Mineral Resources

Syllabus

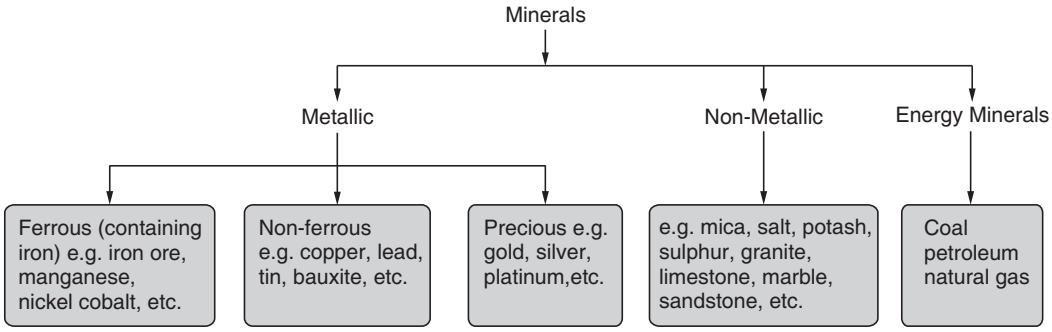
Mineral Resources. Types of minerals, distribution, use and economic importance of minerals, conservation.

Facts that Matter

1. The earth's crust is made up of different minerals found in the rocks and they are extracted by proper refinement. Minerals are an essential part of our lives. The hardest mineral is diamond and the softest is talc. **Minerals** can be defined as a homogenous, naturally occurring substance with a definable internal structure.
2. Minerals are usually found in "ores". **Ore** means an accumulation of any mineral mixed with other elements. Minerals are classified on the basis of a wide range of colours, hardness, crystal forms, lustre and density that a particular mineral possesses.
3. **Rocks** are combinations of homogenous substances called minerals. Some rocks, for instance, limestone, consist of a single mineral only, but majority of the rocks consist of several minerals in varying proportions.
4. Classification of minerals—metallic, non-metallic and energy minerals. Metallic minerals are of three types—Ferrous (containing iron), Non-ferrous (copper, lead, etc.) and precious (gold, silver, etc.). Examples of non-minerals are—mica, salt, potash, etc. Energy minerals are coal, petroleum and natural gas.
5. Minerals occur in the veins and the lodes in **igneous and metamorphic rocks.** For instance, tin, copper, zinc and lead etc. are obtained from these veins and lodes. They also occur in layers in **sedimentary rocks.** Coal and some forms of iron ore are found in it. Minerals such as gypsum, potash, salt and sodium salt are formed with the help of evaporation especially in dry regions. Bauxite is found in the **decomposed surface rocks.**
6. Minerals which do not erode by water are found in **Alluvial deposits.** For example, gold, silver, tin and platinum.
7. The ocean waters contain vast quantities of minerals. Common salt, magnesium and bromine are largely derived from ocean waters. The ocean belts, too, are rich in manganese nodules.
8. India is fortunate to have fairly rich and varied mineral resources. Peninsular rocks contains most of the reserves of coal, metallic minerals, mica and many other non-metallic minerals. In the sedimentary rocks of Gujarat and Assam most of the petroleum deposits are found. Rajasthan with the rock systems of the peninsula, has reserves of many non-ferrous minerals.

