CHAPTER-V

MINERALS AND ENERGY RESOURCES

2 MARK QUESTIONS

1 What is a mineral?

ANSWER:

A mineral can be defined as a homogenous, naturally occurring substance with a definable internal structure. Minerals are found in varied forms in nature, ranging from the hardest diamond to the softest talc.

2. How are minerals formed in igneous and metamorphic rocks?

ANSWER:

In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints. The smaller deposits are called veins and the larger ones are called lodes. When the minerals in liquid/ molten and gaseous forms are forced upward through cavities towards the earth's surface, they cool down and solidify to form veins or lodes. Metallic minerals like tin, copper, zinc and lead are obtained from veins and lodes.

3. Why do we need to conserve mineral resources?

ANSWER:

We need to conserve mineral resources as they are limited on the earth. It takes billions of years for them to be replenished in nature. Continued extraction of ores leads to increasing costs of extraction and a decrease in quality as well as quantity. It takes millions of years for the formation of minerals. Thus, as compared to the current rate of consumption, the rate of replenishment of minerals is very slow.

4. What are placer deposits? Give examples of minerals found in such deposits.

ANSWER:

Certain minerals may occur as alluvial deposits in the sands of valley floors and the base of hills. These deposits are called placer deposits. Gold, silver, tin, and platinum are found in such deposits.

5. Describe any three characteristics of the Orissa Jharkhand belt of iron ore in India.

ANSWER:

Three characteristics of the Orissa Jharkhand belt of iron ore in India are:

- In Orissa, high-grade hematite ore is found
- It is found in Badampahar mines in the Mayurbhanj and Kendujhar districts.
- In the adjoining Singhbhum district of Jharkhand, hematite ore is mined in Gua and Noamundi.

6. Mention any four uses of manganese ore.

ANSWER:

Uses of Manganese ore are:

- It is used in the manufacturing of steel and ferromanganese alloys.
- To manufacture bleaching powder.
- To manufacture insecticides.
- To manufacture paints.

4 MARK QUESTIONS

1. Describe the distribution of coal in India

ANSWER:

In India, major coal deposits are found on the eastern side of the country. Some of the main sites of coal are described below:

- In India, coal occurs in rock series of two main geological ages Gondwana (200 million years old) and tertiary (55 million years old).
- The major resources of Gondwana or metallurgical coal are located in the Damodar valley (West Bengal, Jharkhand), Jharia, Raniganj and Bokaro.
- The Godavari, Mahandi, Son and Wardha valleys also contain coal deposits.
- Tertiary coals occur in the north-eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

2.Why do you think that solar energy has a bright future in India?

ANSWER:

Solar energy is a renewable source of energy produced from the sunlight. It has a bright future in India due to the following reasons:

- India is a tropical country due to which it receives abundance of sunlight throughout the year.
- Solar plants can be easily established in rural and remote areas of the country.
- It will reduce the dependence of rural households on firewood and dung cakes which will ultimately reduce the pollutions and help to conserve the environment.

3.Analyze the impact of mining activities on the local environment and the health of the surrounding communities.

ANSWER:

Problems for miners:

- The miners have to work under tough conditions where no natural light is available.
- There is always a risk of collapse of the mine roof, inundation with water, and fire.
- Miners are at great risk of getting afflicted with pulmonary disorders.

Environmental Damage:

- The water sources in the region get contaminated due to mining.
- Dumping of waste and slurry leads to the degradation of land, and soil, and an increase in stream and river pollution.

4. Why is mica considered the most important mineral in electrical and electronic industries?

ANSWER:

Mica is considered the most important mineral in electrical and electronic industries because:

- Excellent dielectric strength
- Low power loss factor
- Insulating properties
- Resistance to high voltage.

5. How can solar energy solve the energy problem to some extent in India?

ANSWER:

Solar energy can solve the energy problems to some extent in India:

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

6. Name the most abundantly available fossil fuel in India. Evaluate the importance of its different forms.

ANSWER:

The most abundantly available fossil fuel in India is coal.

Forms of Coal:

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

7 MARK QUESTIONS

1. How is bauxite formed? Give its uses. Discuss its distribution in India.

ANSWER:

Formation: Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates.

Uses:

- Bauxite is a clay-like substance from which alumina and later aluminium are obtained.
- Aluminium is an important metal because it combines the strength of metals such as iron with extreme lightness and also with good conductivity and great malleability.

Distribution:

- Bauxite is found in the Amarkantak Plateau, Maikal Hills, and the plateau region of Bilaspur-Katni.
- Odisha is the largest bauxite-producing state in India.

2.Why should we conserve minerals? Suggest three ways to conserve minerals.

ANSWER:

We need to conserve minerals because:

- The strong dependence of industry and agriculture upon mineral deposits and the substances manufactured from them.
- The geological processes of mineral formation are very slow.
- Mineral resources are finite and non-renewable.
- Continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths along with a decrease in quality.

Ways to conserve minerals:

- A concerted effort has to be made in order to use mineral resources in a planned and sustainable manner.

- Improved technologies need to be constantly evolved to allow the use of low-grade ores at low costs.
- Recycling of metals, using scrap metals and other substitutes.

