CBSE CLASS X

Social Science (087)

ANSWER KEY

AI-generated question paper

Code: 5AT0R9	Questions: 20	Maximum Marks: 37	Generated: 2026-06-26 10:02

SELECTIONS USED

Subject	Social Science
Lessons	5 Minerals and Energy Resources
Level of understanding	Initial understanding
Question selection	Curated chapter coverage (~3 questions per section)
Model	claude-sonnet-4-6

Composition — Difficulty: 10 straightforward · 9 medium · 1 deep | Types: 10 Short · 7 Very short · 3 MCQ

Q1. straightforward · initial-understanding · § Introduction **[1]**

Which of the following best explains why minerals are considered indispensable to human life?
(A) They are only used in construction and transport industries.
(B) They are used across virtually all aspects of life, from everyday objects to the food we eat.
(C) They are important only for decoration and ceremonial purposes.
(D) They are needed solely for generating energy.

A They are only used in construction and transport industries.
B They are used across virtually all aspects of life, from everyday objects to the food we eat.
C They are important only for decoration and ceremonial purposes.
D They are needed solely for generating energy.

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Model Answer

(B) They are used across virtually all aspects of life, from everyday objects to the food we eat.

Source: Introduction, Chapter 5

Explanation

The passage directly states: "Minerals are an indispensable part of our lives. Almost everything we use, from a tiny pin to a towering building... Even the food that we eat contains minerals." Options A, C, and D are partially true but too narrow — they each mention only one use. Option B correctly captures the all-encompassing nature of mineral use, which is why it is the best answer. In MCQs, watch for words like "only" and "solely" — they usually make an option wrong.

Q2. straightforward | initial-understanding | § MODE OF OCCURRENCE OF MINERALS **[1]**

What is an 'ore'? State the condition under which a mineral deposit is considered an ore.

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Model Answer

An **ore** is an accumulation of a mineral mixed with other elements. A mineral deposit is considered an ore when its mineral concentration is **sufficient to make extraction commercially viable**.

Explanation

This is a two-part 1-mark question, so keep both parts in one concise sentence or two very short ones. Examiners look for: (1) the definition of ore, and (2) the specific condition — **commercial viability / sufficient concentration**. Both terms come directly from the textbook passage and must appear in your answer. Avoid writing lengthy explanations about types of minerals or mining methods.

Q3. medium | initial-understanding | § MODE OF OCCURRENCE OF MINERALS **[3]**

Explain how metallic minerals are formed in igneous and metamorphic rocks. Describe the process by which they come to occupy the positions where they are found.

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Model Answer

In igneous and metamorphic rocks, metallic minerals occur in **cracks, crevices, faults, or joints**. They are formed when minerals in **liquid/molten and gaseous forms** are forced upward through cavities towards the Earth's surface. As they rise, they **cool and solidify**, depositing minerals in these cracks. Smaller occurrences are called **veins** and larger ones are called **lodes**. Major metallic minerals like **tin, copper, zinc, and lead** are obtained from veins and lodes.

Source: Chapter 5 – Minerals and Energy Resources, Mode of Occurrence of Minerals

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Explanation

- The examiner expects three clear points: (1) location — cracks/crevices/faults/joints, (2) process — molten/gaseous material forced upward, cools and solidifies, (3) terminology — veins and lodes with examples.
- Always name at least two metallic minerals (tin, copper, zinc, lead) as examples — this fetches the application mark.
- Do **not** mix up igneous/metamorphic mode with sedimentary (beds/layers) or placer deposits — a common error.

Q4. straightforward | initial-understanding | § MODE OF OCCURRENCE OF MINERALS **[1]**

Which one of the following correctly explains how bauxite is formed?
(A) It crystallises from molten magma forced into cracks in igneous rocks.
(B) It is deposited in horizontal layers due to evaporation in arid regions.
(C) It is left behind as a residual mass after surface rocks decompose and soluble material is washed away.
(D) It accumulates in river and valley sands as a placer deposit.