9. Ferrous minerals account for about three-fourths of the total value of the production of metallic minerals. Iron ore, manganese, nichel and cobalt are important ferrous minerals.
10. **Iron ore** is the basic mineral and the backbone of industrial development. Iron ores are of two types—Magnetite and Hematite. Magnetite is the finest iron ore with a high content of iron upto 70%. Hematite ore has a slightly lower iron content than magnetite (50–60%). Iron ore is found in states like Karnataka, Odisha, Chhattisgarh, Goa and Jharkhand.
11. The four major iron ore belts are—**Odisha-Jharkhand belt, Durg-Bastar-Chandrapur belt, Bellary-Chitradurga-Chikmaglur-Tumkur belt** and **Maharashtra-Goa belt.**
12. **Manganese** is mainly used in the manufacturing of steel and ferro-manganese alloy. Nearly 10 kg of manganese is required to manufacture one tonne of steel. It is also used in manufacturing bleaching powder, insecticides and paints.
13. India's reserves and production of **non-ferrous** minerals is not very satisfactory.
14. Being malleable, ductile and a good conductor, **copper** is mainly used in electrical cables, electronics and chemical industries. India is critically deficient in the reserve and production of copper. Copper producing states are Madhya Pradesh, Jharkhand and Rajasthan.
15. **Bauxite** deposits are formed by decomposition of rocks rich in aluminium silicates. It is a clay-like substance from which aluminium is 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. It is used in electrical industries, aircraft manufacturing industries, utensil making, etc. Orissa is the largest bauxite producing state in India.
16. **Non-Metallic Minerals** do not contain metals or do not have metallic properties. For example, mica, limestone, salt, potash, sulphur, granite, marble, sandstone, etc.
17. **Mica** can be clear, black, green, red, yellow or brown. Due to its excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage, it is one of the most essential minerals used in electric and electronic industries. Koderma-Gaya—Hazaribagh belt of Jharkhand is the leading producer of Mica. In Rajasthan, the major mica producing area is around Ajmer. Nellore mica belt of Andhra Pradesh is also an important producer in the country.
18. **Limestone** (rock mineral) is the basic raw material for the cement industry and essential for smelting iron ore in the blast furnace. It is found in sedimentary rocks of most geological formations. Major limestone-producing states are Andhra Pradesh, Madhya Pradesh, Rajasthan, Gujarat and Tamil Nadu.
19. Minerals are important for every country for its development. Industry and agriculture depend upon minerals and the substances manufactured from them. They are already in short supply. (Just one per cent of the earth's crust).
20. We are rapidly consuming mineral resources that require millions of years to be created and concentrated. Mineral resources are finite and non-renewable and therefore they must be conserved. Recycling of metals, using scrap metals and other substitutes are steps towards mineral conservation.

Flow-Learning



Words that Matter

1. **Mineral:** A homogenous, naturally occurring substance with a definable internal structure.
2. **Ore:** An accumulation of any mineral mixed with other elements.
3. **Rocks:** Combinations of homogenous substances called minerals.
4. **Mineral Ore:** Metals in their raw state as extracted from the earth.
5. **Non-metallic minerals:** Minerals that do not contain metals or do not have metallic properties.
6. **Rat hole mining:** Coal mining done by family members in the form of long narrow tunnel is known as rat hole mining.

NCERT TEXTBOOK QUESTIONS SOLVED

Q1. Multiple choice questions:

(*i*) Which one of the following minerals is formed by decomposition of rocks, leaving a residual mass of weathered materials?

(*a*) Coal (*b*) Bauxite
(*c*) Gold (*d*) Zinc

(*ii*) Koderma in Jharkhand is the leading producer of which one of the following minerals?

(*a*) Bauxite (*b*) Mica
(*c*) Iron ore (*d*) Copper

(*iii*) Minerals are deposited and accumulated in the strata of which of the following rocks?

(*a*) Sedimentary rocks (*b*) Metamorphic rocks
(*c*) Igneous rocks (*d*) None of the above

(*iv*) Which one of the following minerals is contained in the Monazite sand?

(*a*) Oil (*b*) Uranium
(*c*) Thorium (*d*) Coal

Ans. (*i*)—(*a*), (*ii*)—(*b*), (*iii*)—(*a*), (*iv*)—(*c*).

Q2. Answer the following questions in about 30 words:

(*i*) Distinguish between ferrous and non-ferrous minerals

(*ii*) What is a mineral?

(*iii*) How are minerals formed in igneous and metamorphic rocks?

(*iv*) Why do we need to conserve mineral resources?

