ANSWER KEY & MARKING SCHEME · CBSE CLASS 11

Distribution of Oceans and Continents

Geography · Chapter 4 · Use this with the Board Paper · Companion to Quick Drill

HOW TO USE

Attempt the Board Paper first (closed-book, full time). Then come here. For 2-mark+ questions, compare your answer to the model. For 3-4 mark questions, also consult the **Topper Templates** below — these show the exact step-by-step structure that scores full marks per CBSE marking-scheme conventions.

MODEL ANSWERS · BOARD PAPER

Section A — Very Short Answer (1 mark each, 4 Qs)

Q1. Who proposed the Continental Drift Theory and in which year? [1 mark]

Ans: Alfred Wegener, in 1912.

Q2. Name the single supercontinent and the single ocean of Wegener's theory. [1 mark]

Ans: The supercontinent was Pangaea and the ocean was Panthalassa.

Q3. Where is new ocean crust created? [1 mark]

Ans: At the mid-oceanic ridges, where magma rises from the mantle.

Q4. Name any two major lithospheric plates. [1 mark]

Ans: Any two of: Pacific, North American, South American, Eurasian, African, Indo-Australian, Antarctic plate.

Section B — Short Answer I (2 marks each, 3 Qs)

Q5. What two forces did Wegener propose for continental drift, and why were they criticised? [2 marks]

Ans: Wegener proposed the pole-fleeing force (arising from the earth's rotation / centrifugal effect) and the tidal force (from the gravitational pull of the sun and moon). They were criticised because both forces are far too weak to move continents, which is the main reason the theory was rejected for decades.

Q6. Explain the fossil evidence (Mesosaurus and Glossopteris) for continental drift. [2 marks]

Ans: Mesosaurus, a small freshwater reptile, has fossils found only in southern Africa and eastern South America — it could not have crossed the saltwater Atlantic, so the two must once have been joined. Glossopteris, a fern-like plant, has fossils spread across India, Africa, South America, Antarctica and Australia, showing these continents were once a single connected landmass (Gondwanaland).

Q7. What is sea-floor spreading? [2 marks]

Ans: Sea-floor spreading, proposed by Harry Hess, is the process in which new ocean crust is created at the mid-oceanic ridges as magma rises and solidifies, then spreads outwards on both sides like a conveyor belt; far away at the deep trenches the old floor sinks back into the mantle and is destroyed, so the earth does not expand.

Section C — Short Answer II (3 marks each, 3 Qs)

Q8. Describe any three evidences in support of the Continental Drift Theory. [3 marks]

Ans: (i) Geological: the jigsaw fit of South America and Africa, plus matching rock formations of the same age across the Atlantic. (ii) Climatological: identical tillite (glacial) deposits in India, Africa, South America, Antarctica and Australia, showing a shared glaciated past; and placer gold in Ghana matching source rocks in Brazil. (iii) Biological: identical fossils of Mesosaurus and Glossopteris on continents now separated by wide oceans. Together these prove the continents were once joined.

Q9. Explain how palaeomagnetism confirmed sea-floor spreading. [3 marks]

Ans: Palaeomagnetism is the record of the earth's magnetic field frozen into rocks when they form; since the earth's polarity has reversed many times, new ocean floor locks in the polarity of its moment of formation. Surveys found the ocean floor carries 'magnetic stripes' of alternating normal and reversed polarity that are perfectly symmetrical on both sides of the mid-oceanic ridge. This mirror-image pattern proves the floor formed at the ridge and spread equally outward, confirming Hess's sea-floor spreading.

Q10. Distinguish between the three types of plate boundaries, giving one example of each. [3 marks]

> **Ans:** Divergent (constructive) boundary: plates move apart and new crust forms — e.g. the Mid-Atlantic Ridge. Convergent (destructive) boundary: plates move towards each other and the denser plate subducts, forming trenches or fold mountains — e.g. the Himalayas. Transform (conservative) boundary: plates slide horizontally past each other and crust is neither created nor destroyed — e.g. the San Andreas Fault.