3. Which minerals are used to obtain nuclear energy? How is nuclear energy obtained? Mention the names of all six nuclear power stations in India.

ANSWER:

Uranium and Thorium are used to obtain nuclear energy.
Nuclear energy is obtained by altering the structure of atoms. When such an alteration is made, much energy is released in the form of heat and this is used to generate electric power.

Six nuclear power stations are:

- Naraura Power Plant in Uttar Pradesh
- Rawat Bhata Power Plant in Rajasthan
- Kakrapara Power Plant in Gujarat
- Tarapur Power Plant in Maharashtra
- Kaiga Power Plant in Karnataka
- Kalpakkam Power Plant in Tamil Nadu

4.Define geothermal energy. Also mention two projects which have been set in India to harness geothermal energy.

ANSWER:

Geothermal energy refers to the heat and electricity produced by using the heat from the interior of the Earth. Geothermal energy exists because the Earth grows progressively hotter with increasing depth.
Two experimental projects have been set up in India to harness geothermal energy:

- One is located in the Parvati valley near Manikarn in Himachal Pradesh.

- The other is located in the Puga Valley, Ladakh.

5.Non-conventional resources are the best option to conserve the natural resources" Substantiate this statement with Examples.

ANSWER:

There is a pressing need to use non-conventional sources of energy in India:

- Because of the growing consumption of energy, the country is becoming increasingly dependent on fossil fuels.
- Rising prices of oil and gas and their potential shortages have raised uncertainties about the security of the energy supply in the future.
- These can have serious repercussions on the growth of the national economy.
- Increasing the use of fossil fuels also causes environmental problems.

6. Highlight the importance of petroleum. Explain the occurrence of petroleum in India.

ANSWER:

Importance of petroleum:

- It provides fuel for heat and lighting
- It provides lubricants for machinery
- It provides raw materials for a number of manufacturing industries.
- Petroleum refineries act as a 'nodal industry' for synthetic textile, fertilizer, and numerous chemical industries.

Occurrence of petroleum:

- Most of the petroleum occurrences in India are associated with anticlines and fault traps in the rock formations of the tertiary age.
- 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.

7.Which are the potential sources of biogas? State any four benefits of biogas.

ANSWER:

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

Benefits of biogas:

- High thermal efficiency in comparison to kerosene, dung cake, and charcoal.
- It burns without smoke, causing no pollution.
- It is the most efficient use of cattle dung.
- It improves the quality of manure and also prevents the loss of trees and manure due to the burning of fuel wood and cow dung cakes.

8. Explain the need to adopt a cautious approach for the judicious use of our limited energy resources.

ANSWER:

The need to adopt a cautious approach for the judicious use of our limited energy resources:

- Energy is a basic requirement for economic development. Every sector of the national economy like agriculture, industry, transport, commercial, and domestic needs inputs of energy.
- India is presently one of the least energy-efficient countries in the world. There is an urgent need to develop a sustainable path of energy development.
- Various development plans require increasing amounts of energy to remain operational. The success of economic development plans depends on energy resources.

MULTIPLE CHOICE QUESTIONS

1) Gold, silver and platinum are examples of _____.

a) Ferrous minerals

b) Non-ferrous minerals

c) Precious minerals

d) Non-metallic minerals

Answer: Option (c)

2) Cobalt is an example of ____.

a) Ferrous minerals

b) Non-ferrous minerals

c) Energy minerals

d) Non-metallic minerals

Answer: Option (a)

3) Sandstone and mica are examples of _____.

a) Non-metallic minerals

b) Energy minerals

c) Non-ferrous minerals

d) Ferrous minerals

Answer: Option (a)

4) Coal and natural gas are examples of _____ minerals.

a) Non-metallic

b) Energy

c) Ferrous

d) Non-ferrous

Answer: Option (b)

5) _____ provides a strong base for the development of metallurgical industries.

a) Ferrous minerals

b) Non-ferrous minerals

c) Energy minerals

d) Precious minerals

Answer: Option (a)

6) Coal mining in Jowai and Cherapunjee is done by family members in the form of a long narrow tunnel, known as _____ mining.

a) Rathole

b) Opencast mining

c) Underground mining

d) None of the above

Answer: Option (a)

7) Sedimentary rocks on the western and eastern flanks of the peninsula, in Gujarat and _____ have most of the petroleum deposits.

a) Madhya Pradesh

b) Telangana

c) Assam

d) Maharashtra

Answer: Option (c)

8) Magnetite is the finest iron ore with a very high content of iron up to _____.

a) 70 per cent

b) 50 per cent

c) 40 per cent

d) 30 per cent

Answer: Option (a)

FILL IN THE BLANKS

1.Durg-Bastar-Chandrapur belt lies in **Chhattisgarh** and **Maharashtra**

2. Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt in Karnataka has large reserves of **Iron ore.**

3.**Odisha** is the largest producer of manganese ores in India.

4. In which of the following locations are mica deposits not found **Katni**

5.Koraput has rich deposits of **Bauxite**

SUMMARY

They are of two types: Conventional Sources of energy are those which are traditionally used, such as coal, petroleum, etc. Non-Conventional Sources of energy are those which are not traditional but considered modern sources of energy such as solar energy, tidal energy, wind energy, etc.