GOVERNMENT OF KARNATAKA

DEPARTMENT OF SCHOOL EDUCATION (PRE-UNIVERSITY)

REVISED

QUESTION BANK (2024-25)

SUBJECT – GEOLOGY (37)

FIRST YEAR PUC

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Note:

1. Question bank contains questions which will test the understanding, analysis, application and critical thinking of students.
2. This question bank acts like a guide or path for a student to get complete knowledge of the subject.
3. **Students are advised to prepare for questions which may have not appeared in this questions bank**.
4. Question bank is prepared adhering to the blue print.

UNIT 1

1. General geology 2. Universe & solar system 3. Parameters of earth 4. Earth motion

1 Mark Questions:

1. What is the meaning of the word "Geology"?
2. What is the main subject of study in geology?
3. What are the two types of geological processes?
4. What does the branch "Planetary Geology" study?
5. Which branch of geology studies earthquakes and volcanism?
6. Define geomorphology.
7. What does crystallography study?
8. What branch deals with the geological study of economic minerals?
9. What is paleontology concerned with?
10. Which principle is used in historical geology to understand the past?
11. Which branch of geology deals with the selection of dam and bridge sites?
12. What is the study of groundwater known as?
13. What is oceanography?
14. What does the Big Bang Theory explain?
15. What are the inner planets in the solar system?
16. Name the planet known as the "Blue Planet."
17. What is the densest planet in the solar system?
18. What is the main composition of Earth's atmosphere?
19. What is lithosphere composed of?
20. What does biosphere include?
21. Who discovered the spheroidal shape of Earth?
22. What is the approximate circumference of Earth?
23. What is the difference between the polar and equatorial diameters of Earth?
24. Define rotation of the Earth.
25. What phenomenon causes day and night?
26. How long does Earth take to revolve around the Sun?
27. What are asteroids sometimes called?
28. What is the relationship between asteroids and planets?
29. Name the comet that crashed into Jupiter in 1994.
30. What is seismology the study of?

Multiple choice questions

1. What does the Greek term “Geology” mean?
   A) Study of rocks
   B) Study of earth
   C) Study of weather
   D) Study of water
2. Which branch of geology focuses on the study of fossils?
   A) Paleontology
   B) Mineralogy
   C) Petrology
   D) Seismology

3. Which planet is the largest of the terrestrial planets?
   A) Venus
   B) Earth
   C) Mars
   D) Mercury
4. What is the main gas in Earth's atmosphere?
   A) Oxygen
   B) Carbon dioxide
   C) Nitrogen
   D) Hydrogen
5. Which planet in the solar system is known as the "Blue Planet"?
   A) Mars
   B) Earth
   C) Neptune
   D) Venus
6. The Earth's inner core is primarily composed of:
   A) Iron and nickel
   B) Carbon and nitrogen
   C) Silicon and oxygen
   D) Water and carbon dioxide
7. Which layer of Earth contains semi-fluid molten rock?
   A) Crust
   B) Mantle
   C) Outer core
   D) Inner core
8. Who first proposed that the universe is expanding?
   A) Isaac Newton
   B) Albert Einstein
   C) Edwin Hubble
   D) Galileo Galilei
9. What is the primary feature of comets?
   A) Rocky bodies
   B) Circular orbits
   C) Head and tail
   D) Fixed location
10. The shape of the Earth is best described as:
   A) Perfect sphere
   B) Elliptical
   C) Geoidal
   D) Flat

Fill in the Blanks

1. The term "Geology" is derived from the Greek words "Geo" meaning earth and "logos" meaning _____.
2. _____ geology deals with the study of seismic waves that lead to earthquakes.
3. The Earth takes approximately _____ hours to complete one rotation.
4. The core of the Earth is divided into the _____ core and the _____ core.
5. The outer layer of Earth's atmosphere is primarily composed of _____ and _____.
6. The layer that contains semi-fluid molten rock in Earth is called the _____.
7. A _____ is a non-luminous body that revolves around a star in the solar system.
8. The _____ is the zone that separates the inner and outer planets.
9. Earth is the only planet known to have _____, which makes it habitable for life.
10. _____ is the name of our galaxy.

Match the Following

A	B
1. Paleontology	A. Study of water distribution
2. Hydrosphere	B. Interaction of geology and hydrology
3. Geosphere	C. Includes crust and mantle
4. Milky Way	D. Our Galaxy
5. Rotation	E. Causes day and night
6. Inner Core	F. Solid iron core
7. Geoinformatics	G. Use of remote sensing in geology
8. Engineering Geology	H. Site selection for construction
9. Sun	I. Typical star in the solar system
10. Lithosphere	J. Earth's rigid outer shell

2 Mark Questions:

1. Define physical geology and its significance.
2. Explain the role of dynamic geology.

3. What are the three main branches involved in the study of rocks?
4. Describe the field of mining geology.
5. How does a geologist contribute to economic growth?
6. What are the two groups of planets in the solar system?
7. How is the Earth’s atmosphere essential for sustaining life?
8. What are the three main parts of Earth's geosphere?
9. Define sedimentary rocks and their significance.
10. What does the hydrosphere consist of?
11. Explain how the lithosphere differs from the mantle.
12. Describe the Big Bang Theory's view of the universe's expansion.
13. What are comets, and how are they different from asteroids?
14. What are meteors, and what happens to them when they enter Earth’s atmosphere?
15. How does Earth's revolution affect the seasons?
16. Define engineering geology and its application in construction.
17. What are the key characteristics of outer planets?
18. Explain the role of geophysics in geology.
19. How do fossils help in constructing the geological time scale?
20. What is geomorphology, and how does it shape Earth's surface?
21. Define geoinformatics and its significance in modern geology.
22. What are the main differences between primary, secondary, and tertiary rocks?
23. What are the effects of volcanic activity on the Earth’s surface?
24. Explain the importance of groundwater study in geology.
25. How does the Earth’s magnetic field help protect life?
26. What is the significance of the ozone layer in the atmosphere?
27. Describe how earthquakes are caused and their effects on the Earth.
28. What is the main focus of environmental geology?
29. What are the core principles used to calculate Earth's mass and density?
30. How does Earth’s shape influence its climate and weather patterns?

UNIT 2
Zones of earth

Multiple Choice Questions (MCQs)

1. The Earth's atmosphere is estimated to weigh approximately:
   A) 5.13×10^{11} tons
   B) 5.13×10^{13} tons
   C) 5.13×10^{14} tons
   D) 5.13×10^{10} tons
2. Which of the following gases has the highest percentage in Earth's atmosphere?
   A) Oxygen
   B) Carbon Dioxide
   C) Nitrogen
   D) Argon
3. What is the primary reason for the uneven distribution of sunlight on Earth's surface?
   A) Earth’s rotation
   B) Earth's axis tilt
   C) Earth’s speed
   D) None of the above
4. The troposphere is thicker at the:
   A) Poles
   B) Equator
   C) Temperate zones
   D) Both A and B
5. The process by which water changes from liquid to vapor is called:
   A) Precipitation
   B) Evaporation
   C) Condensation
   D) Transpiration
6. In the water cycle, water that seeps into the ground is called:
   A) Precipitation
   B) Infiltration
   C) Sublimation
   D) Runoff
7. Which layer of Earth contains the ozone layer?
   A) Troposphere
   B) Stratosphere
   C) Mesosphere
   D) Thermosphere
8. The layer of Earth's crust that lies beneath the continents is called:

A) Oceanic Crust
B) Transitional Crust
C) Continental Crust
D) None of the above

9. The mantle is composed primarily of:
A) Silica-rich minerals
B) Igneous rocks
C) Ferro-magnesian silicates
D) Nickel and Iron

10. The Mohorovicic Discontinuity separates:
A) The outer core and the inner core
B) The mantle and the core
C) The crust and the mantle
D) The oceanic and continental crusts

11. Which of the following processes directly returns water to the atmosphere from plants?
A) Evaporation
B) Precipitation
C) Condensation
D) Transpiration

12. The lithosphere consists of:
A) The core
B) The mantle only
C) Both crust and upper mantle
D) The hydrosphere

13. Which gas absorbs ultraviolet radiation in the atmosphere?
A) Nitrogen
B) Carbon Dioxide
C) Ozone
D) Oxygen

14. The process by which ice and snow turn directly into water vapor is known as:
A) Evaporation
B) Transpiration
C) Condensation
D) Sublimation

15. Which part of the core is thought to control Earth’s magnetic field?
A) Outer core
B) Inner core
C) Crust
D) Mantle

16. The Earth’s outermost solid layer is called:
A) Core
B) Mantle
C) Crust
D) Lithosphere

17. Evapotranspiration is defined as:
A) Evaporation only
B) Transpiration only
C) Water lost from ground and plants
D) None of the above

18. The thickness of the oceanic crust is approximately:
A) 60–70 km
B) 20–30 km
C) 11 km
D) 15 km

19. Which of the following gases has the smallest concentration in Earth's atmosphere?
A) Nitrogen
B) Oxygen
C) Argon
D) Hydrogen

20. Which layer of the atmosphere contains most of the water vapor?
A) Troposphere
B) Stratosphere
C) Mesosphere
D) Thermosphere

Fill in the Blanks

1. The Earth’s atmosphere is estimated to weigh _____ tons.
2. _____ is the gas that makes up about 78% of the Earth's atmosphere.
3. The troposphere is thicker at the _____ and thinner at the _____.
4. The process by which water vapor condenses to form clouds is called _____.
5. The lowest layer of the atmosphere is the _____.
6. The ozone layer is primarily found in the _____.
7. _____ is the process of water moving from plants into the atmosphere.
8. The _____ cycle describes the continuous movement of water on Earth.
9. The Earth's crust consists of the _____, _____, and _____ crusts.
10. The mantle is divided into _____ and _____ layers.
11. Earth's core is mainly composed of _____ and _____.
12. The process of water changing from a gas to a liquid is called _____.
13. The boundary between the crust and mantle is known as the _____ discontinuity.
14. The process by which ice turns directly into vapor is called _____.

