent.

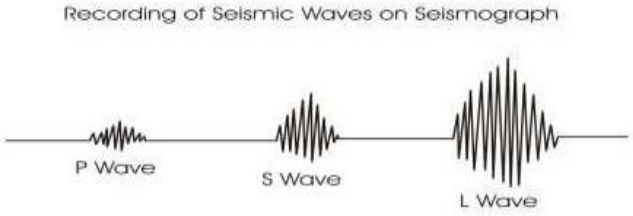


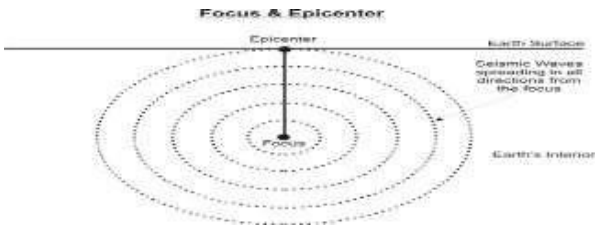
Q 2. List the stages in the evolution of the earth and explain each stage in brief.

Ans. Our planet Earth was formed some 4.6 billion years ago. Like all other planets, earth's formation took place as a result of a slow process mentioned below in three stages:
There are three different stages in the evolution of the Earth:
Stage I: When planetesimals accretion happened, the earth originated. Earth was a hot sphere, rocky, barren, and thin atmosphere of hydrogen and helium.
Stage II: Development of Lithosphere: The heavier materials like iron and nickel moved towards the center and the lighter ones moved towards the surface. Over a while, it cooled solidified, and condensed, later leading to the formation of the core, mental, and crust.
Stage III: Evolution of Atmosphere: During the cooling process of the earth, the gases were outpoured from the interior the process is called degassing. This started the evolution of the early atmosphere which contained nitrogen, carbon dioxide, water vapors methane, and little oxygen. Finally, the composition of the atmosphere was modified by the process of photosynthesis.

CHAPTER 3: INTERIOR OF THE EARTH

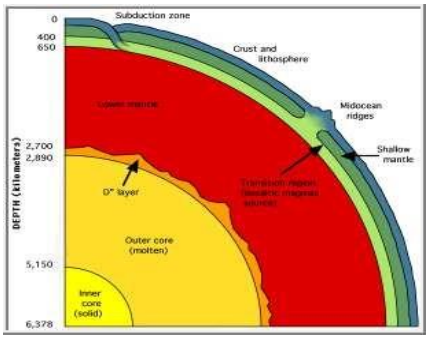
1. There are two sources of information about interior of the earth –
1.1. Direct Sources: a. Mining b. Drilling c. Volcanic Eruption
1.2. Indirect Sources: 7
a. Seismic waves b. Gravitational field c. Magnetic field d.Meteors
3. **EARTHQUAKE**:-It is the shaking of the earth.It is a natural event. It is caused due to release of energy which generates waves that travel to all directions.
3.1. Focus: It is a point inside the earth surface from where an earthquake starts.
3.2. Epicenter: It is a point on the earth surface which records the seismic waves for the first time.
3.3. Seismograph:-An instrument which record the earthquake waves.
3.4. Measurement of earthquake a. Richter Scale b. Mercalli Scale

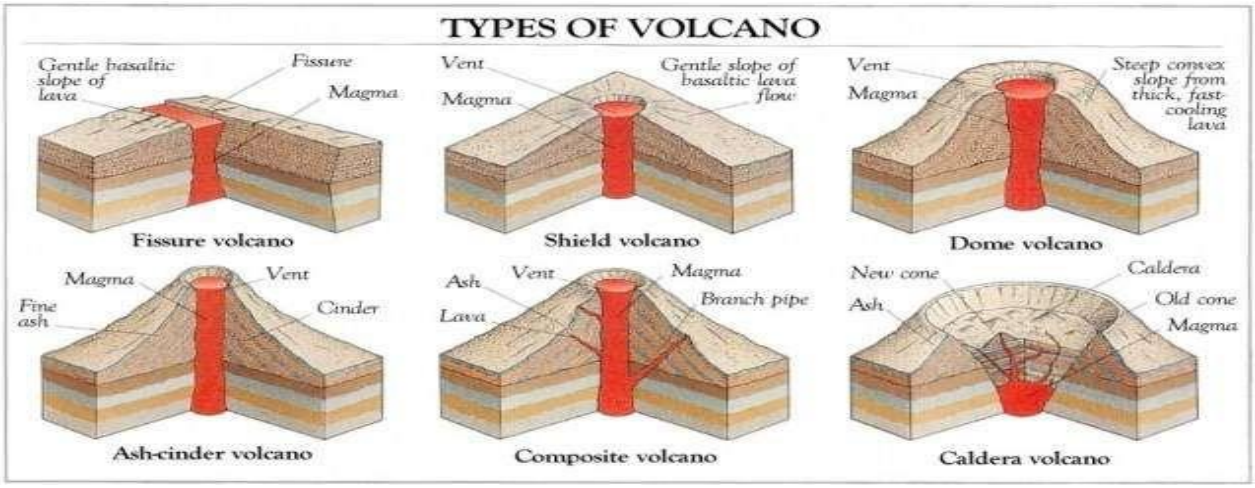




4. Earthquake Waves: Body waves and surface waves.
4.1. P and S waves are called as 'Body Waves' as they move inside the body of the earth. P waves are the fastest wave that move parallel to the direction of waves. These waves can move in solid, liquid and gaseous material.
4.2. S waves are slower than P waves. It moves perpendicular to the direction of the waves. These waves move only in solid and disappear in liquid.
4.3. L waves are the slowest waves. It moves on the earth surface. It causes maximum destruction on the earth surface.
5. Causes of earthquake: a) movement of plates, b) rising of magma, c) folding and faulting, d) violent volcanic eruption.

6. **Structure of the earth:-**
a. Crust:-It is the outermost solid part of the earth.
b. Mantle: - The portion of the interior beyond the crust is called the mantle.
c. Core: - It is the innermost layer of the earth.





7. **VOLCANO**:-Volcano means the vent through which magma and other substances erupt to the surface.
8. TYPES OF VOLCANOES: Classification of volcanoes based on nature of eruption and land forms developed on the surface.
8.1. SHIELD VOLCANO- Largest of volcanoes, Hawaiian Islands are best examples, Basalt lava flow, Lava is very fluid, they are not steep.
8.2. COMPOSITE VOLCANOES- Cool and more viscous lava, Explosive eruptions, they erupt pyroclastic and ashes along with lava, layers are formed.
8.3. CALDERA- A Most explosive type of volcanoes. These volcanoes collapse onto themselves, collapsed depressions are called caldera, The magma chamber is huge and close to surface.
8.4. FLOOD BASALT PROVINCES- Consists of highly fluid lava, Some parts of the world are covered by thousands of sq.km of basalt, There can be the series of flows, Average thickness is more than 50 meter, Individual flow is 100 of sq.k.m, Ex. Deccan plateau
8.5 MID OCEANIC RIDGE VOLCANOES- Found in oceanic surfaces, More than 70,000 km length, Frequent volcanic eruptions, Ex. Mid Atlantic ridge
9. **INTRUSIVE VOLCANIC LANDFORMS:**-When lava comes out forms volcanic rocks, some part cools down in the lower portion forms plutonic rocks.
a. BATHOLITH: A large part of the magma material that cools in the deeper depth of the crust. They are dome shaped, cover large areas. They come out when erosion takes place. They are granite bodies.
b. LACCOLITHS: Large dome shaped intrusive bodies. Consists of level bodies
Connected through pipe like conduit from below.
c. LAPOLITHS: concave shaped lava formation
d. PHACOLITH: wave typed lava formation
e. SILL: horizontal deposit of lava
f. DYKES: vertical lava formation

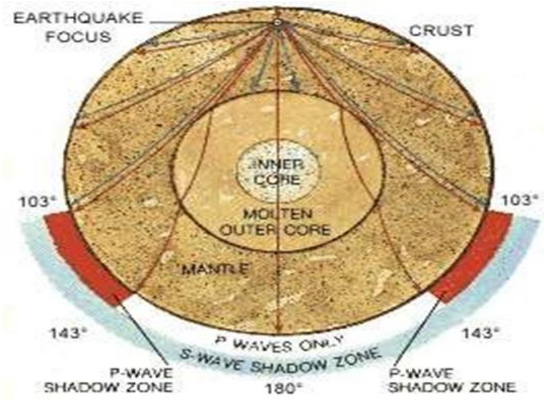
MULTIPLE CHOICE QUESTIONS

1. Identify the incorrect statement.
(A) Velocity of earthquake waves changes as they travel through materials with different densities.
(B) The denser the material, the lower is the velocity.
(C) Their direction also changes as they reflect or refract when coming across materials with different densities .

(D) None of the above
Ans. (B) The denser the material, the lower is the velocity.
2. A saucer shaped, concave to the sky, volcanic landform is ?
(A) Batholith (B) Lacoliths (C) Lapolith (D) Phacolith
Ans. (C) Lapolith
3. Read the assertion and reason and select the correct option.
Assertion: Shield volcanoes are very steep.
Reason: In shield volcanoes magma made up of basalt is very fluid.
(A) A and R are true and R is the correct explanation of A.
(B) A and R true but R is not the correct explanation of A.
(C) A is false but R is true.
(D) A is true but R is false.
Ans. (C) A is false but R is true
4. The crust and mantle are separated by which of the following discontinuities?
(A) Gutenberg discontinuity (B) Moho discontinuity
(C) Conrad discontinuity (D) Lehman discontinuity
Ans. (B) Moho discontinuity
5. Which of the following scales is used to measure magnitude of an earthquake?
(A) Richter Scale (B) Mercalli Scale (C) Beaufort Scale (D) Kelvin Scale
Ans. (A) Richter Scale
6.Identify the Most explosive volcanoes
(A) Shield Volcanoes (B) Composite Volcanoes (C) Flood basalt province (D) Caldera
Ans. (D) Caldera
7.. Assertion (A): S- waves create troughs and crests in the material through which they pass. Reason (R): The direction of vibrations of S-waves is perpendicular to the wave direction in the vertical plane.
(a) A and R are true and R is the correct explanation of A.
(b) A and R true but R is not the correct explanation of A.
(c) A is false but R is true. (d) A is true but R is false.
Ans (a) A and R are true and R is the correct explanation of A..
8. Assertion (A): The outer core of the earth's interior is in liqud state while the inner core is in solid state. Reason (R): The p-waves disappear in outer core while S-waves penetrate up to the inner core. (a) A and R are true and R is the correct explanation of A.
(b) A and R true but R is not the correct explanation of A.
(c) A is false but R is true. (d) A is true but R is false.
Ans (d) A is true but R is false

SHORT ANSWER QUESTIONS (3 MARKS)

Q.1 How would you explain the direct sources of information about the interior of the earth?.
Ans. (a) Mining: The most easily available solid earth material is surface rock or the rocks we get from mining areas.
(b) Deep Ocean Drilling Projects: Many deep drilling projects have provided large volume of information through the analysis of materials collected at different depths.
(C) Volcanic eruptions: During volcanic eruption lava becomes available for laboratory analysis.



Q2.1 What is being shown in this picture?

Ans: Shadow zone

Q.2.2 What do you mean by shadow zone in reference of earthquake?

Ans. Earthquake waves get recorded in seismograph 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'.

Shadow zone of P waves: 105° to 145° from focus.

Shadow zone of S waves: 105 ° to 105° from focus.

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Q.3 Primary waves and Secondary waves have Different characteristics. Explain.

Ans.**P-waves**

1.These are called primary waves.

2. These seismic waves move faster and are the first to arrive at the surface.

3. The shadow zone of P-waves is much smaller than that of the S-waves.

4. They travel through gaseous, liquid and solid materials.

S-Waves

1. These are called secondary waves.

2.These arrive at surface with some time lag.

3. The shadow zone of S waves is much larger than that of the P-waves.

4. S-waves can travel only through solid materials.

LONG ANSWER QUESTIONS

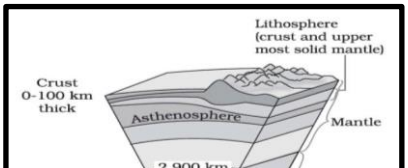
Q.1"The interior structure of the earth is in layers" explain with diagram.

Ans. The earth's interior is divided into three layers:

1.TheCrust: Itistheoutermostsolidpartoftheearth,Thethicknessofthecrustvariesundertheoceanicandcontinentalareas.Themeanthicknessofoceaniccrustis5kmwhereasthatof 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 upto400 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 composed of nickel and iron. It is sometimes referred to as the nife because of its composition.



Q2. plutonic rocks is part of major intrusive volcanic landforms. discuss 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 they forms plutonic rocks. On the basis of shapes intrusive landforms 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.

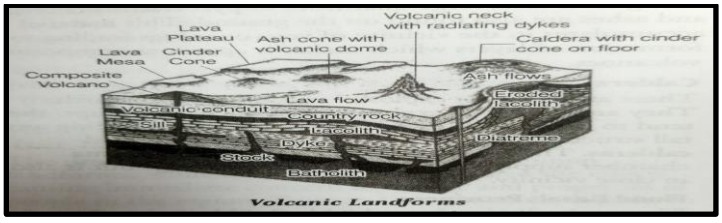
2.Lacoliths: These are large dome-shaped intrusive bodies with a level base and connected by a pipe-like conduit from below.

3.Lapolith: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 a tthe top of anticline in folded igneous country.

5.Sills: The near horizontal bodies of the intrusive igneous rocks are called sill or sheet ,depending on the thickness of the material.

5.Dykes: When the lava makes its way through cracks and the fissures developed in the land,it solidifies almost perpendicular to the ground.



CHAPTER 4: DISTRIBUTION OF OCEANS AND CONTINENTS

GIST OF THE LESSON

Oceans:

- Cover about 71% of the Earth's surface
- Divided into five oceans: Pacific, Atlantic, Indian, Arctic, and Southern
- Pacific Ocean is the largest, covering about 46% of the Earth's water surface
- Oceans are vital for regulating climate, providing food, and serving as a means of transportation

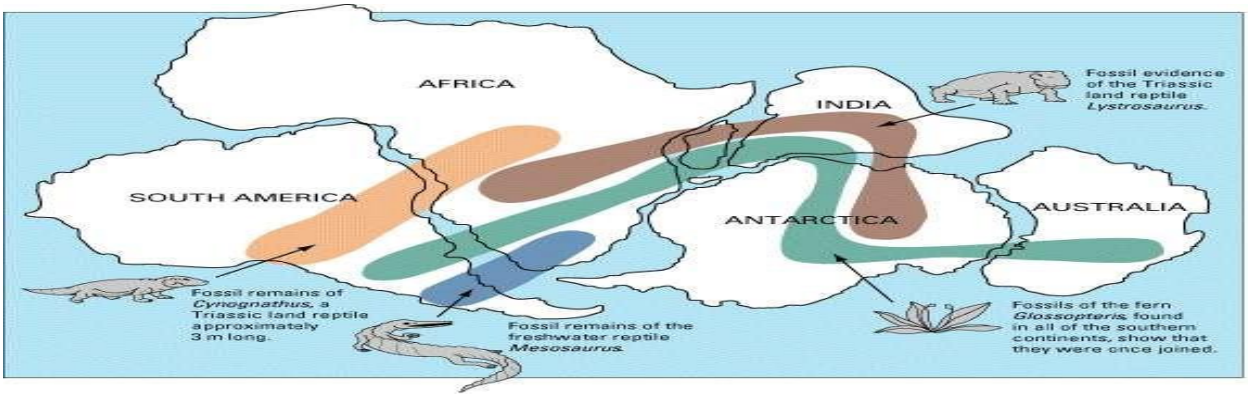
Continents:

- There are seven continents: Asia, Africa, North America, South America, Antarctica, Europe, and Australia
- Asia is the largest continent, covering about 30% of the Earth's land surface
- Africa is the second-largest continent, covering about 20% of the Earth's land surface
- Continents are classified based on geological and geographical features

Earth's surface is composed of landmasses (continents) and water bodies (oceans).

There are seven continents: Asia, Africa, North America, South America, Antarctica, Europe, and Australia.

There are five major oceans: Pacific, Atlantic, Indian, Southern (Antarctic), and Arctic.



Distribution of Continents:

Continents are unevenly distributed across the Earth's surface.

Most continents are in the Northern Hemisphere, with a significant portion of Asia and Europe.

Distribution of Oceans:

Oceans cover about 71% of the Earth's surface.

Pacific Ocean is the largest and deepest ocean, followed by the Atlantic, Indian, Southern (Antarctic), and Arctic Oceans.

Ocean-Continent Distribution:

Continents and oceans have distinct features and compositions.

Continental crust is thicker and less dense compared to oceanic crust.

Understanding the distribution of continents and oceans is crucial for understanding Earth's geography and its impact on climate, ecosystems, and human settlements.

Geographical Features:

Various geographical features such as mountains, plains, and plateaus are found on continents.

Oceans have features like trenches, ridges, and abyssal plains.

Impact on Climate and Life:

Oceans regulate global climate patterns through ocean currents and heat distribution.

Continents support diverse ecosystems and human civilizations due to their varied climates and landscapes.

Overall, the chapter covers the basic geographic distribution of continents and oceans, their characteristics, and their importance in shaping Earth's environment and human activities.

MULTIPLE CHOICE QUESTION

Q.1.Which of the following is the type of plate boundary of the Indian plate is responsible for the formation of Himalayan Mountains?

(a) Ocean-continent convergence (b) Divergent boundary

(c) Transform boundary (d) Continent convergence

Ans - D) Continent convergence

Q.4. Which one of the following is not a minor plate?

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

ANS- D) Antarctica

Q5 Identify the incorrect statement:

a). Alfred Wegner propounded continental drift theory in 1912.

b). All continents formed a single continental landmass-Panthalassa.

c). 200 years ago the super continent began to split. d). Super continent broke into Laurasia and Gondwanaland.

Ans b. All continents formed a single continental landmass-Panthalassa.

Q6 Assertion (A) Divergent plate margin are also called constructive plate margins.

Reason (A) Along divergent plate margins magma comes up to the surface and forms new crust. a. A and R are true and R is the correct explanation of A.

b. A and R true but R is not the correct explanation of A.

c. A is false but R is true. d. A is true but R is false

Ans a. A and R are true and R is the correct explanation of A.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

Q1.1 This picture is related to which theory?

Ans: continental drift theory

Q1.2 Who introduced this theory?

Ans: Alfred Wegener

Q1.3. What are the causes for the drifting of continents?

Ans-The processes of seafloor spreading, rift valley formation, and subduction (where heavier tectonic plates sink beneath lighter ones) were not well-established until the 1960s. These processes were the main geologic forces behind what Wegener recognized as continental drift.

Q2. "sea floor spreading" is a major phenomenon in oceanography. Comment.

Ans.-Seafloor spreading is the geologic process that takes place when tectonic plates diverge, resulting in the creation of new ocean floors. Divergent plates contribute to seafloor spreading, as magma bubbles up from below the earth's crust and then cools, resulting in gains in ground area..

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LONG ANSWER TYPE QUESTIONS (5 MARKS)

Q1There are several evidence in support of the continental drift theory. Explain them.

Ans.-

EVIDENCES TO SUPPORT THE CONTINENTAL DRIFT

1. The matching of continents (jig-saw fit)

A. the shorelines of S. America and Africa have remarkable match

B. it was fit around 1000 fathom line of the shoreline

2. ROCKS OF SAME AGE ACROSS THE OCEANS

A.The belt of ancient rocks of 2000 my from Brazil coast matches with those of Western Africa

B. Marine deposits of South America and Africa belong to Jurassic age.

3.TILLITE

A. sedimentary rock formed out of glacial deposits

B. sediments from India have similar counter parts at different continents of south.
C. Tillile indicates prolonged glaciations
D. The same glaciations is found in Africa, Falklands, Madagascar, Antarctica and Australia
4.PLACER DEPOSITS
A. Formation of placer deposits of gold in Ghana coast has no source rock.
B. The gold bearing veins of rocks are found in Brazil
5.DISTRIBUTION OF FOSSILS
A. Identical species of animals and plants are found along the coastal regions of the different continents.
B. lemurs occurs in India , Madagascar and Africa.
C. The contiguous land mass was called LEMURIA
Q2.Earth is divided into Major and Minor plates .explain.
Ans.-The seven major plates listed from largest to smallest are the Pacific, North American, Eurasian, African, Antarctic, Indo-Australian, and the South American Plate. There are also eight smaller minor plates. Tectonic plates move towards, away from, or past each other because of heat transfer coming from the core.
Minor plates
1.Arabian Plate – Minor tectonic plate
2.Caribbean Plate – A mostly oceanic tectonic plate including part of Central America
3. Caroline Plate – Minor oceanic tectonic plate north of New Guinea
4.Cocos Plate – Young oceanic tectonic plate beneath the Pacific Ocean off the west coast of Central America
5.Nazca Plate – Oceanic tectonic plate in the eastern Pacific Ocean basin

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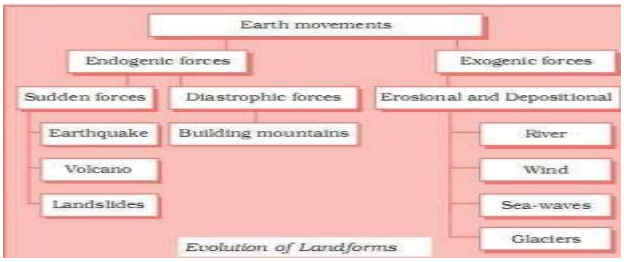
CHAPTER 5: GEOMORPHIC PROCESS

GIST OF THE LESSON

Geomorphic Processes

The earth's crust is dynamic. That means, the earth's surface is being continuously subjected to by external forces originating within the earth's atmosphere and by internal forces from within the earth. The external forces are known as exogenic forces and the internal forces are known as endogenic forces.



Endogenic Processes

- Caused by energy from within the earth
- Examples:

Diastrophism: movement of the earth's crust that builds up landforms
Volcanism: movement of molten rock to the earth's surface

Diastrophism

Includes processes that move the earth's crust vertically or horizontally

Examples:

Orogeny: mountain building
Epeirogeny: continental building
Earthquakes: local movements
Plate tectonics: horizontal movements of crustal plates

Exogenic Processes

- Caused by energy from outside the earth

Examples:

Weathering: breakdown of rocks
-Mass wasting: downslope movement of rocks
Erosion: removal and transportation of rocks
Deposition: settling of rocks in a new location

Weathering

- Breakdown of rocks into smaller pieces

Types:

- Chemical weathering
-Physical weathering
-Biological weathering

Mass Movements

- Downslope movement of rocks under gravity

Examples:

Landslides , Rockfalls and Slumps

Erosion and Deposition

Erosion: removal and transportation of rocks
Deposition: settling of rocks in a new location

- Examples: running water, Groundwater, Glaciers ,Wind and Waves

Soil Formation

- Soil is a dynamic natural body that supports plants

Factors:

Parent material, Topography, Climate, Biological activity and Time

MULTIPLE CHOICE QUESTIONS

Q.1 Which of the geomorphic agents of erosion is not controlled by climate?
(a) Wind (b) Running water (c) Wave (d) Glacier
Ans (c) Wave

Q.2 Consider the following statements. Which of the given statements is correct?
1. Earth materials experience only gravitational stress.
2. Shear stress results in angular displacement of rocks.
Codes
(a) Only 1 (b) Both 1 and 2 (c) Only 2 (d) None of these
Ans (c) Only 2

Q.3. Consider the following statements. Which of the given statements is incorrect?
1. Temperature and precipitation determine density, type and distribution of vegetation.
2. The variations in thermal gradients lead to different climatic regions.
3. Rocks with differences in their structure under similar climatic conditions offer similar resistance to various geomorphic processes.
Codes

(a) 1 and 2 (b) Only 2 (c) Only 3 (d) 1 and 3
Ans (c) Only 3
Q.4. Consider the following statements. Which of the given statements is correct?
1. Weathering is a pre-requisite for mass movement.
2. Mass movement is transfer of mass of rock, debris, soil down the slopes under direct influence of gravity.
Codes
(a) Only1 (b) Both 1 and 2 (c) Only 2 (d) None of these
Ans (c) Only 2
Q.5 Debris avalanche can be included in the category of:
(a) Landslides (b) Slow flow mass movements
(c) Rapid flow mass movements (d) Subsidence
Ans (c) Rapid flow mass movements
Q.6. Assertion (A) Physical weathering process cause great damage to rocks.
Reason (R) The rocks suffer from continued fatigue due to repetition of contraction and expansion.
Ans (a) Both A and R are true and R is the correct explanation of A
Q7. Assertion (A) Human beings have no role in biological weathering.
Reason (R) Human beings help in creating new contacts between air, water and minerals in earth materials by disturbing. Vegetation and ploughing soils.
Ans (d) A is false, but R is true

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

Q1.1 Identify the this question.
Ans:Mushrum Rock
Q1.2Wher is this tructure found?
Ans: In desurt area.
Q1.3. Identify the two feature of mushrum rock?
Ans: mushroom-like shape, with a narrow base and a wider top. This shape is formed by wind erosion
Q2".Earth configuration is out come of geomorphic processes". Justify this statement.
Answer:The endogenetic and exogenetic forces causing physical; stresses and chemical actions on earth materials and bringing about changes in the configuration of the earth's surface are known as geomorphic processes. Diastrophism and volcanism are endogenetic geomorphic processes.
Q3.Distinguish between exogenetic and endogenetic forces.
Ans- Exogenetic forces: The earth's surface is being continuously subjected to external forces induced basically by the energy (sun). These external forces are known as exogenicforces.Endogenic forces: The forces originating within the earth from its interior are known as endogenic forces. They are responsible for building up and wearing down of the earth's surface

LONG ANSWER TYPE QUESTIONS (5 MARKS)

Q1weathering is a non stop processes in formation of the earth surface. Discuss various ways in which it takes place.

Ans-Rock weathering is the chemical decomposition and physical disintegration of rocks.

Weathering takes place in three ways :

1. Chemical weathering
2. Physical or mechanical weathering
3. Biological action

1. Chemical weathering: Chemical weathering is the decomposition of rocks by chemical methods. It produces a chemical change in the minerals of rocks. High temperatures and humidity cause the rocks to decompose.

2. Physical or Mechanical weathering: The physical wear and tear of rocks is called mechanical weathering. In the middle and high latitude climates, and at high altitudes, alternate freezing and melting of water called frost action provide a powerful mechanism for breaking up of rocks.

Water that penetrates joint planes and other natural openings in the rock expands when transformed into ice crystals.

3.Biological weathering: When the breakdown of rocks and minerals is due to plants, animals and bacteria, it is called biological weathering. The main contribution of animals to weathering seems to be repeated mixing of soil material, thus bringing fresh material into exposure to the weathering agents. Snails are common in lime-rich areas and can wear deep holes in the limestone.

Grazing by large animals loosens the soil, thus increasing surface runoff and soil erosion. Larger plants affect weathering in a number of ways. Cracks may be widened by root pressure.

.Q2.Discuss the factors responsible for soil formation and also the processes involved.

Ans: Soil forming factors: There are five factors that influence soil formation, viz., parent material, climate, biota, topography and time.

1. Parent material: Parent material in soil science is weathered bedrock or the transported glacial or alluvial material.

