Minerals and Energy Resources

Previous Years' CBSE Board Questions

1. (A) How is energy a basic requirement for economic development? Explain. (2024)

OR

(B) How are conventional sources of energy different from non- conventional sources? Explain.

Answer. (A) How is energy a basic requirement for economic development? Explain.

i. Energy is required for all activities for example cooking, light, propelling vehicles, run machinery in industries, etc.
ii. Energy can be classified as conventional and non- conventional sources of energy.
iii. Energy is required for large scale manufacturing that is essential for economic development.
iv. Energy is also required for the development of small scale industries.
v. Energy is required to modernise agriculture and increase agricultural production.
vi. Examples of conventional sources of energy are firewood, cattle dung cake, coal, petroleum, natural gas, electricity (thermal) etc.
vii. Examples of non-conventional sources of energy are solar, wind, tidal, geo-thermal, biogas, etc. viii. Any other relevant point. Any five points to be explained

OR

(B) How are conventional sources of energy different from nonconventional sources? Explain.

i. Conventional sources of energy are exhaustible, non-conventional sources are renewable.

ii. Conventional sources of energy take a long time to form. Nonconventional forms of energy are readily available
iii. Conventional forms of energy are usually derived from fossil fuels. Non-conventional sources of energy are derived from sources like sun, wind and Earth.
iv. Conventional sources of energy are relatively cheaper. NonConventional energy sources are initially expensive but become cheaper in due course of time.
v. Non-conventional sources of energy are sustainable while Conventional sources of energy are not sustainable.
vi. Conventional sources of energy often cause air and water pollution. Non-conventional sources of energy cause less damage to the environment.
vii. Examples of Conventional sources of energy are firewood, petroleum, coal, natural gas etc. Examples of non- conventional energy sources are solar, tidal, wind, hydel power. viii. Any other relevant point.

Any five points of difference to be explained

What is a Mineral?; Mode of Occurrence of Minerals

VSA (1 mark)

1. How do minerals occur in sedimentary rocks? (AI 2015)

2. What are the two types of occurrences of minerals in igneous and metamorphic rocks? (Foreign 2015)

3. What is a mineral? (2015)

SAI (3 marks)

4. Classify metallic minerals with an example of each. (2020 C)

5. "Minerals occur in various forms". Support this statement with examples. (2020)

6. "Minerals are an indispensable part of our lives". Support this statement with examples. (2020)
Ferrous and Non-Ferrous Minerals; Non-Metallic Minerals; Rock Minerals

MCQ

7. Which one of the following is an example of the Ferrous Metal? (2023)
(a) Copper
(c) Bauxite
(b) Tin
(d) Nickel

8. Which one of the following minerals is used to harden steel during its manufacturing? (Foreign 2014)
(a) Iron ore
(b) Coking coal
(c) Manganese
(d) Limestone

VSA (1 mark)

9. Why are there a wide range of colours, hardness, crystal forms, lustre and density found in minerals? (Delhi 2016)

10. How is iron-ore transported from Kudremukh mines to a port near Mangaluru? (Foreign 2016)

11. Why aluminium metal has great importance? (2015)

SAI (3 marks)

2. Differentiate between anthracite and bituminous coal on the basis of quality. (2020 C)

13. Describe any three characteristics of the Durg-Bastar-Chandrapur iron-ore belt in India. (Al 2017)

14. Describe any three characteristics of 'Odisha- Jharkhand belt' of iron ore in India. (Delhi 2017)

15. Describe any three characteristics of Ballari- Chitradurga, Chikkamagaluru-Tumakuru iron-ore (Foreign 2017) A belt in India.

