CBSE CLASS X

Social Science (087)

QUESTION PAPER

AI-generated question paper

Code: 0ELZ5B **Questions: 57** **Maximum Marks: 136** **Generated: 2026-06-26 10:07**

SELECTIONS USED

Subject	Social Science
Lessons	5 Minerals and Energy Resources
Level of understanding	Thorough understanding
Question selection	Curated chapter coverage (~5 questions per section + 8 synthesis)
Model	claude-sonnet-4-6

Composition — Difficulty: 3 straightforward · 32 medium · 22 deep | Types: 38 Short · 10 MCQ · 7 Very short · 2 Long

Q1. deep thorough-understanding § Introduction **[3]**

Geologists define a mineral as a homogenous, naturally occurring substance with a definable internal structure. Given this definition, why does the same element — say, carbon — exist as both the hardest and the softest mineral on Earth?

◆ **Minerals and Energy Resources**

Q2. medium thorough-understanding § Introduction **[3]**

A geologist studies the physical and chemical properties of a mineral like iron ore, while a geographer focuses on its spatial distribution, availability, and economic significance across regions. Using iron ore as an example, explain how the two perspectives lead to different but complementary understandings of the same mineral.

◆ **Minerals and Energy Resources**

Q3. medium thorough-understanding § Introduction **[1]**

Which of the following best explains why most rocks consist of several minerals in varying proportions rather than a single mineral?

A Rocks are formed only from metallic elements, which naturally combine in different ratios.
B Different combinations of elements form under varying physical and chemical conditions, producing different minerals within the same rock.
C Minerals are always evenly mixed across all rock types because they originate from the same source material.
D Only sedimentary rocks contain multiple minerals; igneous and metamorphic rocks consist of a single mineral.

◆ **Minerals and Energy Resources**

Q4. medium thorough-understanding § Introduction **[3]**

Minerals are considered indispensable to modern civilisation. Using specific examples from industry, agriculture, construction, and daily life, justify this statement and explain why the depletion of mineral resources is a matter of serious concern.

◆ **Minerals and Energy Resources**

Q5. medium | thorough-understanding | § What is a mineral? **[3]**

A geologist examines two rock samples: one is a block of pure limestone and another is a granite containing feldspar, quartz and mica. How do these samples differ in their mineral composition, and what does this tell us about the relationship between rocks and minerals?

◆ **Minerals and Energy Resources**

Q6. deep | thorough-understanding | § What is a mineral? **[3]**

[short_answer] Diamond and graphite are both made of pure carbon, yet they have strikingly different physical properties such as hardness and appearance. Similarly, talc and quartz are both silicate minerals but differ greatly in hardness. Using these examples, explain what factor — beyond chemical composition — determines the physical properties of a mineral.

◆ **Minerals and Energy Resources**

Q7. medium | thorough-understanding | § MODE OF OCCURRENCE OF MINERALS **[1]**

[mcq] Molten magma cools slowly deep within the Earth, and hot solutions rich in dissolved minerals are forced into cracks in surrounding rocks. Which of the following correctly describes the type of mineral deposit most likely to result from this process? (A) Placer deposits in river valleys (B) Mineral veins and lodes in igneous and metamorphic rocks (C) Beds of evaporite minerals in arid basins (D) Alluvial deposits in floodplains

A Sedimentary rocks are too soft to contain metallic minerals.
B Molten and gaseous minerals are forced upward through cracks and solidify as they cool, a process associated with igneous and metamorphic activity.
C Sedimentary rocks are always found at the surface, so minerals evaporate before they can solidify.
D Igneous rocks are formed by evaporation, which concentrates minerals into veins.

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Q8. medium | thorough-understanding | § MODE OF OCCURRENCE OF MINERALS **[3]**

Gypsum and potash salt are found in arid regions, while coal is found in valley basins. Both form in sedimentary rocks yet through different processes. Explain the contrasting processes by which these two groups of sedimentary minerals are formed.

◆ **Minerals and Energy Resources**

Q9. medium | thorough-understanding | § MODE OF OCCURRENCE OF MINERALS **[3]**

Bauxite is not found in veins and lodes, nor in sedimentary beds formed by compression. What process leads to the formation of bauxite deposits, and what does this tell us about the type of rocks from which it originates?

◆ **Minerals and Energy Resources**

Q10. medium | thorough-understanding | § MODE OF OCCURRENCE OF MINERALS **[2]**

Gold and platinum are recovered from valley floors and hill bases as placer deposits rather than from mines dug into rock. Why are these particular minerals suited to survival as placer deposits, while many other minerals are not found this way?