Ans. (*i*) **Ferrous and non-ferrous minerals**

Ferrous minerals	Non-ferrous minerals
• Minerals containing iron are called ferrous minerals. • Example; iron ore and manganese. •	• Minerals which do not contain iron are called non-ferrous minerals. • Example; bauxite, lead and gold. •

(*ii*) Mineral is a homogenous, naturally occurring substance with a definable internal structure. They are formed by a combination of elements. They are an essential part of our lives. The hardest mineral is diamond and the softest is talc. Minerals are usually found in "ores".

(*iii*) In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints. The smaller occurrences are known as veins and the larger are known as lodes. In most cases, they are formed when minerals in liquid/molten and gaseous forms are forced upwards through cavities towards the earth's surface. They cool and solidify as they rise.

(*iv*) We need to conserve mineral resources because they are finite and non-renewable. Rich mineral deposits are our country's most valuable but short-lived possessions. Continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths along with decrease in quality.

Activity

Fill the name of the correct mineral in the crossword below:

DOWN

1. Found in placer deposit (4)
2. Iron ore mined in Bailadila (8)
3. Indispensable for electrical industry (4)
4. Geological Age of coal found in north east India (8)
5. Formed in veins and lodes (3)

ACROSS

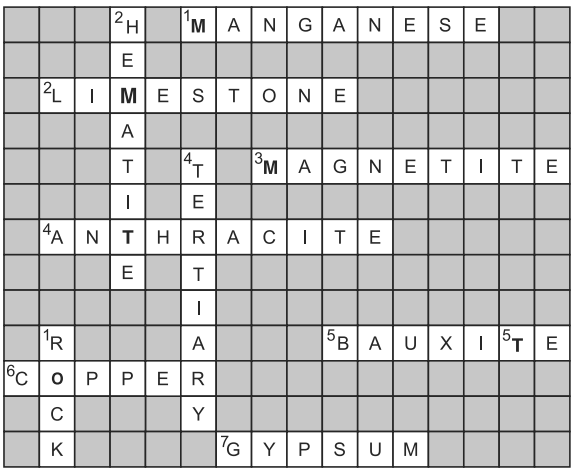
1. A ferrous mineral (9)
2. Raw material for cement industry (9)
3. Finest iron ore with magnetic properties (9)
4. Highest quality hard coal (10)
5. Aluminium is obtained from this ore (7)
6. Khetri mines are famous for this mineral (6)
7. Formed due to evaporation (6)

Ans. **DOWN**

1. ROCK
2. HEMATITE
3. COAL
4. TERTIARY
5. TIN

ACROSS

1. MANGANESE
2. LIMESTONE
3. MAGNETITE
4. ANTHRACITE
5. BAUXITE
6. COPPER
7. GYPSUM



MORE QUESTIONS SOLVED

I. MULTIPLE CHOICE QUESTIONS

Choose the correct answer:

1. Where are minerals usually found? (CBSE 2011)
(*a*) Rocks (*b*) Earth crust
(*c*) Ores (*d*) Earth core

2. When mining is done by family members in the form of a long narrow tunnel it is known as .....
(*a*) Narrow tunnel mining (*b*) Rat hole mining
(*c*) Snake mining (*d*) Killer mining

3. Minerals occur in igneous and metamorphic rocks in ..... .
(*a*) the veins and the lodes (*b*) layers
(*c*) alluvial deposits (*d*) the decomposed surface rocks

4. Ferrous minerals account for about ..... of the total value of the production of metallic minerals.
(*a*) one-fourth (*b*) three-fourths
(*c*) one-fifth (*d*) one-third

5. Which is the basic mineral and the backbone of industrial development?
(*a*) Coal (*b*) Bauxite
(*c*) Copper (*d*) Iron ore

6. Which metal has a very high content of iron up to 70 per cent?
(*a*) Magnetite ore (*b*) Hematite iron
(*c*) Hematite ore (*d*) Iron ore

7. Which is the largest producer of manganese ores in India?
(*a*) Kudremukh (*b*) Bailadila
(*c*) Odisha (*d*) Jharkhand