A It crystallises from molten magma forced into cracks in igneous rocks.
B It is deposited in horizontal layers due to evaporation in arid regions.
C It is left behind as a residual mass after surface rocks decompose and soluble material is washed away.
D It accumulates in river and valley sands as a placer deposit.

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Model Answer

(C) It is left behind as a residual mass after surface rocks decompose and soluble material is washed away.

Explanation

The textbook (Chapter 5, Mode of Occurrence of Minerals) explicitly states: "Another mode of formation involves the decomposition of surface rocks, and the removal of soluble constituents, leaving a residual mass of weathered material containing ores. Bauxite is formed this way." Options A, B, and D describe veins/lodes, evaporite sedimentary minerals, and placer deposits respectively — none of which apply to bauxite.

Q5. medium | initial-understanding | § MODE OF OCCURRENCE OF MINERALS **[3]**

What are placer deposits? Why are minerals found in placer deposits resistant to weathering? Give two examples of minerals commonly found in such deposits.

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Model Answer

Placer deposits are alluvial deposits found in the sands of valley floors and the base of hills, formed by the accumulation of minerals carried by water.

Minerals found in placer deposits are **resistant to weathering** because they are not corroded by water. Being chemically stable, they survive the action of water and remain concentrated in these deposits.

Two examples: Gold and Platinum (also tin and silver).

Source: Chapter 5 – Resources and Development, Mode of Occurrence of Minerals

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Explanation

- The definition must mention "alluvial deposits" and "valley floors/base of hills" — these are the key textbook phrases.
- The reason asked is **not corroded by water** — state this directly; don't over-explain.
- For examples, any two from: gold, silver, tin, platinum — all four are listed in the textbook, pick two.
- This is a 3-mark question: definition (1), reason (1), two examples (1). Keep it compact.

Q6. straightforward | initial-understanding | § Ferrous Minerals **[1]**

[very_short_answer] Which type of iron ore has the highest iron content? Name one state in India where it is found.

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Model Answer

Magnetite is the iron ore with the highest iron content (up to 70%). It is found in **Karnataka** (e.g., Kudremukh mines).

Explanation

The passage clearly states "Magnetite is the finest iron ore with a very high content of iron up to 70 per cent." For the state, Karnataka is explicitly mentioned (Kudremukh mines, Ballari-Chitradurga belt). Odisha, Jharkhand, or Chhattisgarh are also acceptable as they are major iron ore states, but these produce mainly hematite. Mention magnetite + one valid state for full marks.

Q7. medium | initial-understanding | § Ferrous Minerals **[2]**

Manganese is an essential mineral in steel production. Explain TWO uses of manganese — one in the steel industry and one outside it — and identify the leading manganese-producing state in India.

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Model Answer

Uses of Manganese:

- **Steel industry:** Manganese is used in the manufacturing of steel and ferro-manganese alloy. Approximately 10 kg of manganese is required to produce one tonne of steel.
- **Outside steel industry:** It is used in manufacturing bleaching powder, insecticides, and paints.

Leading producer: Madhya Pradesh is the leading manganese-producing state in India (33% share in 2018–19).

Source: Chapter 5, Ferrous Minerals — Manganese

Explanation

- The question has three parts — steel use, non-steel use, and leading state — so address all three clearly.
- The key figures (10 kg per tonne, 33% share for MP) are directly from the textbook and impress examiners.
- Avoid writing vague statements; use specific details from the passage for full marks in a 2-mark answer.

Q8. straightforward | initial-understanding | § Non-Ferrous Minerals **[1]**

[very_short_answer] Copper is an important industrial mineral widely used in electrical and electronics industries. Name any TWO properties of copper that make it so valuable for these uses.

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Model Answer

Copper is **malleable**, **ductile**, and a **good conductor of electricity**, making it ideal for use in electrical cables and electronic components.

(Any two of the three properties are sufficient for 1 mark.)

