

CHAPTER 2.5

Mineral and Energy Resources

ONE MARK QUESTIONS

1. What is a mineral? [CBSE 2016]
Ans :
Mineral is a homogeneous naturally occurring substance with a definable internal structure.
2. Why are there a wide range of colours, hardness, crystal forms, lustre and density found in minerals?
Ans : [CBSE 2016]
The ranges found in minerals are due to physical and chemical conditions.
3. How do minerals occur in igneous and metamorphic rocks? [Delhi 2016]
Ans :
In igneous and metamorphic rocks, minerals may occur in cracks, crevices, faults and joints.
4. How do minerals occur in sedimentary rocks?
Ans : [Delhi 2016, 2015]
In sedimentary rocks, minerals occur in beds or layers. They have been formed as a result of deposition, accumulation and concentration in horizontal strata.
5. Name the minerals formed in beds and layers.
Ans : [CBSE 2016]
Coal, and some forms of iron ore.
6. How does mining affect the health of miners?
Ans : [Foreign 2016]
The dust and the noxious fumes inhaled by the miners makes them vulnerable to pulmonary diseases.
7. How did the Bailadila iron-ore field get its name?
Ans : [CBSE 2016]
The Bailadila hills look like the hump of an ox, hence Bailadila iron-ore field get its name.
8. How is iron-ore transported from Kudremukh mines to a port near Mangaluru?
Ans : [Foreign 2016]
Iron-ore is transported as slurry through pipelines.
9. Why is copper mainly used in electrical cables and electronic industries?
Ans : [Sample Paper 2016]
It is used in electrical cables as it is malleable, ductile and a good conductor of heat and electricity.
10. Why aluminium metal has great importance?
Ans : [All India 2016]
It has great importance because it combines the strength of metals such as iron with extreme lightness and also with good conductivity and great malleability.
11. How are 'Gobar Gas Plants' beneficial to the farmers?
Ans : [All India 2016]
'Gobar Gas Plants' are beneficial to the farmers in the form of energy and improved quality of manure.
12. Which rock consists of single mineral only?
Ans : [CBSE 2015]
Limestone.
13. What is hematite? [CBSE 2015]
Ans :
Hematite ore is the most important industrial iron ore in terms of the quantity used.
14. Why should the use of cattle cake as fuel be discouraged?
Ans : [All India 2015]
The use of cattle cake as fuel should be discouraged because it creates pollution. It consumes most valuable manure which could be used in agriculture.
15. What are placer deposits? [All India 2010]
Ans :
Certain mineral deposits that occur in sands of valley floors and the base of the hills as alluvial deposits are called placer deposits.
16. Which state of India is the largest producer of Bauxite?
Ans : [All India 2010]
Odisha is the largest producer of Bauxite in India.
17. Name the most abundantly available fossil fuel in India.
Ans : [All India 2010]
Coal is the most abundantly available fossil fuel in India.
18. Which is the highest petroleum-producing area in India?
Ans : [Foreign 2010]

Mumbai High is the highest petroleum-producing area in India.

19. Name the gulf that provides ideal conditions for utilising tidal energy in India. [Foreign 2010]

Ans :

Gulf of Khambhat and Gulf of Kutch in Gujarat provide ideal conditions for utilising tidal energy in India.

20. Which is the oldest oil producing state of India?

Ans : [CBSE 2011]

Assam.

21. How power resources are classified?

Ans : [CBSE 2012]

Power resources may be broadly categorised into conventional and non-conventional resources.

22. What are conventional sources of energy?

Ans : [CBSE 2009]

Conventional sources of energy generally nonrenewable sources of energy which have been in common use for a long time. Example: firewood, coal, natural gas, etc.

23. What is biogas energy?

Ans : [CBSE 2009]

Bio gas is produced from shrubs, farm waste, animal and human wastes.

24. Name any one nuclear power station found in India.

Ans : [CBSE 2010]

Kalpakkam in Tamil Nadu.

25. At which place in India, experimental project for geothermal energy has been Set-up?

Ans : [CBSE 2008]

Manikaran.