16. "India is an important iron and steel producing country in the world. Yet we are not able to perform to our full potential." Suggest and explain any three measure to get full potential. (Foreign 2016)

17. Describe any three features of ferrous minerals found in India. (Foreign 2015)

18. How is the mining activity injurious to the health of the miners and environment? Explain. (Delhi 2015)

19. Why is mica considered the most important mineral in electric and electronic industries? Give three reasons. (Al 2014)

Conservation of Minerals; Energy Resources: Conservation of Energy Resources

MCQ

20. In which of the following states is Kalpakkam nuclear power plant located? (2020)
(a) Gujarat
(b) Odisha
(c) Kerala
(d) Tamil Nadu

21. Choose the correct option from column A and B.

	(A)		(B)
(a)	Chandrapur thermal power plant	(i)	Odisha
(b)	Mayurbhanj iron ore mines	(ii)	Amarkantak
(c)	Kalol oil fields	(iii)	Gujarat
(d)	Bauxite mines	(iv)	Jharkhand

(2020)

22. In which of the following States is Narora Nuclear Power Plant located? (2020)
(a) Karnataka
(b) Kerala
(c) Tamil Nadu
(d) Uttar Pradesh

VSA (1 mark)

23. Fill in the blank:
is well known for effective use of wind energy in Rajasthan. (2020)

24. Suggest any one way to enhance the use of natural gas in India. (2020)

25. Fill in the blanks:
'Gobar gas plants' provide twin benefits to the farmers in the form of
and. (2020)

26. Suggest any one way to maximize the use of nuclear energy in the field of medicine. (2020)

27. Why should the use of cattle cake as fuel be discouraged? (Al 2016) An

28. How are 'Gobar Gas Plants' beneficial to the farmers? (2016) U

SAI (3 marks)

29. 'Consumption of energy in all forms has been rising all over the country. There is an urgent need to develop a sustainable path of energy development and energy saving. Suggest and explain any three measures to solve this burning problem. (AI 2016)

30. "There is a pressing need to use renewable energy resources." Justify the statement with suitable arguments. (2016)

31. Which minerals are used to obtain nuclear energy? Name all the six nuclear power stations of India. (2016)

32. "Natural gas is considered an environment friendly fuel." Explain the statement in two points. (2015)

33. How is geothermal energy produced? Explain. (2015)

34. How can biogas solve the energy problem mainly in rural India? Give your suggestions. (2015)

35. Why is energy required for all activities? How can energy be generated? Explain. (Delhi 2014)

SA II (4 marks)

36. Read the given case and answer the questions that follow:
CONSERVATION OF ENERGY RESOURCES Energy is a basic requirement for economic development. Every sector of the national economy
- agriculture, industry, transport, commercial and
domestic - needs inputs of energy. The economic development plans implemented since independence necessarily required increasing amounts of

energy to remain operational. As a result, consumption of energy in all forms has been steadily rising all over the country. In this background, there is an urgent need to develop a sustainable path of energy development. Promotion of energy conservation and increased use of renewable energy sources are the twin planks of sustainable energy. India is presently one of the least energy efficient countries in the world. We have to adopt a cautious approach for the judicious use of our limited energy resources. For example, as concerned citizens we can do our bit by using public transport systems instead of individual vehicles; switching off electricity when not in use, using power-saving devices and using non conventional sources of energy. At last "Energy Saved is energy produced".
(i) Why is sustainable energy a key to sustainable development?
(ii) Why is consumption of energy rising in all over India?
(iii) Explain 'Energy saved is energy produced' (2023)

LA (5 marks)

37. Why is it necessary to conserve mineral resources? Explain any four ways to conserve mineral resources. (AI 2017)

38. 'Energy saved is energy produced. Assess the statement. (2017)

39. Why should we use renewable energy resource? Explain with arguments. (Foreign 2017)

40. Explain the importance of conservation of minerals. Highlight any three measures to conserve them. (AI 2016)

41. Highlight the importance of petroleum. Explain the occurrence of petroleum in India. (Delhi 2016)

42. How can solar energy solve the energy problem to some extent in India? Give your opinion. (2015)

CBSE Sample Questions

Conservation of Energy Resources

VSA (2 marks)

1. Suggest any two ways to conserve energy resources in India. (2022-23) U
2. Suggest any two ways to improve the usage of solar energy. (2022-23) U

ANSWERS

Previous Years' CBSE Board Questions

1. In sedimentary rocks, minerals occur in beds and layers.

2. In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints. The smaller occurrences are called veins and the larger are called lodes.