◆ **Minerals and Energy Resources**

Q11. medium | thorough-understanding | § MODE OF OCCURRENCE OF MINERALS **[1]**

[very_short_answer] The ocean contains vast quantities of dissolved minerals, yet only common salt, magnesium and bromine are commercially extracted from seawater in significant amounts. Give TWO reasons why most other minerals dissolved in ocean water are not economically extracted.

◆ **Minerals and Energy Resources**

Q12. deep thorough-understanding § MODE OF OCCURRENCE OF MINERALS **[3]**

[short_answer] A mining engineer discovers two deposits of the same mineral — one occurring as a vein within metamorphic rock and the other as a placer deposit in a nearby river valley. Compare these two deposits in terms of (i) how the mineral came to be concentrated in each location, and (ii) the likely method of extraction used for each.

◆ **Minerals and Energy Resources**

Q13. deep thorough-understanding § MODE OF OCCURRENCE OF MINERALS **[3]**

India's vast alluvial plains of north India are described as almost devoid of economic minerals, whereas the peninsular rocks are mineral-rich. Using your understanding of how minerals form in different rock types, explain why the alluvial plains are so poor in mineral deposits.

◆ **Minerals and Energy Resources**

Q14. medium thorough-understanding § MODE OF OCCURRENCE OF MINERALS **[3]**

[short_answer] Distinguish between a 'mineral' and an 'ore'. A company finds two deposits of iron-bearing rock — one in a thin scattered vein deep underground and another in a thick surface-accessible sedimentary bed. Using your understanding of ore occurrence, explain which deposit is more likely to be mined commercially and why.

◆ **Minerals and Energy Resources**

Q15. deep thorough-understanding § Ferrous Minerals **[3]**

Magnetite has a higher iron content than hematite, yet hematite is described as the most important industrial iron ore. Why might an ore with slightly lower iron content be more industrially significant than one with higher iron content?

◆ **Minerals and Energy Resources**

Q16. deep thorough-understanding § Ferrous Minerals **[3]**

Iron ore from the Bailadila range in Chhattisgarh is exported to Japan and South Korea. Name the port through which this export takes place and explain what this example reveals about the role of infrastructure in determining the commercial viability of a mineral deposit.

◆ **Minerals and Energy Resources**

Q17. medium thorough-understanding § Ferrous Minerals **[1]**

Which of the following correctly describes why ferrous minerals are considered the foundation of metallurgical industries in India?
(A) They are found only in peninsular India, making them easy to transport.
(B) They account for about three-fourths of the total value of metallic mineral production and support steel manufacturing.
(C) They include minerals like copper and bauxite, which are used in electrical industries.
(D) India imports most of its ferrous minerals to meet industrial demand.

A They are found only in peninsular India, making them easy to transport.
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◆ **Minerals and Energy Resources**

Q18. medium | thorough-understanding | § Ferrous Minerals **[3]**

Manganese is used in the manufacturing of steel and ferro-manganese alloy. How does the quantity of manganese required per tonne of steel influence decisions about the ideal location of steel plants in India? Explain with reference to relevant mineral-producing regions.

◆ **Minerals and Energy Resources**

Q19. deep | thorough-understanding | § Ferrous Minerals **[3]**

The Kudremukh iron ore deposit in Karnataka functions as a 100 per cent export unit. Analyse the factors — including transport technology and market linkages — that determine whether a mineral deposit becomes economically viable, using Kudremukh as your example.

◆ **Minerals and Energy Resources**

Q20. medium | thorough-understanding | § Non-Ferrous Minerals **[3]**

India is described as 'critically deficient' in copper reserves, yet copper remains indispensable to modern industry. What specific properties of copper make it so important, and which industries rely on it most?

◆ **Minerals and Energy Resources**

Q21. deep | thorough-understanding | § Non-Ferrous Minerals **[3]**

Aluminium is described as a versatile metal that combines several superior properties. What are those properties, and why must bauxite ore undergo a refining and smelting process before usable aluminium metal can be obtained? How does this affect the energy requirements of aluminium production?

◆ **Minerals and Energy Resources**

Q22. deep | thorough-understanding | § Non-Ferrous Minerals **[3]**

Despite having poor reserves of non-ferrous minerals overall, India has a strong base of ferrous mineral production. What does this imbalance suggest about the likely challenges India would face in developing its electrical and electronics industries? Use your knowledge of the properties and uses of non-ferrous minerals to justify your answer.