8. ..... is the basic raw material for the cement industry and essential for smelting iron ore in the blast furnace.
(*a*) Gypsum (*b*) Limestone
(*c*) Potash salt (*d*) Sodium salt

9. Which one of the following is the hardest mineral?
(*a*) Gold (*b*) Diamond
(*c*) Ruby (*d*) Silver

10. Which one of the following is the softest mineral?
(*a*) Talc (*b*) Toothpaste
(*c*) Salt (*d*) Cement

11. Which one is not a ferrous mineral?
(*a*) Iron ore (*b*) Manganese
(*c*) Copper (*d*) Hematite

12. Bellary-Chitradurga-Chikmaglur-Tumkur belt is located in ..... .
(*a*) Madhya Pradesh (*b*) Karnataka
(*c*) Andhra Pradesh (*d*) Tamil Nadu

13. Which one of the following is not a property of copper?
(*a*) It is malleable. (*b*) It is ductile.
(*c*) It is good conductor. (*d*) It is hard.

14 The largest bauxite-producing state in India is ..... .
(*a*) Orissa (*b*) Madhya Pradesh
(*c*) Maharashtra (*d*) Jharkhand

15. The mineral ore from which aluminium is mainly obtained ..... .
(*a*) copper (*b*) bauxite
(*c*) iron ore (*d*) none of the above

16. The Khetri mines in Rajasthan are famous for which of the following minerals?
(*a*) Bauxite (*b*) Aluminium
(*c*) Mica (*d*) Copper

17. Name the finest iron ore.
(*a*) Hematite (*b*) Magnetite
(*c*) Manazite (*d*) Lignite

18. In which state does Nellore mica belt lie?
(*a*) Tamil Nadu (*b*) Andhra Pradesh
(*c*) Rajasthan (*d*) Karnataka

19. Which of the following minerals are obtained from veins and lodes?
(*i*) Zinc (*ii*) Copper (*iii*) Coal (*iv*) Bauxite
(CBSE 2011)
(*a*) Only (*i*) and (*ii*) (*b*) Only (*ii*) and (*iii*)
(*c*) Only (*iii*) and (*iv*) (*d*) All of the above

20. Which of the following is a famous metal?
(*a*) Manganese (*b*) Bauxite
(*c*) Gold (*d*) Mica

Ans. 1—(*c*) 2—(*b*) 3—(*a*) 4—(*b*) 5—(*d*) 6—(*a*)
7—(*c*) 8—(*b*) 9—(*b*) 10—(*a*) 11—(*c*) 12—(*b*)
13—(*d*) 14—(*a*) 15—(*b*) 16—(*d*) 17—(*b*) 18—(*b*)
19—(*a*) 20—(*a*)

II. VERY SHORT ANSWER TYPE QUESTIONS

Q1. Which rock consists of single mineral only? (CBSE 2015)

Ans. Limestone consists of a single mineral only.

Q2. Which state is the largest producer of manganese ores in India? What was its total productions in the state in 2000-01?

Ans. Odisha is the largest producer of manganese ores in India. It accounted for one-third of the country's total production in 2000-01.

Q3. How are minerals indispensable part of our lines?

Ans. Almost everything we use, from a tiny pin to a towering building or a big shop, all are made from minerals. Life processes cannot occur without minerals.

Q4. How do geologists define minerals?

Ans. Geologists define minerals as a homogenous, naturally occurring substance with a definable internal structure.

Q5. Name one hardest mineral and one softest mineral.

Ans. Hardest mineral – diamond

Softest mineral – tale

Q6. Why is copper mainly used in electrical cables, electronics and chemical industries?

Ans. Copper is malleable, ductile and a good conductor of electricity. Therefore, it is mainly used in electrical cables, electronics and chemical industries.

Q7. Define the term 'Ore'.

Ans. The term 'Ore' is used to describe an accumulation of any mineral mixed with other elements.