2. Climate: Climate is an important active factor in soil formation. Several processes are involved in soil formation and may to some extent affect the soil profile.

3. Biota: Biota is the collective term for the animal and plant life of a specific area as per the period of time. The decomposition of organic wastes and residues and the activities of living plants and animals have marked influence on soil development.

4. Topography: Topography means relief features. Steep hillsides have thin soil cover because of surface runoff that results in the erosion of the surface.

5. Time: Soil formation is a very slow process. It may take a few hundred to a few thousand years.

CHAPTER 6: LANDFORMS AND THEIR EVOLUTION

GIST OF THE CHAPTER:

Each landform has its own physical shape, size, materials and is a result of the action of certain geomorphic processes and agent. Several landforms together are called landscape.

Landforms are the physical features of the Earth's surface shaped by various geomorphic agents like running water, wind, glaciers, and waves.

Geomorphic agents contribute to erosion by wearing down rocks and sediments and to deposition by transporting and depositing these materials in new locations.

Tectonic movements, like land uplift or subsidence, can create new landforms such as mountains, valleys, and rift valleys.

Geomorphic processes and agents act slowly over time, leading to the gradual formation and transformation of landforms.

RUNNING WATER:

Three Stages of the river

YOUTH

1. Less Streams 2. Less Integration 3. V-shaped Valleys Are Common 4. Stream Divides Are Swampy, Marshy Areas 5. Water Falls and Rapids Are Common

MATURE

1. More Streams 2. More Integration of Streams 3. Deep V-shaped Valleys 4. Wider Flood Plains 5. Meanders are Present 6. Rapids and water walls disappear

OLD

1. Smaller Tributaries 2. Fewin Number 3. Flood Plains Are Common 4. Natural Levees and Oxbow Lakes Are Also Present. 5. Most of the Landscape are just above sea level.

EROSIONAL LANDFORMS

*Valleys- Valleys A valley is an elongated low area often running between hills or mountains, which will typically contain a river or stream running from one end to the other.

*Pot holes -1. They are circular depressions 2. Formed by abrasion3. Pebbles and boulders get collected in these holes and rotated and make depression wider and deep

4. They keep valley deepened 5. At the foot of the water falls they become plunge pools.

*PLUNGE POOLS

Found at the bottom of the Water Falls ,Formed Due to Soft Rocks and They Are Below the Level of River Bed.

MEANDERS

1. Lateral erosion is common in the lower course of the rivers
2. Due to low kinetic energy water is changing its course
3. Generally found in the flood plains
4. When meanders are found in deep and hard rocky areas, they are called incised or entrenched meanders
5. Same meanders develop loops which later on converted into oxbow lakes

RIVER TERRACES

Marking old valley floor, they represent flood plain levels They may consist of stream deposits

UNPAIRED TERRACES

Unpaired terraces are found in the areas of slow upliftment areas. Reasons for the formation of river terraces are

1. Receding water after a peak flow
2. Change in hydrological regime due to climatic change.
3. Tectonic uplift of land
4. Sea level changes in case of rivers closer to the sea.

ALLUVIAL FANS

1. Found near the foot of the hills
2. The river break into number of channels
3. Low gradient
4. Coarse load is deposited

5. Low gradient
6. Cone shaped deposit

ALLUVIAL PLAIN

Formed along the river banks

1. Made of alluvial soils
2. They are divided into two types' khadar and banger
3. Khadar soils are found near the river and banger soils are found away from the river
4. They are very fertile.

NATURAL LEVEES

Natural levees are found along the flood plains of large rivers. They are low linear, parallel ridges made of coarse material found along the river bank. When river shift laterally series of natural levees are formed.

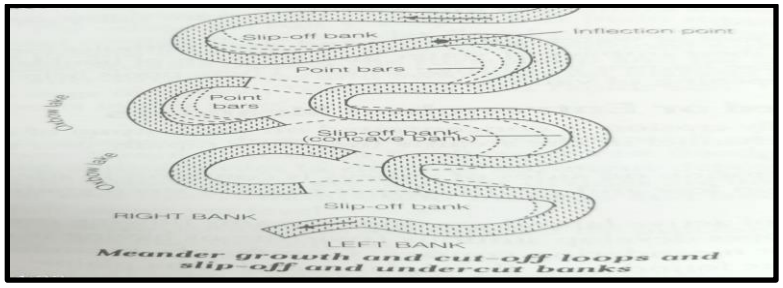
POINT BARS

1. They are also called as meander bars.
2. Found along the convex side of meanders of large rivers.

They are uniform in profile. If there are more than one ridge narrow and elongated depressions are found in between the point bars.

OXBOW LAKES

Found along the river bank on the convex side of the meander. They grow long loops the curve is cutoff and formed into Oxbow lakes.



Meander growth and cut-off loops and slip-off and undercut banks

BRAIDED CHANNEL

When rivers carry coarse material, there can be selective deposition of coarser materials causing formation of a central bar, which diverts the flow towards the banks; and this flow increases lateral erosion on the banks. As the valley widens, the water column is reduced and more and more materials are deposited as islands and lateral bars developing a number of separate channels of water flow.

DELTAS

1. Found near by the mouth of the river.
2. Made of fine alluvial soils.
1. They are in triangular shape.
5. Similar to Greek letter Delta.
6. Divided by distributaries.
7. Deposited material is stratified on the basis of size. Coarse material is deposited first and then fine material

FLOOD PLAINS

1. Major landforms in the river deposition
2. Big boulders are deposited first and then fine material is carried to the longer distance.
3. The flood plains in deltas are called delta plains.

Karst topography is a type of landscape that is formed by the dissolution of soluble rocks such as limestone, dolomite, and gypsum. Conditions that promote karst development are well-jointed, dense limestone near the surface; moderate to heavy rainfall; and good groundwater circulation.

This unique topography is characterized by sinkholes, disappearing streams, caves, and underground drainage systems.

Karst topography is found in many regions around the world and has significant ecological, geological, and human importance.

EROSIONAL LANDFORMS

Sinkholes:Sinkholes are circular depressions in the ground that are formed when the overlying soil and rock collapse into underground cavities.

Caves:Caves are underground chambers and passages that are formed by the dissolution of rock. These can range from small cavities to large, complex systems that span many miles.

Lapies:It is formed due to differential solution activity along parallel to sub-parallel joints.They are also called grooved, fluted and ridge-like features in an open limestone field.

DEPOSITIONAL LANDFORM

The following depositional features are formed within caves.

1. Curtains- Rain water drips from long crack in a cave roof forms a continuous strip of calcites. It is called as curtains.

2. Stalactite drops of water containing dissolved limestone seep down through cracks in the cave roof. Drops of water lose carbon dioxide and deposit calcite. Overtime deposition of calcite forms pillars hanging down from the roof of the cave. It is called as stalactite and where the stalactite stretches towards the sides are known as Helictites.

3. Stalagmite Deposition of calcite forming icicles growing upward from the cave floor is called as stalagmite. Stalactites are calcium carbonate deposits hanging as icicles while Stalagmites are calcium carbonate deposits which rise up from the floor.

4. Pillar:

When both the stalagmite and stalactite join together, it is known as pillers.

EROSIONAL LANDFORMS

CIRQUE- Starting location for mountain glaciers.

Cirques are the most common of land forms in glaciated mountains.

The cirques quite often are found at the heads of glacial valleys.

The accumulated ice cuts these cirques while moving down the mountain tops.

They are deep, long and wide troughs or basins with very steep concave to vertically dropping high walls at its head as sides.

TARN LAKE-

A lake formed in the base of the cirque after the ice has melted. These are called Tarn Lake.

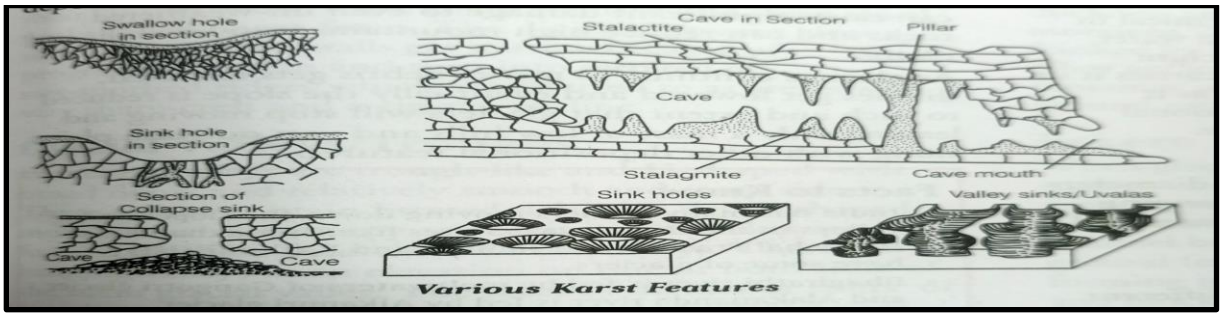
HORNS AND SERRATED RIDGES

Horns form through head ward erosion of the cirque walls. They are sharp- pointed and steep-sided peaks. They are formed by head ward erosion of the cirque wall. Horns form when three or more radiating glaciers cut the head ward until their cirques meet high, sharp-pointed and steep-sided peaks.

Horns formed through head ward erosion of radiating cirques are – The highest peak in the Alps; Matterhorn; The highest peak in the Himalayas Everest.

GLACIAL VALLEYS/TROUGHS

Glacial valley, also called glacial trough, stream valley that has been glaciated, usually to a typical catenary, or U-shaped, cross section. U- shaped valleys occur in many parts of the world and are characteristic features of mountain glaciation. These glacial troughs may be several thousand feet deep and tens of miles long.



DEPOSITIONAL LANDFORMS

MORAINES

A moraine is a type of landform that is formed by the deposition of glacial till. Till is a mixture of rock, sand, and clay that is carried by a glacier. When a glacier melts, it leaves behind its load of till, which can form moraines. Moraines can be found in many different places around the world. They are often found in mountainous areas. Moraines can be a significant feature of the landscape. They can be used to learn about the history of glaciation in an area.

ESKERS

When glaciers melt in summer, the water flows on the surface of the ice or seeps down along the margins or even moves through holes in the ice. These waters accumulate beneath the glacier and flow like streams in a channel beneath the ice. Such streams flow over the ground (not in a valley cut in the ground) with ice forming its banks. Very coarse materials like boulders and blocks along with some minor fractions of rock debris carried into this stream settle in the valley of ice beneath the glacier and after the ice melts can be found as a sinuous ridge called esker

OUTWASH PLAINS-

The plains at the foot of the glacial mountains or beyond the limits of continental ice sheets are covered with glacio-fluvial deposits in the form of broad flat alluvial fans which may join to form outwash plains of gravel, silt, sand and clay.

Coastal processes are among the most dynamic geologic processes since changes in the morphology of many coasts can be seen on an annual (or shorter) timescale.

Other than the action of waves, the coastal landforms depend upon:

Erosional Coastal Landforms

Cliffs:A sea cliff is a vertical precipice created by waves crashing directly on a steeply inclined slope. Hydraulic action, abrasion, and chemical solution all work to cut a notch at the high water level near the base of the cliff. Constant undercutting and erosion causes the cliffs to retreat landward.

Sea Caves:Sea caves form along lines of weakness in cohesive but well-jointed bedrock. Sea caves are prominent headlands where wave refraction attacks the shore.

Sea Stacks:A sea arch forms when sea caves merge from opposite sides of a headland. If the arch collapses, a pillar of rock remains behind as a sea stack.

Sea Terraces:It is a rock terrace formed where a sea cliff, with a wave-cut platform before it, is raised above sea level.

Depositional Coastal Landforms

Beaches:Beaches are deposits of loose sediment adjacent to a body of water. In addition to sand, beaches around the world have a remarkable diversity of sediment size, from boulders to fine silt.

Spits:A sand spit is a linear accumulation of sediment that is attached to land at one end.They usually develop where the coastline bends inland from the longshore drift direction. The spit follows the longshore direction of the updrift coast.

Bars:Sandbar, also known as Offshore Bar, is a ridge built by waves offshore from the beach, usually submerged or partially exposed.

Wind is a geomorphic agent in all terrestrial environments. It is more active in arid regions with fine-textured soils and sediments and little or no vegetation.

Wind can erode desert rocks in two ways:

Deflation: The removal of fine, loose particles from the surface of rocks.

EROSIONAL LANDFORMS

Deflation Hollows:

Deflation basins, called blowouts, are hollows formed by the removal of particles by wind.Blowouts are generally small, but may be up to several kilometers in diameter.

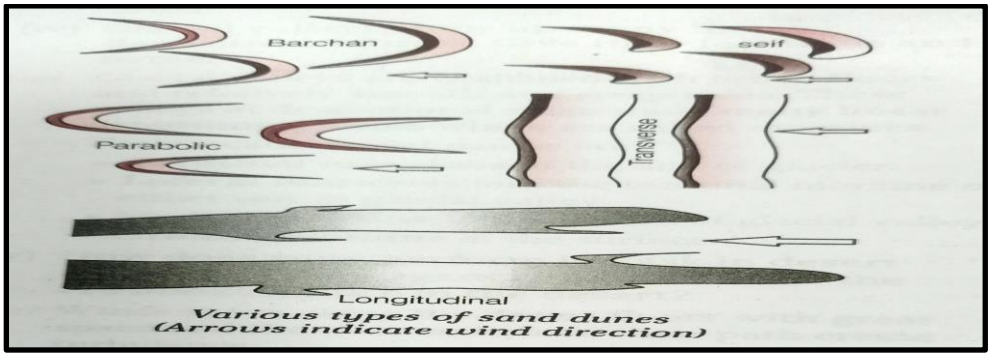
Caves:As wind-borne sand impacts the rock faces, some of the blow-outs become deeper and wider and fit to be called caves.

Yardangs:Yardangs are parallel troughs cut into softer rock running in the direction of the wind, separated by ridges. The direction of the yardangs can indicate the direction of the prevailing wind.

Zeugen:A zeugen is a tabular mass of resistant rock, standing prominently in the desert.It is usually composed of alternating layers of hard and soft rocks.

Playas:Playa is a flat-bottom depression found in interior desert basins and adjacent to coasts in arid and semiarid regions, periodically covered by water.

It slowly filtrates into the groundwater system or evaporates into the atmosphere, causing salt, sand, and mud deposition along the bottom and around the depression's edges.



Various types of sand dunes
(Arrows indicate wind direction)

DEPOSITIONAL LANDFORMS

Ripples: They are regular, wavelike undulations lying at right-angles to the prevailing wind direction.

Loess:Loess is terrestrial sediment composed largely of windblown silt particles made of quartz

Dunes:Dunes are collections of loose sand built piecemeal by the wind.

It is usually composed of quartz, which is extremely hard and doesn't easily decay.

Most Common types of Dunes:

Barchans: Barchans have crescent-shaped points or wings that face away from the wind, or downwind, and where sand is moving over an almost uniform surface from where the wind is constant.

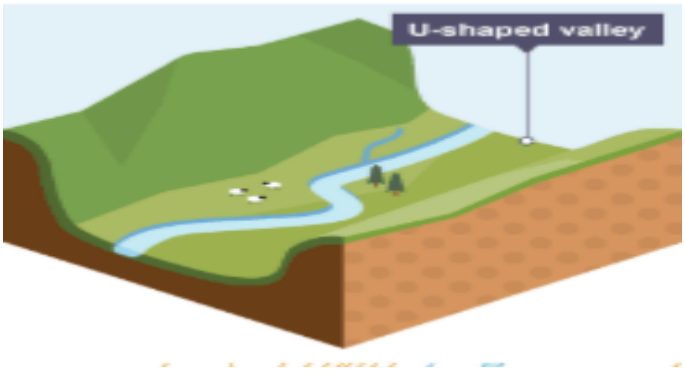
Seif:It is also called linear dunes is similar to barchans with a small difference as it has only one wing or point.

MULTIPLE CHOICE QUESTION

Q1 In which one of the following regions chemical weathering process is not dominant ?
a) Humid region b) Limestone region c) Arid region d) Glacier region
Ans c) Arid region
Q2. In which one of the following regions the chemical weathering process is more dominant than the mechanical process?
(a) Humid region (b) Limestone region (c) Arid region (d) Glacier region
ANS- (b) Limestone region
Q3 A deep, long and wide trough or basin with very steep concave high walls at its head as well as in sides is known as:
(a) Cirque (b) Glacial valley (c) Lateral Moraine (d) Esker
ANS- (a) Cirque
Q4. Which one of the following processes is not a gradational process?
(a) Deposition (b) Diastrophism (c) Volcanism (d) Erosion.
ANS- (c) Volcanism

SHORT ANSWER QUESTION (3 MARKS)

Q.1 “wind forms geomorphic landforms in drier areas” comment.
Answer:Wind move along the desert floors with great speed and the obstructions in their path create turbulence. Wind causes deflations, abrasion and impact. Deflation includes lifting and removal of dust and smaller particles from the surface of rocks. In the transportation process sand and silt act as effective tools to abrade the land surface. The impact is simply sheer force of momentum which occurs when sand is blown into or against a rock surface.
Q2. river terraces are common in hilly areas explain it.
Answer: River terrace are basically products of erosion as they result due to vertical erosion by the stream into its own depositional flood plains. The terraces may result due to:-
Receding water after a peak flow.
Change in hydrological regimes due to climatic changes.
Tectonic uplift of land.
Sea level changes in case of rivers closer to the sea
Q 3. What do incised meanders in rocks and meanders in plains of alluvium indicate?
Ans. A meander, in general, is a bend in a sinous watercourse or river. A meander forms when moving water in a stream erodes the outer banks and widens its valley, and the inner part of the river has less energy and deposits silt. In streams that flow rapidly over steep gradients, normally erosion is concentrated on the bottom of the stream channel. In the case of steep gradient streams lateral erosion on the sides of the valleys is not much when compared to the streams flowing on low and gentle slopes. Because of active lateral erosion, streams flowing over gentle slopes, develop sinuous or meandering courses. It is common to find meandering courses over flood plains and delta plains where stream gradients are very gentle. But very deep and wide meanders can also be found cut in hard rocks. Meander loops develop over original gentle surfaces in the initial stages of development of streams and the same loops get entrenched into the rocks normally due to erosion or slow, continued uplift of the land over which they start. They widen and deepen over time and can be found as deep gorges and canyons in hard rock areas. They give an indication on the status
of original land surfaces over which streams have developed.



. Q**uestion 1:**
What shape does a glacial valley have, and what causes this shape?
Answer:
A U-shaped valley, formed by glacial erosion that widens and deepens a V-shaped river valley

Question 2:
Which features in the diagram indicate glacial erosion?
Answer:
Steep valley sides and a flat valley floor, characteristic of glacially carved U-shaped valleys.

Question 3:
What does the presence of a hanging valley suggest about glacial activity?
Answer:
It indicates that a smaller glacier joined a main glacier, eroding less deeply and leaving a valley suspended above the main U-shaped valley.

LONG ANSWER TYPE QUESTION (5 MARKS)

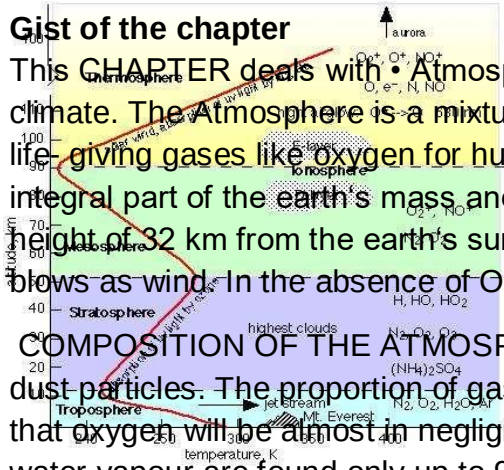
Q1. Limestone behave differently in humid and arid climates. Why? What is the dominant and almost exclusive geomorphic process in limestone areas and what are its results?
Ans. Many depositional forms develop within the limestone caves. The chief chemical in limestone is calcium carbonate which is easily soluble in carbonated water i.e. carbon dioxide absorbed rainwater. This calcium carbonate is deposited when the water carrying it in solution evaporates or loses its carbon dioxide as it trickles over rough rock surfaces. Stalactites, Stalagmites and Pillars Stalactites hang as icicles of different diameters. Normally they are broad at their bases and taper towards the free ends showing up in a variety of forms. Stalagmites rise up from the floor of the caves. In facts, stalagmites form due to dripping water from the surface or through the thin pipe, of the stalactite, immediately below it. The results of the work of groundwater cannot be seen in all types of rocks. But in rocks like limestone or dolomites rich in calcium carbonate, the surface water as well as groundwater through the chemical process of solution and precipitation deposition develop varieties of landforms. These two processes of solution and precipitation are active in limestone or dolomites occurring either exclusively or interbedded with other rocks.
Therefore, underground flow of water is more common than surface run off in limestone areas.
Q2. glaciers accomplish the work of reducing high mountains into low hills and plains, how ?
Ans. Masses of ice moving as sheets over the land or as linear flows down the slopes of mountains in broad trough-like valleys are called glaciers. A glacier in its valley is slow unlike water flow. The movement

could be a few centimeters to a few meters a day or even less or more. Glaciers move basically because of the force of gravity.

Erosion by glaciers is tremendous because of friction caused by sheer weight of the ice. The material plucked from the land by glaciers get dragged along the floors or sides of the valleys and cause great damage through abrasion and plucking. Glaciers can cause significant damage to even un-weathered rocks and can reduce high mountains into low hills and plains.

As glaciers continue to move, debris gets removed, divides get lowered and eventually the slope is reduced to such an extent that glaciers will stop moving leaving only a mass of low hills and vast outwash plains along with other depositional features.

CHAPTER NO 7: C0MPOSITION AND STRUCTURE OF ATMOSPHERE



Gist of the chapter

This CHAPTER deals with • Atmosphere — compositions and structure; elements of weather and climate. The Atmosphere is a mixture of different gases and it envelopes the earth all round. It contains life- giving gases like oxygen for humans and animals and carbon dioxide for plants. The air is an integral part of the earth's mass and 99 per cent of the total mass of the atmosphere is confined to the height of 32 km from the earth's surface. The air is colourless and odourless and can be felt only when it blows as wind. In the absence of Ozone life is not possible on the earth surface.

COMPOSITION OF THE ATMOSPHERE The atmosphere is composed of gases, water vapour and dust particles. The proportion of gases changes in the higher layers of the atmosphere in such a way that oxygen will be almost in negligible quantity at the height of 120 km. Similarly, carbon dioxide and water vapour are found only up to 90 km

Table 8.1 : Permanent Gases of the Atmosphere

Constituent	*Formula*	*Percentage by Volume*
Nitrogen	N_2	78.08
Oxygen	O_2	20.95
Argon	Ar	0.93
Carbon dioxide	CO_2	0.036
Neon	Ne	0.002
Helium	He	0.0005
Krypto	Kr	0.001
Xenon	Xe	0.00009
Hydrogen	H_2	0.00005

from the surface of the earth.

Carbon dioxide is meteorologically a very important gas as it is transparent to the Incoming solar radiation but opaque to the outgoing terrestrial radiation. It absorbs a part of terrestrial radiation and reflects back some part of it towards the earth's surface. It is largely responsible for the green house effect. Ozone is another important component of the atmosphere found between 10 and 50 km above the earth's surface and acts as a filter and absorbs the ultra-violet rays radiating from the sun and prevents them from reaching the surface of the earth.

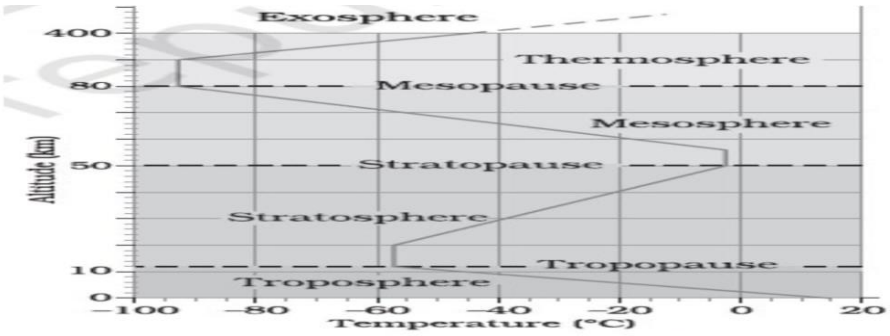
Water vapour is also a variable gas in the atmosphere, which decreases with altitude. In the warm and wet tropics, it may account for four per cent of the air by volume, while in the dry and cold areas of desert and polar regions, it may be less than one per cent of the air. Water vapour also decreases from the equator towards the poles. It also absorbs parts of the insolation from the sun and preserves the earth‘s radiated heat. It thus, acts like a blanket allowing the earth neither to become too cold nor too hot. Dust Particles Atmosphere has a sufficient capacity to keep small solid particles, which may originate from different sources and include sea salts, fine soil, smoke-soot, ash, pollen, dust and disintegrated particles of meteors. Dust particles are generally concentrated in the lower layers of the atmosphere; yet, convectional air currents may transport them to great heights. The higher concentration of dust particles is found in subtropical and temperate regions due to dry winds in comparison to equatorial and polar regions. Dust and salt particles act as hygroscopic nuclei around which water vapour condenses to produce clouds.

STRUCTURE OF THE ATMOSPHERE 1.The atmosphere consists of different layers with varying density and temperature. 2. Density is highest near the surface of the earth and decreases with increasing altitude. 3.The column of atmosphere is divided into five different layers depending upon the temperature condition. 1. Troposphere—It is the lower most layer of the atmosphere. Its average height is 13 km. It heights is 8 km near poles and about 18 km at the equator. All changes in climate and weather takes place in this layer. This is the most important layer for human being.

2. Stratosphere—It extends upto a height of 50 km. The temperaure 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 up to 50 to 80 km. In this layer, temperature starts decreasing with increase in altitude.

4. The ionosphere It is located between 80 and 400 km above the mesopause. 2. It contains electrically charged particles known as ions, and hence, it is known as ionosphere. 3. Radio waves transmitted from the earth are reflected back to the earth by this layer. 4. Temperature here starts increasing with height. 5. The uppermost layer of the atmosphere above reaches up to minus 100 Exosphere 1. the thermosphere is known as the exosphere. 2. This is the highest layer but very little is known about it. 3. Whatever contents are there, these are extremely rarefied in this layer, and it gradually merges with the outer space.



Elements of Weather and Climate The main elements of atmosphere which are subject to change and which influence human life on earth are 1. temperature, 2. pressure, 3. winds, 4. humidity, 5. clouds 6. precipitation.

MULTIPLE CHOICE QUESTIONS

Arrange in Sequence

Q1) Which one of the following groups of gases have been arranged in the sequence as per their percentage by volume in the atmosphere?