15. Rain, snow, and hail are forms of _____.
16. Water flows from highland areas to oceans primarily as _____.
17. The Earth’s rotation axis and distance from the Sun contribute to temperature _____.
18. The Earth's _____ core is liquid, while the _____ core is solid.
19. A layer in the atmosphere that protects life by absorbing UV rays is the _____ layer.
20. The oceanic crust is primarily made up of _____ rocks.

Match the Following

A	B
1. Troposphere	A. Thin layer beneath the ocean
2. Water Cycle	B. Upper atmospheric layer with ozone
3. Lithosphere	C. Water movement on Earth
4. Oceanic Crust	D. Outer solid crust and upper mantle
5. Continental Crust	E. Lower atmospheric layer with weather
6. Mantle	F. Rock layer below crust
7. Sublimation	G. Process from ice to vapor
8. Ozone Layer	H. Absorbs UV radiation
9. Core	I. Composed of iron and nickel
10. Evapotranspiration	J. Plant and ground water loss

1-Mark Questions:

1. What is the estimated mass of the Earth's atmosphere?
2. What percentage of the Earth's atmosphere is made up of nitrogen?
3. Name the layer of the atmosphere closest to the Earth's surface.
4. What gas is most responsible for the "Greenhouse Effect" in the troposphere?
5. What is the approximate thickness of the troposphere at the equator?
6. Which atmospheric layer contains the Ozone layer?
7. Define "evaporation."
8. What process converts water from plants into water vapor?
9. What is the primary source of energy that drives the water cycle?
10. Define "precipitation."
11. What is the process by which ice directly turns into water vapor?
12. What percentage of the Earth's surface is covered by oceans?
13. What is the name of the discontinuity between the Earth's crust and mantle?
14. Name the three types of rocks that make up the Earth's crust.
15. What type of rock forms due to the rapid cooling of magma?
16. What is the uppermost layer of the oceanic crust composed of?
17. What layer of the Earth lies between the crust and the core?
18. How deep does the Earth's core start beneath the surface?
19. What material primarily makes up the Earth's inner core?
20. Name the discontinuity that marks the boundary between the mantle and core.
21. Which atmospheric layer absorbs ultraviolet radiation?
22. What is the term for water stored underground?
23. Define "surface runoff."
24. Which part of the Earth's mantle is partially molten?
25. What is the main constituent of the Earth's mantle rocks?
26. What percentage of the atmosphere is oxygen?
27. What is the approximate depth of the Earth's mantle?
28. What is "sublimation" in the context of the water cycle?
29. What is the primary function of the ozone layer?
30. What causes seismic waves to change velocity within the Earth?

5-Mark Questions:

1. Explain the composition of the Earth's atmosphere and its major gases.
2. Describe the structure and properties of the troposphere.
3. What is the greenhouse effect and how does it influence Earth's temperature?
4. Discuss the importance of the ozone layer and its role in protecting life on Earth.
5. Define and explain the hydrologic cycle, including its main processes.
6. How does precipitation form, and what are the different types of precipitation?
7. Explain the concept of evapotranspiration and its role in the water cycle.
8. Compare and contrast the processes of evaporation, condensation, and sublimation.
9. Describe the structure of the Earth's crust, including the continental, oceanic, and transitional crusts.
10. Explain the formation of different types of rocks in the lithosphere.
11. Discuss the structure and composition of the Earth's mantle.
12. Explain the role of the mantle in plate tectonics and volcanic activity.
13. Describe the Earth's core, its composition, and its role in generating the planet's magnetic field.
14. What are seismic discontinuities, and how are they used to understand Earth's internal structure?
15. Discuss the significance of the Mohorovičić and Gutenberg discontinuities.
16. Explain how the water cycle affects the distribution of water on Earth's surface.
17. Describe the different types of clouds and how they are formed.
18. What are trade winds and how do they influence global weather patterns?
19. Explain the process of monsoon formation and its effects on regional climates.
20. Discuss the importance of groundwater in the hydrosphere and its role in the water cycle.
21. Explain how water infiltrates the ground and recharges aquifers.
22. Describe the process by which springs are formed.
23. How do ocean currents affect the global climate and water distribution?
24. Discuss the importance of volcanic gases and minerals in the Earth's atmosphere and hydrosphere.
25. Explain the process of plate tectonics and how it leads to earthquakes and volcanic eruptions.

UNIT 3
Geological processes

Multiple Choice Questions

1. What is an exogenous geological process?
   A) Tectonic plate movement
   B) Intrusion of magma
   C) Erosion by wind
   D) Earthquake activity
2. What is the primary agent in chemical weathering?
   A) Wind
   B) Water
   C) Sunlight
   D) Temperature
3. The end product of weathering that remains above the parent rock in fragments is called:
   A) Loess
   B) Elluvium
   C) Scree
   D) Delta
4. Which process is responsible for the rounded shape of rocks in riverbeds?
   A) Corrasion
   B) Deflation
   C) Exfoliation
   D) Attrition
5. Pedestal or mushroom rocks are formed mainly due to:
   A) Frost action
   B) Deflation
   C) Erosion by wind
   D) Biological activity
6. What type of dune forms when wind deposits sand due to obstructions?
   A) Loess
   B) Barchan
   C) Scree
   D) Talus
7. The agent that primarily causes oxidation in chemical weathering is:
   A) Carbon dioxide
   B) Nitrogen
   C) Oxygen
   D) Hydrogen
8. Which type of weathering involves organisms like bacteria and plants?
   A) Mechanical
   B) Chemical

C) Biological
D) Physical

9. ‘Talus’ is best described as:
   A) Erosion of river valleys
   B) The gradual wearing away of rocks by wind
   C) A collection of rock fragments at a mountain base
   D) Sediment deposits in a delta
10. In river erosion, a pot hole is formed mainly due to:
   A) Abrasion by sand
   B) Chemical dissolution
   C) Hydraulic action
   D) Swirling currents with rock fragments
11. What term describes sand moved by the wind in a series of jumps along the ground?
   A) Suspension
   B) Deflation
   C) Saltation
   D) Abrasion
12. Which of the following is NOT an erosional feature created by wind?
   A) Ventifact
   B) Pedestal rock
   C) Delta
   D) Mushroom rock
13. Which process involves rocks breaking down with no chemical alteration?
   A) Oxidation
   B) Carbonation
   C) Physical weathering
   D) Corrosion
14. An example of an endogenic process is:
   A) Wind erosion
   B) Earthquake activity
   C) River sediment transport
   D) Frost action
15. The decomposition of rocks due to chemical changes in their composition is called:
   A) Erosion
   B) Weathering
   C) Deposition
   D) Sedimentation
16. The rock structure formed at river bends by water flow is called a:
   A) Delta
   B) Talus
   C) Scree
   D) Pot hole
17. Hydration in chemical weathering primarily results in:
   A) Formation of clay minerals
   B) Absorption of oxygen by rocks
   C) The rock shrinking
   D) Surface rock peeling
18. A characteristic feature of a river’s mouth where fresh and saline water mix is called:
   A) Scree
   B) Estuary
   C) Talus
   D) Dune
19. Which rock type is more vulnerable to biological weathering?
   A) Sedimentary rocks
   B) Igneous rocks
   C) Metamorphic rocks
   D) Volcanic rocks
20. Deflation in wind erosion refers to:
   A) Erosion of bedrock
   B) Removal of loose particles
   C) Chemical dissolution
   D) Smoothing of rock surfaces
21. Which type of glacier forms when valley glaciers converge to create a larger ice mass at the foothills of mountains?
   A) Valley Glacier
   B) Piedmont Glacier
   C) Continental Glacier
   D) Alpine Glacier
22. The U-shaped valley is primarily formed by:
   A) River erosion
   B) Wind erosion
   C) Glacial erosion
   D) Volcanic activity
23. What is the lower boundary of the snow cover called?
   A) Snowfield
   B) Snowline
   C) Glacier terminus
   D) Ice sheet
24. Which zone is located between the soil-water zone and the capillary zone?
   A) Vadose Zone
   B) Soil Zone
   C) Capillary Fringe
   D) Saturation Zone
25. Eskers are formed from:
   A) Wind deposits
   B) River sediment
   C) Glacier debris

