Class X - Social Science

Minerals and Energy Resources

CBSE NOTES

Minerals and Energy Resources - Mastery Worksheet

Advance your understanding through integrative and tricky questions.

Mastery Questions

1. Compare and contrast ferrous and non-ferrous minerals with examples.

Hint: Focus on the presence of iron and magnetic properties for comparison.

Solution: Ferrous minerals contain iron and are magnetic, such as iron ore and manganese, used in steel production. Non-ferrous minerals do not contain iron, are not magnetic, and include copper and bauxite, used in electrical and aluminum industries respectively. Both are essential for industrial development but differ in their applications and properties.

2. Explain the mode of occurrence of minerals in igneous and metamorphic rocks.

Hint: Think about the geological processes that lead to mineral formation in these rocks.

Solution: In igneous and metamorphic rocks, minerals occur in cracks, crevices, faults, or joints. Smaller occurrences are called veins, and larger ones are lodes. They form when minerals in liquid or gaseous forms are forced upward through cavities, cooling and solidifying as they rise. Examples include tin, copper, and zinc.

3. Describe the distribution of coal in India and its significance.

Hint: Consider the geographical and historical aspects of coal formation.

Solution: Coal in India is found in two geological ages: Gondwana (metallurgical coal in Damodar valley, Jharkhand, West Bengal) and Tertiary (in northeastern states like Meghalaya). It's crucial for power generation, industrial energy, and domestic use, forming the backbone of India's energy sector.

4. What are the environmental impacts of mining? How can they be mitigated?

Hint: List the negative effects first, then think about preventive measures.

Solution: Mining leads to land degradation, water contamination, and health hazards like pulmonary diseases. Mitigation includes stricter safety regulations, environmental laws, and sustainable mining practices like using low-grade ores and recycling metals.

5. Compare conventional and non-conventional sources of energy with examples.

Hint: Focus on renewability and environmental impact for comparison.

Solution: Conventional sources include coal, petroleum, and natural gas, which are exhaustible and polluting. Non-conventional sources like solar, wind, and tidal energy are renewable and cleaner. Both are vital but non-conventional sources are sustainable for the future.

6. Why is conservation of minerals essential? Suggest measures for conservation.

Hint: Think about the long-term availability and sustainable use of minerals.

Solution: Minerals are finite and non-renewable, with slow formation rates. Conservation is vital to ensure availability for future generations. Measures include using substitutes, recycling, and improving technologies to utilize low-grade ores efficiently.

7. Explain the significance of solar energy in India's energy sector.

Hint: Consider India's geographical advantage and environmental benefits.

Solution: India's tropical climate offers vast solar energy potential, used for electricity generation and reducing dependence on fossil fuels. It's sustainable, reduces environmental pollution, and is increasingly popular in rural areas for domestic and agricultural purposes.

8. Describe the distribution of iron ore in India and its industrial importance.

Hint: Focus on the geographical regions and the role of iron ore in industry.

Solution: Major iron ore belts in India include Odisha-Jharkhand, Durg-Bastar-Chandrapur, and Ballari-Chitradurga-Chikkamagaluru-Tumakuru. Iron ore is crucial for steel production, industrial development, and exports, forming the backbone of metallurgical industries.

9. What are the advantages of using biogas as a source of energy in rural India?

Hint: Think about the dual benefits of energy production and agricultural improvement.

Solution: Biogas, produced from shrubs, farm waste, and animal dung, provides clean energy, improves manure quality, and reduces deforestation by decreasing reliance on firewood. It's efficient, sustainable, and supports rural households economically and environmentally.

10. Discuss the potential of geothermal energy in India and its challenges.

Hint: Consider the geographical suitability and economic feasibility.

Solution: India has potential in regions with high geothermal gradients like Himachal Pradesh and Ladakh. Challenges include high initial costs, technological barriers, and limited exploration. However, it offers a clean, sustainable energy source with minimal environmental impact.

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Great things take time - be patient and persistent.