(a) Oxygen, Nitrogen, Argon, CO_2, (b) Argon, Nitrogen, CO_2,. Oxygen
(c) Nitrogen, Oxygen, Argon, CO_2, (d) Oxygen, CO_2,. Nitrogen, Argon
Ans (c) Nitrogen, Oxygen, Argon, CO_2
Q2) Which one of the following groups of layers of atmosphere have been arranged in the sequence as per their height from the earth's surface?
(a) Mesosphere, Troposphere, Stratosphere, Ionosphere
(b) Stratosphere, Troposphere, Mesosphere, Ionosphere
(c) Troposphere, Stratosphere, Mesosphere, Ionosphere
(d) Mesosphere, Ionosphere, Troposphere, Stratosphere
Ans (c) Troposphere, Stratosphere, Mesosphere, Ionosphere
Assertion and Reason
In the questions given below are two statements labelled as Assertion (A) and other is labelled as Reason (R). In the context of two statements which one of the following is correct? Codes
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true
Q3) Assertion (A) Atmosphere is a very essential part for human beings as well as for other living organisms.
Reason (R) Atmosphere contains life-giving gases like oxygen for humans and animals.
Ans (a) Both A and R are true and R is the correct explanation of A
Q4) Assertion (A) In subtropical and temperate regions, concentration of dust particles is high.
Reason (R) It is due to dry winds.
Ans (a) Both A and R are true and R is the correct explanation of A

SHORT ANSWER QUESTION (3 MARKS)

Q.1. "The Atmosphere is composed of many gases." Justify the statement.
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 greenhouse effect.
(iv) Ozone gas found between 10 to 50 km above the earth's surface and acts as a filter and absorbs ultra-violet rays.
Q.2. Atmosphere is complex system with different materials. explain in brief.
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%) constitutes the major portion. Next to this carbon dioxide, Argon and Ozone are important gases. All gases have their importance.

Water vapour : The amount of water vapour 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, allowing the earth neither to become too cold nor too hot.

Dust particles: Dust particles act as hygroscopic nuclei and helps in making or forming clouds.

Q.3. Do dust particles in atmosphere is prominent features, justify the statement with suitable diagram?

Ans. (i) Dust particles blows in atmosphere due to wind speed. They are derived from different sources and include sea, slats, fine soil, smoke soot, ash, pollen, dust and disintegrated particles of meteors. (ii) Dust particles helps in cloud formation which causes rainfall. (iii) They also intercept and reflect insolation. (iv) Dust particles produces phenomenon of red and orange sky at the sunrise and the sunset which are known as dawn and dusk respectively.

Q.4. "Troposphere is important layer for biological activity." Justify

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

LONG ANSWER QUESTIONS (5 MARKS)

Q.1. The structure of atmosphere is very complex system? Explain its different layers with their features.

Ans. The column of atmosphere is divides into five layers depending upon the temperature condition. The atmospheric layers on basic of temperature condition are—

1. Troposphere—It is the lower most layer of the atmosphere. Its average height is 13 km. It heights is 8 km near poles and about 18 km at the equator. All changes in climate and weather takes place in this layer. This is the most important layer for human being.

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 up to 50 to 80 km. In this layer, temperature starts decreasing with incrase in altitude.

4. Ionosphere—It is located between 80 and 40 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. Whenever contents are there, these are extremely rarefied in this layer and merges with outer space.

CHAPTER NO. 8 SOLAR RADIATION HEAT BALANCE AND TEMPERATURE.

Gist of the chapter

This chapter deals with Solar radiation, variability of insolation at the surface of the earth heating and cooling of atmosphere, terrestrial radiation ,heat budget of the planet earth, latitudinal variation in net radiation balance, temperature, factors influencing the temperature (such as the latitude, altitude, distance from the sea air mass ocean currents) distribution of temperature, isotherm.

The earth‘s surface receives most of its energy in short wavelengths. The energy received by the earth is known as incoming solar radiation which in short is termed as insolation. As the earth is a Geoid resembling a sphere, the sun‘s rays fall obliquely at the top of the atmosphere and the earth intercepts a very small portion of the sun‘s energy. On an average the earth receives 1.94 calories per sq. cm per minute at the top of its atmosphere.

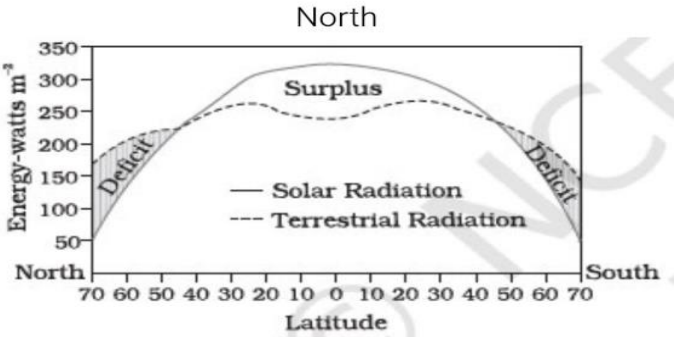


Figure 8.3 : Latitudinal variation in net radiation balance

The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the earth and the sun. During its revolution around the sun, the earth is farthest from the sun (152 million km) on 4th July. This position of the earth is called aphelion. On 3rd January, the earth is the nearest to the sun (147 million km). This position is called perihelion. Therefore, the annual insolation received by the earth on 3 The second factor that determines the amount of insolation received is the angle of inclination of the rays. This depends on the latitude of a place. The higher the latitude the less is the angle they make with the surface of the earth resulting in slant sunrays. The area covered by vertical rays is always less than that covered by the slant rays. If more area is covered, the energy gets distributed and the net energy received per unit area decreases. Moreover, the slant rays are required to pass through greater depth of the atmosphere resulting in more absorption, scattering and diffusion.

The incoming radiation is not fully reached to the earth surface 1. The atmosphere is largely transparent to short wave solar radiation. The incoming solar radiation passes through the atmosphere before striking the earth‘s surface. 2. Within the troposphere water vapor, ozone and other gases absorb much of the near infrared radiation. 3. Very small-suspended particles in the troposphere scatter visible spectrum both to the space and towards the earth surface. Length o r the Day In Hours and Minutes on Winter and Summer Solstices In3 rd January is slightly more than the amount received on 4th July. However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation.

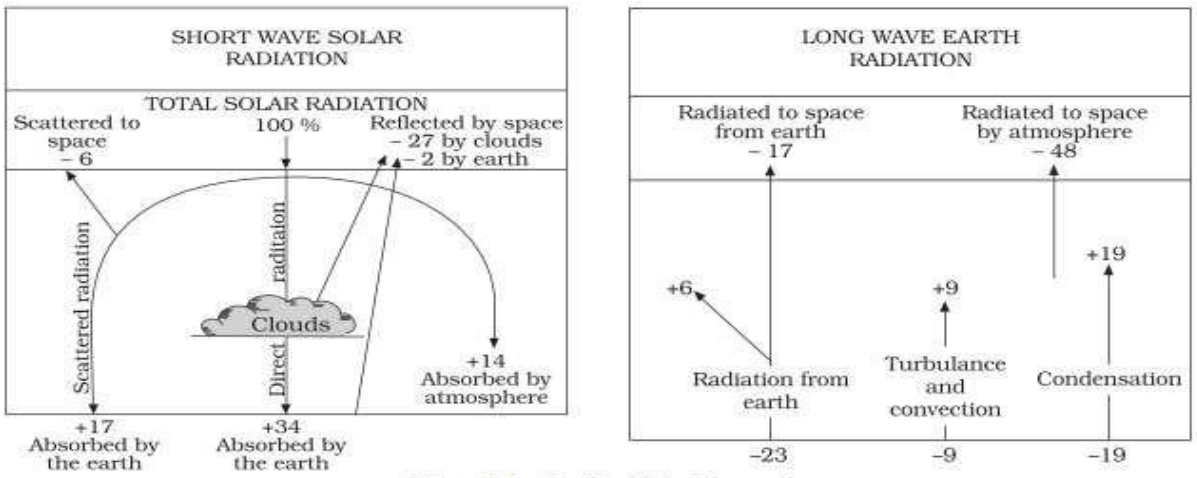


Figure 9.2 : Heat budget of the earth

Variability of Insolation at the Surface of the Earth The amount and the intensity of insolation vary during a day, in a season and in a year. The factors that cause these variations in insolation are (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. The last two however, have less influence. The fact that the earth‘s axis makes an angle of4. This process adds colour to the sky. 5. The red colour of the rising and the setting sun and the blue colour of the sky are the result of scattering of light within the atmosphere

MULTIPLE CHOICE QUESTION

Q1) The main reason that the earth experiences highest temperature in the subtropics in the Northern Hemisphere rather than at the equator is:
(a) Sub-tropical areas tend to have less cloud cover than equatorial areas.
(b) Sub-tropical areas have longer day hours in the summer than the equatorial
(c) Sub-tropical areas have an enhanced "greenhouse effect' compared to equatorial areas.
(d) Sub-tropical areas are nearer to the oceanic areas than the equatorial locations.
Ans (a) Sub-tropical areas tend to have less cloud cover than equatorial areas
Q2) Which of the following is/are the factors responsible for variation in insolation?
1. The rotation of the Earth on its Axis. 2. The length of the Day.
3. Transparency of the Atmosphere.
Codes
(a) 1 and 2 (b) 1, and 3 (c)2 and 3 (d) All of these
Ans (d) All of these
Q3. Which of the following phenomena are arranged in the sequence as per their date to occurrence?
(a) Aphelion, Perihelion, Summer Solstice, Winter Solstice
(b) Perihelion, Summer Solstice, Aphelion, Winter Solstice
(c) Perihelion, Aphelion, Winter Solstice, Summer Solstice
(d) Winter Solstice, Summer Solstice, Perihelion, Aphelion
Ans (b) Perihelion, Summer Solstice, Aphelion, Winter Solstice
Directions (Q. Nos. 4 and 5) in the questions given below are two statements labelled as Assertion (A) and other is labelled as Reason (R). In the context of two statements which one of the following is correct?
Codes
(a) Both. A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true
Q4) Assertion (A) Maximum insolation is received over the sub-tropical deserts.
Reason (R) Cloudiness is the least in the sub-tropical deserts.
Ans (a) Both A and R are true and it is the correct explanation of A
Q5) Assertion (A) The amount of heat causes pressure differences in the atmosphere
Reason (R) The amount of heat receives different parts of the earth is not san
Ans (a) Both A and Fare true and is then explanation of A
Match the Following.
Q6) Match List I with List II. Select the correct answer using the codes given below

List	(Terms)
A Convection	1. Transfer of heat through horizontal movement
B. Advection	2. Vertical heating of the atmosphere
C. Aphelion	3. Shortest distance between the sun and the earth

D. Perihelion 4. Longest distance beta the sun and earth

Codes

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

Ans (a)2 1 4 3

Q7) Match the Following.

a) Latitude 1) Distance from North and South of the equator measured in upto 90 degree

b) Radiation 2)The emission of energy in the form of rays or waves

c) Scattering 3)The process in which radiation or particles are deflected or diffused

d) Isotherm 4)The line which joins the places having equal temperature

Codes

A	B	C	D
(a) 1234	(b) 2314	(c) 3214	(d) 2431

Ans (a) 1234

Q8) Make correct pairs from the following columns

I)insolation (a) The difference between the mean temperature of the warmest and the coldest Month

II) Albedo (b) The lines joining the places of equal temperature

III) Isotherm (c) The incoming solar reduction

IV) Annual range (d) The percentage of visible light reflected by an object.

Ans (10) (c), (ii)(d), (iii) (b),(iv)→(a)

SHORT QUESTIONS (3 MARKS)

Q.1.' Atmosphere get heated more than terrestrial radiation rather than insolation'? Why.

Ans. 1. The insolation received by earth is in short waves forms and heats up it 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 green house gases.

Q.2.Identify the Earth's heat receiving zones and state which one receives the most heat, with reasons?

Ans. Subtropical zone 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.

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 of the contact is broken.

2. Convection—The air 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. variations in insolation is caused by different factors ? Explain.

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.

LONG ANSWER QUESTIONS (5 MARKS)

Q.1. So many factors affecting distribution of temperature on the Earth? Explain.

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.

(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.

Q.2. inversion of temperature is not a common phenomenon ? 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 surface cools down at night due to radiation. The air of the lower layer touching the earths surface is sufficiently cooled while the air of upper layer is still warm.

(ii) (ii) Clear sky—Clear sky is essential for reflection of heat radiations by earth's there by cooling it. Clouds obstruct this reflection and hamper the occurrence of inversion of temperature.

(iii) Stable weather—Continuous radiation of heat is possible in a stable weather. This condition leads to temperature inversion. Change in weather.

(iv) Dry air—Moist air has greater capacity to absorb heat radiation and obstructs the temperature inversion. But dry air does no absorb much radiation and promotes temperature 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

LESSON – 10 ATMOSPHERIC CIRCULATION AND WEATHER SYSTEMS

GIST OF THE CHAPTER

This chapter deals with Atmospheric pressure, vertical variation pressure, horizontal distribution of pressure, world distribution of sea level pressure, factors affecting the velocity and direction of wind (pressure gradient force, frictional force, carioles force, pressure and wind,) general circulation of the atmosphere, ENSO seasonal wind, local winds land and sea breezes mountain and valley winds, air masses , fronts, extratropical cyclone tropical cyclones, thunderstorms, tornadoes. The pressure decreases with height. At any elevation it varies from place to place and its variation is the primary cause of air motion, i.e. wind which moves from high pressure areas to low pressure areas. Vertical Variation of Pressure In the lower atmosphere the pressure decreases rapidly with height. The decrease amounts to about 1 mb for each 10 m increase in elevation. It does not always decrease at the same rate.

The pattern of planetary winds largely depends on: (i) latitudinal variation of atmospheric heating; (ii) emergence of pressure belts; (iii)the migration of belts following apparent path of the sun; distribution continents and oceans; (v) the rotation of earth. The air at the Inter Tropical Convergence Zone (ITCZ) rises because of convection caused by high insolation and a low pressure is created. The winds from the tropics converge at this low pressure zone. The converged air rises along with the convective cell. It reaches the top of the troposphere up to an altitude of 14 km. and moves towards the poles. This causes accumulation of air at about 30 N and S.

Part of the accumulated air sinks to the ground and forms a subtropical high. Another reason for sinking is the cooling of air when it reaches 30 N and S latitudes. Down below near the land surface the air flows towards the equator as the easterlies. The easterlies from either side of the equator converge in the Inter Tropical Convergence Zone (ITCZ). Such circulations from the surface upwards and vice-versa are called cells. Such a cell in the tropics is called Hadley Cell.

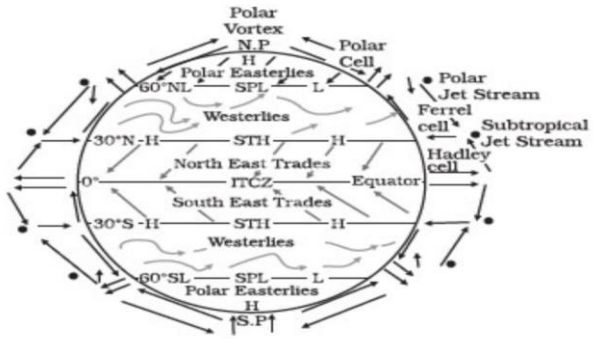


Figure 9. 6 : Simplified general circulation of the atmosphere

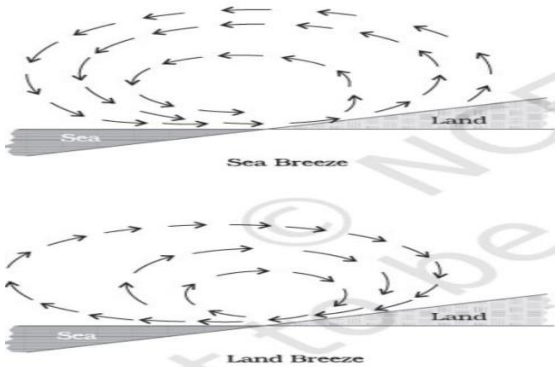


Figure 9.7 : Land and sea breezes

Tropical Cyclones Tropical cyclones are violent storms that originate over oceans in tropical areas and large scale destruction caused by violent winds, very heavy rainfall and storm surges. This is one of the most devastating natural calamities. They are known as Cyclones in the Indian Ocean, Hurricanes in the Atlantic, Typhoons in the Western Pacific and South China Sea, and Willy-willies in the Western Australia. Tropical cyclones originate and intensify over warm tropical oceans. The conditions favourable for the formation and intensification of tropical storms are: Large sea surface with temperature higher than 27° C; (ii) Presence of the Coriolis force; 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.

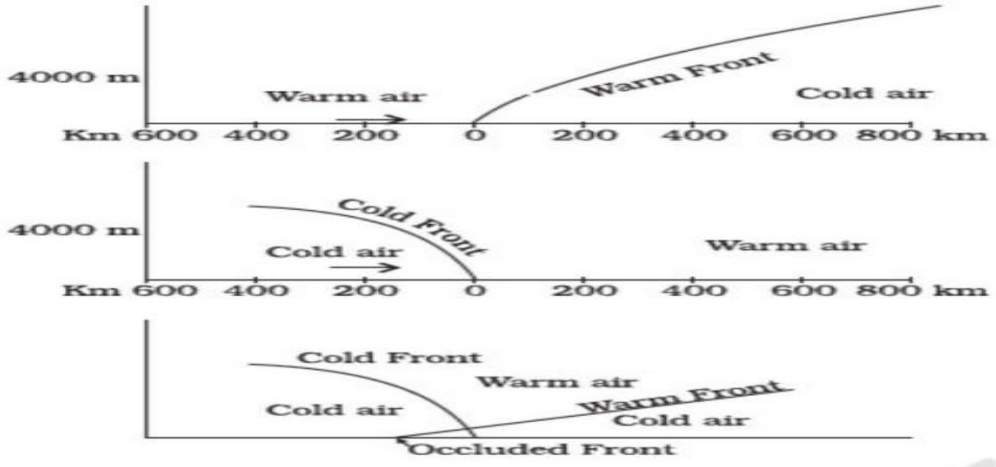


Figure 9.8 : Vertical Sections of : (a) Warm Front; (b) Cold Front; (c) Occluded Front

MULTIPLE CHOICE QUESTIONS

Q1) If the surface air pressure is 1,000 mb, the air pressure at 1 km above the surface will be:

(a) 700 mb (b) 1,100 mb (c) 900 mb (d) 1,300 mb

Ans (c) 900 mb

Q2) Which of the following is not a type of cell?

(a) Hadley cell (b) Ferrell cell (c) Polar cell (d) Deadly cell

Ans (d) Deadly cell

Q3) Arrange the sequence of precipitation by thunderstorm.

1) Intense updraft of rising warm air. 2) Clouds grow bigger.

3) Clouds rise to greater height. 4) Precipitation occurs.

Codes

(a) 1,2,3,4 (b) 3,2,4,1 (c) 4,3,2,1 (d) 2,3,4.1

Ans (a) 1,2,3,4

Q4) The atmospheric pressure is expressed in which of the following units?

1. Millibar 2. Pascals 3. Kilowatt 4. Kilopascal

Codes

(a) 1,2 and 3

(b) 1,2 and 4

(c) 2,3 and 4

(d) All of these

Ans (b) 1, 2 and 4

Q5) Match the Following

Column (Air mass)	Column (Codes)
1. mP	A Maritime tropical
2. m	B Continental tropical
3. CT	C. Maritime polar
4 CP	D. Continental polar

Codes

A	B	C	D
(a) 1 2 3 4	(b) 2314	(c) 3214	(d) 4213

Ans (b)2314

Assertion and Reason

Directions (QNos. 6 and 7) In the questions given below are two statement labelled as Assertion (A) and other is labelled as Reason (F). In the context of two statements which one of the following is correct. codes

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

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

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

Q6) Assertion (A) The pressure decreases with height.

Reason (R) The air at the surface is denser and hence, has higher pressure.

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

Q7) Assertion (A) Wind moves from high pressure areas to low pressure areas.

Reason (R) At any elevation pressure varies from place to place and its variation is the primary cause of air motion.

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

SHORT QUESTION ANSWER (3 MARKS)

Q.1. Why do you think Coriolis force affects directions of wind. Explain.

Ans. Due to rotation of the Earth, winds do not cross the isobars but are deflected from their path — This called Coriolis effect or Coriolis force.

• Coriolis force defects 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. Analyse the Difference 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 anti clock wise direction in the Northern hemisphere and clockwise direction in the Southern hemisphere due to Coriolis effect.

Anti-cyclone—A anti cyclone is a high pressure area surrounded by low pressure ocean from all sides. Winds move to all sides from centre. They assume clock wise direction in the northern hemisphere and anticlock wise direction in the southern hemisphere due to Coriolis effect

Q.3.' Tropical cyclones are common in equatorial region', why ?

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

LONG ANSWER QUESTIONS (5 MARKS)

Q.1. Velocity and direction of winds vary according to the regions? Explain.

Ans. The air is set in motion due to the differences in atmospheric pressure. The horizontal winds near the earth surface respond to combined 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 & is weak where the isobars are apart far away from each other.

(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 minima

(iii) Coriolis Force—This force deflected 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.2. The extra tropical cyclone differs from the tropical cyclone in number of ways. Analysis 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. Where as 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

CHAPTER NO 10: WATER IN ATMOSPHERE

Gist of the chapter

This chapter deals with Humidity, types of humidity, relative humidity, absolute humidity, specific humidity, dew point, condensation, saturated air, types of precipitation –dew, frost, fog, mist, snowfall, hailstones,rainfall types convectional type, orographic rainfall, cyclonic rainfall, world distribution of rainfall. Air contains water vapour. It varies from zero to four per cent by volume of the atmosphere and plays an important role in the weather phenomena.

Water is present in the atmosphere in three forms namely – gaseous, liquid and solid. The moisture in the atmosphere is derived from water bodies through evaporation and from plants through transpiration. Thus, there is a continuous exchange of water between the atmosphere, the oceans and the continents through the processes of evaporation, transpiration, condensation and precipitation.

Water vapour present in the air is known as humidity. It is expressed quantitatively in different ways. The actual amount of the water vapour present in the atmosphere is known as the absolute humidity. It is the weight of water vapour per unit volume of air and is expressed in terms of grams per cubic metre. The ability of the air to hold water vapour depends entirely on its temperature. The absolute humidity differs from place to place on the surface of the earth. The percentage of moisture present in the atmosphere as compared to its full capacity at a given temperature is known as the relative humidity. The air containing moisture to its full capacity at a given temperature is said to be saturated. The temperature at which saturation occurs in a given sample of air is known as dew point.

WATER IN THE ATMOSPHERE EVAPORATION AND CONDENSATION

The amount of water vapour in the atmosphere is added or withdrawn due to evaporation and condensation respectively. Evaporation is a process by which water is transformed from liquid to gaseous state. Heat is the main cause for evaporation. The temperature at which the water starts evaporating is referred to as the latent heat of vaporization.

Clouds

The transformation of water vapour into water is called condensation. Condensation is caused by the loss of heat. When moist air is cooled, it may reach a level when its capacity to hold water vapour ceases. Then, the excess water vapour condenses into liquid form. If it directly condenses into solid form, it is known as sublimation. In free air, condensation results from cooling around very small particles termed as hygroscopic condensation nuclei. Particles of dust, smoke and salt from the ocean are particularly good nuclei because they absorb water.

Condensation also takes place when the moist air comes in contact with some colder object and it may also take place when the temperature is close to the dew point. Condensation, therefore, depends upon the amount of cooling and the relative humidity of the air.

Condensation is influenced by the volume of air, temperature, pressure and humidity. Condensation takes place: 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. However, the most favourable condition for condensation is the decrease in air temperature. After condensation the water vapour or the moisture in the atmosphere takes one of the following forms — dew, frost, fog and clouds. Forms of condensation can be classified on the basis of temperature and location.

Condensation takes place when the dew point is lower than the freezing point as well as higher than the freezing point.

MULTIPLE CHOICE QUESTIONS

Directions (Q Nos. 1 and 3) In the questions given below are two statement labelled as Assertion (A) and other is labelled as Reason (R). In the context of two statements which one of the following is correct.

codes

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

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

(c) A is true, but R is false

(d) A is false, but R is true

Q.1. Assertion A the amount of water in atmosphere added or withdrawn.

Reasoning R Evaporation and condensation are responsible for this change.

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

Q.2. Assertion A The evaporated water is transformed into water.

Reasoning R It is due to the process of condensation.

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

Q.3. Assertion A dew forms on cooler surfaces of solid objects when conditions include clear skies , calm air and high relative humidity .

Reasoning R Dew forms when the dew point is below the freezing point.

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

SHORT ANSWER QUESTION (3 MARKS)

Q.1. The formation of clouds need some favourable conditions in the atmosphere ,How?

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.'Evaporation is a main process of water cycle ' 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.During rainy season we feel more sticky or unfavourable conditions , why ? explain with 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) Relative humidity—It is the ratio of water vapor present in the air a 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. 'Earth's surface is heated during day time and it cools down at night.'? 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—Long nights helps in falling of temperature. So,

dew forms.
(ii) Clear sky—Clear sky permits sufficient heating and large scale evaporation during day. Condensation is caused by cooling at night and dew is formed.
(iii) Clam Air—If the air is calm, it will remain in contact with the earth's surface for a long time and cool down to dew point and dew will be formed.
(iv) High relative humidity.
(v) Dew point should be higher than freezing point

LONG ANSWER QUESTIONS (3 MARKS)

Q.1. Rainfall is the part of precipitation? 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 up thrust of air, the particles will fall down in the form of rain.
Types of Rainfall
(i) Convectional 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 its 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 rainfall.
Q.2. We find different types of clouds, classify the clouds according to their height, 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 colour.
(ii) Cumulus—Cumulus clouds looks like cotton wool. They are generally formed 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. There 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 known as cyclonic or frontal rainfall.

Q.3. “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.

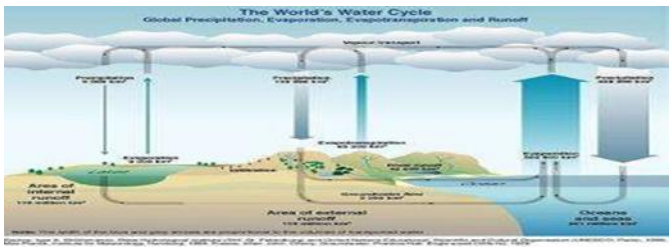
CHAPTER NO 11. WORLD CLIMATE AND CLIMATE CHANGE

(To be tested through internal assessments in the form of project and presentation)

CHAPTER NO 12. WATER (OCEAN)

GIST OF THE CHAPTER

This CHAPTER deals with• Hydrological Cycle • Oceans — submarine relief; distribution of temperature and salinity; movements of ocean water-waves, tides and currents The earth, fortunately has an abundant supply of water on its surface. Hence, our planet is called the ‘Blue Planet’. HYDROLOGICAL CYCLE The hydrological cycle, is the circulation of water within the earth‘s hydrosphere in different forms i.e. the liquid, solid and the gaseous phases. It also refers to the continuous exchange of water between the ocean



. Divisions of the Ocean Floors The ocean floors can be divided into four major divisions: The Continental Shelf; The Continental Slope; The Deep Sea Plain; The Oceanic Deeps.

SALINITY OF OCEAN WATERS: Salinity is the term used to define the total content of dissolved salts in sea water It is calculated as the amount of salt (in gm) dissolved in 1,000 gm (1 kg) of seawater. It is usually expressed as parts per thousand (o/) or ppt. Salinity is an important property of sea water. Salinity of 24.7°/oo has been considered as the upper limit to demarcate brackish water‘.

