

GATE 2026 GG Question Paper with Solutions

Time Allowed :3 Hour	Maximum Marks :100	Total Questions :65
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General Instructions

Please read the following instructions carefully:

- This question paper is divided into three sections:
 - General Aptitude (GA):** 10 questions (5 questions \times 1 mark + 5 questions \times 2 marks) for a total of 15 marks.
 - Environmental Science and Engineering + Engineering Mathematics:**
 - Part A (Mandatory):** 36 questions (1 questions \times 1 mark + 19 questions \times 2 marks) for a total of 55 marks.
 - Part B (Section 1):** Candidates can choose either Part B1 (Surveying and Mapping) or Part B2 (Section 2). Each part contains 16 questions (8 questions \times 1 mark + 11 questions \times 2 marks) for a total of 30 marks.
- The total number of questions is **65**, carrying a maximum of **100 marks**.
- The duration of the exam is **3 hours**.
- Marking scheme:
 - For 1-mark MCQs, $\frac{1}{3}$ mark will be deducted for every incorrect response.
 - For 2-mark MCQs, $\frac{2}{3}$ mark will be deducted for every incorrect response.
 - No negative marking for numerical answer type (NAT) questions.
 - No marks will be awarded for unanswered questions.
- Ensure you attempt questions only from the optional section (Part B1 or Part B2) you have selected.
- Follow the instructions provided during the exam for submitting your answers.

1. The angle between the strike line and the true dip direction of a bed is:

- (A) 0°
- (B) 30°
- (C) 45°
- (D) 90°

Correct Answer: (D) 90°

Solution:

Step 1: Understanding strike and dip.

In structural geology, the **strike** of a bed is the direction of a horizontal line drawn on the plane of the rock surface. The **true dip** is the direction of maximum slope on that plane and is measured perpendicular to the strike direction.

Step 2: Relationship between strike and true dip.

By definition, the true dip direction is always at right angles to the strike line. This is because the strike represents a horizontal line, while the true dip represents the steepest downward inclination on the same plane.

Step 3: Conclusion.

Since the true dip direction is perpendicular to the strike line, the angle between them is 90° . Hence, option **(D)** is correct.

Quick Tip

Always remember: **Strike and true dip are mutually perpendicular.** If the angle is asked, the answer will always be 90° .

2. Which one of the following minerals belongs to the cubic (isometric) crystal system?

- (A) Quartz
- (B) Orthoclase
- (C) Galena
- (D) Gypsum

Correct Answer: (C) Galena

Solution:

Step 1: Understanding the cubic crystal system.

The cubic (or isometric) crystal system is characterized by three crystallographic axes of equal length that intersect each other at right angles. Minerals belonging to this system commonly show cubic or octahedral crystal forms.

Step 2: Evaluating the given options.

- (A) Quartz:** Quartz belongs to the **hexagonal (trigonal)** crystal system, not the cubic system.
- (B) Orthoclase:** Orthoclase feldspar crystallizes in the **monoclinic** system.
- (C) Galena:** Galena crystallizes in the **cubic (isometric)** crystal system and commonly

forms cubic crystals.

(D) Gypsum: Gypsum belongs to the **monoclinic** crystal system.

Step 3: Conclusion.

Among the given minerals, only **Galena** belongs to the cubic (isometric) crystal system. Therefore, the correct answer is **(C) Galena**.

Quick Tip

Common cubic system minerals include **Galena, Halite, Pyrite, and Magnetite**. Memorizing these helps in quick elimination.

3. Which texture is characteristic of rapidly cooled volcanic rocks?

- (A) Pegmatitic
- (B) Phaneritic
- (C) Porphyritic
- (D) Aphanitic

Correct Answer: (D) Aphanitic

Solution:

Step 1: Understanding volcanic rock formation.

Volcanic rocks are formed when magma erupts onto the Earth's surface as lava. At the surface, lava is exposed to atmospheric conditions and cools very rapidly compared to magma that cools below the surface.

Step 2: Effect of rapid cooling on crystal size.

Rapid cooling does not allow sufficient time for mineral crystals to grow large. As a result, the crystals formed are extremely fine-grained and often cannot be seen with the naked eye. This type of texture reflects quick solidification.

Step 3: Analyzing the given options.

(A) Pegmatitic: Characterized by very large crystals, formed by very slow cooling at great depths. Hence, incorrect.

(B) Phaneritic: Consists of coarse-grained crystals formed by slow cooling of magma beneath the Earth's surface. Hence, incorrect.

(C) Porphyritic: Indicates two stages of cooling, not purely rapid cooling. Hence, incorrect.

(D) Aphanitic: Characterized by very fine-grained crystals formed due to rapid cooling of

lava at or near the Earth's surface. This correctly matches volcanic conditions.

Step 4: Conclusion.

Since rapidly cooled volcanic rocks develop very fine-grained textures, the correct answer is **(D) Aphanitic**.

Quick Tip

Aphanitic texture = Rapid cooling = Volcanic rocks. Always associate fine-grained texture with surface cooling.

4. Which fossil group is commonly used as an index fossil of the Mesozoic era?

- (A) Trilobites
- (B) Brachiopods
- (C) Ammonites
- (D) Graptolites

Correct Answer: (C) Ammonites

Solution:

Step 1: Understanding index fossils.