THREE MARKS QUESTIONS

26. How is mining activity hazardous? Explain. [CBSE 2016]

or

How is the mining activity injurious to the health of the miners and environment? Explain. [Delhi 2015]

or

“Mining affects health and environment both.”
Comment. [CBSE 2012]

or

How is mining activity hazardous? Explain.

Ans : [CBSE 2016]

The mining activity is injurious to the health of the miners and environment as:

- The dust and noxious fumes inhaled by miners make them vulnerable to pulmonary diseases.
- The risk of collapsing mine roofs.
- Inundation on coal mines are a constant threat to miners.
- The water sources in the region get contaminated due to mining.
- Dumping of waste and slurry leads to degradation of land, soil and increase in stream and river

pollution.

27. Why is mica considered the most important mineral in electric and electronic industries? Give three reasons. [CBSE 2016]

or

How is mica one of the most indispensable minerals? Explain any three points. [CBSE 2011]

Ans :

Mica is:

- Excellent dielectric in strength and has low power loss factor.
- It has insulating properties and resistance to high voltage.
- Most indispensable mineral used in electric and electronic industries.

28. Which are the two main minerals used to obtain nuclear energy? Name any two states where these minerals are found. [CBSE 2015]

Ans :

Nuclear or atomic energy is obtained by altering the structure of an atom; When such an alteration is made, much energy is released in the form of heat and this is used to generate electric power.

- Uranium and Thorium are used for generating atomic or nuclear power.
- They are available in Jharkhand and Rajasthan.

29. “How is geo-thermal energy produced? Explain.

Ans : [CBSE 2015]

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 to generate electricity.

30. Name the non-metallic mineral which can split easily into thin sheets. Mention its uses. [CBSE 2014]

Ans :

Mica is the non-metallic mineral which can be split easily into thin sheets.

Mica is used in:

- Electric and electronic industries: Mica is used in these industries due to its excellent dielectric strength, low power loss factor, insulating properties and resistance to high voltage.
- Plastic industry uses mica as an extender and filler.

31. Why is conservation of minerals important? How can we conserve minerals? [CBSE 2014, 2012]

Ans :

Conservation of minerals is important for the following reasons:

- Minerals are exhaustible.
- They are limited.
- Minerals have manifold uses.
- Growth of industrialisation has accelerated the extraction of minerals.

We can conserve minerals by making an efficient

use of them and using recyclable sources of energy wherever possible.

32. Why is energy required for all activities ? How can energy be generated? [CBSE 2014]

Ans :

- Energy is a basic requirement for economic development.
- Every sector of the national economy needs input of energy.
- Consumption of energy in all forms has been steadily rising all over the country.
- Rising prices of oil and gas and their potential shortage have raised uncertainties about the security of energy supply in future.

Energy can be generated from fuel minerals like coal, petroleum, natural gas, uranium and from electricity.

33. What are the two main ways of generating electricity? How are they different from each other? Explain.

Ans : [CBSE 2014]

	Thermal Electricity	H y d r o Electricity
1.	It is obtained by using coal, petroleum and natural gas.	It is produced from water.
2.	It is a non-renewable resource.	It is a renewable.
3.	It causes pollution.	It does not cause pollution.
4.	It is expensive in the long run.	It is cheaper in the long run.

34. "Natural gas is considered an environment friendly fuel." Explain the statement in two points.

Ans : [CBSE 2014]

Natural gas is used as a source of energy as well as an industrial raw material.

- It can be transported easily through pipelines.
- Pipelines have helped in setting up fertilizer plants and power plants on its way.
- Natural gas is a clean source of energy.
- It is an environment friendly fuel because of the low carbon emission.

35. Name the mineral ore from which aluminium is extracted. Why is it gaining importance? Give its distribution in India.

Ans : [CBSE 2012]

- Bauxite.
- Aluminium is gaining importance because of its extreme lightness, good conductivity and great malleability. It combines the strength of metals such as Iron.
- It is mainly found in Amarkantak Plateau, Maikal Hills and the plateau region of Bilaspur-Katni. Koraput district in Odisha has large deposits. Odisha is the largest bauxite producing state. Others are Gujarat, Maharashtra and Jharkhand.