Factors affecting ocean salinity are mentioned below: (i) The salinity of water in the surface layer of oceans depend mainly on evaporation and precipitation. (ii) Surface salinity is greatly influenced in coastal regions by the fresh water flow from rivers, and in polar regions by the processes of freezing and thawing of ice. (iii) Wind, also influences salinity of an area by transferring water to other areas(iv) The

ocean currents contribute to the salinity variations. Salinity, temperature and density of water are interrelated.

MULTIPLE CHOICE QUESTIONS

Q1) Hydrological cycle is the circulation of water within the earth's hydrosphere in different forms such as

(a) Solid (b) Liquid (c) Gaseous (d) All of these

Ans (d) All of these

Q2) The component 'water storage in oceans' is associated with which of the following processes of the water cycle?

(a) Evaporatio (b) Evapotranspiration (c) Sublimation (d) All of these

Ans (d) All of these

Q3) Hydrological cycle is the continuous exchange of water between the

1)Oceans 2)Atmosphere 3) Land surface 4) Organisms Codes

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

Ans (d) All of these

Q4)Arrange the following water bodies as per their salinity from highest to lowest.

1)Lake Van 2)Great Salt lake 3) Dead sea 4)Red sea

Codes

(a) 1,2,3,4 (b) 1,3,2,4 (c)3.2.1,4 (d) 4,3,2,1

Ans (b) 1,3,2,4

Directions (Q. Nos. 5 to 8) In the questions given below are two statements labelled as Assertion (A) and other is labelled as Reason (R). In the context of two statements which one of the following is correct?

Codes

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

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

(c) A is true, but R is false

(d) A is false, but R is true

Q5) Assertion (A) Salinity at depth is very much fixed.

Reason (R) There is no way that water is 'lost' or the salt is added at depth.

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

Q6) Assertion (A) In temperate latitudes salinity is lower.

Reason (R) In temperate latitudes, evaporation is less and rains are more abundant.

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

Q7) Assertion (A) There is huge water crisis in different parts of the world.

Reason (R) The renewable water on the earth is constant while the demand is increasing tremendously.

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

SHORT ANSWER QUESTION (3 MARKS)

Q.1. 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 one degree or even less.

• It's 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.2. Continental slope had many main features , Explain?
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.3. The salinity of ocean water is differ in different regions of oceans. describe the horizontal distribution of salinity?
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.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

CHAPTER 13: MOVEMENTS OF OCEAN WATER

Gist of the Chapter

Types Of Tides Semidiurnal, Diurnal Tide, Mixed, Spring, Neap Tides. The ocean water is dynamic. Its physical characteristics like temperature, salinity, density and the external forces like of the sun, moon and the winds influence the movement of ocean water. The horizontal and vertical motions are common in ocean water bodies. The horizontal motion refers to the ocean currents and waves. The vertical motion refers to tides. Ocean currents are the continuous flow of huge amount of water in a definite direction while the waves are the horizontal motion of water. Water moves ahead from one place to another through ocean currents The vertical motion refers to the rise and fall of water in the oceans and seas . Due to attraction of the sun and the moon, the ocean water is raised up and falls down twice a day. The upwelling of cold water from subsurface and the sinking of surface water are also forms of vertical motion of ocean water.

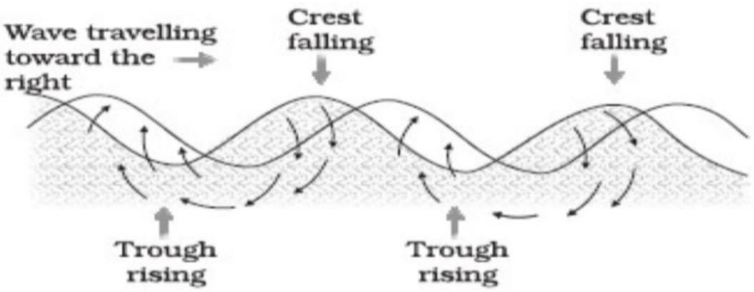


Figure13.1 : Motion of waves and water molecules

Characteristics of Waves (1) Wave crest and trough: The highest and lowest points of a wave are called the crest and trough respectively.

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

(3) Wave amplitude: It is one-half of the wave height.

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

(5)Wavelength: It is the horizontal distance between two successive crests.

(6)Wave speed : It is the rate at which the wave moves through the water, and is measured in knots.
(7)Wave frequency: It is the number of waves passing a given point during a one second time interval.

TIDES 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. Movement of water caused by meteorological effects (winds and atmospheric pressure changes) are called surges. Surges are not regular like tides.

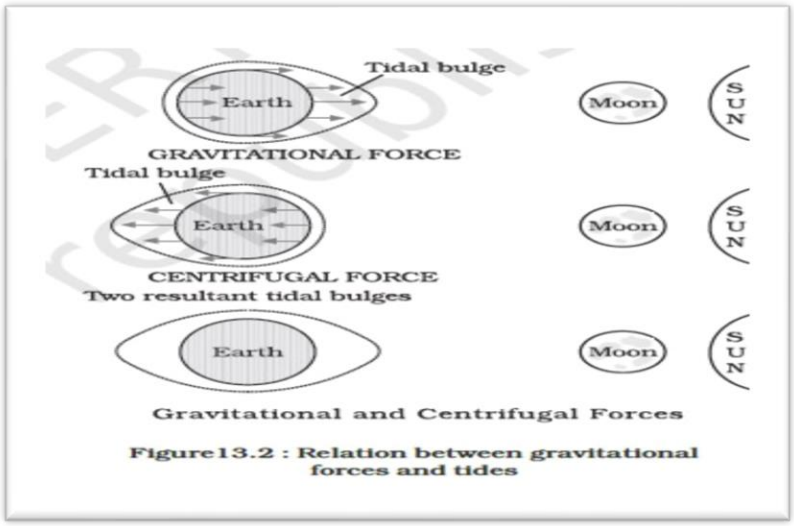


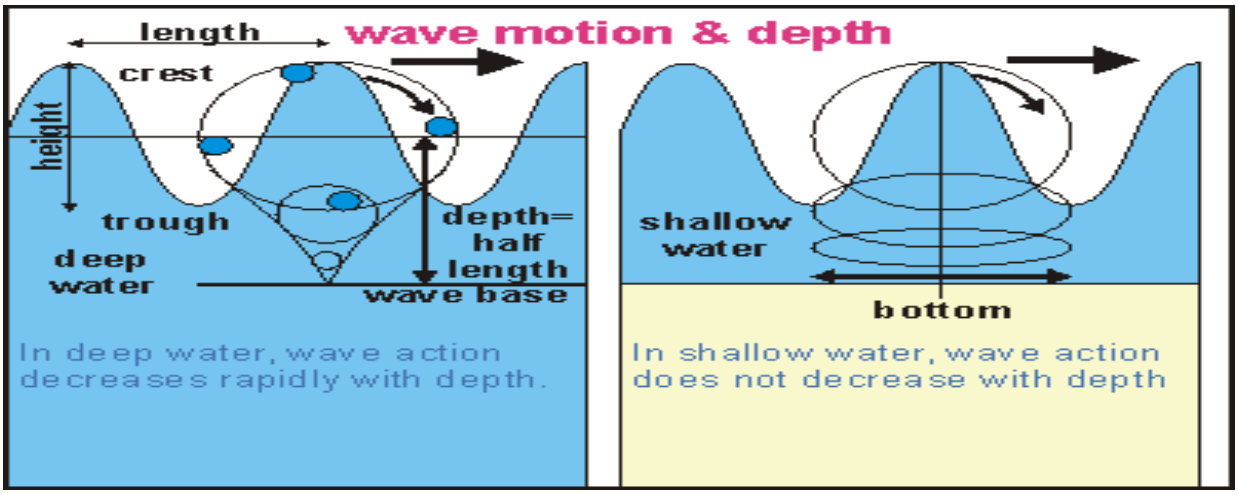
Figure13.2 : Relation between gravitational forces and tides

The tide-generating 'force is the difference between these two forces; i.e. the gravitational attraction of the moon and the centrifugal force. On the surface of the earth, the horizontal tide generating forces are more important than the vertical forces in generating the tidal bulges. The tidal bulges on wide continental shelves, have greater height. When tidal bulges hit the mid - oceanic islands they become low. The shape of bays and estuaries along a coastline can also magnify the intensity of tides. Funnel-shaped bays greatly change tidal magnitudes. When the tide is channelled between islands or into bays and estuaries they are called tidal currents.

Types of Tides- Tides vary in their frequency, direction and movement from place to place and also from time to time. Tides may be grouped into various types based on their frequency of occurrence in one day or 24 hours or based on their height.

Tides based on Frequency

Semi-diurnal tide: The most common tidal pattern, featuring two high tides and two low tides each day. The successive high or low tides are approximately of the same height. Diurnal tide: There is only one high tide and one low tide during each day. The successive high and low tides are approximately of the same height.



MULTIPLE CHOICE QUESTIONS

Q1 Upward and downward movement of ocean water is known as the:
(a) Tide (b) Wave (c) Current (d) None of these
Ans (a) Tide
Q 2 Spring tides are caused:
(a) As result of the Moon and the Sun pulling the Earth gravitationally in the same direction.
(b) As result of the Moon and the Sun pulling the Earth gravitationally.
(c) Indention in the coastline.
(d) None of the above
Ans (a) As result of the Moon and the Sun pulling the Earth gravitationally in the same direction.
Q3 The distance between the Earth and the Moon is minimum when the Moon is in:
(a) Aphelion (b) Perihelion (c) Perigee (d) Apogee
Ans (c) Perigee
Q4 The attraction force caused by the sun and the water to move up down
moon forces ocean
(a) once in a day (b) twice a day (c) thrice a day (d) None of these
Ans (b) twice a day
Q5 The other forms of vertical movement of oceanwater are
(a) upwelling of cold water from sub-surfaces (b) sinking of surface water
(c) tides (d) Both (a) and (b)
Ant (d) Both (a) and (b)
Q6.The maximum wave height is determined by the strength of the
(a) evaporation (b) wind (c) temperature conditions (d) precipitation
Ans(b) Wind

Q7. The crests of waves move in which direction due to gravity?

(a) Forward (b) Downward (c) Upward (d) None of these

Ans (b) Downward

Q8 Periodically rise and fall of the sea level, once in a day due to the attraction of the sun and the moon is called a

(a) Current (b) Waves (c) Tide (d) All of these

Ans. (c) tide

Assertion and Reason

Directions (Q. Nos. 9 and 10) In the questions given below are two statements labelled as Assertion (A) and other is labelled as Reason (R). In the context of two statements which one of the following is correct.

Codes

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

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

(c) A is true, but R is false

(d) A is false, but R is true

Q9. Assertion (A) At higher latitudes, the density of water increases.

Reason (R) At higher latitudes, the temperature is low.

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

Q10. Assertion (A) Deep bottom water remains stagnant.

Reason (R) The horizontal movement of surface water is continued to top surface layer of ocean water.

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

SHORT ANSWER QUESTION (3 MARKS)

Q.1.' Tides are very common phenomena in a coastal areas.' Describe the major types of Tides and its 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 helps 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 electrical power.
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 war 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.' life of flora and fauna is affected by ocean currents'? Explain its effects .
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 replenish 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.

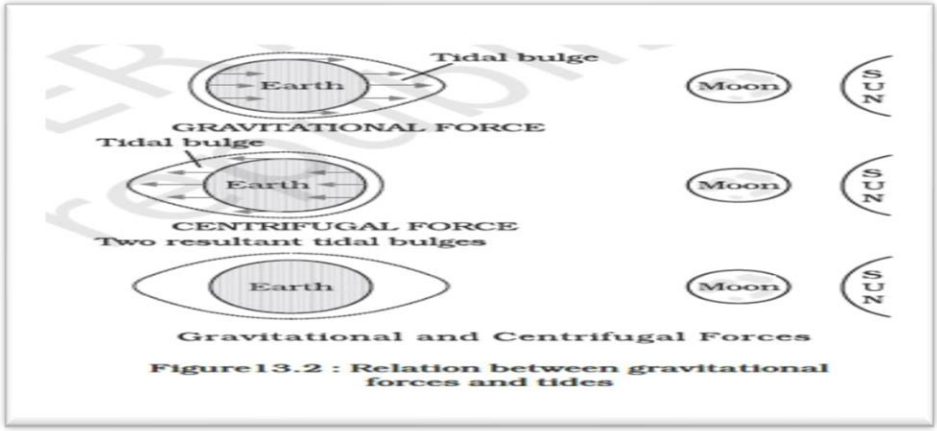


Figure 13.2 : Relation between gravitational forces and tides

Q4.1. Identify this picture?
Answer: Tide
Q4.2.Give the types of tide
Ans: High tide and low tide
Q.4.3 give any two importance of tide
Ans:1. For navigation 2. For Generate power

CHAPTER 14 BIODIVERSITY AND CONSERVATION

(To be tested through internal assessments in the form of project and presentation)

BOOK = INDIA : PHYSICAL ENVIRONMENT
CHAPTER 1 INDIA LOCATION

GIST OF THE LESSON

Location:

1. India is located in South Asia, entirely in the Northern Hemisphere.
2. It lies between latitudes 8°4' N and 37°6'N and longitudes 68°7' E and 97°25'E.
3. Bounded by the Himalayas in the north, it tapers southward to the Indian Ocean, dividing into the Bay of Bengal to the east and the Arabian Sea to the west.
4. India extends from Kashmir in the north to Kanniyakumari in the south and Arunachal Pradesh in the east to Gujarat in the west.
5. India's territorial limit further extends towards the sea up to 12 nautical miles (about 21.9 km) from the coast.

Size:

1. India covers an area of about 3.287 million square kilometers, making it the seventh-largest country in the world by land area.
2. It has a land frontier of about 15,200 kilometers and a coastline of about 7,516 kilometers, including the mainland, Lakshadweep Islands, and the Andaman and Nicobar Islands.
3. The actual distance measured from north to south extremity is 3,214 km and that from East to West is only 2,933 km.

India and Its Neighbors

1. Pakistan: To the northwest, with a border length of about 3,323 kilometers.
2. China: To the north and northeast, with a border length of about 3,488 kilometers.
3. Nepal: To the north, with a border length of about 1,751 kilometers.
4. Bhutan: To the northeast, with a border length of about 699 kilometers.
5. Bangladesh: To the east, with a border length of about 4,096 kilometers.
6. Myanmar: To the east, with a border length of about 1,643 kilometers.

Additionally, India shares maritime borders with:

1. Sri Lanka: Separated by the narrow Palk Strait.
2. Maldives: Situated to the southwest in the Indian Ocean.

Indian Standard Time (IST) and Its Implications

• IST is the time observed throughout India and Sri Lanka.
• It is 5 hours and 30 minutes ahead of Coordinated Universal Time (UTC+5:30).
• The reference point for IST is the 82.5°E longitude, passing through Mirzapur near Allahabad(Prayagraj) in Uttar Pradesh.

Implications of India's Location

India's strategic location in the Indian Ocean has significant implications across various dimensions, including economic, geopolitical, cultural, and environmental aspects

1. Economic Implications: Trade and Commerce, Energy Security, Fisheries and Marine Resources
2. Geopolitical Implications: Strategic Military Presence, Influence and Diplomacy, Regional Stability and Security.
3. Cultural and Historical Implications: Cultural Exchange, Diaspora and Migration
4. Environmental Implications: Marine Ecosystems, Climate and Weather Patterns.

MULTIPLE CHOICE QUESTIONS

Assertion Reasoning based Questions:-

A .Both A and R are correct and R explain A completely

B. Both A and R incorrect
C. A is correct and R is not correct explain
D. A is incorrect and R is correct
Q.1 Assertion (A)--Northern part of India is located in subtropical part and southern part of India is located in tropical zone
Reasoning R)-- tropic of Cancer passes through centre of India
Ans:A .Both A and R are correct and R explain A completely
Q.2 (A) From Gujarat to Arunachal Pradesh there is a time lag of 2 hours
(R) Eastern and western ends have 30 degree longitude difference
Ans:A .Both A and R are correct and R explain A completely
3(A) all watches in Kolkata Delhi Mumbai Chennai show the same time
(R) All these places are located on standard meridian of India
Ans:C. A is correct and R is not correct explain
5. Arrange the following countries correctly in the terms of their rank in area in the world?
(a)Russia Canada China Brazil
(b)Russia India Brazil China
(c)Canada Brazil China Russia
(d)Brazil India China Russia
Ans:(a)Russia Canada China Brazil
Question 6.Match the following latitudes/longitudes with their geographical significance:

A	B
1.82°30'E	a. Standard meridian of India
2.23°30' N	b. Tropic of Cancer
3.8°4'N	c.southern most point of India's mainland
4.37°6'N	d. Northernmost latitude of India

Options:
a) 1-a, 2-b, 3-c, 4-d b) 1-b, 2-a, 3-d, 4-c
c) 1-d, 2-c, 3-a, 4-b d) 1-a, 2-c, 3-b, 4-d
Answer: a) 1-a, 2-b, 3-c, 4-d

SHORT ANSWER QUESTIONS

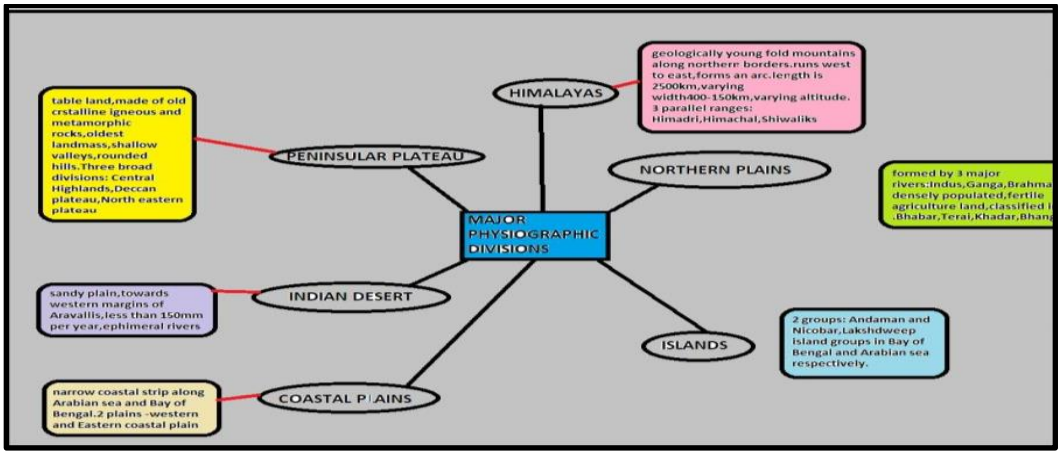
Q. 1. Does India need to have more than one standard time? If yes, why do you think so?
Answer: Yes, I think India needs to have more than one standard time.
• There is time variation of 2 hours between the Easternmost and the westernmost parts of our country. The sun rises two hours earlier in Arunachal 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.
• Many countries like USA, Canada and Russia have more than one standard time because their longitudinal extent is large. India's longitudinal extent is also 30° approximately. Therefore.
Q. 2." latitudinal spread of India advantageous to India" justify the statement?

Answer: There are three major advantages of latitudinal extent-
1. Tropic of cancer (23 1/2°.) – It divides India into two parts. Southern part is in the tropical zone while northern part is in the temperate zone. Therefore biodiversity in India is exceptional.
2. It also brings climatic diversity in India which has many advantages.
3. As we move from Kanyakumari to Jammu and Kashmir duration of day and night decreases by more than 4 hours 30 minutes.
4. We have places of all climates. It makes India a subcontinent.
Q.3".India is often referred to as a subcontinent". Justify the statement with reference to its location and size.
Answer:India is called a subcontinent because it is a distinct landmass, separated from the rest of Asia by natural features like the Himalayas. It is the seventh-largest country in the world with a vast area of 3.28 million sq km. Its location between 8°4'N and 37°6'N latitudes and 68°7'E and 97°25'E longitudes gives it diverse climates and geography, distinguishing it from other Asian countries.

Long answer Question

Q. 1. While the sun rises earlier in the east, say Nagaland and also sets earlier, how do the watches at Kohima and New Delhi show the same time? Elaborate.
Answer: While the sun rises earlier in the east, say Nagaland and also sets earlier but the watches at Kohima and New Delhi show the same time because India follows one standard time all over its land. It is time shown at standard meridian of India. There is a general understanding among the countries of the world to select the Standard Meridian in multiples of 7° 30′ of longitude. Hence, 82°30′ E is chosen as the Standard Meridian of India and the time along the Standard Meridian of India passing through Mirzapur is taken as the Standard Time for the whole country.

CHAPTER 2: STRUCTURE AND PHYSIOGRAPHY



GIST OF THE LESSON

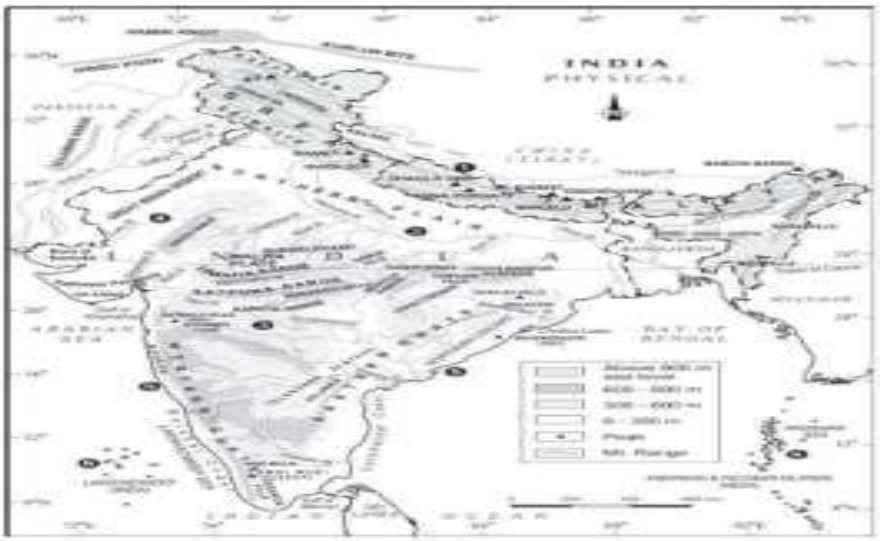
Geological divisions of India

1.The peninsular block
2. The Himalayas and other peninsular mountain
3. Indo Ganga Brahmaputra plain

Physiography

India can be divided into the following physiographic division

1.The north and North eastern mountain
2.The northern plain
3. The peninsular plateau
4.The Indian desert
5.The Coastal plane
6.The islands



Key points

1. The Peninsular Plateau is a prominent physiographic division in India.
2. The Indian Desert is a significant arid region in the northwest part of the country.
3. The Coastal Plains play a crucial role in India's geography and economy.
4. The Islands of India are divided into two major groups in the Bay of Bengal and the Arabian Sea.
5. The North and Northeastern Mountains include the Himalayas and Northeastern hills.
6. The Himalayas consist of parallel mountain ranges with different orientations in various regions.
7. The Great Himalayan range is the central axial range with a length of approximately 2,500 km.
8. The Andaman and Nicobar Islands are the two principal island groups in the Bay of Bengal.
9. The Andaman and Nicobar Islands are separated by the Ten degree channel.
10. The islands in the Bay of Bengal are believed to be an elevated portion of submarine mountains.
11. The Western Ghats are comparatively higher in elevation than the Eastern Ghats.
12. The average elevation of the Western Ghats is about 1,500 m.
13. The Western Ghats exhibit an increase in height from north to south.
14. The physiography of India includes various relief features and landforms.
15. The concept of water sheds is essential in understanding the drainage systems of India.16. The Himalayan drainage system and the peninsular drainage system are significant in India.
17. The Dodabeta peak is situated in the Nilgiri hills.
18. The Western Coastal Plain is devoid of any delta due to specific geological reasons.
19. The Arabian Sea and Bay of Bengal island groups have distinct characteristics.
20. Geomorphological features in river valley plains include floodplains, meanders, and levees.
21. Major Himalayan peaks can be identified from west to east using an atlas.
22. The physiography of different states in India influences the major economic activities practiced there.
23. The physiographic features of India have a significant impact on its climate and biodiversity.
24. The movement of tectonic plates has shaped the physiography of India over millions of years.
25. Understanding the physiography of India is crucial for various fields such as geography, geology, and environmental science.

MULTIPLE CHOICE QUESTIONS

-Assertion and Reasoning Questions

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

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

c) A is true but R is false.

d) A is false but R is true.

Q. 1 Assertion (A): The Himalayas are considered young fold mountains.

Reason (R): They were formed due to the collision of the Indian plate with the Eurasian plate.

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

Q.2.Assertion (A): The Peninsular Plateau is more stable than the Himalayan region.

Reason (R): The Peninsular Plateau is made up of hard, crystalline igneous and metamorphic rocks.

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

Q 3. Assertion (A): The Northern Plains are highly fertile and agriculturally productive.

Reason (R): These plains are formed by the deposition of alluvium brought by rivers originating in the Himalayas and the Peninsular Plateau.

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

Q 4.Assertion (A): The Western Ghats receive more rainfall than the Eastern Ghats.

Reason (R): The Western Ghats are parallel to the monsoon winds.

Answer: c) A is true but R is false.

Q.5.Assertion (A): The Indo-Gangetic plain has a low relief and gentle slope.

Reason (R): It is a tectonically active region formed due to recent upliftment.

Answer: c) A is true but R is false.

SHORT ANSWER QUESTION

Q.1.Island groups of the Bay of Bengal and the Arabian Sea are different in many ways. Explain

Ans- Difference between the island groups of the Bay of Bengal and the Arabian Sea:

Lakshadweep:

- Lakshadweep Islands group is lying close to the Malabar Coast of Kerala. - This group is composed of small coral Islands.
- It covers small area of 32 sq. km.
- Kavarati is the capital of Lakshadweep.

Andaman and Nicobar:

- These islands are close to equator and have thick forest cover.
- They are bigger in size and more in number.
- There is a great diversity of flora and fauna.
- It is believed that these Islands are elevated portion of submarine mountains

Q.2.India has the potential of Coastal Tourism and Port Development for Economic Growth. Comment.

Ans- India, with a coastline of over 7,500 km, has immense potential in coastal tourism and port development, both of which can significantly contribute to the nation's economic growth.

1. Coastal Tourism

Coastal areas are rich in natural beauty, cultural heritage, and biodiversity, attracting both domestic and international tourists.

-Economic Benefits: Employment generation: Jobs in hospitality, transport, water sports, and local crafts.

-Foreign exchange earnings: Increase in international tourist arrivals.