◆ **Minerals and Energy Resources**

Q23. deep | thorough-understanding | § Non-Metallic Minerals **[3]**

Mica is described as one of the most indispensable minerals in the electrical and electronic industries. What specific combination of properties makes it so valuable for these industries — and why would a mineral possessing only one or two of these properties be an inadequate substitute?

◆ **Minerals and Energy Resources**

Q24. medium | thorough-understanding | § Non-Metallic Minerals **[1]**

[mcq] Which of the following correctly describes the significance of the Koderma–Gaya–Hazaribagh belt for mica production in India?
(A) It is located in the alluvial plains of the Ganga, where mica accumulates as placer deposits carried by rivers from the Himalayas.
(B) It lies along the northern fringe of the Chota Nagpur plateau in Jharkhand and is the leading mica-producing region in the country.
(C) It falls within the Deccan Trap region of Maharashtra, where mica crystallises from volcanic lava flows.
(D) It is part of the Rajasthan desert belt where mica forms as an evaporite mineral in dry lake beds.

A Jharkhand has ideal coastal conditions that allow mica to form through evaporation of seawater.
B The northern edge of the Chota Nagpur plateau, which falls in Jharkhand, hosts the Koderma–Gaya–Hazaribagh belt, the country's leading mica-producing region.
C Jharkhand's alluvial plains deposit mica as placer deposits along river valleys.
D Mica is a by-product extracted from bauxite refining in the Amarkantak plateau.

◆ **Minerals and Energy Resources**

Q25. deep | thorough-understanding | § Non-Metallic Minerals **[3]**

Limestone is an essential raw material for both the cement industry and the iron-smelting process in blast furnaces. Using your understanding of how limestone is formed and where it occurs geologically, explain why limestone is widely available across India, and why it makes economic sense to locate cement plants close to limestone deposits.

◆ **Minerals and Energy Resources**

Q26. medium | thorough-understanding | § CONSERVATION OF MINERALS **[3]**

Mineral resources are described as 'finite and non-renewable'. What characteristic of the geological process of mineral formation makes this so, and why does it mean that even a large mineral reserve will eventually be exhausted?

◆ **Minerals and Energy Resources**

Q27. deep | thorough-understanding | § CONSERVATION OF MINERALS **[3]**

As minerals are extracted more and more deeply from the earth, the cost of extraction rises and the quality of ore decreases. How does this economic reality strengthen the case for recycling scrap metals, and why is recycling considered a step in mineral conservation?

◆ **Minerals and Energy Resources**

Q28. medium | thorough-understanding | § CONSERVATION OF MINERALS **[1]**

Which of the following best explains why improving technology to use low-grade ores is considered a mineral conservation measure?
(A) It reduces the need to import minerals from other countries.
(B) It allows workable deposits to last longer by making previously unviable ores economically useful.
(C) It speeds up the geological process of mineral formation.
(D) It increases the total volume of mineral deposits in the earth's crust.

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◆ **Minerals and Energy Resources**

Q29. medium | thorough-understanding | § Energy Resources **[3]**

Coal-based thermal power stations in India are deliberately located close to coalfields rather than near the cities they supply. Using your knowledge of coal's physical properties, justify this locational decision.

◆ **Minerals and Energy Resources**

Q30. deep | thorough-understanding | § Energy Resources **[3]**

India's rural households are being encouraged to shift from burning firewood and cattle dung cakes to using biogas plants. Explain how this single change can produce two agricultural and two environmental benefits simultaneously.

◆ **Minerals and Energy Resources**

Q31. medium | thorough-understanding | § Conventional Sources of Energy **[1]**

Which of the following correctly explains why thermal power stations are located close to coalfields rather than near cities they supply?

A Coal is a bulky material that loses weight on use as it burns to ash, making long-distance transport costly and inefficient.
B Coal releases toxic gases that make it unsafe to transport through populated areas.
C Electricity cannot travel long distances through transmission lines without losing all its power.
D Water needed for cooling turbines is only available near coalfields.

◆ **Minerals and Energy Resources**

Q32. medium | thorough-understanding | § Conventional Sources of Energy **[1]**

Anthracite, bituminous, lignite and peat are all forms of coal. What single factor primarily determines which form is produced?