D) Layered sand and gravel from glacial streams

26. Which of the following carries the heaviest load at the bottom of a glacier?
    A) Medial moraines
    B) Lateral moraines
    C) Ground moraines
    D) Terminal moraines
27. Which type of spring results from cracks in bedrock where water flows through?
    A) Artesian Spring
    B) Water Table Spring
    C) Fracture Spring
    D) Bedding Spring
28. A structure that forms on a cave ceiling due to calcium carbonate deposits is called:
    A) Stalagmite
    B) Stalactite
    C) Dripstone
    D) Pillar
29. Which of the following refers to a glacier's erosive process caused by rocks embedded in the ice?
    A) Plucking
    B) Frost Wedging
    C) Quarrying
    D) Abrasion
30. Drumlins are:
    A) U-shaped valleys
    B) Rounded hills formed by glacial deposits
    C) Sharp mountain peaks
    D) Glacial caves
31. When water moves laterally instead of vertically between rock layers, it forms:
    A) Water Table Spring
    B) Artesian Well
    C) Bedding Spring
    D) Capillary Fringe
32. Glaciers flow due to:
    A) Wind force
    B) Temperature
    C) Gravity
    D) Earthquakes
33. Which rock feature grows upward from the cave floor?
    A) Stalactite
    B) Dripstone
    C) Stalagmite
    D) Speleothem
34. The terminal moraine is located at:
    A) The sides of the glacier
    B) The center of the glacier
    C) The end of the glacier
    D) The surface of the glacier
35. Which glacier type covers an extensive region such as Antarctica?
    A) Valley Glacier
    B) Ice Sheet
    C) Piedmont Glacier
    D) Alpine Glacier
36. What is the definition of an aquifer?
    A) A porous rock that holds oil
    B) A water-bearing geologic formation
    C) A type of rock resistant to erosion
    D) A zone where the water table is below ground
37. Karst topography is typically found in regions with:
    A) Sandstone
    B) Basalt
    C) Limestone
    D) Granite
38. An opening in the ground to extract water where depth exceeds the largest surface dimension is called:
    A) Aquifer
    B) Well
    C) Spring
    D) Sinkhole
39. Which of these glacial features is a knife-edge ridge?
    A) Horn
    B) Cirque
    C) Arete
    D) Drumlin
40. Which type of spring is associated with a confined aquifer under pressure?
    A) Artesian Spring
    B) Fracture Spring
    C) Water Table Spring
    D) Bedding Spring

Fill in the Blank

1. Endogenic processes include tectonic forces such as _____ and _____.
2. The process of disintegration and decomposition of rocks is called _____.

3. Water absorbs carbon dioxide to form a weak acid, leading to the process of _____ in weathering.
4. _____ weathering involves rocks breaking down without chemical changes.
5. _____ is the rounded or ellipsoidal hollow on a riverbed caused by swirling rock fragments.
6. The transportation of rock fragments by wind in jumps or leaps is called _____.
7. The place where a river enters a sea is known as the _____.
8. _____ are pebbles that have been smoothed by wind abrasion.
9. _____ are deposits formed by wind from the finest dust particles.
10. The action of frost leads to the widening of rock cracks and is known as _____.
11. In mechanical weathering, temperature changes cause rock layers to peel in a process called _____.
12. The deposition of river sediments at the mouth of a river forms a _____.
13. Windblown sand accumulating in a mound or ridge is called a _____.
14. Loosely consolidated fragments formed by gravity at a mountain base are called _____.
15. The process of fine sand and silt polishing rock surfaces by wind is known as _____.
16. Biological weathering involves organisms like plants, animals, and _____.
17. Oxidation in rocks, commonly seen as rusting, occurs due to _____ exposure.
18. The continuous collision and rounding of transported rock fragments is called _____.
19. _____ refers to the removal of weathered material by wind.
20. The upper layers of rock separating in sheets due to daily temperature changes is _____.
21. Glaciers move due to the force of _____.
22. A cirque is a semi-circular depression commonly found at the _____ of glacial valleys.
23. _____ is the process by which glaciers scrape and erode the ground.
24. _____ glaciers are vast and cover entire continents, such as Antarctica.
25. The _____ moraine is located at the end of a glacier.
26. The boundary between the zone of aeration and zone of saturation is called the _____.
27. _____ are low mounds of clay found in glaciated regions.
28. _____ springs occur when groundwater intersects the land surface at valley floors.
29. The zone of aeration is divided into the soil water zone, the intermediate vadose zone, and the _____ zone.
30. Stalactites grow from the _____ of caves.
31. The rocky material carried and deposited by glaciers is known as _____.
32. _____ is the narrow ridge created when two glacial valleys meet.
33. The U-shape of a glacial valley is formed due to _____ erosion.
34. A _____ is a sharp peak formed by the erosion of multiple cirques.
35. _____ glaciers form in mountain valleys.
36. The narrow ridge of gravel left by glacial meltwater channels is called an _____.
37. When water-bearing rock layers are sandwiched between impermeable layers, it forms a(n) _____ aquifer.
38. An _____ well taps into confined groundwater.
39. _____ springs occur when water emerges at the base of an alluvial fan.
40. Karst landforms are often found in regions with _____ rock.

Match the Following

A	B
1. Frost action	A) Rock fragments at mountain base
2. Elluvium	B) Mound of sand formed by wind
3. Deflation	C) Mixing of fresh and saline water
4. Pedestal or mushroom rock	D) Chemical reaction with water
5. Talus	E) Disintegration due to ice in cracks
6. Pot hole	F) Weathering product above parent rock
7. Estuary	G) Erosional feature by wind
8. Dune	H) Pebbles smoothed by wind action

A	B
9. Ventifact	I) Removal of particles by wind
10. Hydration	J) Rounded depressions on riverbed

1 Mark Questions:

1. What is an exogenous process in geology?
2. Name any two endogenous processes.
3. What are the main agents of physical weathering?
4. Define weathering.
5. What is the role of water in chemical weathering?
6. What is exfoliation?
7. Define oxidation in the context of chemical weathering.
8. What is the process of carbonation in weathering?
9. What is the difference between elluvium and delluvium?
10. Define deflation in wind erosion.
11. What is a pedestal rock?
12. Name any two types of dunes.
13. What is an estuary?
14. Define hydraulic action in river erosion.
15. What are potholes in riverbeds?
16. What is attrition in river erosion?
17. How are ventifacts formed?
18. What are scree or talus?
19. What is aeolian deposition?
20. What is a delta?
21. What is a snowfield?
22. Define the snowline.
23. Name the three types of glaciers.
24. What is a valley glacier?
25. What is a piedmont glacier?
26. Which continents are covered by ice sheets?
27. What causes the movement of glaciers?
28. What is abrasion in glacial erosion?
29. Define a U-shaped valley.
30. What is a hanging valley?
31. Name one erosional feature caused by glaciers.
32. What is a horn in glacial topography?
33. Define a lateral moraine.
34. What is a drumlin?
35. What is porosity in underground water?
36. What is permeability in rocks?
37. Name the zone between the zone of aeration and the zone of saturation.
38. What is an aquifer?
39. Define a dug well.
40. What is an artesian spring?
41. What is karst topography?
42. What are stalactites?
43. What is a stalagmite?
44. Name two zones of aeration.
45. What is a spring?

3 Mark Questions:

1. Explain the difference between exogenous and endogenous processes with examples.
2. How does frost action contribute to mechanical weathering?
3. Describe the process of exfoliation in mechanical weathering.

4. What are the key processes involved in chemical weathering?
5. How does hydration affect rocks during weathering?
6. Describe the process of oxidation in rock weathering.
7. Explain carbonation and its effects on rocks.
8. What are the differences between elluvium and delluvium as products of weathering?
9. Describe the process of deflation and its role in wind erosion.
10. Explain how wind causes erosion through abrasion.
11. What are the transportation mechanisms of wind for fine materials?
12. Describe the formation of barchans.
13. How does a river transport its load?
14. What is the difference between solution and suspension in river transport?
15. Explain hydraulic action and its role in river erosion.
16. What are pot holes, and how are they formed?
17. Describe how a delta is formed at the mouth of a river.
18. Explain how wind contributes to the formation of ventifacts.
19. How does wind energy affect the transportation of particles?
20. What is the role of the estuary in the geological action of rivers?
21. Explain the difference between valley glaciers and continental glaciers.
22. Describe the process of frost wedging in glacial erosion.
23. What are the main features of cirques in glacial landscapes?
24. Explain the formation of arêtes and horns.
25. Describe the types of moraines.
26. What are eskers and how are they formed?
27. What is porosity, and what factors affect it?
28. Describe the difference between permeability and porosity.
29. Explain the capillary zone in the context of underground water.
30. Describe the formation of artesian springs.
31. What is a bedding spring?
32. Differentiate between fracture springs and alluvial fan springs.
33. Explain the process of deposition by glaciers.
34. What is a U-shaped valley, and how is it formed?
35. Explain the formation of a hanging valley.
36. What is karst topography, and what are its main features?
37. Explain the significance of stalactites and stalagmites in caves.
38. Describe the role of exogenous processes in shaping Earth's surface.
39. List the types of wells and briefly describe them.
40. What are the three sub-zones of the zone of aeration?