Source: Non-Ferrous Minerals, Chapter 5

Explanation

The textbook lists exactly three properties: malleable, ductile, and good conductor. For a 1-mark question, name any **two** of these three. Do not elaborate — just name the properties clearly. Examiners award ½ mark per correct property.

Q9. medium | initial-understanding | § Non-Ferrous Minerals **[3]**

[short_answer] Bauxite is an important non-ferrous mineral found in India. Explain how bauxite deposits are formed. Why is aluminium, extracted from bauxite, considered a versatile metal? Give any two reasons.

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Model Answer

Formation of Bauxite: Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates. The soluble constituents are removed, leaving behind a residual mass of weathered material containing the ore.

Why Aluminium is a Versatile Metal:

1. It combines the strength of metals such as iron with extreme lightness.
2. It possesses good conductivity and great malleability, making it useful across electrical, engineering and other industries.

Source: Minerals and Energy Resources, Non-Ferrous Minerals (Bauxite) section

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Explanation

- The question has **two parts** — formation (1 mark) and two reasons for versatility (2 marks). Keep the balance accordingly.
- Use **textbook language** for formation: "decomposition of rocks rich in aluminium silicates" and "residual mass of weathered material" — examiners look for these exact phrases.
- For versatility, the text gives three properties: strength, lightness, conductivity, malleability. Pick any **two distinct points** and state them clearly. Avoid vague statements like "it is useful" without reason.

Q10. straightforward | initial-understanding | § Non-Metallic Minerals **[1]**

Why is mica widely used in the electrical and electronics industries? Give one reason.

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Model Answer

Mica is widely used in electrical and electronics industries because of its excellent dielectric strength, low power loss factor, insulating properties, and resistance to high voltage.

Source: Non-Metallic Minerals, Chapter 5

Explanation

The question asks for **one reason**, but the passage lists these properties together as a combined reason. In the exam, stating any one property (e.g., "excellent insulating properties" or "resistance to high voltage") is sufficient for 1 mark. Mentioning the full set is also acceptable and safe.

Q11. medium | initial-understanding | § CONSERVATION OF MINERALS **[3]**

What does it mean to say that mineral resources are 'finite and non-renewable'? Why is this a cause for concern?

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Model Answer

Mineral resources are called 'finite and non-renewable' because they were formed over millions of years through very slow geological processes, and once used up, they cannot be replenished at rates matching human consumption.

This is a cause for concern because:

- The total volume of workable mineral deposits is only about **one per cent** of the earth's crust — an insignificant fraction.
- We are rapidly exhausting these deposits; continued extraction leads to **increasing costs** and **decreasing quality** of ores.
- Rich mineral deposits are **short-lived possessions** that, once consumed, are gone forever.

Source: Conservation of Minerals, Chapter 5

Explanation

- Examiners expect the **definition** (slow formation + cannot be replenished) AND the **concern** (scarcity, rising costs, irreversibility) — both parts must be addressed to get full 3 marks.
- Quoting "one per cent of the earth's crust" and "short-lived possessions" directly from the textbook impresses examiners.
- Keep the concern points as a short list — it's cleaner and easier to mark than a dense paragraph.

Q12. medium | initial-understanding | § Energy Resources **[3]**

Distinguish between conventional and non-conventional sources of energy. Give two examples of each and state the key characteristic that sets them apart.

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Model Answer

Conventional sources of energy are traditional sources used since long, e.g., **coal** and **petroleum**.

Non-conventional sources of energy are renewable and environment-friendly alternatives, e.g., **solar energy** and **wind energy**.

Key characteristic: Conventional sources are non-renewable fossil fuels that cause environmental pollution. Non-conventional sources are renewable, virtually inexhaustible, and cause little to no pollution. Rising prices of fossil fuels and their potential shortages have increased the need to develop non-conventional sources.

