Class X - Social Science

Minerals and Energy Resources

CBSE NOTES

Minerals and Energy Resources - Challenge Worksheet

Push your limits with complex, exam-level long-form questions.

Challenge Questions

1. Evaluate the role of minerals in the development of a country's economy with examples from India.

Hint: Consider the impact of mineral resources on industrial growth and the balance between economic development and environmental conservation.

Solution: Minerals play a crucial role in the economic development of a country by providing raw materials for industries, generating employment, and contributing to GDP. For instance, India's iron ore and coal reserves have been pivotal in the growth of its steel and power sectors, respectively. However, over-dependence on mineral extraction can lead to environmental degradation and resource depletion, highlighting the need for sustainable practices.

2. Discuss the environmental impacts of mining activities in India and suggest measures to mitigate them.

Hint: Think about the direct and indirect effects of mining on ecosystems and human health.

Solution: Mining activities in India have led to deforestation, soil erosion, water contamination, and air pollution. For example, the Rat-Hole mining in Meghalaya has caused significant environmental damage. Mitigation measures include enforcing stricter environmental laws, promoting sustainable mining practices, and rehabilitating mined areas.

3. Compare and contrast the distribution of coal and petroleum resources in India.

Hint: Consider the geological ages and regions where these resources are found.

Solution: Coal resources in India are primarily found in the Gondwana formations, with major reserves in Jharkhand, Odisha, and Chhattisgarh. Petroleum, on the other hand, is found in tertiary formations, with major reserves in Mumbai High, Gujarat, and Assam. While coal is abundant and widely used for power generation, petroleum is limited and crucial for transportation and industries.

4. Analyze the potential of non-conventional energy sources in India to reduce dependence on fossil fuels.

Hint: Think about the geographical advantages and policy support for renewable energy in India.

Solution: Non-conventional energy sources like solar, wind, and biogas have significant potential in India due to its tropical climate and vast rural areas. For instance, Tamil Nadu's wind farms and Rajasthan's solar plants are leading examples. However, challenges like high initial costs and technological barriers need to be addressed for wider adoption.

5. Explain the significance of the 'One Nation One Grid' initiative in the context of India's energy resources.

Hint: Consider the benefits of a unified grid for energy security and economic growth.

Solution: The 'One Nation One Grid' initiative aims to integrate India's regional power grids into a single network to ensure efficient transmission and distribution of electricity. This is crucial for balancing the demand and supply of energy across regions, especially with the increasing share of renewable energy sources.

6. Critically assess the impact of mineral conservation policies on India's mining industry.

Hint: Think about the long-term benefits versus the immediate economic impacts.

Solution: Mineral conservation policies, such as recycling and using substitutes, aim to ensure sustainable use of resources. While these policies help in reducing environmental damage and extending resource availability, they may also increase operational costs for the mining industry and limit short-term economic gains.

7. Discuss the challenges faced by India in harnessing its geothermal energy potential.

Hint: Consider the technical and financial constraints in developing geothermal energy.

Solution: India faces challenges like limited exploration, high drilling costs, and lack of technology in harnessing geothermal energy. Despite having potential in regions like Himachal Pradesh and Ladakh, these barriers hinder large-scale utilization.

8. Evaluate the role of public transport systems in conserving energy resources in urban India.

Hint: Think about the collective impact of reduced vehicle usage on energy conservation.

Solution: Public transport systems play a vital role in conserving energy by reducing the reliance on individual vehicles, thus lowering fuel consumption and emissions. For example, metro systems in Delhi and Bangalore have significantly cut down on petroleum use and pollution.

9. Analyze the socio-economic benefits of biogas plants in rural India.

Hint: Consider the multiple benefits beyond just energy production.

Solution: Biogas plants in rural India provide clean energy, improve sanitation by managing waste, and produce organic manure, enhancing agricultural productivity. They also reduce the drudgery of women by eliminating the need to collect firewood.

10. Discuss the implications of India's increasing energy consumption on its energy security.

Hint: Think about the balance between growing demand and sustainable supply.

Solution: India's rising energy consumption, driven by industrialization and urbanization, poses challenges to energy security due to dependence on imports and finite domestic resources. Diversifying energy sources and improving efficiency are essential to ensure sustainable energy security.

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