5 Mark Questions:

1. Discuss the differences between mechanical, chemical, and biological weathering processes.
2. Describe the process of frost action and its effects on rock disintegration.
3. Explain the key chemical processes involved in the weathering of rocks.
4. How does wind act as an agent of erosion, transportation, and deposition? Provide examples.
5. What are the major types of dunes, and how are they formed?
6. Describe the different erosional features created by wind, such as pedestal rocks and ventifacts.
7. Explain the processes of erosion, transportation, and deposition by rivers.
8. How do rivers erode their beds and banks through hydraulic action, abrasion, and solution?
9. Discuss the process of pot hole formation and its significance in river erosion.
10. Describe the geological action of wind, focusing on deflation, abrasion, and attrition.
11. Explain the various products of weathering and how they are classified.
12. Discuss how biological weathering contributes to the disintegration of rocks.
13. What are the different factors that affect the transportation power of wind?
14. Describe the formation and significance of deltas in river systems.
15. Compare and contrast the processes of deflation, attrition, and abrasion in wind erosion.
16. Describe the processes of erosion and deposition in glaciers.
17. Explain the types of glaciers and how they are distributed globally.

18. Discuss the geological actions of glaciers, including transportation and deposition.
19. What are moraines? Describe their different types and formation processes.
20. Explain the formation and features of U-shaped valleys, hanging valleys, cirques, horns, and arêtes.
21. Describe the process of underground water movement and the formation of wells.
22. What are the different types of springs? Describe the formation of each.
23. Discuss the significance of karst topography and the formation of caves, stalactites, and stalagmites.
24. What are drumlins and eskers? Explain their significance in glacial landscapes.
25. Explain the role of porosity and permeability in underground water storage.
26. Describe the various zones of underground water, and explain their significance.
27. Discuss the process of glacier movement and its impact on landscapes.
28. Explain the role of glaciers in reshaping mountain valleys and creating new landforms.
29. How do exogenous processes contribute to the restructuring of Earth's surface?
30. Describe the significance of glaciation in the hydrological cycle and landscape formation.

UNIT 4
Endogenous processes

2-Mark Questions:

1. Define the terms "focus" and "epicentre" in relation to an earthquake.
2. What is the elastic rebound theory?
3. Differentiate between body waves and surface waves.
4. What is a seismograph?
5. What are pyroclasts in the context of a volcanic eruption?
6. Define "lava" and explain its role in volcanic eruptions.
7. What are active, dormant, and extinct volcanoes?
8. Describe the role of tectonic forces in causing earthquakes.
9. What is a caldera in a volcano?
10. What are shallow earthquakes, and how deep is their focus?
11. Define a "fissure eruption" in volcanism.
12. What is the Richter Scale?
13. What gases are commonly emitted during volcanic eruptions?
14. What is a volcanic bomb?
15. Name two main earthquake belts in the world.
16. What is a seismogram?
17. What is meant by "deep-seated earthquake"?
18. What is a volcanic tuff?
19. What is the difference between cinders and volcanic blocks?
20. Mention the gases involved in volcanic explosions.
21. Define an "intermediate earthquake."
22. What is the Circum-Pacific Belt?
23. What is the function of the pendulum in a seismograph?
24. What is the significance of endogenous processes in Earth's crust?
25. What is the difference between non-tectonic and tectonic earthquakes?

3-Mark Questions:

1. What is the role of seismic waves in determining the intensity of an earthquake?
2. Differentiate between the three types of earthquakes based on the depth of focus.
3. Explain the difference between P (primary) and S (secondary) seismic waves.
4. Describe the different products of volcanic eruptions.
5. How do earthquakes trigger tsunamis?
6. What is a volcanic caldera, and how does it form?
7. Explain the role of convection currents in the generation of tectonic forces.
8. How does a seismograph work to record an earthquake?
9. What are the hazards associated with earthquakes and volcanic eruptions?

10. Discuss the various gases emitted during a volcanic eruption and their impact on the environment.
11. How does the elastic rebound theory explain the occurrence of earthquakes?
12. Discuss the significance of volcanoes in land formation and destruction.
13. Describe the pyroclastic materials released during a volcanic eruption.
14. How do earthquakes of different magnitudes impact human settlements differently?
15. Explain the process of faulting during an earthquake.
16. Describe the mechanism of a volcanic eruption through a central vent.
17. How does the Richter scale measure the magnitude of earthquakes?
18. Discuss the formation of volcanic islands.
19. Differentiate between active, dormant, and extinct volcanoes with examples.
20. What are the differences between Love and Rayleigh seismic waves?

5-Mark Questions:

1. Discuss the classification of seismic waves and their role in earthquake detection.
2. Explain the elastic rebound theory in detail with an example.
3. Describe the process of volcanic eruption and the types of material expelled during the eruption.
4. Discuss the hazards and environmental impacts of both earthquakes and volcanoes.
5. Compare and contrast body waves and surface waves, and their effects during an earthquake.
6. Describe the formation and significance of the Circum-Pacific Belt and the Alpine-Himalayan Belt.
7. Explain how earthquakes are measured using the Richter Scale and what the scale represents.
8. Discuss the various types of volcanic eruptions and their impact on land formation.
9. Explain how volcanic gases contribute to atmospheric warming and environmental change.
10. Discuss the role of tectonic forces in shaping the Earth's crust through earthquakes and volcanoes.
11. Describe the mechanism of a seismograph and how it records seismic activity.
12. What is a volcanic tuff, and how is it formed?
13. Explain the relationship between earthquakes, tsunamis, and tectonic plate movements.
14. Discuss the role of endogenous processes in the formation of mountain ranges.
15. Describe how volcanic eruptions contribute to both the creation and destruction of landforms.
16. Explain the formation of lava plateaus with reference to the Deccan volcanic lava flows.
17. Discuss the environmental and societal impacts of recent major earthquakes in India.
18. Compare the geological significance of shallow, intermediate, and deep-seated earthquakes.
19. Explain the role of gases in volcanic eruptions and how they influence the eruption process.
20. Analyze the geological events leading to the creation of the island south of Tokyo, Japan, due to volcanic activity

UNIT 5
Mineralogy

Multiple Choice Questions

1. Which of the following is not a characteristic of a mineral?
   A) Naturally occurring
   B) Organic in nature
   C) Definite chemical composition
   D) Crystalline structure
2. Which mineral has the highest hardness according to Moh's scale?
   A) Talc
   B) Quartz
   C) Diamond
   D) Feldspar
3. The specific gravity of quartz is:
   A) 1.0
   B) 2.5
   C) 2.65
   D) 3.0
4. A mineral with perfect basal cleavage and foliated structure is:
   A) Quartz
   B) Feldspar
   C) Mica
   D) Hematite
5. The hardness of feldspar on Moh's scale is:
   A) 4 B) 5 C) 6 D) 7
6. Which mineral shows conchoidal fracture?
   A) Calcite
   B) Feldspar

C) Quartz D) Mica

7. Which of the following is an example of an accessory mineral?
   A) Olivine C) Magnetite
   B) Orthoclase D) Quartz
8. What type of luster is shown by a diamond?
   A) Vitreous C) Adamantine
   B) Pearly D) Resinous
9. Which group of minerals is a silicate?
   A) Galena C) Mica
   B) Pyrite D) Bauxite
10. Which mineral is commonly used in electrical industries as an insulator?
    A) Quartz C) Mica
    B) Feldspar D) Hematite
11. The crystal system in which quartz crystallizes is:
    A) Hexagonal C) Triclinic
    B) Monoclinic D) Cubic
12. Which mineral is often used in glass manufacturing?
    A) Hematite C) Quartz
    B) Mica D) Feldspar
13. An example of a metallic ore mineral is:
    A) Mica C) Quartz
    B) Galena D) Bauxite
14. The term “botryoidal” is used to describe a mineral that resembles:
    A) A knife blade C) Bunches of grapes
    B) Thin sheets D) Broken glass
15. Which mineral is classified as a native element?
    A) Quartz C) Graphite
    B) Calcite D) Feldspar
16. What is the streak color of sulfur?
    A) Yellow C) White
    B) Red D) Colorless
17. The most common rock-forming mineral group is:
    A) Feldspar C) Galena
    B) Calcite D) Magnetite
18. Minerals with a greasy or waxy luster include:
    A) Quartz C) Galena
    B) Chalcedony D) Calcite
19. Which mineral can be classified as flexible and elastic?
    A) Feldspar C) Mica
    B) Quartz D) Hematite
20. The cleavage of a mineral refers to its:
    A) Color in powdered form C) Ability to split along planes
    B) Color in natural state D) Resistance to scratching
21. Which mineral is used in ceramics and glazes?
    A) Mica C) Hematite
    B) Feldspar D) Quartz
22. Which of the following minerals is associated with perfect cleavage?
    A) Quartz C) Magnetite
    B) Calcite D) Galena
23. The resistance of a mineral to scratching is called:
    A) Tenacity C) Cleavage
    B) Hardness D) Fracture
24. Which is a primary mineral?
    A) Zeolites C) Calcite
    B) Quartz D) Magnetite

25. An example of a mineral that forms an amorphous habit is:
    A) Mica
    B) Quartz
    C) Chert
    D) Galena

Fill in the Blanks

1. Minerals are the smallest geological units forming the _____.
2. Minerals with metallic luster are generally more consistent in _____.
3. _____ is a mineral known for its foliated form.
4. The hardness scale developed by Friedrich Mohs ranges from 1 to _____.
5. A mineral that can be cut into slices is described as _____.
6. The crystal system of feldspar can be _____ or triclinic.
7. _____ fracture is characterized by a surface that looks like broken glass.
8. A mineral's weight relative to an equal volume of water is its _____.
9. Calcite is an example of a mineral that has _____ cleavage.
10. _____ is commonly used in the making of lenses and optical instruments.
11. The mineral group mica includes two main types: _____ and _____.
12. Hematite is classified as a _____ mineral.
13. Minerals with a resinous luster resemble _____.
14. Minerals that transmit light are categorized based on _____.
15. The atomic composition of quartz is _____.