3. Mineral is a naturally occurring substance with a definite chemical and crystallographic structure.

4. Metallic minerals can be classified as:
(i) Ferrous: Provides a strong base for development of metallurgical industries. e.g., Iron ore, manganese
(ii) Non-ferrous: Plays a vital role in metallurgical, engineering and electrical industries. e.g., Copper, lead, bauxite.
(iii) Precious: It is an expensive metallic mineral and not corroded by water. It is found in placer deposits e.g. gold, silver, platinum etc.

5. Occurrence of minerals:
(i) In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints. The smaller occurrences are called veins and the larger are called lodes.
(ii) In most cases, they are formed when minerals in liquid/ molten and gaseous forms are forced upward through cavities towards the earth's surface. They cool and solidify as they rise. Major metallic minerals like tin, copper, zinc and lead, etc., are obtained from veins and lodes.
(iii) In sedimentary rocks, a number of minerals occur in beds or layers. They have been formed as a result of deposition, accumulation and concentration in horizontal strata. For example gypsum, potash salt and sodium salt. These are formed as a result of evaporation especially in arid regions.
(iv) 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.

(v) Certain minerals may occur as allvial deposits in sands of valley floors and the base of hills. These deposits are called 'placer deposits' and generally

contain minerals, which are not corroded by water. Gold, silver, tin and platinum are most important among such minerals.

6. Minerals are an indispensable part of our lives.
(i) Almost everything we use, from a tiny pin to a towering building or a big ship, all are made from minerals.
(ii) The railway lines and the roads, our implements and machines are all made from minerals.
(iii) Cars, buses, trains, aeroplanes are manufactured from minerals and run on power resources derived from the earth.
(iv) Even the food that we eat contains minerals.
(v) In all stages of development, human being have used minerals for their livelihood, decoration, festivities, religious and ceremonial rites.

7. (d): Nickel

8. (c): Manganese

9. The varied colours found in minerals are due to its chemical composition, and the parameters such as temperature, pressure, rate of cooling etc., present during its formation.

10. Iron ore is transported as slurry through pipelines.

11. Aluminium metal combines the properties of great strength, lightness, malleability and conductivity.

12.

	Basis of difference	Anthracite coal	Bituminous coal
(i)	Quality	This is the highest quality hard coal.	This is comparatively low grade in quality.
(ii)	Carbon content	It causes less pollution as compared to bituminous, as it has high carbon.	It causes high pollution compare to anthracite, as it has less carbon.
(iii)	Availability	In India, it is available in small quantity.	In India, it is available in abundance.

13. Durg-Bastar-Chandrapur belt lies in Chhattisgarh and Maharashtra.
(a) It provides very high grade hematite from the famous Bailadila range of hills in the Bastar district of Chhattisgarh.
(b) The range of hills comprise of 14 deposits of super high-grade hematite iron ore. It has the best physical properties needed for steel making.
(c) Iron ore from these mines is exported to Japan and South Korea via Vishakhapatnam port.

14. Odisha-Jharkhand belt:
(a) In Odisha, high grade haematite ore is found in Badampahar mines in the Mayurbhanj and Kendujhar districts.
(b) In the adjoining Singbhum district of Jharkhand haematite iron ore is mined in Gua and Noamundi.
(c) These mines feed the steel industry in the eastern and other parts of India.

15. Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt in Karnataka has large reserves of iron ore.
(a) The Kudremukh mines located in the Western Ghats of Karnataka.
(b) They are a 100 per cent export unit.
(c) Kudremukh deposits are known to be one of the largest in the world. The ore is transported as slurry through a pipeline to a port near Mangaluru.

16. Though, India is an important iron and steel producing country in the world yet, we are not able to perform to our full potential largely due to the following reasons: High costs and limited availability of coking coal and poor supportive infrastructure. Many of the steel plants have outdated technology. We can greatly improve our performance by adapting the following measures:
(a) Modernising the technology and machinery.
(b) Streamlining supply of inputs such as iron ore coke etc.
(c) Having adequate buffer of electricity capacity.
(d) Streamlining customer demand and supplies.

17. Ferrous minerals in India account for approximately three-fourths of the total price of the production of metallic minerals. They provide a strong foundation for the expansion of metallurgical industries. India is also a leading exporter of ferrous minerals, magnetite, hematite are some of the common ferrous minerals. Odisha, Chhattisgarh and Maharashtra are the chief states where these minerals are found.