36. Explain any three different forms in which minerals

generally occur.

Ans : [CBSE 2012]

- Minerals occur in the form of veins and lodes (In igneous and metamorphic rocks).
- In sedimentary rocks, a number of minerals occur in beds and layers.
- As residual mass of weathered material.
- As alluvial deposits in ocean waters.

37. Describe any three important uses of coal as a source of energy. [CBSE 2012]

Ans :

Importance of coal as a source of energy in India are:

- Coal is the most abundantly available fossil fuel in India.
- It provides a substantial part of the nation's energy needs.
- It is used for power generation.
- It supplies energy to industry as well as for domestic needs.

38. Why is it essential to use renewable sources of energy?

Ans : [CBSE 2012]

- Non-renewable sources are going to exhaust such as coal, petrol, natural gas etc. They can cause environmental pollution therefore, we have to use' renewable resources.
- India has abundance of solar energy, wind, water and biomass.
- Rising prices of oil and gas and their shortage have raised uncertainties about energy resources in the future.

39. Describe any three non-conventional sources of energy.

Ans : [CBSE 2012]

Non-conventional sources of energy are:

- Solar Energy:** India is a tropical country. It has enormous possibilities of trapping solar energy. Photovoltaic technology converts sunlight directly into electricity. Solar energy is rapidly becoming popular in rural and remote areas.
- Wind Energy:** India now ranks as a 'wind super power' in the world. The largest wind farm cluster is located in Tamil Nadu from Nagercoil to Madurai. Apart from these, Andhra Pradesh, Karnataka, Gujarat, Kerala, Maharashtra and Lakshadweep have important wind farms. Nagercoil and Jaisalmer are well-known for effective use of wind energy in the country.
- Biogas:** Shrubs, farm waste, animal and human waste are used to produce biogas for domestic consumption in rural areas. Biogas plants using cattle dung are known as 'Gobar Gas Plants' in rural India. These provide twin benefits to the farmer in the form of energy and improved quality of manure.

40. Which are the potential sources of biogas? State any four benefits of biogas. [CBSE 2012]

Ans :

Potential sources of biogas are: Shrubs, farm wastes, animal waste, human waste, etc.

Four benefits of biogas are:

- Its calorific value is high.
- It burns without smoke, causing no pollution.
- It is the cheapest gaseous fuel.
- Biogas plants provide twin benefits to the farmer in the form of energy and improved quality of manure.

41. Explain three factors that make mineral extractions commercially viable. [CBSE 2011]

Ans :

- The minerals content of the ore must be in sufficient concentration.
- The type of formation or structure in which they are found determines the relative cases with which mineral ores may be mined.
- The mineral should be close to the market so that the transportation cost is low.

42. What are the uses of copper? Name the two leading copper producing states of India. [CBSE 2011]

Ans :

Uses of copper:

- In manufacturing electrical cables.
- In electronic industries.
- In chemical industries.

The two leading copper producing states of India are Madhya Pradesh and Rajasthan.

43. What are 'placer deposits'? Give examples of minerals found in such deposits. [CBSE 2010]

Ans :

- Certain minerals may occur as alluvial deposits in sands of valley floors and base of hills. These deposits are called 'placer deposits'.
- They generally contain minerals which are not corroded by water.
- Gold, silver, tin and platinum are examples of some important minerals found in 'placer deposits'.

Two MARKS QUESTIONS

44. Explain the importance of conservation of minerals. Highlight any three measures to conserve them.

[Foreign 2016]

or

Why is conservation of mineral resources essential? Explain any three methods to conserve them.

[CBSE 2015, 2014]

Ans :

Reasons for Conservation:

- The strong dependence of industry and agriculture upon minerals.
- The process of mineral formation is slow.
- They are non-renewable.