Match the Following

A	B
1. Quartz	A. Potassium Aluminosilicate
2. Hardest mineral	B. Conchoidal fracture
3. Feldspar	C. 10 on Moh’s scale
4. Mica	D. Electrical insulator
5. Cleavage plane	E. Plane of separation
6. Specific Gravity	F. Weight to water volume ratio
7. Talc	G. Softest mineral on Moh’s scale
8. Colorless streak	H. Quartz and Sulfur
9. Tenacity	I. Resistance to breaking
10. Metallic ore mineral	J. Hematite

1-Mark Questions

1. What is mineralogy?
2. What is the definition of a mineral?
3. Give an example of a native mineral.
4. What percentage of the continental crust is made up of silicon?
5. Name any two elements found in continental crust minerals.
6. What are rock-forming minerals?
7. What is an example of an economic mineral?
8. What are primary minerals?
9. Name one secondary mineral.
10. What are essential minerals?
11. Define accessory minerals.
12. What is the streak of sulfur?
13. What type of luster does galena have?
14. What mineral shows a greasy luster?
15. What is the hardest mineral on Moh's scale?
16. What is cleavage in minerals?
17. Give an example of a mineral with conchoidal fracture.

18. What type of mineral form does asbestos exhibit?
19. What is the specific gravity of quartz?
20. What is the chemical composition of quartz?
21. What is the streak of feldspar?
22. What is the hardness of feldspar?
23. What type of tenacity does mica exhibit?
24. What is the hardness of mica?
25. Name a mineral from the mica group.
26. What type of mineral is hematite?
27. What is the boiling point of metals, high or low?
28. Name a non-metallic ore mineral.
29. What is the luster of diamond called?
30. What is diaphaneity?
31. Name one transparent mineral.
32. What is a tabular form of a mineral?
33. Give an example of a bladed mineral.
34. What are non-metallic minerals?
35. What is the chemical composition of calcite?

3-Mark Questions

1. What are the common elements in the continental crust and their percentages?
2. How minerals are classified based on chemical composition?
3. Differentiate between primary and secondary minerals.
4. Explain the physical properties of quartz.
5. Describe the uses of quartz in various industries.
6. What are the properties of feldspar?
7. List the types of fractures and provide examples of minerals showing each type.
8. Explain the cleavage property in minerals and differentiate between perfect and imperfect cleavage.
9. What is Moh's scale of hardness? Provide examples of two minerals on the scale.
10. What are economic minerals? Provide two examples.
11. What is the difference between metallic and non-metallic minerals?
12. Describe the specific gravity determination method using Walker's Steel Yard balance.
13. How do minerals show different colors? Provide an example of a mineral with varying colors.
14. What are the main types of luster in minerals? Provide examples.
15. What is tenacity? Describe the five types of tenacity and provide examples.
16. Define rock-forming minerals. Provide two examples.
17. What is streak, and how does it differ from the color of the mineral?
18. Discuss the occurrence and uses of mica.
19. What are the physical properties of feldspar and how does it occur in nature?
20. Explain diaphaneity and its types in minerals.
21. How are specific gravity and mineral composition related?
22. Discuss the fracture properties of quartz.
23. What is cleavage in minerals? Provide an example of a mineral with perfect cleavage.
24. What is fracture? Differentiate between even and uneven fractures.
25. Describe the crystal habit of minerals with examples.
26. What are native minerals? Provide examples.
27. What is the role of oxygen in continental crust minerals?
28. Discuss the physical properties and uses of feldspar.
29. Explain the role of minerals in daily life and technology.
30. How does the occurrence of minerals vary in different types of rocks?

5-Mak Questions

1. Describe in detail the classification of minerals into rock-forming and economic minerals with examples.
2. Explain the Moh's scale of hardness in detail. Discuss the importance of this scale in mineralogy.
3. Discuss the physical properties of minerals, including color, streak, hardness, and cleavage.

4. Explain the different forms of fractures in minerals, providing examples of each type.
5. What is specific gravity? Explain its determination using Walker's Steel Yard balance with an example.
6. Discuss the major mineral groups (quartz, feldspar, mica) in detail, including their physical properties and uses.
7. Explain the classification of minerals based on chemical composition with examples.
8. How are primary and secondary minerals different? Provide examples and explain their significance in geology.
9. Discuss the physical and chemical properties of quartz. What are its varieties and their uses?
10. What are the common mineral-forming elements in the continental crust? Discuss their significance in geology.
11. Describe the processes involved in the formation of minerals in igneous, sedimentary, and metamorphic rocks.
12. Explain the role of minerals in industrial applications, providing examples from the quartz, feldspar, and mica groups.
13. Discuss the types of luster found in minerals. Provide examples of minerals that exhibit different types of luster.
14. How do minerals contribute to the prosperity of a country? Discuss with examples of economic minerals.
15. Describe the physical properties of feldspar and its importance in geology and industry.
16. What is tenacity in minerals? Explain the different types of tenacity with relevant examples.
17. Discuss the role of minerals in the formation of rocks. Explain how minerals are grouped as essential and accessory minerals.
18. Describe the structure and composition of native elements. Provide examples of their occurrence and uses.
19. How does cleavage differ from fracture in minerals? Provide examples and explain their significance in mineral identification.
20. Explain the chemical composition and uses of calcite in various industries.
21. Discuss the physical and chemical properties of mica, focusing on its uses in electrical industries.
22. How is the streak of a mineral determined, and why is it important in mineral identification?
23. What are the characteristics of metallic and non-metallic minerals? Provide examples and explain their significance in geology.
24. Explain the process of determining specific gravity in minerals with an example.
25. Discuss the role of minerals in geological formations and how they are essential for various industries.

UNIT 5
Crystallography

MCQ Questions

1. What is crystallography the study of?
   A. Rock formations
   B. All aspects of a crystal
   C. Chemical composition of minerals
   D. Mineral hardness
2. A crystal is defined as a solid polyhedral body bounded by:
   A. Edges only
   B. Solid angles only
   C. Faces, edges, and solid angles
   D. Chemical elements
3. Which term describes the smooth, flat surface of a crystal?
   a) Edge
   b) Face
   c) Solid angle
   d) Cleavage
4. According to Euler's Law, the sum of the total number of faces and solid angles is equal to the sum of edges and:
   a) 1 b) 2 c) 3 d) 4
5. The interfacial angle of a crystal is measured using a:
   a) Contact Goniometer
   b) Protractor
   c) Scale
   d) Compass

6. Which system has four crystallographic axes?
    a) Isometric
    b) Tetragonal
    c) Hexagonal
    d) Monoclinic
7. A cube belongs to which crystal system?
    a) Tetragonal
    b) Monoclinic
    c) Isometric
    d) Triclinic
8. What type of mineral is commonly associated with the Tetragonal system?
    a) Beryl
    b) Kyanite
    c) Zircon
    d) Quartz
9. Which crystal system has all three axes of unequal lengths and all are inclined?
    a) Triclinic
    b) Hexagonal
    c) Orthorhombic
    d) Monoclinic
10. In which crystal system are there 9 planes of symmetry?
    a) Orthorhombic
    b) Monoclinic
    c) Hexagonal
    d) Isometric
11. Which of the following is not a form in the Tetragonal system?
    a) Prism
    b) Dodecahedron
    c) Pyramid
    d) Pinacoid
12. The center of symmetry refers to:
    a) Intersection of all axes
    b) Axis rotation
    c) Symmetry character in crystals
    d) Pair arrangement of faces
13. In the Isometric crystal system, how many axes of symmetry are there?
    a) 9
    b) 13
    c) 6
    d) 5
14. Which mineral is a type mineral for the Monoclinic system?
    a) Zircon
    b) Gypsum
    c) Quartz
    d) Feldspar
15. The plane dividing a crystal into symmetrical halves is called:
    a) Edge
    b) Face
    c) Axis
    d) Plane of symmetry
16. A crystal with six planes of symmetry belongs to which system?
    a) Tetragonal
    b) Hexagonal
    c) Isometric
    d) Orthorhombic
17. What type of symmetry is found only in the Monoclinic system?
    a) Axis of symmetry
    b) Center of symmetry
    c) Plane of symmetry
    d) None of these
18. The measurement of interfacial angles involves using:
    a) Magnetic compass
    b) Goniometer
    c) Clinometer
    d) Altimeter
19. Which system's crystal structure includes diads and tetrads?
    a) Hexagonal
    b) Orthorhombic
    c) Isometric
    d) Monoclinic
20. The form "pinacoid" is commonly found in which systems?
    a) Triclinic and Orthorhombic
    b) Isometric and Hexagonal
    c) Monoclinic and Tetragonal
    d) Triclinic and Hexagonal
21. The crystal system with the highest degree of symmetry is:
    a) Triclinic
    b) Tetragonal
    c) Isometric
    d) Orthorhombic
22. Which system has no planes or axes of symmetry?
    a) Isometric
    b) Hexagonal
    c) Triclinic
    d) Orthorhombic
23. Hexagonal prisms are commonly associated with which crystal system?
    a) Tetragonal
    b) Hexagonal
    c) Monoclinic
    d) Orthorhombic
24. Which mineral is considered a type mineral for the Triclinic system?