Q8. What is an important condition to make the extraction of minerals commercially viable?

Ans. The mineral context of the ore must be in sufficient concentration.

Q9. What are veins and lodes?

Ans. 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 cabled lodes.

Q10. Name the major metallic minerals which are obtained from veins and lodes.

Ans. Tin, copper, zinc and lead.

Q11. Where do minerals occur in sedimentary rocks?

Ans. In sedimentary rocks minerals occur in beds or layers.

Q12. Which minerals are largely derived from ocean waters?

Ans. Common salt, magnesium and bromine are some minerals largely derived from ocean waters.

Q13. How are ferrous minerals important?

Ans. They are important because they provide a strong base for the development of metallurgical industries.

Q14. Mention the context of iron present in magnetite.

Ans. A very high context of iron, upto 70 percent, is present in magnetite.

Q15. What are placer deposits?

Ans. There are some minerals which occur as alluvial deposits in sands of valley floors and the base of hills. These deposits are called placer deposits.

Q16. Name any four minerals which obtained form placer deposits.

Ans. Gold, silver, tin and platinum.

Q17. Where are the Kudermukh mines located?

Ans. They are located in the western Ghats of Karnataka.

Q18. Where is high grade hematite ore found in Orissa?

Ans. In Orissa high grade hematite ore is found in badampahar mines in the Mayurbhanj and Kendujhar districts.

Q19. What is the main use of manganese?

Ans. Manganese is mainly used in the manufacturing of steel and ferro-manganese alloy.

Q20. What are ferrous minerals? Give two examples.

Ans. The minerals which contain iron ore are called ferrous minerals.

Two examples — manganese, nickel.

Q21. What are non-ferrous minerals? Give two examples.

Ans. The minerals which do not contain iron ore are called non-ferrous minerals.

Q22. What are the Khetri mines in Rajasthan famous for?

Ans. The Khetri mines in Rajasthan are famous for copper production.

Q23. How are bauxite deposits formed?

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

Q24. How is aluminium an important metal?

Ans. Aluminium combines the strength of metals such as iron, with extreme lightness and also with good conductivity and great malleability.

Q25. Name the regions where India's bauxite deposits are mainly found.

Ans. The Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katur.

Q26. Name the regions where India's mica deposits are mainly found.

Ans. The northern edge of the Chhota Nagpur plateau.

Q27. What are a constant threat to miners?

Ans. The risk of collapsing mine roofs, inundation and fires in coalmines are a constant threat to miners.

Q28. 'Different regions of India contain different minerals'. What is the reason behind it?

Ans. It happens because of the difference in the geological structure, processes and time involved.

Q29. Name the two countries which import iron ore from India.

Ans. Japan and South Korea.

III. SHORT ANSWER TYPE QUESTIONS

Q1. What are non-metallic minerals? Write a short note on uses of mica and its distribution in India.

Ans. Minerals which do not contain metals or do not have metallic properties are called non-metallic minerals. For example, mica, limestone, salt, potash, sulphur, granite, marble, sandstone, etc.

Uses of Mica: Mica is considered to be the most important mineral in electric and electronic industries. Due to its excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage, it is one of the most essential minerals used in electric and electronic industries.

Distribution of Mica in India: Koderma Gaya–Hazaribagh belt of Jharkhand is the leading producer of Mica. Mica deposits are found in the northern edge of the Chhota Nagpur plateau. In Rajasthan, the major mica producing area is around Ajmer. Nellore mica belt of Andhra Pradesh is also an important producer in the country.

Q2. Describe any two facts regarding the importance of manganese in our daily life. Also name the four states which are known for its production.

Ans. Manganese is mainly used in the manufacturing of steel and ferro-manganese alloy. Nearly 10 kg of manganese is required to manufacture one tonne of steel.

It is also used in manufacturing bleaching powder, insecticides and paints.

Orissa is the largest producer of manganese ores in India. It accounted for one-third of the country's total production in 2000-01. Other manganese-producing states are Madhya Pradesh and Karnataka.