Methods to conserve:

- Minerals should be used in a planned and sustainable manner.
- Improved technology needs to be constantly evolved to allow use of low grade ore at low cost.
- Recycling of metals using scrap metals.
- Wastage in the mining and processing should be

minimised.

45. Highlight the importance of petroleum. Explain the occurrence of petroleum in India. [CBSE 2016]

Ans :

Importance of Petroleum:

- Petroleum is the major energy source in India.
- Provides fuel for heat and lighting.
- Provides lubricant for machinery.
- Provides raw material for a number of manufacturing industries.
- Petroleum refineries act as nodal industry for synthetic textile, fertilizer and chemical industries.

Its occurrence:

- Most of the petroleum occurrences in India are associated with anticlines and fault traps.
- In regions of folding, anticline or domes, it occurs where oil is trapped in the crest of the upfold.
- Petroleum is also found in fault traps between porous and non-porous rocks.

46. "Which minerals are used to obtain nuclear energy ? Name all the six nuclear power stations of India.

Ans :

[CBSE 2016]

The minerals which are used to obtain this energy are:

(i) Uranium and (ii) Thorium.

The six nuclear power stations of India are

- Narora nuclear power station
- Kakrapara nuclear power station.
- Tarapur nuclear power station.
- Kaiga nuclear power station.
- Kalpakkam nuclear power station.
- Rawat Bhata nuclear power station.

47. "Conservation of minerals is the need of the hour". Support the statement with five facts.

Ans :

[CBSE 2016, 2015]

Conservation of minerals is the need of the hour:

- Minerals are considered to be the backbone of the economy.
- Industry and agriculture depend on mineral deposits.
- The substances manufactured from them also depend on mineral deposits.
- Total volume of workable mineral deposits is very less-only 1% of the earth's crust.
- Mineral resources are being consumed rapidly, and minerals require millions of years to be created and concentrated.
- The geological processes of mineral ; formation are so slow that the rates of replenishment are infinitely small in comparison to the present rates of consumption.
- Minerals resources are finite and non-renewable.
- The rich mineral deposits of our country are extremely valuable but short-lived possessions.

48. There is an urgent need to develop a sustainable path of energy development. Give two broad measures for it. As concerned citizens, how can you help to conserve energy?

Ans :

[CBSE 2016]

Twin planks/measures:

- Promotion of energy conservation.

(ii) Increased use of renewable energy sources. As concerned citizens we can do our bit by:

- (i) Using public transport systems instead of individual vehicles.
- (ii) Switching off electricity when not in use.
- (iii) Using power-saving devices.
- (iv) Using non-conventional sources of energy.

49. "There is a pressing need to use renewable energy resources." Justify the statement with suitable arguments.

Ans : [Foreign 2016]

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 the national economy.
- (iv) Increasing use of fossil fuels also causes serious environmental problems.
- (v) Hence, there is a pressing need to use renewable energy sources like solar energy, wind, tidal, biomass and energy from waste material.

50. Which is the most abundantly available fossil fuel in India? Assess the importance of its different forms.

Ans : [CBSE 2015]

Abundantly available fossil fuel in India is coal. Importance of its different forms are:

- a. Peat has low carbon and high moisture content and low heating capacity
- b. Lignite is a low grade brown coal which is soft with high moisture content. It is used for generating electricity.
- c. Bituminous is the most popular coal of commercial use. It has a special value for smelting iron in blast furnaces.
- d. Anthracite is the highest quality hard coal.

51. Why is energy needed? How can we conserve energy resources? Explain. [CBSE 2015]

Ans :

Energy is required for all activities. It is needed to cook, to provide light and heat, to propel vehicles and to drive machinery in industries.

To conserve energy resources:

1. Need to develop a sustainable path of energy development, i.e., energy development but not at the cost of environment or needs of future generation.
2. Judicious use of limited energy resources.
3. Wastage of minerals should be minimised.
4. Modern technology should be used for the exploitation of energy resources.
5. Export of energy resources should be minimised.
6. Use of substitutes in order to save energy resources.
7. Encourage recycling of energy resources.