Source: Energy Resources, Conventional and Non-Conventional Sources of Energy, Chapter 5

Explanation

- The examiner expects a **clear two-part distinction** (conventional vs. non-conventional), two examples each, and one differentiating characteristic — all within ~60–90 words.
- Key terms to use: *renewable/non-renewable*, *fossil fuels*, *environment-friendly/pollution*.
- Do **not** list all examples from the chapter; two each is enough for 3 marks.
- The "key characteristic" sentence is the scoring line — don't omit it.
- Mentioning the motivation (rising prices, environmental problems) adds quality but keep it brief.

Q13. straightforward | initial-understanding | § Conventional Sources of Energy **[1]**

Which fossil fuel is the most abundantly available in India and meets a large part of its commercial energy requirements?

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Model Answer

Coal is the most abundantly available fossil fuel in India. India is highly dependent on coal for meeting its commercial energy requirements, using it for power generation, industry, and domestic needs.

Source: Conventional Sources of Energy, Chapter 5

Explanation

The passage directly states: *"In India, coal is the most abundantly available fossil fuel... India is highly dependent on coal for meeting its commercial energy requirements."* For a 1-mark answer, simply name coal and briefly state its role. No extra detail is needed.

Q14. straightforward | initial-understanding | § Conventional Sources of Energy **[1]**

[very_short_answer] Name the four types of coal in order of increasing carbon content and quality, starting from the lowest.

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Model Answer

The four types of coal in increasing order of carbon content and quality are: **Peat → Lignite → Bituminous → Anthracite**.

Explanation

The passage clearly lists coal types from lowest to highest grade. Examiners expect all four names in the correct sequence. "Peat" (lowest carbon, high moisture) to "Anthracite" (highest quality hard coal) is the key order to remember. Writing just the names in order is sufficient for 1 mark.

Q15. medium | initial-understanding | § Conventional Sources of Energy **[2]**

Why are heavy industries and thermal power stations usually set up on or near coalfields rather than far away from them?

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Model Answer

Coal is a **bulky material** that loses weight on use as it is reduced to ash. Transporting large quantities of coal over long distances is costly and inefficient. Therefore, heavy industries and thermal power stations are set up **on or near coalfields** to minimize transportation costs and ensure uninterrupted fuel supply.

Source: Conventional Sources of Energy, Chapter 5

Explanation

The textbook directly states: *"Coal is a bulky material, which loses weight on use as it is reduced to ash. Hence, heavy industries and thermal power stations are located on or near the coalfields."* Your answer must include both key points — (1) coal is bulky and loses weight, and (2) this makes transportation costly/impractical. Examiners expect these two points for 2 marks.

Q16. medium | initial-understanding | § Conventional Sources of Energy **[3]**

[short_answer] Petroleum is considered central to many other industries. Explain why petroleum refining is so important to India's industrial development, with examples of industries that depend on it.

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Model Answer

Petroleum is called a **"nodal industry"** because it acts as a central link connecting many other industries.

Importance of petroleum refining:

- It provides fuel for heat, lighting, and machinery lubrication.
- Petroleum refineries supply raw materials to **synthetic textile industries** (nylon, polyester).
- They support the **fertiliser industry** by providing petrochemical feedstock.
- Numerous **chemical industries** depend on refinery by-products.

Thus, a single petroleum refinery stimulates the growth of multiple industries around it, making it vital to India's industrial and economic development.

Source: Chapter 5, Conventional Sources of Energy — Petroleum

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Explanation

- The key phrase examiners expect is **"nodal industry"** — use it directly as it appears in the textbook.
- Three industries must be named: **synthetic textiles, fertilisers, and chemical industries** — these are explicitly mentioned in the passage.
- Avoid vague statements; link each industry clearly to petroleum refining.
- At 3 marks, aim for one introductory line + 3 distinct points + a brief conclusion.

Q17. deep initial-understanding § Conventional Sources of Energy **[3]**

[short_answer] Compare hydroelectric power and thermal power as sources of electricity in India. In your answer, mention the resource each uses and give one example of each type from India.