Index fossils are fossils of organisms that lived for a relatively short geological time span but were widely distributed geographically. Such fossils are extremely useful for correlating and dating rock layers.

Step 2: Fossil groups and geological eras.

Different fossil groups are characteristic of specific geological eras. Trilobites are typical of the Paleozoic era, while Graptolites are mainly associated with the Ordovician and Silurian periods.

Step 3: Identifying the Mesozoic index fossil.

Ammonites evolved rapidly, were abundant, and had a wide geographic distribution during the Mesozoic era. Their rapid evolutionary changes make them excellent index fossils for this era.

Step 4: Conclusion.

Since ammonites are widely used to identify and correlate Mesozoic rock sequences, the correct answer is **(C) Ammonites**.

Quick Tip

Trilobites = Paleozoic, Ammonites = Mesozoic. Remembering era–fossil pairs helps in quick elimination.

5. Which geophysical method is most suitable for locating groundwater aquifers?

- (A) Magnetic method
- (B) Gravity method
- (C) Electrical resistivity method
- (D) Seismic refraction method

Correct Answer: (C) Electrical resistivity method

Solution:

Step 1: Understanding groundwater detection.

Groundwater occurs in subsurface porous and permeable formations. These formations generally contain water that significantly affects the electrical properties of the subsurface materials.

Step 2: Principle of electrical resistivity method.

The electrical resistivity method works on the principle that water-saturated rocks have lower electrical resistivity compared to dry or compact rocks. By measuring variations in resistivity, groundwater-bearing zones can be identified.

Step 3: Evaluating other methods.

- (A) **Magnetic method:** Mainly used for detecting magnetic minerals, not groundwater.
- (B) **Gravity method:** Useful for large-scale density variations, not ideal for shallow aquifers.
- (D) **Seismic refraction method:** Used for subsurface layering and bedrock depth, but less effective for direct groundwater detection.

Step 4: Conclusion.

Since groundwater significantly reduces electrical resistivity, the **electrical resistivity method** is the most suitable technique for locating groundwater aquifers. Hence, option (C) is correct.

Quick Tip

Low resistivity = Presence of water. Electrical resistivity surveys are the most commonly used method in groundwater exploration.

6. The oldest rock system in the Indian stratigraphic succession is:

- (A) Dharwar Supergroup
- (B) Vindhyan Supergroup
- (C) Cuddapah Supergroup
- (D) Gondwana Supergroup

Correct Answer: (A) Dharwar Supergroup

Solution:

Step 1: Understanding Indian stratigraphic succession.

The Indian stratigraphic succession represents the chronological order of rock formations in India, ranging from the oldest Precambrian rocks to the youngest recent deposits. The earliest part of this succession belongs to the Archean Eon.

Step 2: Age of the given supergroups.

The Dharwar Supergroup belongs to the Archean age and represents some of the oldest crustal rocks of the Indian shield. The Cuddapah and Vindhyan Supergroups are Proterozoic in age, while the Gondwana Supergroup is much younger, belonging to the late Paleozoic to Mesozoic era.

Step 3: Comparing the options.

- (A) Dharwar Supergroup:** Archean age and the oldest rock system in India.
- (B) Vindhyan Supergroup:** Younger Proterozoic rocks.
- (C) Cuddapah Supergroup:** Proterozoic age, younger than Dharwar.
- (D) Gondwana Supergroup:** Much younger sedimentary sequence.

Step 4: Conclusion.

Since the Dharwar Supergroup represents the oldest Archean rocks in the Indian stratigraphic succession, the correct answer is **(A) Dharwar Supergroup**.

Quick Tip

Oldest to youngest (simplified): Dharwar → Cuddapah → Vindhyan → Gondwana. Remember this order for stratigraphy questions.

7. Which geomorphic process is primarily responsible for the formation of sand dunes?

- (A) Fluvial action
- (B) Glacial action
- (C) Aeolian action
- (D) Marine action

Correct Answer: (C) Aeolian action

Solution:

Step 1: Understanding sand dune formation.

Sand dunes are depositional landforms composed mainly of sand and are commonly found in deserts and coastal regions. Their formation depends on the transportation and deposition of loose sand particles.

Step 2: Role of geomorphic agents.

Different geomorphic agents such as rivers, glaciers, wind, and sea waves shape the Earth's surface. Each agent produces distinct landforms based on its mode of action.

Step 3: Identifying the responsible process.

Wind action, also known as **aeolian action**, is responsible for the erosion, transportation, and deposition of sand in arid and semi-arid regions. Continuous wind movement leads to the accumulation of sand into dune structures.

Step 4: Evaluation of options.

- (A) **Fluvial action:** Forms riverine features like floodplains and deltas.
- (B) **Glacial action:** Produces landforms like moraines and drumlins.
- (D) **Marine action:** Forms coastal features such as beaches and cliffs.

Step 5: Conclusion.

Since sand dunes are formed by the action of wind, the correct answer is (C) **Aeolian action**.

Quick Tip

Dunes = Wind = Aeolian. Always associate desert landforms with aeolian processes.