52. "How can solar energy solve the energy problem to some extent in India? Give your opinion. [CBSE 2015]

or

Why is solar energy fast becoming popular in rural

and remote areas of India? Explain. [CBSE 2014]

Ans :

- a. India is a tropical country therefore it receives sunlight in abundance throughout the year.
- b. Solar plant can be easily established in rural and remote areas.
- c. It will minimise the dependence of rural households on firewood and dung cakes which in turn will contribute to environmental conservation and adequate quantity of manure.

53. How can biogas solve the energy problem mainly in rural India? Give your suggestions. [Foreign 2015]

Ans :

Biogas to solve energy problem:

1. Availability of raw material.
2. Awareness to be created about biogas.
3. It will reduce the burden on conventional sources of energy.
4. Educate the rural people about the use of biogas.
5. It is a renewable source of energy.
6. Eco-friendly.
7. Model structures to be introduced by the government agencies at a subsidised rate.

54. "Minerals are indispensable part of our lives". Support the statement with example.

Ans :

Minerals are an indispensable part of our lives:

- a. Almost everything we use, from a tiny pin to a towering building or a big ship, all are made from minerals.
- b. The railway lines and the tarmac (paving) of the roads, our implements and machinery too are made from minerals.
- c. Cars, buses, trains, aeroplanes are manufactured from minerals and run on power resources derived from the earth.
- d. Even the food that we eat contains minerals.
- e. In all stages of development, human beings have used minerals for their livelihood, decoration, festivities, religious and ceremonial rites.

55. Explain any three values which inspire us to conserve our energy resources. [CBSE 2014]

Ans :

Values:

- a. Our responsible behaviour will lead us to conserve energy resources.
- b. Our sustainable thinking which inspires us to preserve and protect the resources for the future generation.
- c. Our consciousness towards our environment will inspire not to over-utilize the resources and exploit them.

56. What efforts are required to use mineral resources in a planned and sustainable manner? Explain in three points.

Ans :

[CBSE 2012]

Following efforts have to be made to use mineral in a planned and sustainable manner:

- a. Recycling of metals: We should recycle the metal or metal-made products to prevent its scarcity.

For example: Used steel blade should be sent for recycling, so that the steel can be used again for other purposes.

- b. Improved technologies need to be evolved: Traditional technologies should be replaced with new and improved technologies, so that the wastages can be minimised.
- c. Use of substitute or alternative resources: The resources which cannot be recycled or reused should be replaced with the recyclable resources, e.g. Use of green gas instead of coal for cooking purpose.

57. India is presently one of the least energy efficient countries in the world. We have to adopt cautious approaches for the judicious use of our limited energy resources.” Analyse this statement. [CBSE 2012]

or

Explain any three steps to be taken to conserve the energy resources. [CBSE 2012]

or

How can we save our limited energy sources? Suggest any three ways for its judicious use. [CBSE 2012]

Ans :

The statement is right to a great extent. Therefore, we need to adopt a cautious approach for the judicious use of energy resources.

1. Need to develop a sustainable path of energy development, i.e., energy development but not at the cost of environment or needs of future generation.
2. Judicious use of limited energy resources,
3. Wastage of minerals should be minimised,
4. Modern technology should be used for the exploitation of energy resources.
5. Export of energy resources should be minimised.
6. Use of substitutes in order to save energy resources.
7. Encourage recycling of energy resources.

58. 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.

[CBSE 2011,2016]

or

In the present day energy crisis, which step will you take for saving energy? [CBSE 2015]

Ans :

The following steps can be taken for saving energy:

1. Judicious use of energy resources.
2. Use of public transport/ car pool.
3. To use bicycle for short distances.
4. Switching off electrical gadgets when not in use.
5. Regular cleaning of gas burners and switching off the gas regulator when not in use.
6. Avoid using refrigerator/ A. C. when not needed.
7. Creating awareness in neighbourhood with catchy slogans.
8. As India has been blessed with abundance of sunlight, water, wind and biomass, we must use these to overcome present day energy crisis. (Any three)