Section D — Long / Source-Based (5 + 6 marks, 2 Qs)

Q11. Explain Wegener's Continental Drift Theory, including the supercontinent, its break-up, the forces, and the reason the theory was rejected. [5 marks]

> **Ans:** (1) In 1912 Alfred Wegener proposed that all continents were once joined in a single supercontinent, PANGAEA ('all-earth'), surrounded by one ocean, PANTHALASSA ('all-water'). (2) About 200 million years ago Pangaea split into LAURASIA in the north and GONDWANALAND in the south, separated by the TETHYS Sea; these in turn fragmented into today's continents. (3) Wegener attributed the drift to the POLE-FLEEING force (from the earth's rotation) and the TIDAL force (from the sun and moon's gravity). (4) The theory was supported by the jigsaw fit, matching rocks, tillite, placer deposits and fossils. (5) However, it was rejected for decades because the proposed forces were far too WEAK to move continents and Wegener wrongly imagined continents sliding across the ocean floor; it was vindicated only later by convection currents and sea-floor spreading.

Q12. Read the passage and answer: 'India was once part of Gondwanaland, lying far south of the equator. As Gondwanaland broke up, the Indian plate drifted rapidly north-eastward across the Tethys Sea towards Asia. Eventually it collided with the Eurasian plate, and the sediments on the floor of the Tethys were squeezed and folded upward into towering mountains. Today, marine fossils are found high in these ranges.' (a) From which landmass did India originate? (b) In which direction did the Indian plate move, and what sea closed as it did so? (c) With which plate did it collide, and what mountain range resulted? (d) What type of plate boundary does this collision represent? (e) Why are marine fossils found high in these mountains? [6 marks]

> **Ans:** (a) India originated from GONDWANALAND, in the southern hemisphere. (b) The Indian plate moved NORTH-EASTWARD, and the TETHYS Sea closed in front of it. (c) It collided with the EURASIAN plate, producing the HIMALAYAS (and the Tibetan plateau). (d) This is a CONVERGENT (destructive) plate boundary, where two plates moved towards each other. (e) The rocks now forming the Himalayas were once the FLOOR of the Tethys Sea; the collision squeezed and folded this sea floor upward, carrying its marine fossils to great heights — which is why they are found high in the mountains today.

★ TOPPER ANSWER TEMPLATES

3 TEMPLATES · MEMORISE THE FORMAT

★ TOPPER TEMPLATE — 5-mark question: 'Explain Wegener's Continental Drift Theory.'
CBSE SQP 2020, 2022; School Annual recurrently

Step 1 [1 mark]	**State the central claim + Pangaea**	Open: 'In 1912 Alfred Wegener proposed that all present continents were once joined in a single supercontinent called PANGAEA, surrounded by a single ocean PANTHALASSA.' Name the man, the year and the two terms straight away.
Step 2 [1 mark]	**The break-up into Laurasia and Gondwanaland**	'Around 200 million years ago Pangaea began to split — first into LAURASIA (the northern landmass) and GONDWANALAND (the southern landmass), separated by the TETHYS Sea — and these in turn drifted apart into today's continents.'
Step 3 [1 mark]	**The forces Wegener proposed**	'Wegener attributed the drift to two forces: the POLE-FLEEING force arising from the earth's rotation, and the TIDAL force from the gravitational pull of the sun and moon.' Name both forces explicitly.
Step 4 [1 mark]	**Mention the supporting evidences**	Briefly cite the evidences: the jigsaw fit of the Atlantic coastlines, matching rock formations and ages across the ocean, the tillite (glacial) deposits, placer deposits, and matching fossils such as Mesosaurus and Glossopteris.
Step 5 [1 mark]	**Note the limitation / conclusion**	Conclude honestly: 'The theory was rejected for decades because the pole-fleeing and tidal forces were far too weak to move continents; it was later vindicated by convection currents and sea-floor spreading.' Showing the limitation earns the final mark.