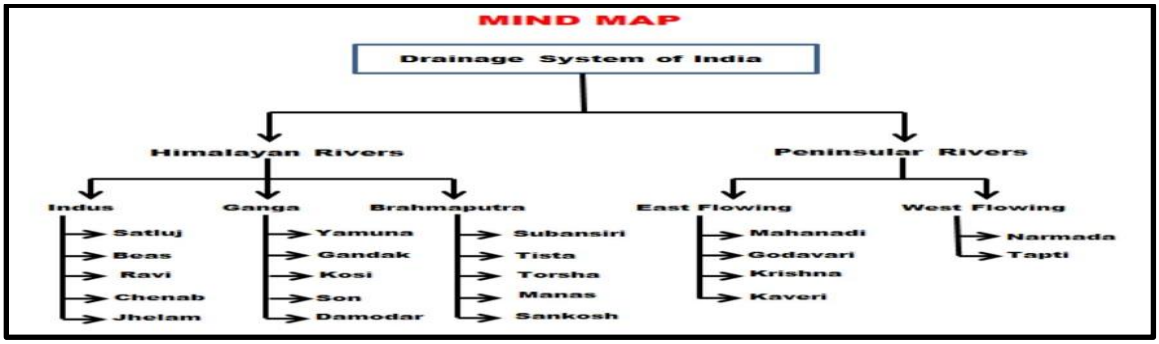
-Development of local economies: Growth in small businesses and services.
Popular Destinations: Goa, Kerala, Andaman & Nicobar Islands, Puducherry, Odisha's beaches.
-Sustainable Potential: Promotes eco-tourism, cultural tourism, and marine conservation.
2. Port Development
-Ports are gateways for international trade and are vital for import and export activities.
-Boost to trade and commerce: Efficient ports reduce logistics cost and time.
Industrial growth: Development of port-based industries and Special Economic Zones (SEZs).
-Employment: Jobs in shipping, warehousing, logistics, and construction.

LONG ANSWER QUESTIONS

Q 1: The formation of Himalayan mountain ranges have evolved in several phases. discuss
Answer: The Himalayas, one of the most prominent mountain ranges in the world, were formed as a result of the collision between the Indian Plate and the Eurasian Plate. This collision led to the upliftment of the Himalayas, creating a series of parallel mountain ranges with varying orientations in different regions of India. The Great Himalayas, also known as the central axial range, span approximately 2,500 km from east to west and have a width ranging from 160-400 km from north to south. The Himalayas act as a natural barrier between the Indian subcontinent and Central and East Asian countries, influencing the climate and biodiversity of the region. The range is characterized by diverse ecosystems, including alpine meadows, temperate forests, and snow-capped peaks, making it a hotspot for biodiversity and a crucial source of freshwater for the Indian subcontinent.

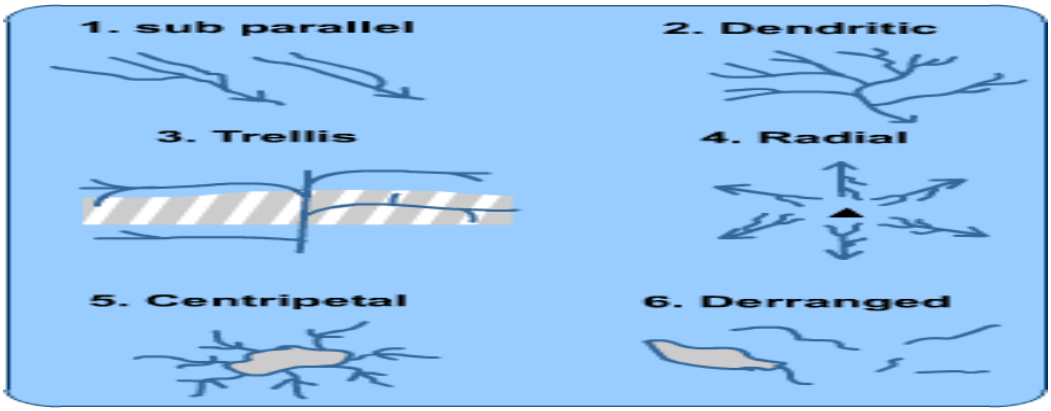
Q 2: The Peninsular Plateau in India is the oldest landmass of the indian subcontinent. Explain
Answer: The Peninsular Plateau in India is a vast elevated region characterized by its irregular triangular shape and relatively stable landmass. Rising from approximately 150 m above the river plains to elevations of 600-900 m, the plateau is bordered by prominent features such as the Delhi Ridge, Rajmahal Hills, Gir Range, and Cardamom Hills. This plateau is home to a series of patland plateaus, including the Hazaribagh Plateau, Palamu Plateau, Ranchi Plateau, Malwa Plateau, Coimbatore Plateau, and Karnataka Plateau. The Peninsular Plateau is one of the oldest landmasses in India and plays acrucial role in influencing the drainage patterns of the region. The general eastward slope of the plateau is reflected in the flow of rivers, which support fertile alluvial soils and sustain agricultural activities, contributing significantly to the economy and livelihoods of the local population.

CHAPTER 3.
DRAINAGE SYSTEM



GIST OF THE LESSON

1. DRAINAGE: The flow of water through well-defined channels.
2. DRAINAGE SYSTEM: The network of well-defined channels.
3. Catchment area: A river drains the water collected from a specific area.
4. Drainage basin: An area drained by a river and its tributaries.
5. Watershed: The boundary line separating one drainage basin from the other.
6. River basins: The catchments of large rivers.
7. Important Drainage Patterns: A) Dendritic B) Radial C) Trellis D) Centripetal.
8. On the basis of discharge of water (orientations to the sea), it may be grouped into:



(i) The Arabian Sea drainage; and (ii) the Bay of Bengal drainage.

9. On the basis of the size of the watershed: i) Major rivers ii) Medium rivers iii) Minor rivers.

10. On the basis of the mode of origin, nature and characteristics, the Indian drainage may also be classified into: i) the Himalayan drainage and ii) the peninsular drainage.

11. **DRAINAGE SYSTEMS OF INDIA:**

I) **THE HIMALAYAN DRAINAGE:**

a) It mainly includes (A) the Ganga, (B) the Indus and the (C) Brahmaputra river basins.

b) Characteristics: Fed by melting snow, precipitation, perennial, form V- shaped valley, rapids, waterfalls.Indo– Brahma River was dismembered into three main drainage systems: (i) the Indus and its five tributaries in the western part; (ii) the Ganga and its Himalayan tributaries in the central part; and (iii) the stretch of the Brahmaputra in Assam and its Himalayan tributaries in the eastern part.

13. THE RIVER SYSTEMS OF THE HIMALAYAN DRAINAGE:

(I) The Indus System; (II) The Ganga System; III) The Brahmaputra System.

14. **THE PENINSULAR DRAINAGE SYSTEM:** Older River system; shallow valleys; western ghats act as water divide; Most of the major Peninsular rivers except Narmada and Tapi flow from west to east.

15. The Evolution of Peninsular Drainage System: Three major geological events in the distant past have shaped the present drainage systems of Peninsular India: (i) Subsidence of the western flank of the Peninsula; (ii) Upheaval of the Himalayas; (iii) Slight tilting of the Peninsular block from northwest to the southeastern.
16. River Systems of the Peninsular Drainage: Mahanadi; Godavari; Krishna; Kaveri; Narmada and Tapi river systems.

Table 3.1 : Comparison between the Himalayan and the Peninsular River

Sl. No.	Aspects	Himalayan River	Peninsular River
1.	Place of origin	Himalayan mountain covered with glaciers	Peninsular plateau and central highland
2.	Nature of flow	Perennial; receive water from glacier and rainfall	Seasonal; dependent on monsoon rainfall
3.	Type of drainage	Antecedent and consequent leading to dendritic pattern in plains	Super imposed, rejuvenated resulting in trellis, radial and rectangular patterns
4.	Nature of river	Long course, flowing through the rugged mountains experiencing headward erosion and river capturing; In plains meandering and shifting of course	Smaller, fixed course with well-adjusted valleys
5.	Catchment area	Very large basins	Relatively smaller basin
6.	Age of the river	Young and youthful, active and deepening in the valleys	Old rivers with graded profile, and have almost reached their base levels

17. **EXTENT OF USABILITY OF RIVER WATER**: carry huge volumes of water per year; perennial rivers; During the rainy season, much of the water is wasted in floods and flows down to the sea. Similarly, when there is a flood in one part of the country, the other area suffers from drought. These problems be solved or minimized by transferring the surplus water from one basin to the water deficit basins.
18.**Namami Gange Programme',** is an Integrated Conservation Mission, approved as "Flagship Programme" by the Union Government in June 2014 with the twin objectives of effective abatement of pollution, conservation and rejuvenation of the National River Ganga.
Main pillars of the Namami Gange Programme are:
•Sewerage Treatment Infrastructure
•River-Front Development
•River-Surface Cleaning
• Bio-Diversity
• Afforestation
•Public Awareness
•Industrial Effluent Monitoring
•Ganga Gram

MULTIPLE CHOICE TYPE QUESTIONS

Assertion and Reasoning Questions
A) Both A and R are true, and R is the correct explanation of A.
B) Both A and R are true, but R is not the correct explanation of A.
C) A is true, but R is false.
D) A is false, but Ris true.
Q.1.ASSERTION (A): The Ganga River system is the largest river system in India.
REASON (R): The Ganga River has the maximum number of tributaries among allIndian rivers.

ANS- A)Both A and R are true, and R is the correct explanation of A.
Q.2. ASSERTION (A): The Himalayan rivers are perennial in nature.
REASON (R): The Himalayan rivers are fed by both rain and melting snow from the glaciers.
ANS- A) Both A and R are true, and R is the correct explanation of A.
Q.3. STATEMENT I: The Ganga River basin is the largest river basin in India.
STATEMENT II: The Ganga River is primarily fed by monsoonal rainfall.
Which one of the following is correct?
ANS- B) Both A and R are true, but R is not the correct explanation of A.
Q.4.Match Column I with Column II and choose the correct option:

COLUMN I (NAME OF THE RIVER)	COLUMN II (PLACE OF ORIGIN)
I. Godavari	1. Amarkantak plateau
II. Krishna	2. Brahmagiri hills
III. Kaveri	3. Mahabaleshwar in Sahyadri
IV. Narmada	4. Nasik district of Maharashtra

Options:
A) III – 1, IV – 2, II – 3, I – 4
B) III – 1, I – 2, II – 3, IV – 4
C) II – 2, III – 1, IV – 4, I – 3
D) IV – 1, III – 2, I – 4, II – 3
Ans D) IV – 1, III – 2, I – 4, II – 3
Q.5.Which of the following is Not a characteristic of Indian Peninsular rivers? A) Rivers Originates from central highland and Western Ghats.
B) Peninsular rivers have fixed course with well-adjusted valleys.
C) Rivers are at youthful stage.
D) Peninsular rivers are seasonal in nature and are dependent on Monsoon
rainfall.
Ans- C) Rivers are at youthful stage

SHORT ANSWER TYPES

.Q.1 East-flowing and West-flowing rivers of Peninsular India have different physiographic pattern. comment
ANSWER: The east-flowing and west-flowing rivers of Peninsular India havedistinct characteristics:
1. Direction of Flow: East flowing rivers, such as Godavari, Krishna and Kaveri flow towards the Bay of Bengal, whereas west flowing rivers, like the Narmada and Tapi, flow towards the Arabian Sea.
2. Delta Formation: East-flowing rivers generally form large deltas at their mouths due to the deposition of sediments, whereas west-flowing rivers form estuaries.
3. Length and Basin Size: East-flowing rivers tend to be longer with larger basins compared to west flowing rivers, which have shorter courses and smaller basins.

LONG ANSWER TYPE QUESTIONS: 5 MARKS

Q.1: The significance of interlinking of rivers in India is very important. Discuss its potential benefits and challenges.
ANSWER: River interlinking in India aims to transfer water from surplus regions to deficit areas, enhancing water availability.
BENEFITS:

1. WATER DISTRIBUTION: Balances water availability across region, aiding agriculture and drinking water supply.
2. FLOOD CONTROL: Reduces flood risks in surplus areas.
3. IRRIGATION: Increases irrigated land, boosting agricultural productivity.
4. HYDROELECTRIC POWER: Potential for hydroelectric power generation.
CHALLENGES:
1. ENVIRONMENTAL IMPACT: Alters ecosystems and affects biodiversity.
2. DISPLACEMENT: Displaces communities due to construction of reservoirs and canals.
3. COST: High financial burden on the government.
4. INTER STATE DISPUTES: Potential for conflicts between states over water sharing.
Q.2: “The Ganga is the most important river of India both from the point of view of its basin and cultural significance.” Justify the statement with suitable arguments.
ANSWER: The Ganga River system, originating from the Gangotri Glaciers in the Himalayas, is one of the most significant river systems in India.
CHARACTERISTICS:
1. PERENNIAL RIVER: Receives water from both rain and glaciers.
2. EXTENSIVE BASIN: Covers a large area including northern India.
3. MAJOR TRIBUTARIES: Includes rivers like Yamuna, Ghaghara and
Son.
4. ALLUVIAL PLAINS: Forms fertile plains, beneficial for agriculture.
IMPORTANCE:
1. AGRICULTURE: Supports irrigation, aiding food production.
2. CULTURAL SIGNIFICANCE: Sacred to Hindus, with numerous pilgrimage sites.
3. ECONOMIC ACTIVITY: Facilities fishing, transport and trade.
4. BIODIVERSITY: Supports diverse flora and fauna including endangered species like the Ganga River dolphin.
Q3: River pollution in India is a major concern. Suggest measures to control it.
ANSWER: CAUSES:
1. INDUSTRIAL DISCHARGE: Release of untreated industrial waste into rivers.
2. SEWAGE DISPOSAL: Dumping of untreated sewage from urban areas.
3. AGRICULTURAL RUNOFF: Runoff of pesticides and fertilizers from farmlands.
4. RELIGIOUS ACTIVITIES: Disposal of religious offerings and ashes.
EFFECTS:
1. HEALTH HAZARDS: Contaminated water leads to diseases like cholera and dysentery.
2. ECOSYSTEM DAMAGE: Affects aquatic life, reducing biodiversity.
3. WATER SCARCITY: Polluted water becomes unusable for drinking and irrigation.
4. ECONOMIC LOSS: Affects fisheries and tourism.
MEASURES:
1. TREATMENT PLANTS: Establishment of sewage and industrial effluents treatment plants.
2. REGULATIONS: Strict enforcement of pollution control laws.
3. PUBLIC AWARENESS: Educating the public on the impact of river pollution.
4. SUSTAINABLE PRACTICES: Promoting organic farming and proper waste disposal.

CHAPTER 4 CLIMATE

CLIMATE OF INDIA

TROPICAL MONSOON CLIMATE
(Seasonal reversal Of Wind Direction)

FACTORS INFLUENCING CLIMATE	RHYTHM OF SEASONS	IMPACT ON ECONOMIC LIFE
*Latitude	*Cold Weather Season (NE Monsoon)	*Agriculture
*Himalayas	*Hot Weather Season (Pre Monsoon)	*Types Of Crops Grown
*Distribution of Land & Sea	*SW Monsoon Season (Rainy Season)	*Food, clothing & house types
*Distance from Sea	*Retreating Monsoon Season (Autumn Season)	*Types of crops
*Altitude		*Drought, Flood, soil erosion
*Relief		*Temperature
*Atmospheric Pressure		
*Upper Air Circulation		

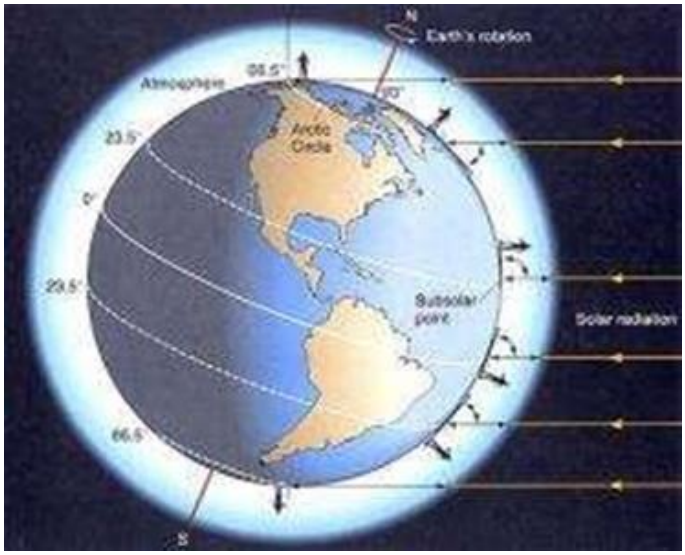
GIST OF THE CHAPTER:

Weather and Climate

Weather: The momentary state of the atmosphere, changing rapidly, within days or weeks.

Climate: The average weather conditions over a long period, noticeable over 50 years or more.

• Elements of Weather: Include temperature, pressure, wind direction and velocity, humidity and precipitation.



Monsoon Climate

India experiences a hot monsoonal climate, prevalent in South and Southeast Asia.

Monsoons are characterized by seasonal reversals in wind direction.

• Unity and Diversity:

The monsoon regime unifies India with Southeast Asia.

Despite this unity, regional climatic variations exist, creating sub-types of monsoon climate.

Examples: The climates of Kerala and Tamil Nadu differ significantly from Uttar Pradesh and Bihar, yet all experience monsoonal climate.

Regional Climatic Variations

• Temperature:

Extreme variations exist, such as temperatures reaching 55°C in Rajasthan during summer and dropping to -45°C in Leh during winter.Examples include Churu in Rajasthan recording over 50°C in June, while Tawang in Arunachal Pradesh

stays around 19°C on the same day.

• Rainfall:

Varies significantly across regions, contributing to different climatic sub-types.

The western coast receives heavy rainfall, whereas the interior of the Deccan Plateau remains relatively dry.

Factors Determining the Climate of India

• It can be broadly divided into two groups factors:

→ Factors related to location and relief:

Latitude

The Himalayan Mountains

Distance from the Sea

Distribution of Land and Water

Difference in Altitude

Relief

→ Factors related to air pressure and winds

Distribution of air pressure and winds on the surface of the earth.

• Upper air circulation caused by factors controlling global weather and the inflow of different air masses and jet streams.

• Inflow of 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.

Seasons in India.

• Meteorologists recognize four main seasons:

A. Cold Weather Season (winter):

▪ Starts by mid-November in northern India, with December and January being the coldest months.

▪ Mean daily temperatures fall below 21°C in northern India.

B. Hot Weather Season (summer):

▪ Begins in March, with the sun moving northward towards the Tropic of Cancer.

▪ April, May, and June are the hottest months in northern India, with temperatures ranging from 30°C to 48°C.

▪ Southern India experiences milder summers due to oceanic influences.

C. Southwest Monsoon Season:

▪ The onset of monsoons begins in early June over the Kerala coast, spreading across India by mid-July.

▪ Characterized by heavy rainfall and significant agricultural dependence.

D. Retreating Monsoon Season (autumn):

▪ Monsoon winds retreat by September, leading to a transition period with decreased rainfall.

Mechanism of the Monsoon

• Factors:

The Inter-Tropical Convergence Zone (ITCZ) and the shift in trade winds play crucial roles.
Monsoon winds are influenced by the Coriolis force, leading to the southwest monsoon.
The Himalayas act as a barrier, causing rainfall across the subcontinent

Break in the Monsoon

• Characteristics:

Periods when monsoon rainfall ceases for one or more weeks.
Different regions experience breaks for varied reasons, such as lack of rain-bearing storms or winds blowing parallel to the coast Impact of Monsoons

• Agriculture:

The monsoon is crucial for India's agricultural cycle, with 64% of the population relying on agriculture.
Variability in rainfall can lead to droughts or floods, affecting crop yields.
Adequate and timely distributed rainfall is essential for agricultural prosperity.
Global Warming and Climate Change
A. Rising global temperatures due to human activities like industrialization and pollution.
B. Carbon dioxide emissions from fossil fuel combustion are significant contributors to global warming.
C. Climate change impacts weather patterns, leading to more extreme and unpredictable climatic Conditions.

MULTIPLE CHOICE QUESTIONS

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Q1. The phenomenon of El Niño is associated with:
A) Changes in wind patterns in the Atlantic Ocean
B) Changes in the temperature of ocean currents in the Pacific Ocean
C) Changes in precipitation patterns in Europe
D) Changes in atmospheric pressure in the Indian Ocean
Ans- B) Changes in the temperature of ocean currents in the Pacific Ocean
.Q2 A farmer notices that the monsoon season is delayed and the rainfall is less than usual. Which of the following actions would be the most effective in addressing the situation?
A) Planting the same crops as usual.
B) Switching to drought-resistant crops.
C) Increasing the use of chemical fertilizers.
D) Irrigating fields using the same methods as in previous years.
Ans- B) Switching to drought-resistant crops.
Q3. If a region experiences a sudden increase in temperature and a decrease in rainfall over a few years, which of the following impacts is most likely to occur?
A) Expansion of forest cover.
B) Increased agricultural yields.
C) Desertification of the area.
D) Increase in water bodies.
Ans - C) Desertification of the area.

Assertion and Reasoning Questions

A) Both A and R are true, and R is the correct explanation of A.
B) Both A and R are true, but R is not the correct explanation of A.
C) A is true, but R is false
D) A is false, but R is true.
Q.4.Assertion (A): The Indian subcontinent experiences a monsoon type of climate.

Reason (R): The monsoon climate in India is influenced by the differential heating of land and water.
Ans- A) Both A and R are true, and R is the correct explanation of A.
Q5. Assertion (A): The Western Ghats receive heavy rainfall during the monsoon season.
Reason (R): The Western Ghats obstruct the moisture-laden winds coming from the Arabian Sea, causing orographic rainfall.
Ans-(A) Both A and R are true, and R is the correct explanation of A
Q6. Assertion (A): The coastal areas of India have a moderate climate.
Reason (R): The coastal areas are influenced by the moderating effect of the sea, which reduces temperature extremes.
Ans- A) Both A and R are true, and R is the correct explanation of A.

SHORT ANSWER QUESTION

Q1.The main features of cold weather season is cold wave in northern india. explain
Ans. -Winter starts around mid-November and lasts till February.
-December and January are the coldest months in northern India.
-Temperature decreases from south to north.
-Days are warm, while nights are cold with clear skies, low humidity, and variable winds.
-This season is crucial for cultivating “rabi” crops.
Q2. El Niño affect the Indian monsoon? How?
Ans- El Niño affects the Indian monsoon in the following ways:
1. Reduction in Monsoon Rainfall: During El Niño years, the sea surface temperatures in the Pacific Ocean rise significantly, altering global weather patterns. This change often results in a weakening of the Indian monsoon. Regions across India experience below- average rainfall, which can lead to drought conditions in some parts of the country.
2. Impact on Agricultural Output: The reduced monsoon rainfall influenced by El Niño can have severe implications for agriculture in India. Crops dependent on timely and sufficient rainfall may suffer, leading to lower agricultural yields. This affects the livelihoods of millions of farmers and can contribute to food insecurity and economic challenges.
3. Temperature Variations: El Niño can also lead to variations in temperature across different parts of India. Some regions may experience higher temperatures than usual, exacerbating the effects of reduced rainfall on crops and water resources. This temperature variability can further complicate agricultural planning and management during the monsoon season.
Q3. Write the salient features of Advancing Monsoon (The Rainy Season).
Ans- -The southwest monsoon originates from southeast trade winds over warm subtropical areas,crossing the equator and entering India as the southwest monsoon.
-The monsoon covers the country for about a month, with regions like Mawsynram in the Khasi Hills receiving the highest average rainfall globally.
-The monsoon is characterized by breaks in rainfall, influenced by the movement of the monsoon trough and the frequency and intensity of tropical depressions.

LONG ANSWER QUESTION

Q1. There are many distinct seasons are found in India as per the Indian Meteorological Department? Discuss the weather conditions associated with any one season in detail.
Ans. In India, as per the Indian Meteorological Department, there are four distinct seasons:
(a) Winter Season (from December to February)
(b) Summer Season (from March to May)
(c) Southwest monsoon season (from June to September)

(d) Retreating Monsoon (from October to November).
Retreating/Post Monsoons (The Transition Season):
● October-November marks the transition from the hot rainy season to dry winter conditions.
● The retreat of the monsoon brings clear skies and rising temperatures.
● Day temperatures are high, while nights are cool and pleasant.
● Towards the end of October, temperatures start to decrease rapidly in northern India.
Q2. So many factors determine the climate of India. Discus
Ans-
• Latitude: India stretches across different latitudes, resulting in varied climates. The southern parts near the equator are tropical with consistently high temperatures, while the northern regions have sub-tropical and temperate climates with more temperature variations.
• Himalayan Mountains: The Himalayas act as a barrier that blocks cold northern winds and influences the path of monsoon winds. They cause these winds to release moisture over India, affecting rainfall patterns.
• Land and Water Distribution: India's positioning with the Indian Ocean on three sides affects its climate. Coastal areas have milder climates due to the ocean's moderating influence, while inland regions experience more extreme weather variations.
• Altitude: Temperature decreases as altitude increases. Mountainous regions like Darjeeling, at higher altitudes, are cooler than plains areas like Agra, even if they are at similar latitudes.
• Relief: Geographical features such as mountains and plateaus affect India's climate. Regions like the windward side of the Western Ghats receive heavy rainfall during monsoons, while the leeward side remains dry due to sheltering from rain-bearing winds.

CHAPTER 5: NATURAL VEGETATION

GIST OF THE LESSON

Meaning: Natural vegetation refers to the plant life that grows naturally in an area without human intervention. It includes all forms of plant life such as forests, grasslands, and shrubs that occur in a region.

Types of Forest in India

1. **Tropical Evergreen and Semi Evergreen Forests:**

• Found in areas with heavy rainfall.

• Dense and multi-layered with a variety of trees.
• Common in Western Ghats, Andaman and Nicobar Islands, and parts of North-East India.

2. **Tropical Deciduous Forests:**
• Also known as monsoon forests.
• Shed their leaves in the dry season to conserve water.
• Found in areas with moderate rainfall.
• Spread across the central and northern parts of India.

3. **Tropical Thorn Forests:**
• Found in regions with low rainfall.
• Trees are small, thorny, and have thick bark.
• Predominant in Rajasthan, Gujarat, and parts of Haryana.

4. **Montane Forests:**
• Found in mountainous areas.
• Vary with altitude, including temperate forests and alpine vegetation.
• Common in the Himalayan region.

5. **Littoral and Swamp Forests (Mangrove Forests):**
• Found in coastal areas and estuaries.
• Trees have stilt roots to survive in salty waters.

As of the latest data, India's forest cover is around 21.71% of its total geographical area. The government categorizes forest cover into three types:
• Very Dense Forests: Canopy density of 70% and above.
• Moderately Dense Forests: Canopy density between 40% and 70%.
• Open Forests: Canopy density between 10% and 40%.

Forest Conservation

India has implemented several measures to conserve its forests:

1. Forest Conservation Act, 1980: Restricts deforestation and the use of forest land for non- forest purposes without central government approval.
2. National Afforestation Programme: Promotes afforestation and reforestation activities.
3. Joint Forest Management: Involves local communities in the protection and management of forests.

Social Forestry

Social forestry aims to involve the local population in forest management and afforestation projects to meet the needs of rural and urban people. It includes:

1. Agro forestry: Combining agricultural crops with tree planting.
2. Community Forestry: Community involvement in raising and protecting trees.
3. Urban Forestry: Planting trees in urban areas to improve the environment.

Farm Forestry

Farm forestry involves farmers growing trees on their own land. This practice helps in meeting the demand for timber, fuel, fodder, and other forest products, reducing the pressure on natural forests.

Wildlife in India

India is home to diverse wildlife, including mammals, birds, reptiles, and amphibians. Notable species include the Bengal tiger, Indian elephant, Indian rhinoceros, and various species of deer and antelope. It's estimated that around 4-5% of all known plant and animal species on Earth are found in India, owing to its diverse ecosystems preserved over ages. However, human activities have disturbed their habitats, leading to a significant decline in their numbers. Some species are on the verge of extinction.