a) Gypsum
b) Kyanite
c) Quartz
d) Feldspar

25. The presence of what symmetry character distinguishes the Normal class of a crystal?
    a) Center of symmetry
    b) Planes of symmetry
    c) Axes of symmetry
    d) All of the above

Fill in the Blanks

1. Crystallography is the study of _____.
2. A crystal is defined as a solid bounded by _____, _____, and _____.
3. The smooth flat surface of a crystal is known as the _____.
4. Euler's Law states that the sum of faces and solid angles is equal to the sum of _____ and _____.
5. The interfacial angle of a crystal is measured using a _____.
6. _____ symmetry divides a crystal into similar halves.
7. The _____ system has four crystallographic axes.
8. A cube belongs to the _____ crystal system.
9. Gypsum is a type mineral for the _____ system.
10. The _____ system includes crystals with no planes or axes of symmetry.
11. The resistance of a crystal to crushing or bending is called _____.
12. Contact goniometers measure angles between adjacent crystal _____.
13. The _____ axis in the Hexagonal system is either longer or shorter than the others.
14. The intersection of two adjacent faces forms an _____.
15. Minerals like Beryl crystallize in the _____ system.

Match the Following

A	B
1. Tetragonal system -	a) Bery
2. Isometric system -	b) Zircon
3. Center of symmetry -	c) Paired arrangement of faces
4. Pinacoid form -	d) Common in Monoclinic system
5. Contact Goniometer -	e) Measures interfacial angles
6. Orthorhombic axes -	f) Unequal and perpendicular
7. Diads and triads -	g) Symmetry axes
8. Triclinic system -	h) No planes or axes of symmetry
9. Prism -	i) Tetragonal form
10. Gypsum -	j) Monoclinic mineral

1-Mark Questions:

1. What is crystallography?
2. Define a crystal.
3. What is the face of a crystal?
4. What is an edge in a crystal?
5. Define a solid angle in a crystal.
6. What is a form in a crystal?
7. What does Euler's Law state?
8. Define interfacial angle.
9. What instrument is used to measure the interfacial angle?
10. How many planes of symmetry does a cube have?
11. What is the axis of symmetry called when a crystal repeats itself 3 times in rotation?
12. Which system does the mineral Galena belong to?
13. How many crystallographic axes are there in a hexagonal system?
14. What mineral belongs to the isometric system?
15. Which axis in the monoclinic system is inclined?
16. Define the term "Centre of Symmetry."
17. What is the symmetry character of the hexagonal system?
18. Which mineral is an example of the triclinic system?
19. How many planes of symmetry are there in the tetragonal system?
20. Define the orthorhombic system.

21. What is a pinacoid?
22. Which system has no symmetry planes or axes?
23. What are the axial relations in the cubic system?
24. What is a hexagonal bond known for?
25. How many fold symmetry does a tetrad axis have?
26. Define a "diad" axis.
27. How many axes of symmetry does the isometric system have?
28. What is the crystallographic axis designation for the orthorhombic system?
29. Which system has 7 planes of symmetry?
30. What is a "prism" in crystal forms?
31. What is the longest crystallographic axis in the tetragonal system?
32. How many axes of symmetry are present in the hexagonal system?
33. Define the monoclinic system.
34. Which system has the strongest bond in nature?
35. Name a mineral that belongs to the orthorhombic system

2-Mark Questions:

1. Explain the difference between a simple and combination form of crystals.
2. What are crystallographic axes, and why are they important?
3. Explain how to measure the interfacial angle using a Contact Goniometer.
4. What is a plane of symmetry in a crystal?
5. Define the term “Axes of Symmetry.”
6. Explain the significance of the centre of symmetry in a crystal.
7. What is the axial relation in the cubic system?
8. Give the symmetry characters of the cubic system.
9. Describe the crystallographic axes in the tetragonal system.
10. List the symmetry characters of the tetragonal system.
11. What is the crystallographic axis relation in the hexagonal system?
12. Explain the symmetry characters of the hexagonal system.
13. What are the forms of crystals found in the hexagonal system?
14. Describe the crystallographic axes of the orthorhombic system.
15. List the symmetry characters of the orthorhombic system.
16. What is unique about the monoclinic system's axes?
17. Explain the forms of crystals found in the monoclinic system.
18. Describe the axial relation in the triclinic system.
19. What are the symmetry characters of the triclinic system?
20. What forms of crystals belong to the triclinic system?
21. What is the importance of Euler's Law in crystallography?
22. Define the term "Hexad" in the context of symmetry axes.
23. How is a pyramid form different from a prism in crystals?
24. Explain why all crystals are minerals, but not all minerals are crystals.
25. What is the crystallographic difference between a pinacoid and a dome?

3-Mark Questions:

1. Explain the morphology of a crystal.
2. Describe the different symmetry elements in a crystal.
3. What are the three criteria used to define the symmetry of a crystal?
4. Compare and contrast the cubic and tetragonal systems.
5. How does the hexagonal system differ from the orthorhombic system?
6. Explain the forms and axial relations of the tetragonal system.
7. Describe the crystallographic features and forms of the monoclinic system.
8. How can a Contact Goniometer be used to measure the interfacial angle of a crystal?
9. Explain the axial relation and symmetry characters of the hexagonal system.
10. What is the significance of the centre of symmetry in different crystal systems?
11. Explain the role of crystallographic axes in classifying crystals.
12. Describe the forms and symmetry elements of crystals in the orthorhombic system.
13. How does the triclinic system differ from the monoclinic system?

14. Explain the difference between 3-fold and 4-fold symmetry axes.
15. Compare the forms of crystals in the tetragonal and hexagonal systems.
16. What are the important crystallographic forms in the isometric system?
17. Discuss the symmetry elements of the orthorhombic crystal system.
18. Describe the axial relation and forms of crystals in the triclinic system.
19. How does the concept of symmetry influence the classification of crystal systems?
20. What are the symmetry characters of the cubic system?
21. Explain how the crystallographic axes are designated in the monoclinic system.
22. Discuss the forms of crystals found in the tetragonal system.
23. Describe the crystallographic and symmetry characters of the triclinic system.
24. How does a diad axis differ from a tetrad axis?
25. Discuss the forms of crystals found in the monoclinic and triclinic systems

5-Mark Questions:

1. Describe in detail the six different crystal systems, their axial relations, and symmetry characters.
2. Explain how Euler's Law applies to crystallography with examples.
3. Discuss the various symmetry elements in a crystal with examples from different systems.
4. Compare and contrast the isometric and hexagonal crystal systems in terms of symmetry and forms.
5. How does the use of crystallographic axes aid in the classification of crystals into different systems?
6. Explain the steps involved in measuring the interfacial angle of a crystal using a Contact Goniometer.
7. Describe the different forms of crystals in the cubic system with their symmetry characteristics.
8. Discuss the symmetry elements and crystallographic axes of the tetragonal system with examples.
9. What are the different types of axes of symmetry, and how do they differ in various crystal systems?
10. Explain the crystallographic axes, forms, and symmetry elements of the hexagonal system in detail.
11. Compare the symmetry elements of the monoclinic and orthorhombic systems.
12. Discuss the significance of symmetry planes, axes, and centers in crystallography.
13. Explain the axial relation and forms of crystals found in the triclinic system.
14. Describe the process of classifying crystals into the six systems based on their crystallographic features.
15. How do symmetry elements help in determining the forms of crystals in different systems?
16. Discuss the role of crystallographic axes in the formation of crystal faces and angles.
17. Explain the different forms of crystals found in the tetragonal system with examples.
18. Compare and contrast the forms and symmetry elements of crystals in the orthorhombic and hexagonal systems.
19. Discuss the importance of planes of symmetry in defining the morphology of a crystal.
20. Explain the symmetry characters and crystallographic axes of the isometric system with examples.
21. What are the crystallographic and symmetry differences between the monoclinic and triclinic systems?
22. Describe the forms and symmetry elements found in the hexagonal system.
23. How different crystal systems classified are based on the crystallographic axes and symmetry characters?
24. Discuss the forms of crystals found in the orthorhombic system and their axial relations.
25. Explain the classification of crystals based on crystallographic axes and symmetry into different systems.