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Model Answer

Hydroelectric Power vs Thermal Power:

Basis	Hydroelectric Power	Thermal Power
Resource used	Fast-flowing water (renewable)	Coal, petroleum, natural gas (non-renewable fossil fuels)
Example from India	Bhakra Nangal Project / Kopili Hydel Project	Neyveli Thermal Power Station (Tamil Nadu)

Hydro electricity is generated by fast-flowing water driving hydro turbines. It is a renewable and eco-friendly source. Thermal electricity is generated by burning fossil fuels like coal to drive turbines; these fuels are non-renewable and cause environmental pollution.

Source: Conventional Sources of Energy, Chapter 5

Explanation

- Examiners expect a **clear contrast** on: (1) resource used, (2) renewable vs non-renewable nature, and (3) one example of each — all three are needed for full 3 marks.
- Bhakra Nangal, Damodar Valley Corporation, and Kopili are all valid hydro examples from the textbook. Neyveli (lignite/coal) is the clearest thermal example mentioned.
- A small table plus two explanatory lines is a neat, efficient format for a 3-mark compare question — it shows clarity without over-writing.

Q18. straightforward | initial-understanding | § Non-Conventional Sources of Energy **[1]**

Which of the following correctly describes how geothermal energy is used to generate electricity?
(A) Uranium atoms are split to release heat, which boils water into steam to drive turbines.
(B) Groundwater heated by rocks deep in the Earth rises as steam and is used to drive turbines.
(C) Sunlight is focused onto water to convert it into steam that drives turbines.
(D) Organic waste is decomposed to release gas, which is burned to produce steam for turbines.

A Uranium atoms are split to release heat, which boils water into steam to drive turbines.
B Groundwater heated by rocks deep in the Earth rises as steam and is used to drive turbines.
C Sunlight is focused onto water to convert it into steam that drives turbines.
D Organic waste is decomposed to release gas, which is burned to produce steam for turbines.

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Model Answer

(B) Groundwater heated by rocks deep in the Earth rises as steam and is used to drive turbines.

Explanation

The passage on Geothermal Energy clearly states: *"Groundwater in such areas absorbs heat from the rocks and becomes hot... it turns into steam. This steam is used to drive turbines and generate electricity."* Options A (nuclear), C (solar), and D (biogas) describe other energy sources. Always match the definition to the correct source.

Q19. medium | initial-understanding | § Non-Conventional Sources of Energy **[2]**

Biogas is considered a more efficient use of cattle dung than burning dung cakes directly as fuel. Justify this statement.

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Model Answer

Biogas has **higher thermal efficiency** compared to dung cakes. When cattle dung is burned directly, it wastes valuable manure. In contrast, biogas plants convert dung into gas for fuel **and** also yield improved quality manure as a by-product. Thus, biogas provides twin benefits — energy and manure — making it a more efficient use of cattle dung.

Source: Non-Conventional Sources of Energy, Chapter 5

Explanation

The key points examiners look for are:

- **Higher thermal efficiency** of biogas vs. dung cakes/charcoal
- **Twin benefits**: energy (gas) + improved manure
- Burning dung cakes directly **destroys** the manure value

The textbook explicitly states: *"Biogas is by far the most efficient use of cattle dung. It improves the quality of manure and also prevents the loss of trees and manure due to burning."* Quote or paraphrase this directly for full marks. Don't over-explain — two clear points earn both marks.

Q20. straightforward initial-understanding § ACTIVITY **[1]**

Which type of iron ore is known for its magnetic properties and has the highest iron content among all iron ores?

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Model Answer

Magnetite is the iron ore known for its magnetic properties. It has the highest iron content among all iron ores, up to **70 per cent**, and is especially valuable in the electrical industry.

Source: Chapter 5, Iron Ore section

Explanation

The question tests direct recall of a specific fact. Examiners expect two key points in one line: the name **Magnetite** and its iron content (**up to 70%**). Mentioning its magnetic quality and use in the electrical industry adds completeness. Do not confuse it with Hematite, which is more widely *used* industrially but has a lower iron content (50–60%).

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