Several factors contribute to the decline of wildlife:

1. Industrial and technological advancements have led to increased exploitation of forest resources.
2. Expansion of agriculture, human settlements, roads, mining, and reservoirs has resulted in habitat loss.
3. Local communities cut trees for fodder and fuel wood, affecting wildlife and their habitat.
4. Hunting, once a sport for the elite, has now turned into commercial poaching.
5. Forest fires also pose a threat to wildlife and their habitats.

Recognizing the importance of wildlife conservation for national and global heritage, as well as the promotion of ecotourism, the government has taken steps in this direction.

Wildlife Conservation in India

Efforts for wildlife conservation include:

1. Wildlife Protection Act, 1972: Provides legal protection to wildlife and establishes protected areas.
2. Project Tiger: Launched in 1973 to conserve the Bengal tiger.
3. Project Elephant: Launched in 1992 to protect elephants and their habitats.
4. Protected Areas: Includes national parks, wildlife sanctuaries, and conservation reserves.

Biosphere Reserves

Biosphere reserves are areas designated to promote the conservation of biodiversity, research, and sustainable development. India has several biosphere reserves, including:

1. Nilgiri Biosphere Reserve: Encompasses parts of Tamil Nadu, Kerala, and Karnataka.
2. Sundarbans Biosphere Reserve: Famous for its mangrove forests and Royal Bengal tigers.
3. Gulf of Mannar Biosphere Reserve: Known for its marine biodiversity.
4. Nanda Devi Biosphere Reserve: Located in the Himalayan region, it supports a wide range of flora and fauna.

MULTIPLE CHOICE QUESTIONS

Assertion and Reasoning

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

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

c A is true but R is false.

d A is false but R is true.

Q.1 Assertion (A) : The dry deciduous forests are found in areas having rainfall between 90 cm and 80 cm.

Reason (R): The forests are found in the rainer parts of the peninsular plateau and the plains of Bihar and Uttar Pradesh.
Ans- d) A is false but R is true.
Q.2 Assertion (A): The mangrove tidal forests are found in the areas of coasts influenced by tides.
Reason (R) : At higher elevations, temperate grasslands are common.
Ans-b)Both A and Rare true but R is not the correct explanation of A.
Q.3 Assertion (A) : India is also rich in its fauna.
Reason (R): It has more than 90,000 of animal species.
Ans-a) Both A and R are true and R is the correct explanation of A.
Q.4 Assertion (A): Thorn Forests and scrubs receive less than 70 cm of rainfall.
Reason (R): This type of vegetation is found in the north-western part of the country.
Ans-c)A is true but R is false.
Q.5 Assertion (A) : In India almost the entire rainfall in brought in by the advancing southwest monsoon and retreating monsoons.
Reason (R) : Areas of heavy rainfall have more dense vegetation as compared to other areas of heavy rainfall.
Ans-d) A is false but R is true.

SHORT ANSWER QUESTIONS

Q1).India has different types natural vegetation. Under what climatic conditions do tropical evergreen forests develop?
Answer: 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. India is a land of great variety of natural vegetation.
Tropical Evergreen forests are found in the western slope of the Western Ghats, hills of the north eastern region and the Andaman and Nicobar Islands. They are found in warm and humid areas with an annual precipitation of over 200 cm and mean annual temperature above 22°C.
Q2). social forestry is a part of rural area in India. comment
Answer: 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:
1. Urban forestry,
2. Rural forestry and
3. Farm forestry.
Q3). Biosphere reserves conserve diversity flora and fauna in India. Justify
Answer: 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 (MAB) Programme. The Biosphere Reserve aims at achieving the three objectives:
• Conservation of biodiversity and ecosystem
• Association of environment with development;
• Providing international network in research and monitoring.

LONG ANSWER QUESTIONS

Q1. national forest policy has got various objectives to fulfil. What are they?
Ans: Objectives of new forest policy are:

• Bringing 33% of the geographical areas under forest cover.
• Maintaining environmental stability and to restore forests where ecological balance was disturbed.
• Conserving the natural heritage of the country.
• Its biological diversity and gentle pool.
• Checks soil erosion extension of the deserts land and reduction of floods and droughts.
• Increasing the forest cover through social forestry and afforestation on degraded lands.
• Increasing the productivity of forest to make timber, fuel, fodder and food available to rural population dependent on forests and encourage the substitution of wood.
• Creating massive people's movement involving women to encourage planting of trees, stop felling of trees and thus, reduce pressure on the existing forest.

Q 2. wildlife in India is in danger. comment

Answer: Important reasons for the decline of Wildlife in India are-

• Industrial and technological advancement brought about a rapid increase in the exploitation of forest resources.
• More and more lands were closed for agriculture, human settlement, roads, mining, resources, etc.
• Pressure on forests maintained due to looping for fodder and fuel, wood and removal of small timber by the local people.
• Grazing by domestic cattle caused an adverse effect on wildlife and its habitat.
• 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.
• Incidence of forest fire.

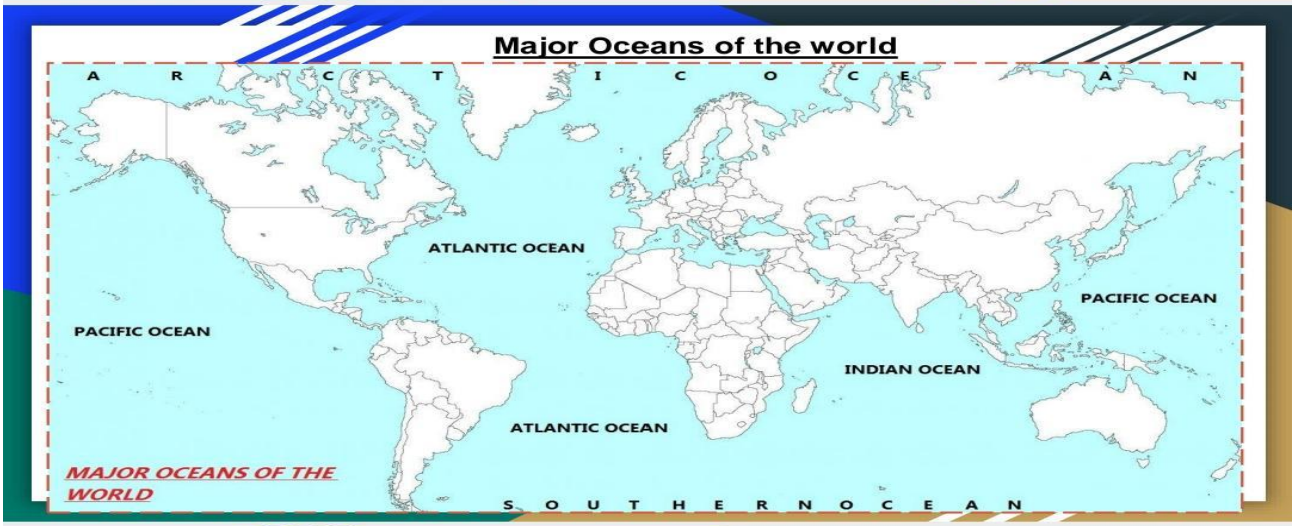
Chapter 6 : Natural Hazards and Disasters

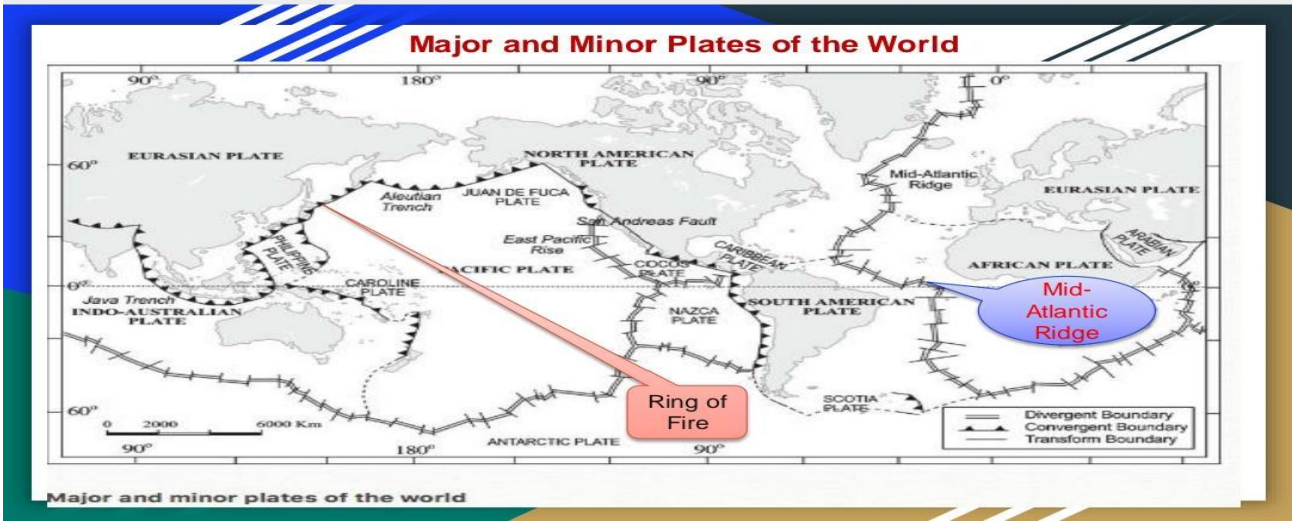
(To be tested through internal assessments in the form of project and presentation)

MAP WORK

Book 1 World map

Chapter 4 Distribution of Oceans and continents



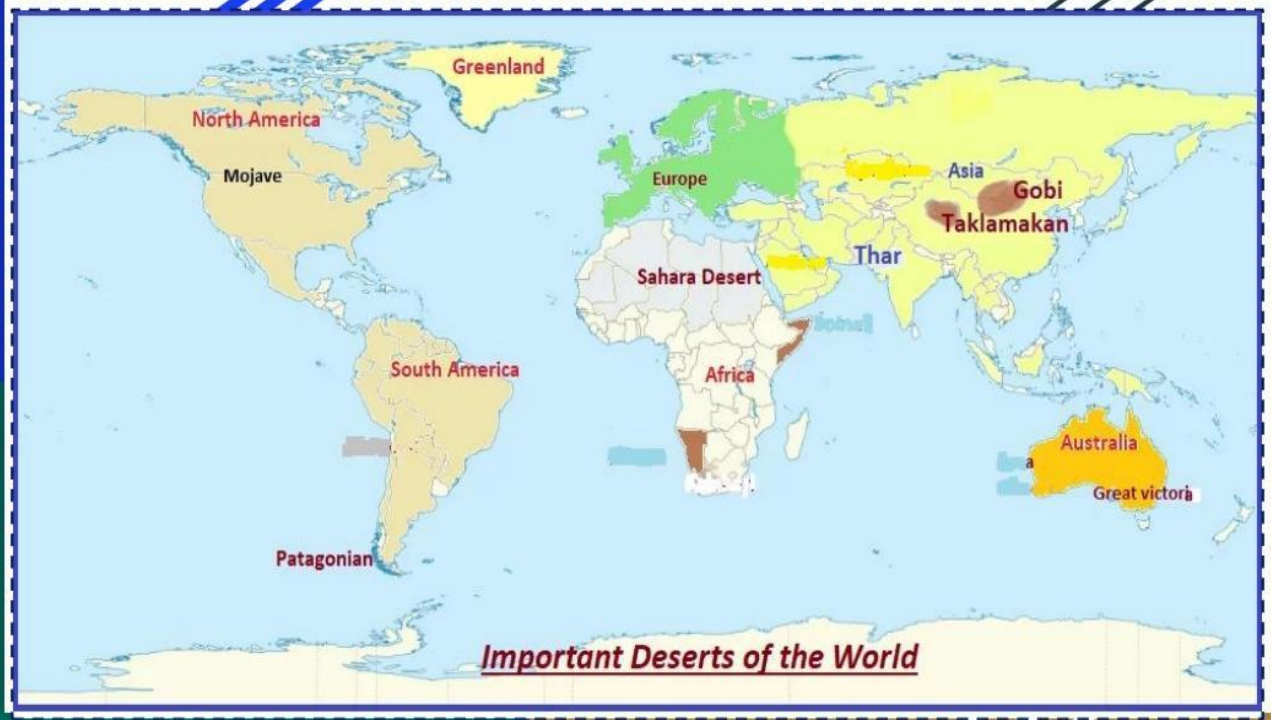


CHAPTER 9 ATMOSPHERIC CIRCULATION AND WEATHER SYSTEM

Major Hot Desert of The World

1. Mojave Desert- Nevada, US
2. Patagonian Desert- Argentina
3. Sahara- Africa
4. Gobi Desert- Mongolia, Asia
5. Thar desert- India
6. Great Victoria desert- Australia

Major Hot Desert of The World



1. Locate and Label following major seas on the physical map of the World.

1. Black sea
2. Baltic sea
3. Caspian Sea
4. Mediterranean Sea
5. North Sea
6. Red sea
7. Bay of Fundy (Canada)-Famous for the highest tides in the world

1. Locate and Label following ocean currents on the physical map of the World.

A. Cold Currents–

1. Humboldt Current
2. California Current
3. Falkland Current
4. Canaries Current
5. West Australian Current
6. Oyashio Current
7. Labrador Current

B. Warm Currents–

1. Alaska Current
2. Brazilian Current
3. Aughlas Current
4. Kuroshio Current
5. Gulf stream Current

Major Ocean Currents

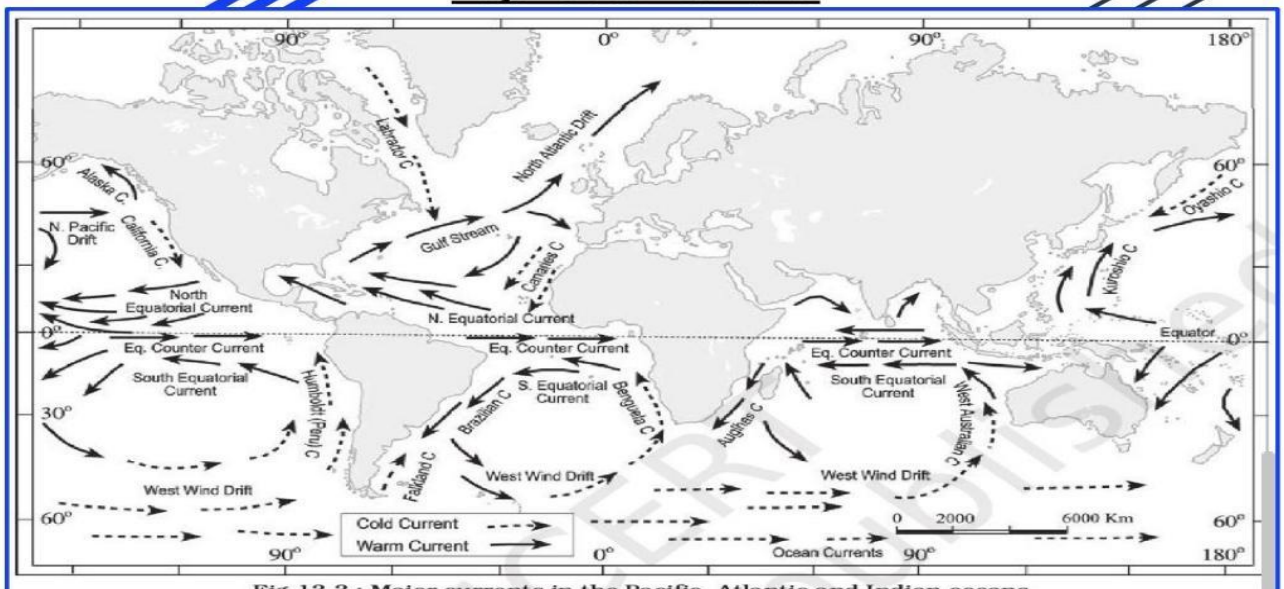
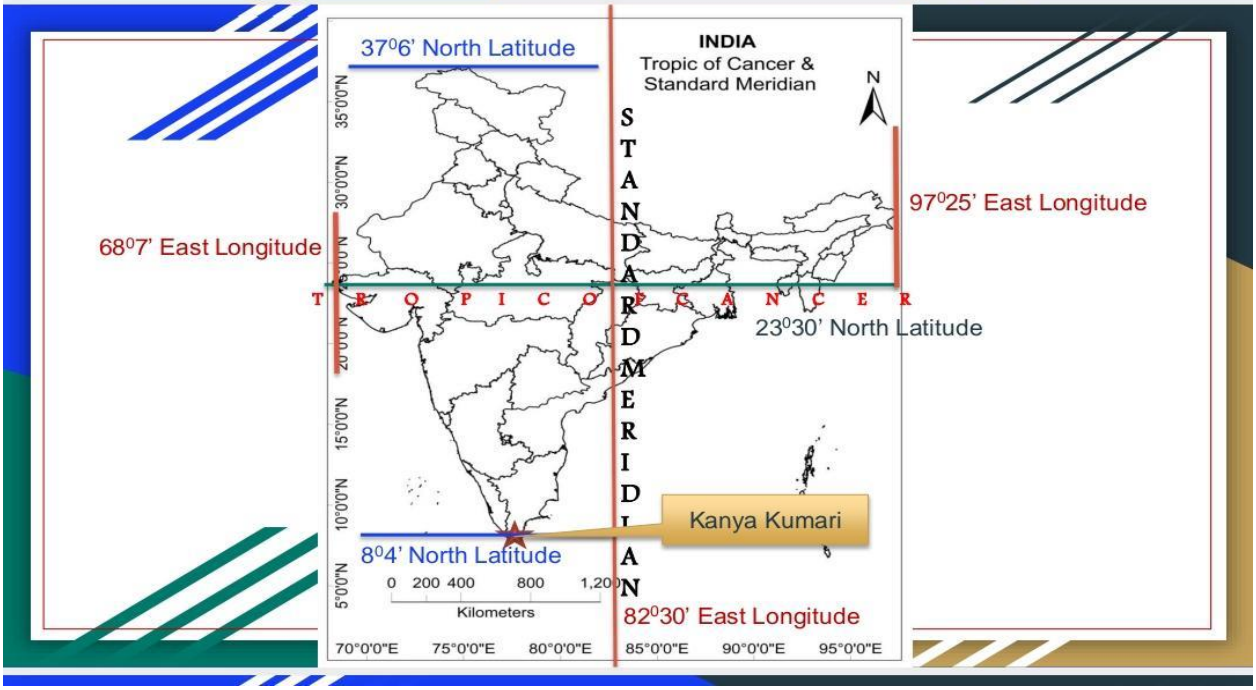


Fig. 13.3 : Major currents in the Pacific, Atlantic and Indian oceans

CHAPTER: 1- INDIA- LOCATION

Q1. Locate and label following features on political map of India.

1. Latitudinal extent of India.
2. Longitudinal extent of India.
3. Standard Meridian of India.
4. Important latitude passing through India (Tropic of Cancer).
5. Southern Most Point of main land of India (Kanya Kumari).



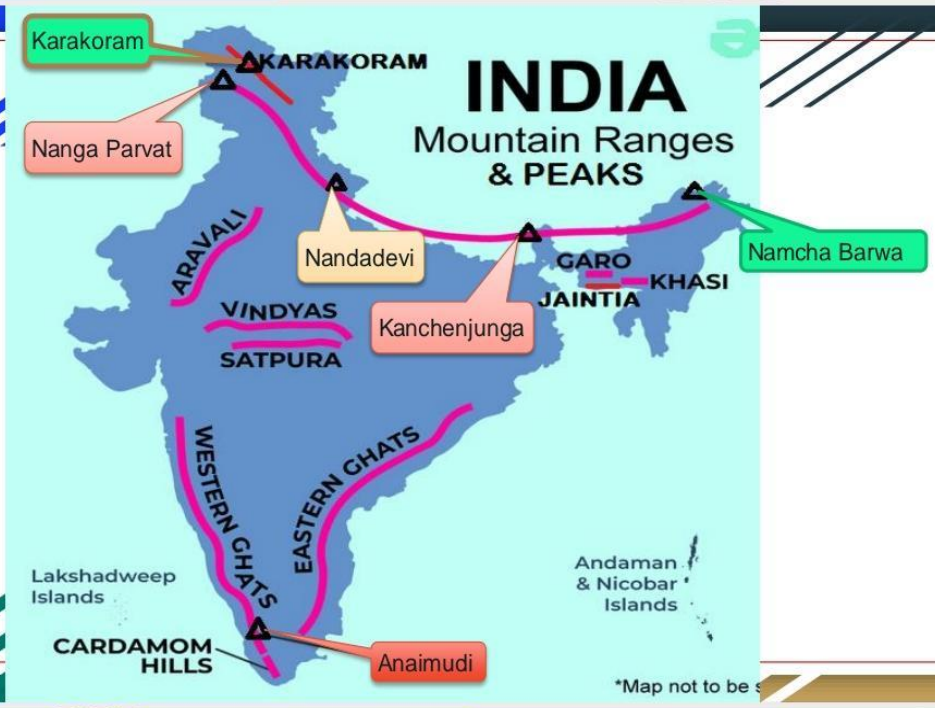
CHAPTER 2
STRUCTURE AND PHYSOGRAPHY

CHAPTER: 2- STRUCTURE AND PHYSIOGRAPHY

Q1. Locate and label following features on political map of India.

A. Mountains: Karakoram Range, Garo- Khasi- Jaintia hills, Aravalli Range, Vindhyan Range, Satpura Range, Western ghats & Eastern ghats.

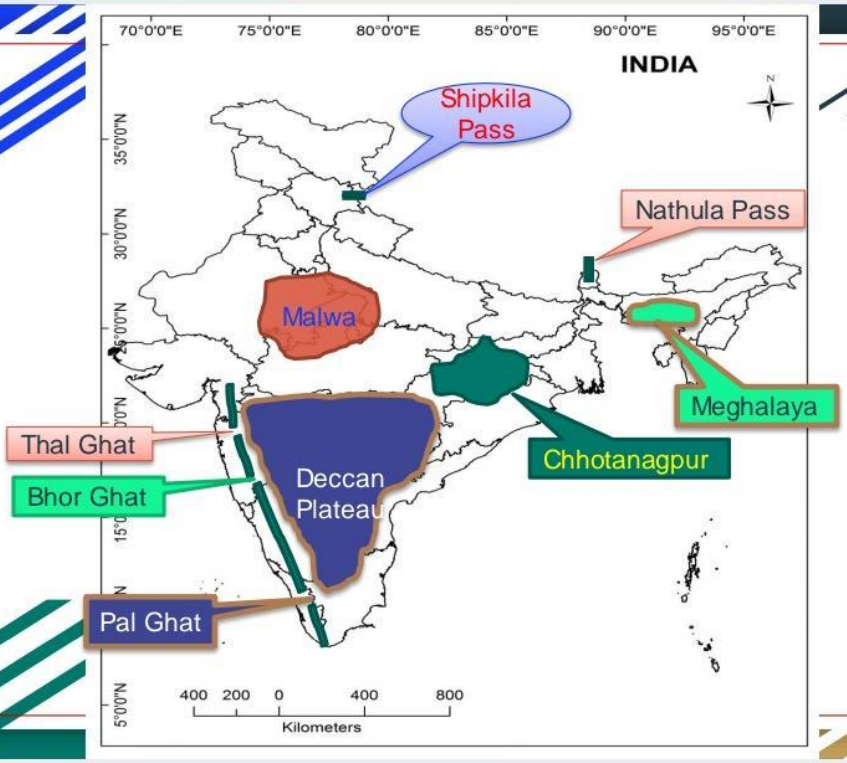
B. Peaks: K2, Kanchenjunga, Nandadevi, Nanga Parvat, Namcha Barwa and Anaimudi.



Q2. Locate and label following features on political map of India.

C. Plateaus: Malwa, Chhotanagpur, Meghalaya and Deccan Plateau.

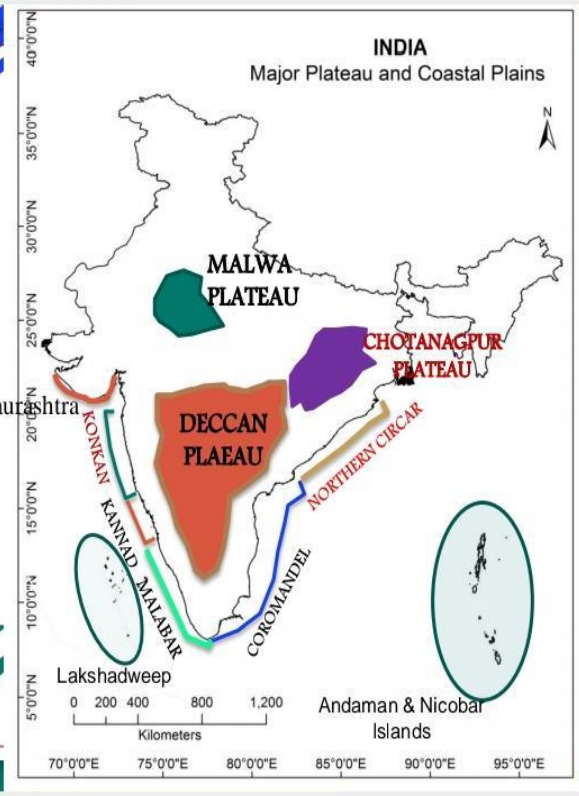
D. Passes: Shipkila, Nathula, Palghat, Bhor ghat and Thal ghat.



Q3. Locate and label following features on political map of India.

E. Coastal Plains: Saurashtra, Konkan, North and South Kanara, Malabar, Coromandel and Northern Circar.

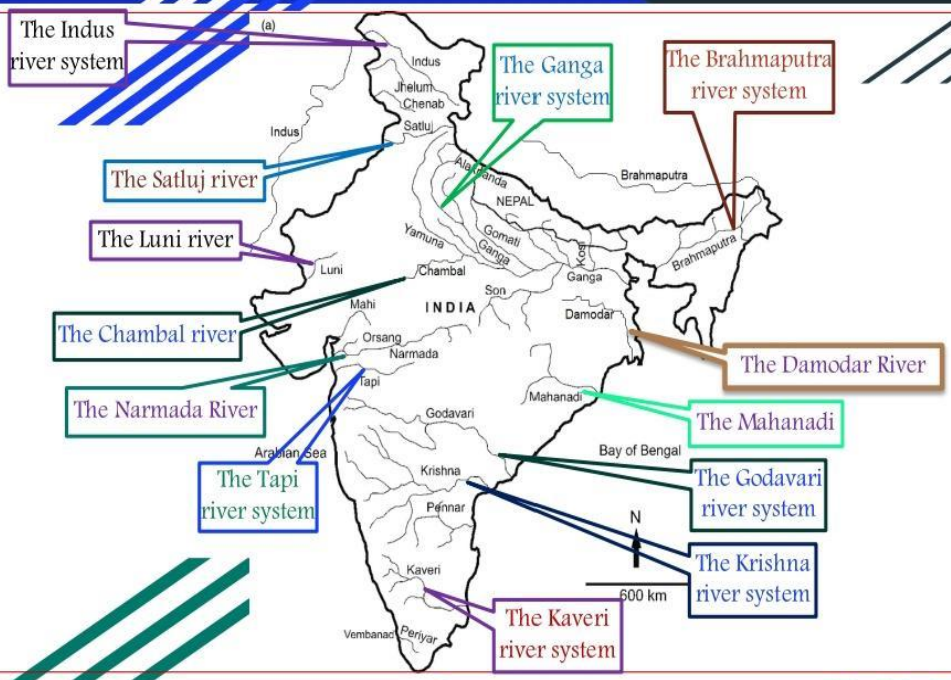
F. Islands: Andaman & Nicobar Islands and Lakshadweep Islands.