UNIT 6
Environmental geology

Multiple Choice Questions (MCQs)

1. What is Environmental Geology primarily concerned with?
   A) The study of minerals
   B) The application of geology to human-related environmental issues
   C) The study of marine ecosystems
   D) The classification of rocks
2. Which of the following is not a natural hazard?
   A) Earthquake
   B) Drought
   C) Air pollution
   D) Volcanic eruption
3. Ecology is the science of...
   A) Rocks and minerals
   B) Living organisms and their habitats
   C) Water purification
   D) Human history
4. Which is considered the most disastrous natural phenomenon?
   A) Landslides
   B) Floods
   C) Earthquakes
   D) Drought
5. The term ‘colluvial creep’ refers to:
   A) Rock formation
   B) Soil erosion on slopes
   C) Water pollution
   D) Airborne pollutants
6. Which human activity contributes to soil erosion?
   A) Reforestation
   B) Urbanization
   C) Building dams
   D) Crop rotation
7. Pollution is defined as the contamination of air, water, or soil beyond:
   A) Safe consumption
   B) Permissible limits
   C) Ecological impact
   D) Industrial application
8. What is the main component of air?
   A) Oxygen
   B) Hydrogen
   C) Nitrogen
   D) Carbon dioxide
9. Forest fires primarily cause pollution by releasing:
   A) Particulate matter
   B) Industrial chemicals
   C) Nutrients
   D) Heavy metals
10. Excessive carbon dioxide in the air results in:
    A) Water pollution
    B) Soil erosion
    C) Air pollution
    D) Industrial development
11. Anthropogenic hazards are caused by:
    A) Natural phenomena
    B) Human activities
    C) Climate change
    D) Marine ecosystems
12. The presence of which heavy metal in high amounts is harmful to ecosystems?
    A) Carbon
    B) Oxygen
    C) Cadmium
    D) Calcium
13. Which pollutant is known to deplete the ozone layer?
    A) Nitrogen
    B) Sulphur dioxide
    C) Chlorofluorocarbons (CFCs)
    D) Carbon monoxide
14. Groundwater contamination in some areas is due to high content of:
    A) Oxygen
    B) Fluorine
    C) Hydrogen
    D) Sulphur
15. The primary pollutants in atmospheric air are:
    A) Gaseous pollutants and nutrients
    B) Gaseous pollutants and particulate matter
    C) Water vapors
    D) Radioactive minerals
16. What kind of natural disaster affects coastal regions most severely?

A) Earthquake
B) Landslide
C) Cyclone
D) Wildfire

17. Which atmospheric component is vital for aerobic life?
A) Oxygen
B) Hydrogen
C) Carbon dioxide
D) Helium

18. One of the consequences of dam construction is:
A) Soil fertility increase
B) Coastal erosion
C) Forest fires
D) Higher soil pH

19. Which mineral type in water can cause toxicity at high levels?
A) Iron and copper
B) Fluoride and lead
C) Silicon and aluminum
D) Nitrogen and hydrogen

20. High levels of fluoride in water are harmful above what ppm?
A) 2.0 ppm
B) 1.5 ppm
C) 3.0 ppm
D) 4.0 ppm

21. In an ecological context, what does the term "tolerance level" refer to?
A) The minimum required nutrients
B) Organisms' sensitivity to pollutants
C) Water purity
D) Oxygen supply

22. Which of the following is a secondary effect of deforestation?
A) Increased soil moisture
B) Loss of biodiversity
C) Reduced soil erosion
D) Higher pH levels in soil

23. The contamination of a substance beyond its permissible limits is known as:
A) Pollution
B) Conservation
C) Rehabilitation
D) Neutralization

24. Which natural event often occurs during periods of high rainfall?
A) Volcanic eruption
B) Earthquake
C) Landslide
D) Drought

25. Which pollutant category includes toxic metals like lead and mercury?
A) Particulate pollutants
B) Nutrient pollutants
C) Gaseous pollutants
D) Heavy metals

Fill-in-the-Blank Questions

1. _____ Geology applies geologic principles to human-created environmental problems.
2. The relationship between organisms and their habitats is studied in the field of _____.
3. When forests are removed, it can lead to soil erosion and _____ creep.
4. A mixture of gases that is crucial for life and contains mainly oxygen, hydrogen, and nitrogen is called _____.
5. Volcanic eruptions can release gases that _____ the atmosphere.
6. A cyclone affecting a coastal area is an example of a _____ hazard.
7. The buildup of harmful substances beyond safe limits in air, water, or soil is known as _____.
8. _____ is a process by which fertile topsoil is removed by water or wind.
9. Anthropogenic hazards are those that are _____ in origin.
10. An increase in atmospheric _____ can disrupt ecosystems and contribute to global warming.
11. Deforestation increases soil exposure, leading to _____.
12. Heavy metals in ecosystems, even at low levels measured in ppm or ppb, can be _____.
13. Saltwater _____ is an issue that may arise when freshwater sources are limited by dams.
14. Common heavy metals that cause pollution include lead, mercury, and _____.
15. The air pollutant category that includes dust and smoke is known as _____ pollutants.

Match the Following Questions

A	B
1. Air pollution	A. Soil erosion
2. Anthropogenic hazard	B. Cadmium
3. Forest fires	C. Industrial development

A	B
4. Colluvial creep	D. Atmospheric contamination
5. Earthquake	E. Water contamination
6. Heavy metals	F. Deforestation
7. Saltwater intrusion	G. High rainfall
8. Cyclone	H. Groundwater issue
9. Dams	I. Coastal erosion
10. Landslide	J. Natural hazard

1 Mark Questions:

1. What is environmental geology?
2. What is ecology?
3. Define hazards.
4. Name one human-induced hazard.
5. What are earthquakes?
6. How many active volcanoes are there in the world?
7. What natural event causes destruction in volcanic belts?
8. Which areas are frequently affected by floods?
9. What geographical areas are severely affected by cyclones?
10. What phenomenon often triggers landslides in highlands?
11. Name two factors that aggravate forest fires.
12. What does soil erosion lead to?
13. What is the consequence of cutting down forests on the soil?
14. How does dam construction affect coastal erosion?
15. What is pollution?
16. What is the main gas essential for aerobic life?
17. What is air pollution?
18. What is the major cause of air pollution?
19. Define particulate pollutants.
20. Define gaseous pollutants.
21. What is the permissible unit of measurement for pollutants in the air?
22. Name a harmful heavy metal that causes pollution.
23. What is the sensitivity or tolerance level in pollution?
24. What is considered toxic in high concentrations in water?
25. How many ppm of fluorine makes groundwater toxic?
26. How many tremors strike the earth surface daily?
27. How many earthquakes cause widespread damage annually?
28. Define the term ecosystem.
29. Name two gases that are useful in small quantities.
30. What is the definition of air?
31. What are the main constituents of air?
32. How is air pollution measured?
33. Name two pollutants found in the atmosphere.
34. Name a metal pollutant harmful in parts per million (ppm).
35. Name a common gas found in the air.
36. What is meant by ground water contamination?
37. Name two types of water pollutants.
38. What is global warming?
39. Name a mineral that can cause water contamination.
40. What is the most significant component of the environment?

2 Mark Questions:

1. What is the role of environmental geology in understanding hazards?
2. Explain the relationship between organisms and their habitats as described in ecology.

3. How do human activities contribute to natural hazards?
4. Describe the effect of earthquakes on geodynamically active zones.
5. How does volcanic activity impact the environment and atmosphere?
6. Explain how floods impact agricultural areas.
7. Describe the effect of cyclones on coastal areas.
8. How does rainfall contribute to natural landslides?
9. Explain the relationship between deforestation and soil erosion.
10. How does dam construction lead to coastal erosion?
11. What causes pollution to exceed permissible limits?
12. Describe the composition of air and its importance to life.
13. How do rapid industrialization and urbanization contribute to air pollution?
14. What are the main types of air pollutants?
15. Explain how population growth increases the magnitude of pollution.
16. What is the impact of an imbalanced ecosystem due to pollution?
17. How are heavy metals like lead and zinc harmful to living beings?
18. Describe the different tolerance levels of organisms to pollutants.
19. What is water contamination and how does it affect human health?
20. Explain the significance of high fluorine content in groundwater.
21. What is the frequency of tremors that strike the earth daily?
22. How do earthquakes lead to widespread destruction?
23. Discuss the significance of environment in the context of global warming.
24. How do forests help prevent soil erosion and land sliding?
25. Describe how human interference exacerbates forest fires.
26. How do contaminants like lead and mercury impact ecosystems?
27. What role do trees play in protecting soil from rainfall erosion?
28. Describe the effect of water flow through mineral zones on pollution.
29. Explain the role of natural events in causing environmental hazards.
30. Discuss how colluvial creep contributes to landslides.
31. How does salt water intrusion impact coastal wells?
32. What is the importance of studying environmental geology in relation to human interference?
33. How can reducing industrial pollutants improve air quality?
34. What are the harmful effects of having excessive amounts of nitrogen and phosphates in ecosystems?
35. How does soil erosion affect agricultural productivity?
36. Explain the process of saltwater intrusion due to reduced water flow.
37. What is the environmental impact of 15-20 destructive earthquakes each year?
38. Discuss the role of heavy metals in water pollution.
39. How do pollutants in parts per billion (ppb) differ from pollutants in parts per million (ppm)?
40. What are the long-term impacts of air and water pollution on global ecosystems?