COMMON LOSS OF MARKS:

- Swapping Pangaea and Panthalassa, or Laurasia and Gondwanaland.
- Naming the supercontinent but forgetting the two forces.
- Not mentioning why the theory was rejected — examiners reward the limitation.

★ TOPPER TEMPLATE — 3-mark question: 'Describe any three evidences in support of continental drift.'

CBSE SQP 2019, 2021; School Annual 2021, 2022

Step 1 [1 mark]	**Geological evidence — fit + matching rocks**	'The JIGSAW FIT: the eastern coast of South America and the western coast of Africa fit together like puzzle pieces. Matching rock formations of the SAME AGE (e.g. the 2,000-million-year-old belts) are found across the Atlantic, showing the continents were once joined.'
Step 2 [1 mark]	**Climatological evidence — tillite + placer**	'TILLITE (glacial sedimentary rock) of identical character is found in India, Africa, South America, Antarctica and Australia, proving they once shared a glaciated climate together. PLACER DEPOSITS of gold in Ghana with no source rock there match the source rocks of Brazil — meaning the two were once adjacent.'
Step 3 [1 mark]	**Biological evidence — fossils**	'Identical FOSSILS of the freshwater reptile MESOSAURUS and the fern GLOSSOPTERIS occur in continents now separated by wide oceans these organisms could never have crossed — only possible if the landmasses were once united.'

COMMON LOSS OF MARKS:

- Listing evidences without classifying them (geological / climatological / biological).
- Confusing tillite (climate evidence) with placer (mineral evidence).
- Naming only the jigsaw fit and stopping — it is the weakest single evidence on its own.

★ TOPPER TEMPLATE — 5-mark question: 'Explain plate tectonics and the three types of plate boundaries.'

CBSE SQP 2023; common at school level

Step 1 [1 mark]	**Define plate tectonics**	Open: 'The theory of plate tectonics (1960s) states that the earth's lithosphere is broken into several rigid PLATES that move slowly over the plastic asthenosphere, driven by convection currents in the mantle.'
Step 2 [1 mark]	**Name major and minor plates**	'There are seven MAJOR plates — Pacific, North American, South American, Eurasian, African, Indo-Australian and Antarctic — and several MINOR plates such as the Cocos, Nazca, Arabian, Philippine and Caribbean plates.'
Step 3 [1 mark]	**Divergent boundary**	'At a DIVERGENT (constructive) boundary, plates move APART; magma rises to form new crust — e.g. the Mid-Atlantic Ridge. This is where sea-floor spreading occurs.'
Step 4 [1 mark]	**Convergent boundary**	'At a CONVERGENT (destructive) boundary, plates move TOWARDS each other; the denser plate subducts and is destroyed, forming trenches, fold mountains or volcanic arcs — e.g. the Himalayas (India-Eurasia collision).'
Step 5 [1 mark]	**Transform boundary + conclude**	'At a TRANSFORM (conservative) boundary, plates slide PAST each other horizontally; crust is neither created nor destroyed — e.g. the San Andreas Fault. Conclude that these moving boundaries explain earthquakes, volcanoes and mountain-building worldwide.'

COMMON LOSS OF MARKS:

- Giving only two boundary types and forgetting transform / conservative.
- Not pairing each boundary with a real-world example (Mid-Atlantic Ridge, Himalayas, San Andreas).
- Confusing divergent (constructive) with convergent (destructive).

MARKING SCHEME — GENERAL NOTES

- For 'continental drift', stating Pangaea/Panthalassa, the break-up, the two forces AND the reason for rejection earns full marks; missing the limitation usually caps the answer.
- For 'evidences', answers must be classified (geological / climatological / biological) — a random list caps the mark.
- Do not reverse Pangaea (land) and Panthalassa (water), or Laurasia (north) and Gondwanaland (south).
- For plate boundaries, each type must be paired with a real example (Mid-Atlantic Ridge, Himalayas, San Andreas) for full credit.
- Source-based answers must use the passage; generic answers that ignore the given text are penalised.