CHAPTER: 3- DRAINAGE SYSTEM

Q1. Locate and label following features on political map of India.

A. Rivers: Brahmaputra, Indus, Satluj, Ganga, Yamuna, Chambal, Damodar Mahanadi, Krishna, Kaveri, Godavari, Narmada, Tapti and Luni.



Q2. Locate and label following features on political map of India.

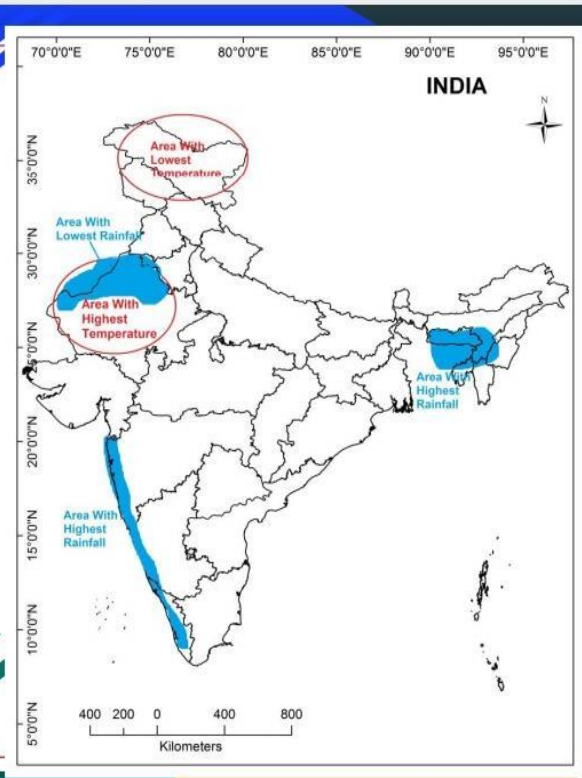
B. Lakes: (Identification) Wular, Sambhar, Chilika, Kolleru, Pulicat & Vembanad.

C. Straits, Bays, Gulfs: Palk Strait, Rann of Kachchh, Gulf of Kachchh, Gulf of Mannar & Gulf of Khambat.

CHAPTER: 4- CLIMATE

Q1. Locate and label following features on political map of India.

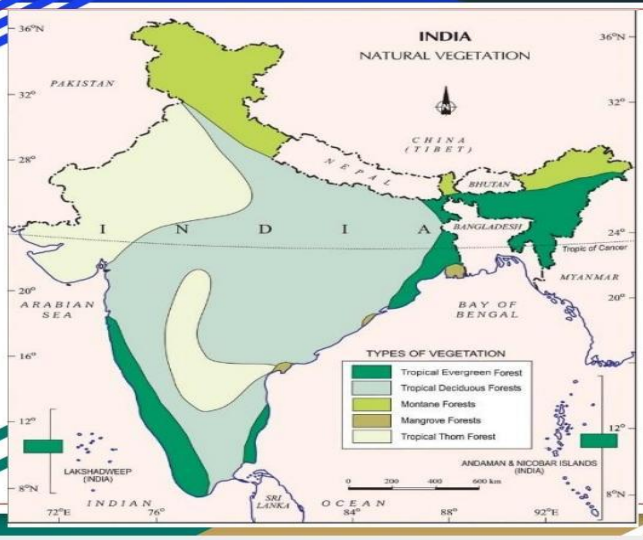
- Area with highest temperature in India
- Area with lowest temperature in India
- Area with highest rainfall in India
- Area with lowest rainfall in India



CHAPTER: 5- NATURAL VEGETATION

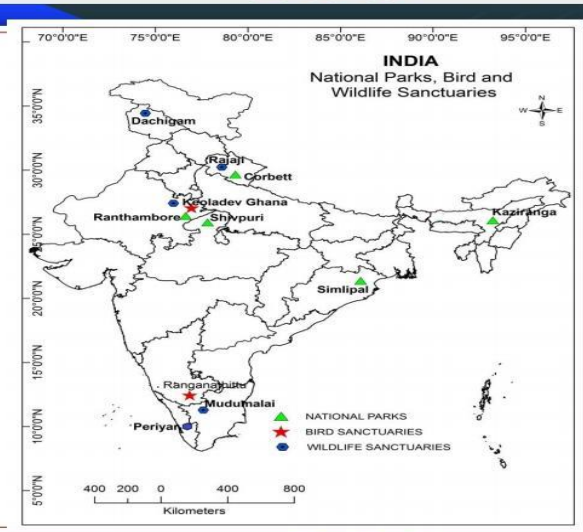
Q1. Locate and label following features on physical map of India.

✓ Tropical evergreen, Tropical deciduous, Tropical thorn, Montane and Littoral/Swamp forests.



Q2. Locate and label following features on physical map of India.

- ✓ **National Parks:** Corbett, Kaziranga, Ranthambore. Shivpuri, Simlipal
- ✓ **Bird Sanctuaries:** Keoladev Ghana and Ranganathittu
- ✓ **Wild life Sanctuaries:** Periyar, Rajaji, Mudumalai, Dachigam,



Solved sample Question paper and session ending

KENDRIYA VIDYALAYA SANGATHAN
SESSION ENDING EXAMINATION (2024-25)

CLASS XI
SUBJECT : GEOGRAPHY

MAX MARKS: 70
TIME : 3 Hours

Blue Print

Sl no.	Name of chapter (Book –I) Fundamental of Physical geography	MCQS (1 MARKS)	SA (3 MARKS)	LQ (5 MARKS)	MAP SKILL(5+5)10 MARKS	TOTAL MARKS
	UNIT -I GEOGRAPHY AS A DISCIPLINE					
1	Geography as a discipline		1(3)			3
	UNIT-II THE EARTH					
2	The origin and evolution of earth	1(1)				9
3	Interior of the Earth	1(2)				
4	Distribution of ocean and continent	1(1)		1(5)		
	UNIT-III LANDFORMS					
5	Geomorphic processes	1(1)				6
6	Landform and their evolution			1(5)		
	UNIT-IV CLIMATE					
7	Composition and structure of Atmosphere		1(3)			8
8	Solar Radiation, Heat balance and Temperature		1(3) SBQ			
9	Atmospheric Circulations and Weather Systems	1(1)				
10	Water in the Atmosphere	1(1)				
11	World Climate and Climate Change (To be tested through internal assessments in the form of project and presentation)					
	UNIT-V Oceans					
12	Water (Oceans)	1(1)				4
13	Movements of Ocean Water		1(3)			
	Unit-VI Life on the Earth					
14	Biodiversity and Conservation (To be tested through internal assessments in the form of project and presentation)	-	-	-	-	-
	MAP				5(1)	5
	TOTAL	8	12	10	5(1)	35
	Book –II India Physical Environment					
	Unit-I Introduction					
1	India location	1(2)	1(3)			5
	Unit II Physiography					
2	Structure and Physiography	1(1)		1(5)		13
3	Drainage System	1(2)		1(5)		
	Unit III Climate Vegetation and Soil					
4	Climate	1(3)		1(5)		12
5	Natural Vegetation	1(1)	1(3) SBQ			
	Unit-IV Natural Hazards and Disasters: Causes Consequences and Management					
6	Natural Hazards and Disasters (To be tested through internal assessment in the form of Projects and presentation)	-	-	-	-	-
	MAP				1(5)	5
	Total	9	6	15	1(5)	35
	GRAND TOTAL (70)	17(1)	6(3)	5(5)	(5+5)10	70

*Figure inside the bracket () indicates Marks of the Question and out side the bracket indicates Number of Questions.

Session Ending Examination

Subject – Geography

Time – 3Hrs **Class- XI** **MM- 70**

General Instructions

1.There are 30 questions in all.

2.All questions are compulsory.

3.Marks for each question are indicated against it.

4.There are 5 sections in question paper- A, B, C , D and E .

5. SECTION A – Question No 1 to 17 is multiple choice questions carrying one mark each.

6. SECTION B & C – Question NO 18 to 23 are short answer questions carrying 3 marks each. Answer to each of these questions should not exceed 80 words.

7. SECTION D- Question No 24 to 28 are long answer questions of 5 marks each. Answer to each of these questions should not exceed 120 words

8. SECTION E – Questions No 29 and 30 are related to Identification or labeling of geographical features on maps. Every questions carries 5 marks each.

Section – A (Q1 to 17) (1 Marks each)

1.Which one of the following disciplines attempt temporal synthesis?

a) Sociology b)Geography c)Anthropology d)History

2.Light year is used to measure-

a) Years b) Light c) Distance d) Diameter

3.Arrange the layers of the earth in sequence from exterior to interior.

1. Crust 2. Outer Core 3. Inner Core 4. Mantle

Codes:

a)1-4-3-2 b) 1-4-2-3 c)1-2-3-4 d) 1-3-2-4

4.Match column I with column II and select the correct answer using the codes given below :

Column I	Column II
1.Cocos plate	A. Between South America and Pacific plate
2.Nazca plate	B. North – East of Australia
3.Caroline plate	C. Between Central America and Pacific Plate
4.Fuji plate	D. Between Phillippines and Indian plate

Code :

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

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

5.Assertion (A): Human beings have no role in biological weathering.

Reason I: Human beings help in creating new contacts between air, water and minerals in earth materials by disturbing vegetation and ploughing soils.

Codes

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

6.Which of the following correctly defines meanders?

a) Large natural hollow in cliff.
b) Loop like channel patterns develop over flood and delta plain.
c) Ridge of sand and shingle in off- shore zone of sea.

d) Off-shore bar exposed due to addition of sand.

7.Which of the given statement is incorrect ?

a)The atmosphere is composed of gases, water vapour and dust particles.

b)Ozone absorbs the harmful ultra-violate radiation received from Sun.

c)Water vapour increases from equator towards the pole

d)Dust particles act as hygroscopic nuclei.

8.Which of the following is/are the factors responsible for variation in insolation ?

1.The rotation of the Earth on its axis.

2.The length of the day.

3.Transparency of the atmosphere.

Code:

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

9.Which of the following are the lines connecting places having equal pressure?

a) Isobars b) Isoclinic c) Isoneph d) Isohyet

10. When the moisture is deposited in the form of water droplets on cooler surface of solid objects such as stone, grass blades and plant leaves, it is known as :

a) Dew b) Frost c) Fog d) Mist

11.The distance between the Earth and the moon is minimum when the moon is in—----------

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

12.Which of the following countries is/are larger than India in terms of area?

1.USA 2. Canada 3. China

Codes:

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

13.Consider the following about the Thar desert and choose the option which is correct ?

1.It lies to the northwest of Aravali hills.

2.It is covered with Barchans.

3.It has tropical evergreen climate.

Codes :

1 and 2 b) 1 and 3 c) 2 and 3 d) 1,2 and 3

14.Which of the following rivers is known as sorrow of Bihar :

a) Damodar b) Kosi c) Son d) Chambal

15.Which of the following statements about the south west monsoon is correct?

(a) Monsoon winds blow from the land to the sea in summer.

(b) Monsoon winds blow from the sea to the land in summer.

I Monsoon winds blow from the land to the sea in winter.

(d) Monsoon winds blow from the sea to the land in winter.

16.What causes rainfall on the coastal areas of Tamil Nadu in the beginning of winters?

(a) South-West monsoon (b) North-Eastern monsoon

I Temperate cyclones (d) Local air circulation

17.Which one of the following proportion of area of the country was targeted to be under forest in Forest Policy of India?

(a) 33% (b) 55% (c) 44% (d) 22%

SECTION B (Q.No.18-19)(3 Marks each)

SOURCE BASED

Read the following passage and answer the question that follows :

Q.18.The salinity for normal open ocean ranges between 33 o/oo and 37 o/oo. In the land locked Red Sea. It is as high as 41 o/oo, while in the estuaries and the Arctic, the salinity fluctuates from 0-35 o/oo, seasonally. In hot and dry regions, where evaporation is high, the salinity sometimes reaches to 70o/oo.

The salinity variation in the Pacific Ocean is mainly due to its shape and larger areal extent. Salinity decreases from 35o/oo – 31o/oo on the western parts of the northern hemisphere because of the influx of melted water from the Arctic regions. In the same way, after 15o – 20o south, it decreases to 33o/oo.

The average salinity of the Atlantic ocean is around 36o/oo.The highest salinity is recorded between 15o and 20o latitudes. Maximum salinity (37o/oo) is observed between 20o N and 30o N and 20o W – 60o W. It gradually decreases towards the north. The North Sea, in spite of its location in higher latitudes, records higher salinity due to 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 salinity due to high evaporation. Salinity is, however, very low in Black Sea due to enormous fresh water influx by rivers.

The average salinity of the Indian Ocean is 35o/oo. The salinity trend is observed in the Bay of Bengal due to influx of river water by the river Ganga. On the contrary, the Arabian sea shows higher salinity due to high evaporation and low influx of fresh water.

18.1 In hot and dry regions salinity is high, because

Evaporation is high b) Condensation is slow

c) Quantity of salt is high d) Sublimation not happens

18.2. Baltic Sea records low salinity because

Location near poles b)Enormous fresh water influx by rivers

c)High rate of evaporation d) Presence in the drainage of Mediterranean Sea

18.3The average salinity of Indian sea is :

a) 20o/oo b) 30o/oo c) 35o/oo d) 40o/oo

19.Read the following passage and answer the questions that follow :

The ganga is the most important river of India both from the point of view of its basin and cultural significance. It rises in the Gangotri glacier near Gaumukh (3,900 m) in the Uttarkashi district of Uttarakhand. Here, 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; hereafter it is known as the Ganga. The Alaknanda has its source in the Satopath glacier above Badrinath. The Alaknanda consists of the Dhauli and the Vishnu Ganga which meet at Joshimath or Vishnu Prayag.

The other tributaries of Alaknanda such as the Pindar joins it at Karna Prayag while Mandakini or Kali Ganga meets it at Rudra Prayag. The Ganga enters the plains at Haridwar. From here , it flows first to the South, then to the South-East and East before splitting into two distributaries, namely the Bhagirathi and the Padma. The river has a length of 2525 km. It is shared by Uttarakhand (110 km) and Uttar Pradesh (1,450 km), Bihar (445 km) and West Bengal (520 km). The Ganga basin covers about 8.6 lakh sq. km area in India alone.

The Ganga river system is the largest in India having a number of perennial and non- perennial rivers originating in the Himalayas in the North and the Peninsula in the South, respectively. The son is its major right bank tributary. The important left bank tributaries are the Ramganga, the Gomati, the Ghaghara, the Ghandak, the Kosi and the Mahananda. The river finally discharges itself into the Bay of Bengal near the Sagar Island.

19.1 River Ganga enters the great plains in which of the following states?

a) Himachal Pradesh b) Uttarakhand c) Punjab d) Haryana

19.2 Ganga forms the world's largest delta in Bay of Bengal along with which other river?

a)Kosi b) Yamuna c) Brahmputra d) Son

19.3 Rudra Prayag is the confluence of which of the following rivers?

a) Bhagirathi and Alaknanda b) Alaknanda and Pindar

c) Mandakini and Alaknanda d) Ganga and Yamuna

SECTION C (Q.No.20- 23)(3 Marks each)

Q.20."Along with multiple merits, tides are also supportive to economy of the nation." Give your argument in support of this statement.

Or

What are tides ? Explain spring tide and neap tides?

Q.21.Running water is by far the most dominating geomorphic agent in shaping the Earth surface in humid as well as an arid climate. Explain any three erosional landforms made by running water?

Q.22.What is the subcontinent ? Name the countries included in Indian subcontinent?

Q.23.The monsoon winds flowing in the South – Westerly direction approach the landmass of India in two branches. Describe how the Arabian sea branch of the monsoon causes rainfall in various regions.

Or

What is climate? Name the four seasons of India ?

SECTION D (Q.No.24- 28)(5 Marks each)

Q.24 Discuss the process with suitable diagram through which the earth atmosphere system maintains heat balance?

Or

Explain about the factors which influence the temperature of air at any place.

Q.25.What do you mean by tropical cyclones? Explain the favourable conditions for their formations.

Q.26.What are the important characteristics features of North Indian rivers? How are these different from Peninsular rivers?

Q.27.Not withstanding the broad climatic unity, the climate of India has many regional variations. Elaborate this statement giving suitable examples.

Q.28.Differentiate between forest area and forest cover. Why and how the British had exploited the forests in India?

Or

What is natural vegetation? Name the different types of forest found in India? Distinguish between the two types of tropical deciduous forest?

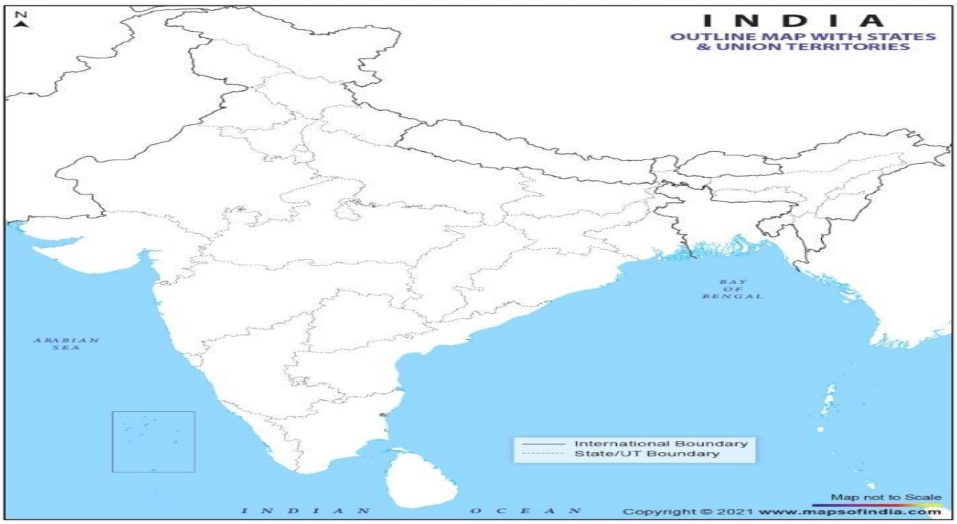
SECTION E (Q.No.29-30)(5 Marks each)

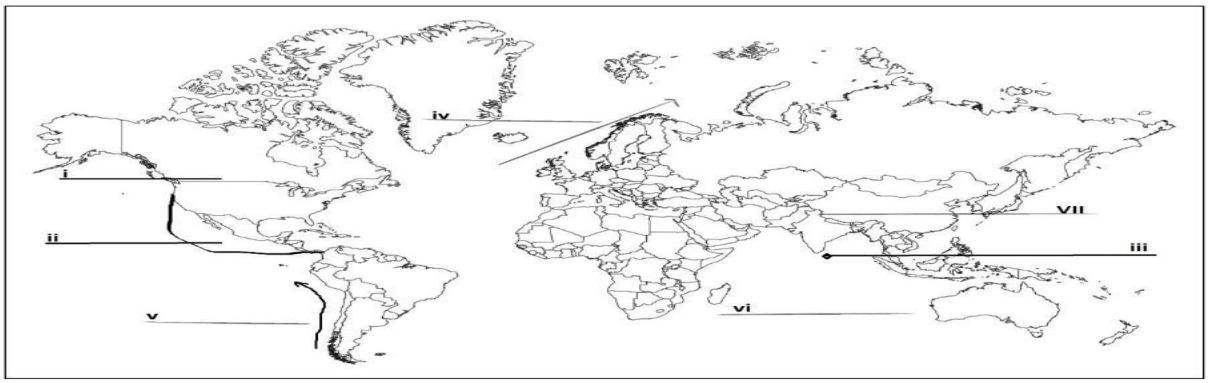
Q.29.On the given political map of India, locate and label any five of the following with appropriate symbols:

i. Capital of Karnataka
ii. Aravali Range
iii. Chilika Lake
iv. Area of rainfall with more than 200 cm
v. Area of Littoral and Swamp Forest
vi. Nilgiri Biosphere Reserve
Vii. Coromandal Coast

Q.30.On the given political map of the world, the following seven features are shown. Identify any five of these features and write their correct names on the answer sheet.

i) Name of a continent
ii) A minor tectonic plate.
iii) A Neighboring country of India
iv) A warm oceanic current
v) A cold oceanic current
vi) Name of the Ocean
vii) Highest mountain peak of India





Marking Scheme

Kendriya Vidyalaya Sangthan

Session Ending Examination

Time – 3Hrs **Subject – Geography** **Class- XI** **MM- 70**

Marking scheme

Section A

Ans 1 : d) History
Ans 2 : c) Distance
Ans 3 : b) 1-4-2-3
Ans 4 : c) 1-C, 2-A, 3-D, 4-B
Ans 5 : d) A is false, but R is true.
Ans 6 : b) loop like channel patterns develop over flood and delta plain
Ans 7 : c) Water vapour increases from equator towards the pole

Ans 8 : d) All of these
Ans 9 : a) Isobars
Ans 10 : a) Dew
Ans 11 : b) Perigee
Ans 12 : d) All of these
Ans 13 : a) 1 and 2
Ans 14 : b) Kosi
Ans 15 : b) Monsoon winds blow from the sea to the land in summer.
Ans 16 : b) North-Eastern monsoon
Ans 17 : a) 33 %

Section B

Ans 18.1 a) Evoparation is high
Ans 18.2 b) enormous fresh water influx by rivers
Ans 18.3 c) 35%
Ans 19.1: b) Uttarakhand
Ans 19.2 c) Brahmputra
Ans 19.3 : c) Mandakini and Alaknanda

Section C

Ans 20 : Navigation, Shipping, Electricity, Minerals, Fishery, Salt Industries etc.

Or

Tides are the regular rise and fall of sea levels caused by the gravitational pull of the Moon and the Sun, along with the Earth's rotation.

Spring tide-when the sun, the moon and the earth are in straight line, the height of the tide will be higher these are called spring tides.

Neap tide-normally there is a 7 day interval between the spring tide and neap tide, at this time the sun and moon are at right angles to each other .

Ans 21 : Running water is one of the most powerful geomorphic agents, shaping the Earth's surface through erosion. It forms various landforms in both humid and arid regions by eroding rocks and sediments. Below are three significant erosional landforms created by running water:

1. V-Shaped Valleys: Running water in rivers cuts vertically into the Earth's surface, eroding the bedrock and carrying sediments downstream.
2. Waterfalls: Waterfalls form where a river flows over layers of hard and soft rocks.
3. Gorges : A gorge is a deep, narrow valley with nearly vertical walls, created by a river cutting into hard bedrock.

Ans 22:A subcontinent is a large, distinct landmass that is part of a continent but is geographically, culturally, and politically unique. It is often separated from the rest of the continent by natural boundaries such as mountains, rivers, or seas.

The Indian subcontinent comprises the following seven countries:

8. India 2. Pakistan 3. Bangladesh 4. Nepal 5. Bhutan 6. Sri Lanka 7. Maldives

Ans 23 : 1. One branch obstructed by Western ghats. Heavy rainfall in Sahyadri's and western coastal plain, Little rainfall East of Western Ghats.

2. second branch strikes the coast North of Mumbai and cause rainfall in central highlands.

3. The third branch of these winds strike the saurashtra Peninsula and the Kachchh and move further towards Rajasthan, Punjab and Haryana.

Or

Climate refers to the average weather conditions of a region over a long period, typically 30 years or more. It includes factors such as temperature, precipitation, humidity, wind patterns, and atmospheric pressure that prevail in a specific area.

Four Seasons of India

1. Cold weather season/Winter (January to February)
2. Hot weather season/Summer/Pre-Monsoon (March to May)
3. Advance Monsoon season/Southwest Monsoon (June to September)
4. Retreating monsoon season/ Post-Monsoon/Autumn (October to December)

Section D

Ans 24 : Heat budget : 27 reflected back from clouds, 2 units from the snow and ice covered area, 6 units by scattering. 17+34 absorbed by earth, 14 absorbed by atmosphere.

Out of 51, 17 units are radiated to space directly and remaining 34 units are absorbed by the atmosphere. Within 34 units 6 absorbed by atmosphere, 9 units through convection and turbulence and 19 units through latent heat of condensation. Explanation of each with diagram.

Or

The latitude, 2. The altitude, 3. Distance from sea 4. Air Mass and Ocean currents etc. Explanation of Each.

Ans 25: A tropical cyclone is a rapidly rotating storm system , form over warm ocean waters in tropical and subtropical regions and are called different names based on their location: hurricanes (Atlantic and Eastern Pacific), typhoons (Western Pacific), and cyclones (Indian Ocean).

Favorable Conditions for the Origin of Tropical Cyclones

1. Warm Ocean Waters
2. High Humidity
3. Presence of a Pre-Existing Disturbance
4. Weak Vertical Wind Shear
5. Coriolis Force
6. Atmospheric Instability
7. Divergence in the Upper Atmosphere

Ans 26 : Characteristics of the North-Indian rivers are as follows :

They are fed by melting of snow and precipitation. 2. These are perennial in nature or have water throughout the year. 3. Forms gorges, V shape valleys etc. And any other point.

Differentiation from peninsular river : 1. Himalayan river are perennial but peninsular are seasonal. 2.Himalayan rivers have very large basins but peninsular relatively smaller basin. 3.Himalayan rivers are young and youthful but peninsular rivers are old rivers with graded profile. Any other suitable difference.

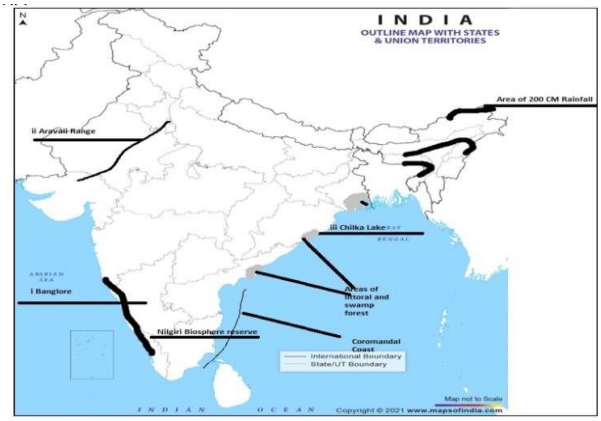
Ans 27: The monsoon regime emphasises the unity of India with the rest of south-east Asian region. This view of broad unity of the monsoon type of climate should not, however, lead one to ignore its regional variations which differentiate the weather and climate of different regions of India. The climate of Kerala and Tamil Nadu in the south is so different from that of Uttar Pradesh and Bihar in the north, and yet all of these have a monsoon type of climate.

1.While in the summer the mercury occasionally touches 55°C in the western Rajasthan, it drops down to as low as minus 45°C in winter around Leh. Churu in Rajasthan may record a temperature of 50°C or more on a June day while the mercury hardly touches 19°C in Tawang (Arunachal Pradesh) on the same day.