Q3. State two main uses of copper. Also, mention three major copper-producing districts of India.

Ans. Being malleable, ductile and a good conductor, copper is mainly used in electrical cables, electronics and chemical industries.

India is critically deficient in the reserve and production of copper.

Three major copper producing regions of India:

(*i*) Madhya Pradesh is the largest producer of copper in India. The Balaghat mines in Madhya Pradesh produces 52 per cent of India's copper.

(*ii*) Rajasthan is the second largest producer of copper. The Khetri mines in Rajasthan are famous.

(*iii*) The Singhbhum district of Jharkhand has also large reserves of copper.

Q4. How is the mining activity injurious to the health of the miners and environment? Explain. (CBSE 2015)

Or

How does mining adversely affect the health and the environment?

Ans. Mining activity is often called a "killer industry" due to high risks involved. The dust and poisonous fumes inhaled by the miners expose them to pulmonary diseases.The risk of collapsing mine roofs, inundation and fires in coalmines 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 river pollution.

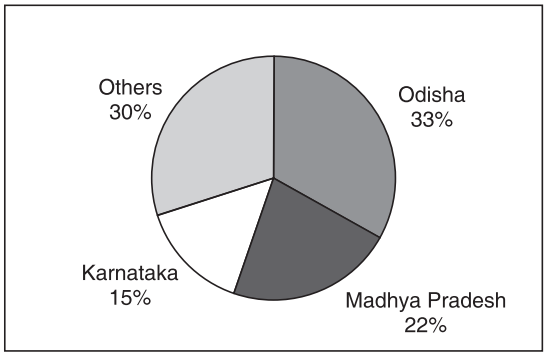
Q5. State uses of limestone. Also mention the states where it is produced.

Ans. Limestone is the basic raw material for the cement industry and essential for smelting iron ore in the blast furnace.

It is found in association with rocks composed of calcium carbonates or calcium and magnesium carbonates. It is found in sedimentary rocks of most geological formations.

It is produced in states like Andhra Pradesh, Madhya Pradesh, Rajasthan, Gujarat and Tamil Nadu.

Q6. The pie chart given below shows the production of manganese in different states. On the basis of reading of diagram answer the following questions:



1. Mention any two uses of Manganese.
2. Which is the largest producer of Manganese?

Ans. 1. Uses of Manganese:

(*i*) Manganese is mainly used in the manufacturing of steel and ferro-manganese alloy. Nearly 10 kg of manganese is required to manufacture one tonne of steel.

(*ii*) It is also used in manufacturing bleaching powder, insecticides and paints.

2. Odisha is the largest producer of manganese ores in India approximately one-third of the country's total production.

Q7. Mention any three major iron-ore belts of India. Write any three characteristics of the southernmost iron-ore belt.

Ans. Three major iron-ore belts of India are:

(*i*) Odisha – Jharkhand belt

(*ii*) Durg – bastar – Chandrapur belt in Chhattisgarh and Maharashtra.

(*iii*) Bellary – Chitradurga – Chikmaglur – Tumkur belt in Karnataka.

Three characteristics of the southernmost iron-ore belt:

(*i*) The ore is transported as slurry through a pipeline to a port near Mangalore.

(*ii*) The ores are not of very high quality, yet they are efficiently exploited.

(*iii*) Iron-ore is exported through Marmagao port.

Q8. Differentiate between metallic and non metallic minerals with examples.

(AI CBSE 2013)

Ans.

Metallic Minerals	**Non–metallic Minerals**
(*i*) Metallic minerals are those from which we get metals. in other words, we can say that metallic minerals contain metals.	(*i*) Non-metallic minerals do not contain metals.
(*ii*) Ores of iron, copper gold, silver lead, aluminum, tin etc. are example of metallic minerals.	(*ii*) Coal, petroleum, limestone, mica, etc. are examples of non-metallic minerals.
(*iii*) They are good conductor of heat and electricity.	(*iii*) They are bad conductors of heat and electricity.