UNIT 7
Role of Indian organizations/institutes in geology

Multiple Choice Questions (MCQs)

1. Which organization is responsible for geological surveys and studies in India?
   A) Oil and Natural Gas Corporation Limited (ONGC)
   B) Geological Survey of India (GSI)
   C) Indian Space Research Organization (ISRO)
   D) Atomic Energy Commission (AEC)
2. Where is the Geological Survey of India headquartered?
   A) Bangalore
   B) Hyderabad
   C) Kolkata
   D) Mumbai
3. The Department of Mines and Geology (DMG) is located in which Indian city?
   A) Mumbai
   B) Dehradun
   C) Bangalore
   D) Delhi

4. Which organization is India's largest oil and gas exploration company?
   A) NMDC
   B) Coal India Limited
   C) ONGC
   D) NIO
5. The Atomic Energy Commission (AEC) was established in which year?
   A) 1961
   B) 1978
   C) 1948
   D) 1956
6. Which organization is responsible for nuclear research and has laboratories like BARC and IGCAR?
   A) GSI
   B) AEC
   C) ONGC
   D) NGRI
7. The National Institute of Oceanography (NIO) is headquartered in which state?
   A) Karnataka
   B) Kerala
   C) Goa
   D) Tamil Nadu
8. Which organization's primary objective is to advance space technology in India?
   A) NRSA
   B) ISRO
   C) NGRI
   D) NMDC
9. National Mineral Development Corporation (NMDC) primarily produces which mineral?
   A) Oil
   B) Iron Ore
   C) Coal
   D) Gold
10. Which organization operates India's only mechanized diamond mine?
   A) GSI
   B) NMDC
   C) ONGC
   D) NGRI
11. Which agency, located in Hyderabad, focuses on remote sensing data?
   A) NGRI
   B) NRSA
   C) NIO
   D) CIL
12. The National Geophysical Research Institute (NGRI) primarily studies:
   A) Space exploration
   B) Groundwater management
   C) Atmospheric sciences
   D) Oceanography
13. Which organization is the world's largest coal producer?
   A) Coal India Limited (CIL)
   B) National Mineral Development Corporation (NMDC)
   C) Geological Survey of India (GSI)
   D) Atomic Energy Commission (AEC)
14. Centre for Earth Science Studies (CESS) is located in:
   A) Mumbai
   B) Trivandrum
   C) Bangalore
   D) Kolkata
15. The primary focus of the Centre for Earth Science Studies (CESS) includes:
   A) Space research
   B) Marine sciences and natural hazard assessment
   C) Nuclear energy
   D) Coal production
16. The NRSA is sponsored by which department?
   A) Ministry of Coal
   B) Ministry of Petroleum and Natural Gas
   C) Department of Space
   D) Department of Mines
17. Which agency is responsible for the extraction and exploration of hydrocarbons in India?
   A) CIL
   B) NGRI
   C) NMDC
   D) ONGC
18. Which organization's research areas include earthquake hazard assessment and hydrocarbon exploration?
   A) NIO
   B) NRSA
   C) NGRI
   D) ISRO
19. Which organization produced India's first satellite, Aryabhata?
   A) ONGC
   B) ISRO
   C) NMDC
   D) NGRI
20. Which laboratory focuses on the special oceanographic features of the Northern Indian Ocean?

A) NGRI
B) CESS
C) NIO
D) GSI

Fill-in-the-Blank

1. _____ was established in 1851 and is the second oldest survey organization in India.
2. The Geological Survey of India is attached to the Ministry of _____.
3. The Department of Mines and Geology (DMG) is located in _____.
4. The primary goal of ONGC is to explore and exploit _____ in India.
5. The Atomic Energy Commission was founded in the year _____.
6. The Indira Gandhi Centre for Atomic Research (IGCAR) is located in _____, Tamil Nadu.
7. The National Institute of Oceanography (NIO) has its headquarters in _____.
8. ISRO, established in 1969, is headquartered in _____.
9. National Mineral Development Corporation (NMDC) is India's largest producer of _____.
10. India's only mechanized diamond mine, operated by NMDC, is located in _____, Madhya Pradesh.
11. The primary function of the NRSA is to acquire, process, and disseminate _____ data.
12. The National Geophysical Research Institute (NGRI) is located in _____.
13. Coal India Limited (CIL) is controlled by the Ministry of _____.
14. Centre for Earth Science Studies (CESS) was established in _____ in Trivandrum, Kerala.
15. The National Remote Sensing Agency receives data from India's own _____ satellites.

Match the Following Questions

A	B
1. Geological Survey of India (GSI)	A. Space technology advancement
2. National Mineral Development Corporation (NMDC)	B. Remote sensing
3. Oil and Natural Gas Corporation (ONGC)	C. Coal production
4. Atomic Energy Commission (AEC)	D. Mineral exploration
5. ISRO	E. Hydrocarbon exploration
6. National Geophysical Research Institute (NGRI)	F. Earth science research
7. Coal India Limited (CIL)	G. Atomic mineral research
8. National Remote Sensing Agency (NRSA)	H. Oil and gas exploration
9. National Institute of Oceanography (NIO)	I. Oceanographic research
10. Centre for Earth Science Studies (CESS)	J. Geological surveys

1 Mark Questions:

1. When was the Geological Survey of India (GSI) established?
2. Where is the headquarters of the Geological Survey of India located?
3. Under which ministry does the GSI operate?
4. What is the primary function of the Geological Survey of India?
5. In which year was the Department of Mines and Geology (DMG) established?
6. Where is the Department of Mines and Geology located?
7. Who was one of the pioneering geologists in the DMG?
8. Which Indian company is the largest oil and gas exploration firm?
9. Where is the headquarters of Oil and Natural Gas Corporation (ONGC)?
10. When was ONGC founded?
11. What percentage of India's crude oil is produced by ONGC?
12. When was the Atomic Energy Commission (AEC) established?
13. What is the primary objective of the Atomic Energy Commission?
14. Where is the Bhabha Atomic Research Centre (BARC) located?
15. What is the full form of IGCAR?

16. When was the National Institute of Oceanography (NIO) established?
17. Where is the headquarters of NIO located?
18. How many regional centres does NIO have?
19. What is the primary focus of the National Institute of Oceanography?
20. When was the Indian Space Research Organization (ISRO) established?
21. What was the first satellite built by ISRO?
22. Where is ISRO headquartered?
23. What is the full form of NMDC?
24. Which state in India has the only mechanized diamond mine operated by NMDC?
25. What does NRSA stand for?
26. Where is NRSA located?
27. What is the primary function of the National Remote Sensing Agency?
28. Which organization is responsible for developing sensors and payloads for NRSA?
29. When was the National Geophysical Research Institute (NGRI) established?
30. Where is the NGRI located?
31. Under which organization does NGRI operate?
32. How many scientists support the NGRI?
33. What are some key research areas covered by NGRI?
34. Where is Coal India Limited (CIL) headquartered?
35. What percentage of coal production in India is contributed by CIL?
36. When was CIL conferred with Maharatna status?
37. Where is the Centre for Earth Science Studies (CESS) located?
38. When was CESS established?
39. What is the primary objective of CESS?
40. What are the main areas of study at the Centre for Earth Science Studies?

2 Mark Questions:

1. Describe the role of the Geological Survey of India (GSI).
2. What contributions did R. Bruce Foote and H.K. Slater make to the DMG?
3. What is the main objective of the Department of Mines and Geology?
4. Discuss the contributions of ONGC to India’s oil and gas sector.
5. What are the major functions of the Atomic Energy Commission in India?
6. List the research centres under the Atomic Energy Commission.
7. Explain the significance of the National Institute of Oceanography in oceanographic research.
8. Describe the primary focus of research at the NIO.
9. What are the key milestones achieved by the Indian Space Research Organization (ISRO)?
10. Discuss the role of NMDC in India’s mineral exploration and production.
11. What minerals are explored by the National Mineral Development Corporation?
12. What are the functions of the National Remote Sensing Agency (NRSA)?
13. Describe how NRSA supports satellite data acquisition in India.
14. Explain the key research activities undertaken by the National Geophysical Research Institute.
15. How does NGRI contribute to earthquake hazard assessment in India?
16. Describe the role of Coal India Limited in India's coal production.
17. What are the major contributions of CIL to the Indian economy?
18. Discuss the objectives of the Centre for Earth Science Studies (CESS).
19. How does CESS contribute to natural hazard assessment and mitigation?
20. What are the key areas of research at CESS?
21. What are the different mineral deposits discovered by DMG in Mysore?
22. Explain the importance of ISRO’s first satellite Aryabhata.
23. What role does the Bhabha Atomic Research Centre (BARC) play in atomic research?
24. Describe the role of IGCAR in atomic energy research.
25. How does NMDC support India's steel and iron ore industries?
26. What technologies are used by NRSA for satellite data reception and processing?
27. Discuss the contribution of ONGC to natural gas production in India.
28. What are the goals of the Atomic Minerals Directorate for Exploration and Research?
29. How does the Variable Energy Cyclotron Centre contribute to nuclear research in India?

30. Describe the importance of hydrocarbon exploration research conducted by NGRI.
31. What is the significance of seismic studies conducted by NGRI?
32. Explain how the Indian Space Research Organization supports national development.
33. What impact does Coal India Limited have on the environment?
34. How does the National Remote Sensing Agency aid in disaster management?
35. What is the importance of the oceanographic research carried out by NIO in the Northern Indian Ocean?
36. How does CESS support environmental research in Kerala?
37. Discuss the role of NGRI in mineral exploration.
38. How do ONGC's operations impact India's energy sector?
39. What are the main sources of funding and administrative control for ISRO?
40. Describe the contributions of CIL to global coal production.