2. On a December night, temperature in Drass (Jammu and Kashmir) may drop down to minus 45°C while Thiruvananthapuram or Chennai on the same night records 20°C or 22°C.
3. In Kerala and in the Andaman Islands, the difference between day and night temperatures may be hardly seven or eight degree Celsius. But in the Thar desert, if the day temperature is around 50°C, at night, it may drop down considerably upto 15°-20°C.
4. While snowfall occurs in the Himalayas, it only rains over the rest of the country. Similarly, variations are noticeable not only in the type of precipitation but also in its amount. While Cherrapunji and Mawsynram in the Khasi Hills of Meghalaya receive rainfall over 1,080 cm in a year, Jaisalmer in Rajasthan rarely gets more than 9 cm of rainfall during the same period.
5. Tura situated in the Garo Hills of Meghalaya may receive an amount of rainfall in a single day which is equal to 10 years of rainfall at Jaisalmer. While the annual precipitation is less than 10 cm in the north-west Himalayas and the western deserts, it exceeds 400 cm in Meghalaya.
These examples confirm that there are seasonal variations in temperature from place to place and from region to region in India. In spite of these differences and variations, the climate of India is monsoonal in rhythm and character.
Ans 28: Meaning: The forest area is the area notified and recorded as the forest land irrespective of the existence of trees, while ie actual forest cover is the area occupied by forests with canopy.
Estimation: The former is based on the records of the State Revenue Department, while the latter is based on aerial photographs and satellite imageries.
The British were aware of the economic value of the forests in India, hence, large scale exploitation of these forests was started. The structure of forests was also changed. The oak forests in Garhwal and Kumaon were replaced by pine (chirs) which was needed to lay railway lines. Forests were also cleared for introducing plantations of tea, rubber and coffee. The British also used timber for construction activities as it acts as an insulator of heat. The protectional use of forests was, thus, replaced by commercial use.

Or
Natural vegetation refers to plant life that grows naturally without human interference, adapted to the specific climatic and soil conditions of a region. It varies depending on factors like temperature, rainfall, and altitude.
Types of Natural Vegetation in India
1. Tropical Evergreen Forests 2. Tropical Deciduous Forests
3. Tropical Thorn Forests 4. Montane Forests
5. Mangrove Forests 6. Temperate Forests 7. Alpine Vegetation
Features of Two Types of Tropical Deciduous Forests in India
8. Tropical Moist Deciduous Forests
Location: Found in regions with moderate rainfall (100 cm to 200 cm), such as parts of the Himalayan foothills, Eastern and Western Ghats, and Madhya Pradesh.
Characteristics:
Trees shed leaves during the dry season to conserve water.
Includes species like teak, sal, sandalwood, and rosewood.
Can be dense in areas with abundant rainfall.
These forests are important for timber and fuelwood.
2. Tropical Dry Deciduous Forests
Location: Found in areas with slightly lower rainfall (70 cm to 100 cm), such as Rain-shadow regions of the Western Ghats, interior Deccan Plateau, and parts of Uttar Pradesh and Bihar.

Characteristics:
Trees shed leaves in the dry season to adapt to water scarcity.
Vegetation is less dense and trees are shorter compared to moist deciduous forests.
Common tree species include acacia, mango, bamboo, and kikar.
These forests are important for grazing and timber.
29.INDIA



30. WORLD MAP
i) North America
ii) Cocos plate
iii) Srilanka
iv) Gulf stream
v) Humboldt (Peru)
vi) Indian ocean
vii) Kanchenjunga

Sample Paper 2
KENDRIYA VIDYALAYA SANGATHAN
Session Ending Examination
GEOGRAPHY (029)

Time: 3 Hours Class-XI. Maximum Marks: 70

General Instructions:
1.There are 30 questions in all.
2.Questions number 1 to 17 are multiple-choice questions (MCQs) carrying 1 mark each. Write only the correct answer in your answer sheets.
3.Questions number 18 to 19 Source Based Questions carry 3 marks each.
4.Questions number 20 to 23 are short answer questions carrying 3 marks each. Answer to each of these questions should not exceed 80-100 words.
5.Questions number 24 to 28 are long answer questions carrying 5 marks each. Answer to each of these questions should not exceed 120 words.
6.Questions number 29 to 30 are related to the identification or location and labelling of geographical features on maps, carrying 5 marks each.
7.Outline a map of India and the world provided to you that must be attached to your answer book.
8.Use of a template or stencils for drawing outline maps is allowed.

SECTION-A

MULTIPLE-CHOICE QUESTIONS (MCQs) (1*17=17 Mark)

Q.1 Which one of the following figures represents the age of the earth?

(a) 4.6 million years (b) 4.6 billion years

(c)13.7 billion years (d) 13.7 trillion years

Q.2 _____ instrument is used to record the earthquake waves.

(a) Anemometer (b) Rain Gauge

(c) Seismograph (d) Barometer

Q.3 The crust and mantle are separated by which of the following discontinuities?

(a) Gutenberg discontinuity (b) Moho discontinuity

(c) Conrad discontinuity (d) Lehman discontinuity

Q.4 A specific zone with active volcanoes in Pacific Ocean is called:

(a) Ring of Fire (b) Ball of Fire

(c) Fire rain area (d) Volcanic area

Q.5 Which force helps in Geomorphic Processes?

(a) Endogenic Forces (b) Exogenic Forces

(c) Both a & b (d) None of these

Q.6 In which category of wind Monsoon is kept:

(a) Local winds (b) Seasonal winds

(c) Planetary winds (d) Periodic winds

Q.7 Which one of the following is the highest cloud in the sky?

(a) Cirrus. (b) Stratus

(c) Nimbus (d) Cumulus

Q.8 Identify the element which is not a part of the hydrological cycle:

(a) Evaporation (b) Hydration

(c) Precipitation (d) Condensation

Q.9 Which one of the following countries shares the longest land frontier with India?

(a) Bangladesh (b) China

(c) Pakistan (d) Myanmar

Q.10 Which country does NOT comes under INDIAN SUB-CONTINENT?

(a) Bhutan (b) China

(c) Pakistan (d) Nepal

Q.11 What are some important consequences of the northward movement of the Indian plate?

(a) Formation of the Himalayas (b) Changes in climate patterns

(c) Shifts in river courses (d) All of these

Q.12 ASSERTION (A): The Ganga River system is the largest river system in India.

REASON (R): The Ganga River has the maximum number of tributaries among all Indian rivers.

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

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

c) A is true, but R is false.

d) A is false, but R is true.

Q.13 Choose the correct option

Column A Column B

1. Ganga River		a) Perennial River
2. Godavari River		b) Rift Valley
3. Indus River		c) Largest River
4. Narmada River		d) Peninsular River

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

Q.14 Which of the following is a greenhouse gas?

(a) Oxygen (b) Nitrogen

(c) Carbon dioxide (d) Helium

Q.15 Which of the following statements about the south west monsoon is correct?

(a) Monsoon winds blow from the land to the sea in summer.

(b) Monsoon winds blow from the sea to the land in summer.

(c) Monsoon winds blow from the land to the sea in winter.

(d) Monsoon winds blow from the sea to the land in winter.

Q.16 What causes rainfall on the coastal areas of Tamil Nadu in the beginning of winters?

(a) South-West monsoon (b) North-Eastern monsoon

(c) Temperate cyclones (d) Local air circulation

Q.17 Which one of the following proportion of area of the country was targeted to be under forest in Forest Policy of India?

(a) 33% (b) 55% (c) 44% (d) 22%

SECTION-B

SOURCE BASED QUESTIONS (3*2=6 Marks)

Q.18 SOLAR RADIATION

The earth's surface receives most of its energy in short wavelengths. The energy received by the earth is known as incoming solar radiation which in short is termed as insolation. As the earth is a geoid resembling a sphere, the sun's rays fall obliquely at the top of the atmosphere and the earth intercepts a very small portion of the sun's energy. On an average the earth receives 1.94 calories per sq. cm per minute at the top of its atmosphere. The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the earth and the sun. During its revolution around the sun, the earth is farthest from the sun (152 million km) on 4th July. This position of the earth is called aphelion. On 3rd January, the earth is the nearest to the sun (147 million km). This position is called perihelion. Therefore, the annual insolation received by the earth on 3rd January is slightly more than the amount received on 4th July. However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation. Hence, this variation in the solar output does not have great effect on daily weather changes on the surface of the earth.

Q.18.1 What do you understand by Insolation?

Q.18.2 On which date earth is farthest from the sun?

Q.18.3 Explain perihelion?

Q.19 Biosphere Reserve

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 (MAB) Programme.The Biosphere Reserve aims at achieving the three objectives: Conservation of Biodiversity and Ecosystem, Association of environment with development, International network for research and monitoring There are 18 biosphere reserves in India. They protect larger areas of natural habitat than a typical national park or animal sanctuary, and often include one or more national parks or reserves, along with buffer zones that are open to some economic uses. Protection is granted not only to the flora and fauna of the protected region, but also to the human communities who inhabit these regions, and their ways of life. In total there are 18 biosphere reserves in India. Twelve of the eighteen biosphere reserves are a part of the World Network of Biosphere Reserves, based on the UNESCO Man and the Biosphere (MAB) Programme list.

Q.19.1 What do you understand by Biosphere Reserves?

Q.19.2 What are the objectives of establishing Biosphere Reserves?

Q.19.3 Which Biosphere Reserves is situated in Sikkim?

प्रश्न 19.1 बायोस्फीयर रिजर्व से आप क्या समझते हैं?

प्रश्न 19.2 बायोस्फीयर रिजर्व स्थापित करने के उद्देश्य क्या हैं?

प्रश्न 19.3 सिक्किम में कौन सा बायोस्फीयर रिजर्व स्थित है?

SECTION-C

SHORT ANSWER QUESTIONS (3*4=12 Marks)

Q.20 Define Geography and How Physical Geography is helpful for the managing the natural resources?

Q.21 What do you understand by atmosphere? Explain in your words.

Or

Draw the diagram of the different layers of the atmosphere? Explain the lowest layer of the atmosphere.

Q.22 What are tides? Name the two types of tides on basis of location of sun earth and the moon.

Q.23 How is the latitudinal spread of India advantageous to India?

SECTION-D

LONG ANSWER QUESTIONS (5*5=25 Marks)

Q. 24 What are the evidences in support of the continental drift theory?

Or

Differentiate between divergent and convergent plate boundaries.

Q.25 Explain the depositional landform created by running water with pictures/Diagram.

Or

Explain the depositional landform created by Glaciers with pictures/Diagram.

Q.26 Discuss the formation and characteristics of the Himalayan mountain range in India.

Or

Explain the physiographic features of the Peninsular Plateau in India and their significance.

Q.27 Discuss the causes and effects of river pollution in India. Suggest measures to control it.

Q.28 How many distinct Seasons are found in India as per the Indian Meteorological Department? Discuss the weather conditions associated with any one season in detail.

SECTION-E

MAP BASED QUESTIONS (1*10=10 Marks)

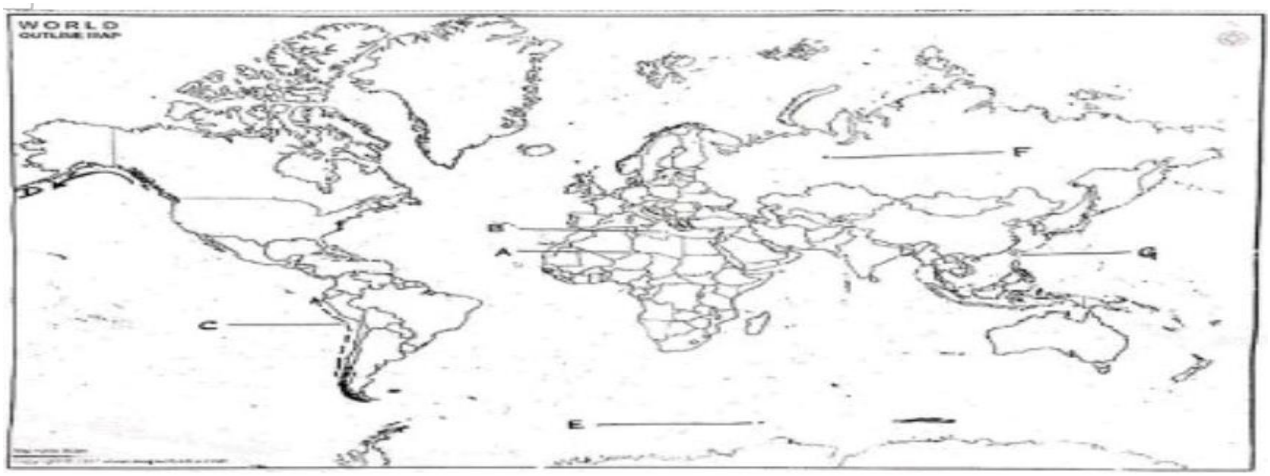
Q.29 Identify the geographical features marked as A, B, C, D, E, F and G on the basis of information given and write their names against the space provided in the map. (Attempt any five)

a) A hot desert in north Africa

b) A major sea.
c) A cold ocean current
d) A warm ocean current
e) A major ocean
f) A major tectonic plate.
g) A minor tectonic plate

Q.30 Locate and label the following features with appropriate symbols on the given political outline map of India. (Attempt any five)

a) Kaziranga National Park
b) Area with lowest rainfall in India
c) Pulicat Lake
d) Nathula mountain pass
e) Lakshadweep islands
f) Deccan plateau
g) Coromandel coastal plains



Sample Paper 3

KENDRIYA VIDYALAYA SANGATHAN

SESSION ENDING EXAMINATION

Max. Marks – 70 SUBJECT – GEOGRAPHY CLASS – XI Duration 3hrs

Instruction:

There are 30 questions in all.

Questions number 1 to 17 are multiple-choice questions (MCQs) carrying 1 mark each. Write only the correct answer in your answer sheets.

Questions number 18 to 19 are Source based questions carrying 3 marks each.

Questions number 20 to 23 are short answer questions carrying 3 marks each. Answer to each of these questions should not exceed 80-100 words.

Questions number 24 to 28 are long answer questions carrying 5 marks each. Answer to each of these questions should not exceed 120 words.

Question no 29 to 30 are outline a map of India and the world provided to you that must be attached to your answer book.

Use of a template or stencils for drawing outline maps is allowed.

Section – A

Q.1 A specific zone with active volcanoes in Pacific Ocean is called: (a) Ring of Fire (b) Ball of Fire

(c) Fire rain area (d) Volcanic area

Q.2 Which one of the following material is affected by hydration process ?

(a) Granite (b) Clay (c) Quartz (d) Salt

Q.3 The Inter Tropical Convergence Zone normally occurs ….

(a) Near the equator (b) Near the Tropic of Cancer

(c) Near the Tropic of Capricorn (d) Near the Arctic Circle

Q.4 Given below is a list of climatic phenomena and their type according to classification. Which of the following pair is NOT correctly matched ?

Phenomena	Characteristics
(a) ITCZ.	-Winds Converge
(b) Tropical Cyclone	-Arabian Sea
(c) Jet Stream	-North of Himalayas
(d) El –Nino.	-Warm Current

Q.5 Which of the following countries is larger in area than India ?

(a) China (b) Egypt (c) France (d) Iran

Q. 6 There are two statement marked as assertion (A) and reason (R) ,Mark your answer as the codes provided .

A . Assertion – The air at the ITCZ rises because of convection caused by high insolation .

R. Reason – The winds from the tropic diverge this low pressure zone .

OPTIONS –(a) Both (A) and (R) are true and R is not correct explanation of (A)
(b) Both (A) and (R) are true and (R) is the correct explanation of (A)
(c) Both (A) and (R) are incorrect .
(d) (A) ia correct but (R) is incorrect .

Q.7 Consider the following and choose the correct answer with the help of given codes

Column 1	Column 2
i)Equatorial Low	1)60° N-S
ii)Sub tropical High	2) Near 90°
iii)Sub polar Low	3) Near 0°
iv)Sub Polar High	4) 90° N-S

Options	i	ii	iii	iv
A)	3	4	2	1
b)	2	4	1	3
c)	3	4	1	2
d)	4	3	2	1

Q.8 Given below is a list of natural vegetation and the type of trees found 0 degree density . Which of the following pair is NOT correctly matched ?

Natural Vegetation	Tree
a) Tropical Evergreen	Ebony
b) Tropical Deciduous	Tendu
c) Tropical Thorn	Babool
d) Montane	Amaltas

Q.9 Which one of the following longitudes of the standard meridian for India ?
A) 69’30’ E B) 82’30’ E c) 75’30’E d) 90’30’E

Q.10 Consider the following and choose the correct answer with the help of given codes.

Column 1	Column 2
I)Peninsular Plateau	1) Nilgiri Hills
ii) Meghalaya Plateau	2) Anaimundi
iii) Western Ghats	3) Raj Mahal Hills
iv) Central Highlands	4) Khasi Hills

Codes	I	II	III	IV
A)	2	4	1	3
B)	3	4	1	2
C)	3	2	4	1
D)	4	3	2	1

Q.11 Which one of the following rivers was known as the sorrow of Bengal ?
a) The Gandak b) The Son c) The Kosi d) The Damodar

Q.12 Which one of the following revers flows in a rift valley ?
a) The Son b) The Narmada c) The Yamuna d) The Lun

Q.13 Which one of the following process is responsible for transforming liquid into vapour ?
a) Condensation b) Transpiration c) Evaporation d) Precipitation

Q.14 If the surface air pressure is 1000 mb ,the air pressure at km above the surface will be ?
a) 700 mb b) 1100 mb c) 900 mb d) 1300 mb

Q.15 Which of the following statements about the south west monsoon is correct?
(a) Monsoon winds blow from the land to the sea in summer.

(b) Monsoon winds blow from the sea to the land in summer.
(c) Monsoon winds blow from the land to the sea in winter.
(d) Monsoon winds blow from the sea to the land in winter.

Q.16 What causes rainfall on the coastal areas of Tamil Nadu in the beginning of winters?

(a) South-West monsoon (b) North-Eastern monsoon
(c) Temperate cyclones (d) Local air circulation

Q.17 Which one of the following proportion of area of the country was targeted to be under forest in Forest Policy of India?

(a) 33% (b) 55% (c) 44% (d) 22%

Section – B

Source Based Question (3x2=6)

Q.18. Read the following paragraph carefully and give the answer of the following questions .

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. It was observed that seismographs located at any distance within 105° from the epicentre, recorded the arrival of both P and S-waves. However, the seismographs located beyond 145° from epicentre, record the arrival of P-waves, but not that of S-waves. Thus, a zone between 105° and 145° from epicentre was identified as the shadow zone for both the types of waves. The entire zone beyond 105° does not receive S-waves. The shadow zone of S-wave is much larger than that of the P-waves. The shadow zone of P-waves appears as a band around the earth between 105° and 145° away from the epicentre. The shadow zone of S-waves is not only larger in extent but it is also a little over 40 per cent of the earth surface. You can draw the shadow zone for any earthquake provided you know the location of the epicentre.

Q.18 .1 what is seismograph ?

A) Volcanic measurement B) Weathering measurement
C) Earthquake measurement D) Diastrophism measurement

Q.18 .2 What is Shadow Zone?

Q.18.3 What is the Shadow Zone of P –waves ?

A) Between 105° and 145° away from the epicentre
B) Between 90 to 105° away from the epicentre
C) Between 145 to 105 away from the epicentre
D) Between 140 to 145 away from the epicentre

Q.19. Read the following paragraph and answer the question given below .

Forests have an intricate interrelationship with life and environment. These provide numerous direct and indirect advantages to our economy and society. Hence, conservation of forest is of vital importance to the survival and prosperity of humankind. Accordingly, the Government of India proposed to have a nation-wide forest conservation policy, and adopted a forest policy in 1952, which was further modified in 1988. According to the new forest policy, the Government will emphasise sustainable forest management in order to conserve and expand forest reserve on the one hand, and to meet the needs of local people on the other. The forest policy aimed at : (i) bringing 33 per cent 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 land; (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 a massive peoples movement involving women to encourage planting of trees, stop felling of trees and thus, reduce pressure on the existing forest. Forests and Life To a vast number of tribal people, the forest is a home, a livelihood, their very existence.

Q.19.1 When was the first forest policy adopted ?

Q.19.2 How much geographical area should be covered in forest policy ?

Q.19.3 Give any two points of forest policy .

Section c

Q.20. As a scientific discipline with how many categories of questions is geography concerned ? Explain

Q.21. What are the factors that control temperature distribution on the surface of the Earth ?

Q.22. How do Currents affect the temperature? How does it affect the temperature of coastal areas in the North –west Europe?

Q.23. What are the implication of India having a long coastline?

Section –D

Q.24. Explain the basic concept of continental drift theory.

OR

How many divisions The ocean floor may be segmented into based on the depth as well as the forms of relief ?

Q.25. Glacial valleys show up many linear dispositional form . Give their locations and names ?

OR

What are the causes behind formation of river meander land form ?

Q.26. Explain the characteristics or features of northern plain .

OR

Difference between Western Ghat and Eastern Ghat .

Q.27. What are socio –economic advantages of interlinking of river in India ?

OR

What are the important characteristics features of North India rivers ? How are they different from Peninsular Rivers ?

Q.28. How many distinct season are formed in India as per the Indian meteorological department ?Discuss the weather conditions associated with one season in detail .

Section –E

Q.29. on the outline map of India show the following . Any five

a) Any one area of winter rainfall

b) Narmada River

c) Great Rann of Kutch

d) Kanchenjunga

e) Sundarbans.

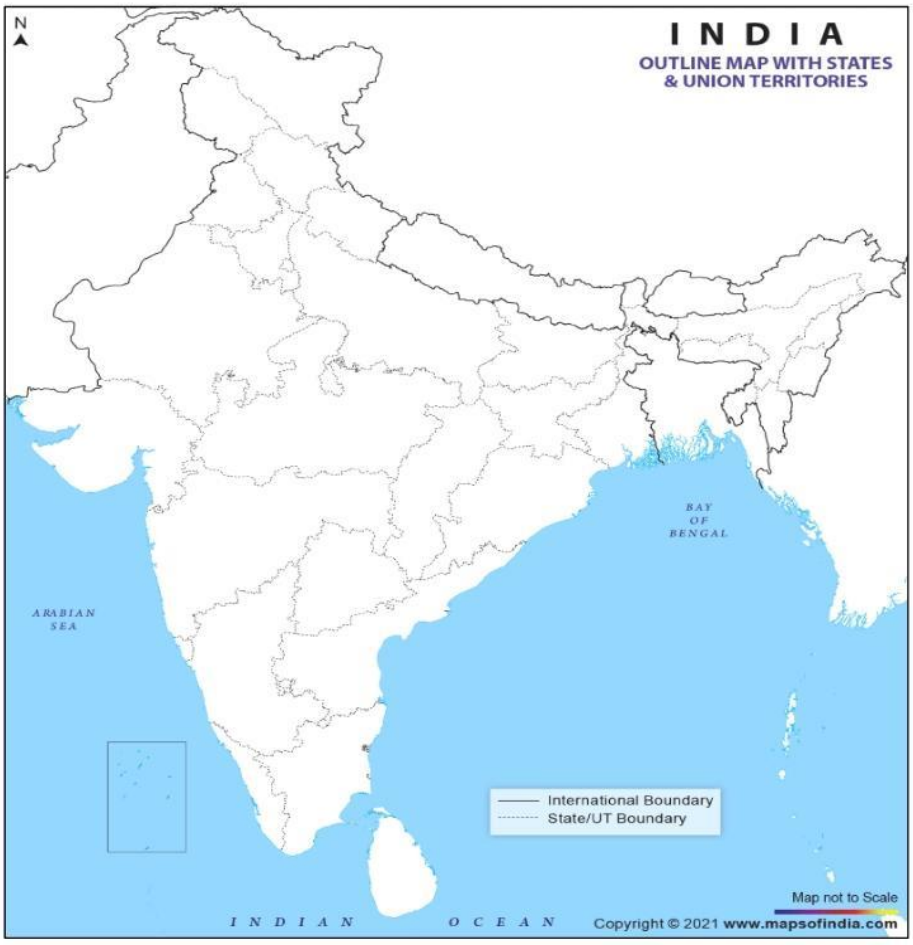
f) Nilgiri Hills

Q.30. World Map (Any Five)

On the given political map of the world, the following seven features are shown. Identify any five of these features and write their correct names on the answer sheet.

i)Name of a continent

ii)A minor tectonic plate.
iii)A Neighboring country of India
iv)A warm oceanic current.
v)A cold oceanic current
vi)Name of the Ocean.
vii)Highest mountain peak of India.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INDIA
OUTLINE MAP WITH STATES
& UNION TERRITORIES
BAY
OF
BENGAL
ARABIAN
SEA
International Boundary
State/UT Boundary
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INDIAN OCEAN
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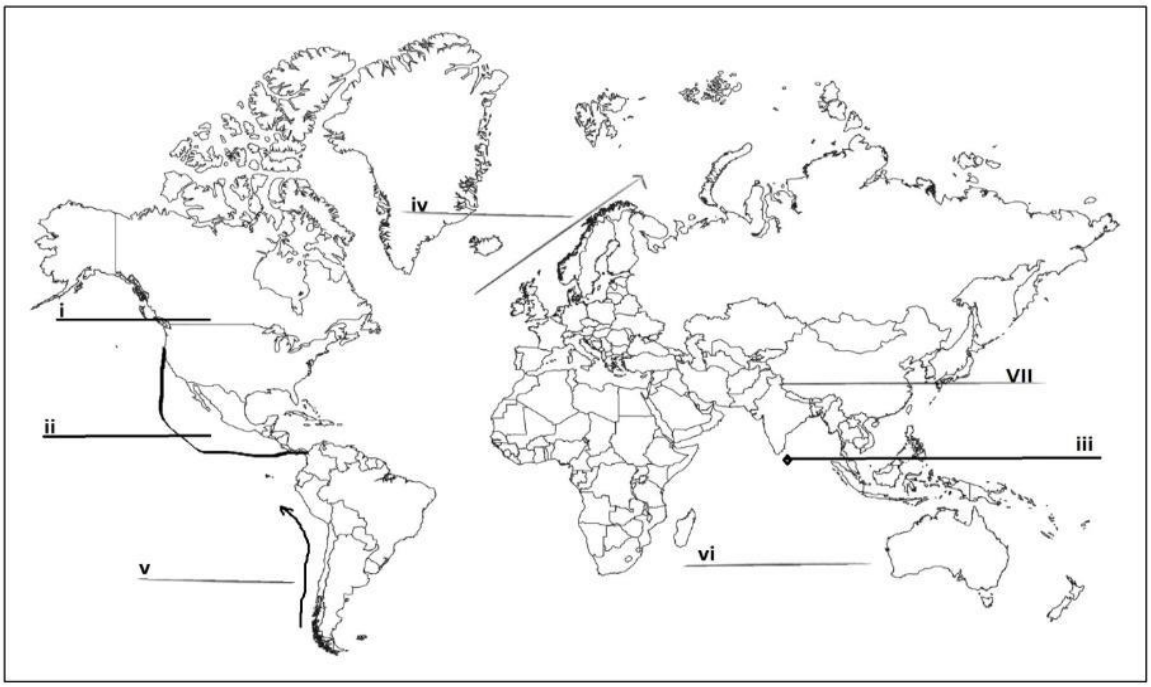
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VII