Q9. Explain any three values attached with the use of minerals in a sustainable manner. [AI CBSE 2013(C)]

Ans. (*i*) Our industries and agriculture immensely depend on mineral deposits and the substances manufactured from them. The total volume of workable mineral deposits is an insignificant fraction i.e. one per cent of the earth's crust. Hence, minerals should be used cautiously.

(*ii*) 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.

(*iii*) Mineral resources are finite and non-renewable. Rich mineral deposits are our country's extremely valuable but short-lived possessions.

Q10. What are the different varieties of iron one? How will you differentiate between them? Give any two points.

Ans. Iron-ore is the backbone of India's industrial development. The different varieties of iron-ore are-Magnetite, hematite, Limonite and Siderite.

- **Magnetite** is the finest iron-ore with a very high content of iron up to 70%. It has excellent magnetic qualities. it is valuable for electrical industry.
- **Hematite** is the most important industrial iron-ore in term of quantity used. It has a slightly lower iron content than 50-60%.
- **Limonite** has 40-60% iron content.
- **Siderite** has 40-50% iron content.

Q11. How do minerals occur in sedimentary rocks? (CBSE 2011)

Ans. (*i*) In sedimentary rocks a number of minerals occur in beds or layers.

(*ii*) They have been formed as a result of deposition, accumulation and concentration in horizontal strata.

(*iii*) Coal and some forms of iron ore have been concentrated as a result of long periods under great heat and pressure.

(*iv*) Another group of sedentary numerals such as gypsum, potash salt and sodium salt are formed as a result of evaporation.

Q12. (*i*) **How are deposits of bauxite formed and aluminium obtained?**

(*ii*) **What is the utility of aluminium?**

(*iii*) **Describe the distribution of aluminium.**

Ans. (*i*) Bauxite deposits are formed due to decomposition of wide variety of rocks rich in aluminium silicates. Ores containing aluminium are obtained from bauxite which is a clay-like substance from which alumina and later aluminium is obtained.

(*ii*) It is an important metal because it combines the strength of metals such as iron with good conductivity and great malleability.

(*iii*) Odisha is the largest bauxite producing state. 45% of country's total production in 2000-2001 was from Orissa. Panchpatmali deposits in Koraput district are the most important bauxite deposits in the state.

Q13. How are minerals an indispensable part of our lives? Explain with three examples.

Ans. Minerals from an indispensable part of our lives in the following ways:

(*i*) From a tiny pin that we use to a towering building or tall ships are all made up of minerals.

(*ii*) The food that we consume also contains minerals which are essential for the growth of human body.

(*iii*) Cars, buses, trains and aeroplanes are manufactured with the help of minerals and they run on power resource derived from minerals.

Q14. State any two factors affecting the economic viability of mineral reserves. [CBSE 2008(F)]

Ans. (*i*) The mineral content of the ore must be in sufficient concentration to make its extraction commercially viable.

(*ii*) The type of formation or structure in which minerals are found determines the relative ease with which mineral ores may be mined. This also determines the cost of extraction.

Q15. (*i*) **How are bauxite formed?**

(*ii*) **Where are India's bauxite deposits found?**

(*iii*) **Which are the most important bauxite deposits located in Orissa?**

Ans. (*i*) Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates.

(*ii*) India's bauxite deposits are found in the Amarkantak plateau, Maikal hills and the plateau region of Bilaspur – Katre.

(*iii*) Panchapatmali deposits in Koraput district the most important bauxite deposits in Orissa.

Q16. How do minerals occur in igneous and metamorphic rocks? (CBSE 2011)

Ans. See NCERT Textbook Q2. (*iii*).

Q17. Explain Rat-Hole mining in the tribal areas. **(HOTS)**

Ans. (*i*) In most of the tribal areas of north-east India, minerals are owned by individuals or communities.

(*ii*) In Meghalaya, there are large deposits of coal, iron-ore, limestone, dolomite etc.