18. The mining activity is injurious to the health of the miners and environment as:
(a) The dust and toxic fumes can cause pulmonary disease to the miners.
(b) The roofs and walls of the mines have a risk of collapsing.
(c) Flooding or fire are a great risk in mines.
(d) The water bodies in the region get contaminated by mineral dust.
(e) Dumping of waste and slurry degrades the land.
19. Mica is:
(i) Excellent di-electric in strength and has low power loss factor.
(ii) It has insulating properties and resistance to high voltage.
(iii) It is the most indispensable mineral used in electric and electronic industries.

20. (d): Tamil Nadu

21. (c): Kalol oil fields – Gujarat

22. (d): Uttar Pradesh

23. Nagarcoil and Jaisalmer

24. Use of natural gas:
Making people aware about the importance of using this clean energy resources because this gas is considered environment friendly.

25. Energy and manure

26. Nuclear medicine use radio-active substances, mostly to diagnose cancer as well as cardiac and other diseases.

27. (a) Cattle cake creates pollution.
(b) By burning, a manure resource is destroyed, which can improve soil fertility.

28. Gobar Gas Plants are beneficial to the farmers in two ways. It provides a clean fuel for domestic cooking and lighting. It also provides high quality manure.

29. Energy is a basic requirement for economic development. The strategy of economic develop- ment that India adopted since independence required increasing amount of energy consumption. As a result, consumption of energy in all forms has been rising. To take care of this concern various measures that

need to be adopted are as follows:
(i) We need to increase the use of renewable energy resources like solar, wind power, biogas, tidal energy and geothermal energy. This will decrease the dependence on non-renewable ressources.
(ii) We have to adopt a cautious approach for judicious use of our limited energy resources. For example, as a concerned citizen we can use public transport system in place of individual vehicle.
(iii) Another measure that needs to be adopted is promotion of energy conservation, e.g., switching off electrical devices when not in use, using power saving devices etc.

30. Need to use renewable energy resources are:
(i) The growing consumption of energy has resulted in the country becoming increasingly dependent on fossil fuels such as coal, oil and gas.
(ii) Rising prices of oil and gas and their potential shortages have raised uncertainties about the security of energy supply in future.
(iii) Has serious repercussions on the growth of our country.
(iv) Hence, there is a pressing need to use renewable energy resources like solar energy, wind, tide, biomass and energy from waste material.

31. The minerals which are used to obtain nuclear energy are uranium and thorium. Nuclear Power Stations in India
(i) Narora nuclear power station.
(ii) Kakrapara nuclear power station.
(iii) Tarapur nuclear power station.
(iv) Kaiga nuclear power station.

(v) Rawat Bhata nuclear power station.
(vi) Kalpakkam nuclear power station.

32. Natural gas is used as a source of energy as well as an industrial raw material.
(i) It can be transported easily through pipelines.
(ii) Pipelines have helped in setting up fertilizer plants and power plants on its way.
(iii) Natural gas is a clean source of energy. This is because it causes very less pollution.

33. The earth grows progressively hotter with increasing depth. Where the geothermal gradient is high, high temperatures are found at shallow depths. Groundwater in such areas absorbs heat from the rocks and becomes hot. It is so hot that when it rises to the earth's surface it turns into steam. This steam is used to drive turbines and generate electricity.

34. Biogas can solve energy problem:
(i) Availibitlity of raw material is not a problem.
(ii) Awareness to be created about biogas.
(iii) It will reduce the burden on conventional sources of energy.
(iv) Educate the rural people about the use of biogas.
(v) It is a renewable source of energy.
(vi) Eco-friendly.

35. (i) Energy is a basic requirement for economic development.
(ii) Every sector of the national economy needs input of energy.
(iii) Consumption of energy in all forms has been steadily rising all over the country.
(iv) Rising prices of oil and gas and their potential shortage have raised uncertainities about the security of energy supply in future. Energy can be generated from fuel minerals like coal, petroleum, natural gas, uranium and from electricity.