◆ **Minerals and Energy Resources**

Q33. straightforward | thorough-understanding | § Conventional Sources of Energy **[1]**

Bituminous coal found in India's Gondwana formations is classified into two categories based on industrial use. Which category is specifically valued for smelting iron in blast furnaces, and where are its major reserves located in India?

◆ **Minerals and Energy Resources**

Q34. medium | thorough-understanding | § Conventional Sources of Energy **[3]**

Gondwana coalfields and tertiary coalfields are both found in India, yet they differ greatly in age, location and type of coal. Compare the two, explaining where each is found and what makes Gondwana coal particularly significant for industry.

◆ **Minerals and Energy Resources**

Q35. medium | thorough-understanding | § Conventional Sources of Energy **[2]**

A refinery is described as a 'nodal industry' for several other industries. Justify this description by explaining what petroleum provides to industries beyond just fuel.

◆ **Minerals and Energy Resources**

Q36. medium | thorough-understanding | § Conventional Sources of Energy **[1]**

In petroleum-bearing rock formations, gas is almost always found above oil rather than below it. Why is this so?

◆ **Minerals and Energy Resources**

Q37. straightforward | thorough-understanding | § Conventional Sources of Energy **[3]**

Natural gas has grown into a major energy resource in India. Identify any THREE distinct sectors or uses for which natural gas is now employed, and briefly explain why it is considered an environment-friendly fuel compared to coal or oil.

◆ **Minerals and Energy Resources**

Q38. deep thorough-understanding § Conventional Sources of Energy **[2]**

The per capita consumption of electricity is considered an index of a country's development. Why is electricity — rather than total coal or oil consumption — used as this measure?

◆ **Minerals and Energy Resources**

Q39. deep thorough-understanding § Conventional Sources of Energy **[5]**

India depends heavily on coal for commercial energy, yet coal is also a major cause of environmental problems. Using your understanding of both energy resources and mineral conservation, explain why India must develop a strategy that goes beyond simply increasing coal extraction to meet its growing energy needs.

◆ **Minerals and Energy Resources**

Q40. deep thorough-understanding § Conventional Sources of Energy **[2]**

The Krishna-Godavari basin has emerged as a significant new source of natural gas along India's east coast. Given that petroleum occurrences are associated with anticlines and fault traps in tertiary rock formations, what does the discovery of gas in this basin suggest about its underlying geological structure?

◆ **Minerals and Energy Resources**

Q41. straightforward thorough-understanding § Non-Conventional Sources of Energy **[1]**

[very_short_answer] What does photovoltaic technology do, and how does it differ from solar thermal energy?

◆ **Minerals and Energy Resources**

Q42. medium thorough-understanding § Non-Conventional Sources of Energy **[1]**

Which of the following correctly explains why biogas is considered a more efficient use of cattle dung than burning it as dung cake?
(A) Dung cake produces more heat per kilogram than biogas.
(B) Biogas yields energy AND improves manure quality, while burning dung cake destroys its value as manure.
(C) Biogas plants are cheaper to build than burning dung cake directly.
(D) Burning dung cake releases harmful nuclear radiation.

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◆ **Minerals and Energy Resources**

Q43. medium thorough-understanding § Non-Conventional Sources of Energy **[3]**

Geothermal power plants harness steam from underground to generate electricity. What chain of natural events produces that steam, starting from the Earth's interior?

◆ **Minerals and Energy Resources**

Q44. deep thorough-understanding § Non-Conventional Sources of Energy **[3]**

Nuclear energy is classified as a non-conventional source, yet it uses mined minerals — uranium and thorium — as fuel. Using what you know about both conventional and non-conventional energy, justify why nuclear energy is placed in the non-conventional category rather than with fossil fuels.

◆ **Minerals and Energy Resources**

Q45. medium | thorough-understanding | § Non-Conventional Sources of Energy **[1]**

[very_short_answer] India's largest wind farm cluster is located at the southern tip of Tamil Nadu. Identify the specific location and explain the geographical characteristic that makes it exceptionally suitable for wind energy generation.

◆ **Minerals and Energy Resources**

Q46. medium | thorough-understanding | § Non-Conventional Sources of Energy **[3]**

A rural household currently burns firewood and dung cakes for cooking. A biogas plant is installed nearby. Explain TWO specific ways in which switching to biogas would benefit both the environment and agricultural productivity of that household.