36. (i) Sustainable energy is a key to sustainable development, as sustainability demands that resource reserves including exhaustible, natural and environmental resources, be maintained.
(ii) After getting independence development of all sectors like agriculture, industry, transport, domestic needs etc. necessarily required to remain in operation, hence consumption of energy in all forms has increased all over India.
(iii) Energy saved is energy produced. We cannot keep onproducing non-renewable energy like petrol, diesel and electricity. So the need of the hour is the better utilisation of exisiting resources. We have to adopt cautions approach for the judicious use of our limited energy resources.

37. The various reasons for conservation are:
(i) Strong dependence of industry and agriculture upon minerals. But, are limited in availability.

(ii) Process of mineral formation is slow.
(iii) They are non-renewable and exhaustible.
Methods to conserve:
(i) Minerals should be used in a planned and sustainable manner.
(ii) Improved technology needs to be constantly evolved to allow use of low grade ore at low cost.
(iii) Recycling of minerals must be practiced.
(iv) Use of alternative renewable substitutes.
38. Energy is required for all activities in industries, agriculture, transport and domestic use. It implies that all these activities can take initiatives to conserve energy if we discipline ourselves. To begin with, each one of us should be always ready and be vigilant to take note of wasteful use and correct it immediately. It may be as simple as putting off an electrical appliance when not in use. We should develop a mindset to use public transport system instead of individual vehicles. Electronic devices must be switched off when not in use. We should use more and more power saving devices and at home we should plan to install solar panels to generate some electricity. When we do not use a particular quantity of electric power someone else can use it. In absolute sense power plants will need to produce that much less of power; which benefits the environment as that much less fossil fuel will have to be burnt.

39. In the present circumstances particularly in India, there is a pressing need to use renewable energy resources because:
(i) Non-renewable resources are limited and will get exhausted in few decades, thus there is a need to use inexhaustible energy resources such as solar power, for sustainable development.
(ii) There has been a rapid depletion of non-renewable resources like coal, gasoline, petroleum that took millions of years to form. Thus, it makes immense sense to use renewable non-polluting energy resources.
(iii) Fossil fuels like coal, petroleum products etc., create pollution which has resulted in environmental degradation making clean energy an urgent requirement.
(iv) Newer sources of fossil fuels are becoming more and more difficult to find hence they have become more expensive. Thus, it again points to adaptation to renewable energy sources like solar, geothermal, wind energy etc.

40. Conservation of minerals is the need of the hour:
(i) Minerals are considered to be the backbone of the economy.
(ii) Industry largely depends on mineral deposits.
(iii) Total volume of workable mineral deposits is very less-only 1% of the earth's crust.
(iv) Mineral resources are being consumed rapidly, and minerals deposits need millions of years to be created and concentrated.
(v) The geological process of mineral formation are so slow that the rates of replenishment are infinitely small in comparison to the present rates of consumption.
(vi) Mineral resources are finite and non-renewable.
(vii) The rich mineral deposits of our country are extremely valuable but shorts-lived possessions.

41. Importance of petroleum are as follows:
(i) Petroleum is the major energy source in India.
(ii) It provides fuel for heat and lighting.
(iii) It provides lubricant for machinery.
(iv) It provides raw materials for a number of manufacturing industries.
(v) Petroleum refineries act as core industry for synthetic, textile, fertilizer and chemical industries. Occurrence:
(i) Most of the petroleum reserves in India are associated with anticlines and fault traps.
(ii) In regions of folding anticline or domes, it occurs where oil is trapped in the crust of the upfold.
(iii) Petroleum is also found in fault traps between porous and non-porous rocks.

42. (i) India is a tropical country, therefore it receives sunlight in abundance throughout in rural and remote areas.
(ii) Solar plants can be easily established in rural and remote areas.
(iii) It will minimise the dependence of rural household on firewood and dung cakes which in turn will contribute to environmental conservation and adequate quantity of manure.

CBSE Sample Questions

1. Methods to conserve energy resources:
(i) Minerals should be used in a planned and sustainable manner.
(ii) Improved technology needs to be constantly evolved to allow use of low grade ore at low cost.
(iii) Recycling of minerals must be practiced.
(Any two points to be explained) (2)

2. (i) Reducing the cost of solar panels.
(ii) Increase awareness of using solar energy.
(iii) Buy panels with high Concentrated Photovoltaic cells (CPV).
(iv) Buy one of the most efficient solar panel models.
(Any two points to be explained) (2)