◆ **Minerals and Energy Resources**

Q47. deep | thorough-understanding | § Non-Conventional Sources of Energy **[1]**

[very_short_answer] Experimental geothermal energy projects have been set up in Puga Valley (Ladakh) and Parvati Valley (Himachal Pradesh). What geological conditions make these sites suitable for geothermal electricity generation?

◆ **Minerals and Energy Resources**

Q48. medium | thorough-understanding | § Conservation of Energy Resources **[3]**

India's energy consumption has been rising steadily since Independence, placing immense pressure on its finite energy resources. Explain why sustainable energy development is critical for India, and discuss how promotion of energy conservation and use of renewable energy sources together address this challenge.

◆ **Minerals and Energy Resources**

Q49. deep | thorough-understanding | § Conservation of Energy Resources **[3]**

A student argues: 'Saving energy is not as useful as producing more energy, because saving does not add to the total supply.' Using your understanding of energy resources and their limitations, explain why this argument is flawed.

◆ **Minerals and Energy Resources**

Q50. deep | thorough-understanding | § ACTIVITY **[3]**

Magnetite is considered the finest iron ore, yet hematite is the most important iron ore industrially. Explain why this apparent contradiction exists.

◆ **Minerals and Energy Resources**

Q51. medium | thorough-understanding | § ACTIVITY **[1]**

[mcq] Which of the following correctly pairs a mineral with both its mode of occurrence AND one of its major uses?
(A) Bauxite — formed in veins and lodes — used in making aluminium
(B) Mica — formed as placer deposits — used in electrical and electronic industries
(C) Copper — found in igneous and metamorphic rock veins — used in electrical cables and electronics
(D) Manganese — formed by evaporation of sea water — used in making steel and ferro-manganese alloy

A Bauxite — formed in veins and lodes — used in electrical cables
B Mica — formed as placer deposits — used in electrical and electronic industries
C Copper — found in igneous and metamorphic rock veins — used in electrical cables and electronics
D Gold — formed by decomposition and weathering of surface rocks — used in smelting iron

◆ **Minerals and Energy Resources**

Q52. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

Coal is found in sedimentary rock formations, while metallic minerals like copper, tin and zinc are found in igneous and metamorphic rocks. What does this difference in host rock tell us about the contrasting processes by which these two categories of minerals were formed?

◆ **Minerals and Energy Resources**

Q53. medium | thorough-understanding | § (whole-chapter synthesis) **[1]**

Consider the following two statements:
Assertion (A): Heavy industries and thermal power stations are preferably located on or near coalfields.
Reason (R): Coal is a bulky material that loses weight on use as it is reduced to ash.
Choose the correct option:
(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(C) (A) is true, but (R) is false.
(D) (A) is false, but (R) is true.

A Both (A) and (R) are true and (R) is the correct explanation of (A).
B Both (A) and (R) are true, but (R) is not the correct explanation of (A).
C (A) is true, but (R) is false.
D (A) is false, but (R) is true.

◆ **Minerals and Energy Resources**

Q54. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

Both bauxite and coal are found in significant quantities in the peninsular plateau region of India, yet their modes of formation are completely different. Explain how each of these minerals is formed, and identify one state in peninsular India where deposits of both are found.

◆ **Minerals and Energy Resources**

Q55. deep | thorough-understanding | § (whole-chapter synthesis) **[2]**

Mica is prized for its di-electric and insulating properties, while copper is valued for its electrical conductivity. Both are described as indispensable to the electrical and electronics industries. Explain the specific role each mineral plays in this industry, and account for why the industry cannot function without both despite their seemingly opposite electrical properties.

◆ **Minerals and Energy Resources**

Q56. medium | thorough-understanding | § (whole-chapter synthesis) **[1]**

Which of the following pairings correctly matches a non-conventional energy source with the specific natural condition in India that makes it especially viable?
(A) Geothermal energy — India is a tropical country with abundant sunlight
(B) Tidal energy — fast-flowing Himalayan rivers with large dams
(C) Solar energy — India is a tropical country receiving intense solar radiation
(D) Wind energy — hot springs and high geothermal gradients in peninsular India

A Geothermal energy — India is a tropical country with abundant sunlight
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◆ **Minerals and Energy Resources**

Q57. deep thorough-understanding § (whole-chapter synthesis) **[5]**

Minerals are described as indispensable to human life at every level — from basic biological processes to everyday household needs to large-scale industrial and infrastructure development. Justify this statement by giving one example each at the biological, household, and industrial level, explaining in each case why the specific mineral cannot simply be substituted or left out.

◆ **Minerals and Energy Resources**

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