(*iii*) Coal mining in Jowai and Cherapunjee is done by family members in the form of a long narrow tunnel known as 'Rat-Hole Mining'.

Q18. Mention three properties of mica. **(HOTS)**

Ans. (*i*) Mica is a mineral made up of a series of plates or leaves.

(*ii*) It splits easily into thin sheets. These sheets can be so thin that a thousand can be layered into a mica sheet of a few centimeters high.

(*iii*) Mica can be clear, black, green, red-yellow or brown.

(*iv*) Due to its excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage, mica is considered an important mineral used in electric and electronic industries.

III. LONG ANSWER TYPE QUESTIONS

Q1. Why is conservation of mineral resources essential? Explain any three methods to conserve them. (CBSE 2015)

Ans. The total volume of workable mineral deposits is an insignificant fraction i.e. one per cent of the earth's crust. We are rapidly consuming mineral resources that took 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. Mineral resources are, therefore, finite and non-renewable. Hence their conservation is essential.

Three methods to conserve minerals:

(*i*) Mineral resources should be used in planned and sustainable manner.

(*ii*) Improved technology need to be constantly evolved to allow use of low grade ores at low costs.

(*iii*) Recycling of metals, using scraps metals and other substitutes are steps in conserving our mineral resources for the future.

Q2. What are the two main qualities of iron ore deposits of India? Explain the two types of iron ore mainly found in the country. Which are the major states known for the production of iron ore?

Ans. Two qualities of iron ore:

1. Iron ore is the basic mineral and the backbone of industrial development.
2. It provides a strong base for the development of metallurgical industries.

They are of two types: Magnetite and Hematite.

1. **Magnetite:** It is the finest iron ore. It has a very high content of iron up to 70 per cent. It has excellent magnetic qualities, especially valuable in the electrical industry.
2. **Hematite:** This ore is the most important industrial iron ore. It is the largest used iron ore in terms of the quantity in India. It has slightly lower iron content than magnetite. (50-60 per cent).

The major iron-ore producing states are Karnataka, Orissa, Chhattisgarh, Goa and Jharkhand.

Q3. In which various forms do minerals occur? **(HOTS)**

Ans. Minerals occur in following forms:

1. In igneous and metamorphic rocks, minerals occur in the veins and the lodes. For instance, tin, copper, zinc and lead etc. are obtained from these veins and lodes.
2. In sedimentary rocks minerals occur in beds or layers. They have been formed as a result of deposition, accumulation and concentration in horizontal strata. Coal and some forms of iron ore are found in it. Other groups of Sedimentary minerals such as gypsum, potash salt and sodium salt are formed with the help of evaporation especially in dry regions.
3. 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 in this way.
4. Some minerals occur as alluvial deposits in sands of valley floors and base of hills. These deposits contain minerals which are not eroded by water. For example, gold, silver, tin and platinum.

5. Ocean waters contain vast quantities of minerals. Common salts, magnesium and bromine are derived from ocean waters. The ocean beds, too, are rich in manganese nodules.

Q4. Give an account of the distribution of minerals in India.

Or

'Minerals in India are unevenly distributed'. Explain. (CBSE 2011)

Ans. India is fortunate to have fairly rich and varied mineral resources.

(*i*) In peninsular plateau the reserves of coal, metallic minerals, mica and many other non-metallic minerals are found.

(*ii*) In the sedimentary rocks of Gujarat and Assam most of the petroleum deposits are found.

(*iii*) Rajasthan with the rock systems of the peninsula, has reserves of many non-ferrous minerals.

(*iv*) The alluvial plains of north India are almost devoid of economic minerals.

(*v*) These variations in the distribution of minerals exist due to differences in the geological structure, process and the time involved in the formation of minerals.

Q5. Why is Chhotanagpur plateau called a 'store house of minerals'?

Ans. (*i*) Chhotanagpur plateau is called a store house of minerals as it has very high grade haematite iron ore.

(*ii*) The ranges of hills in Chhotanagpur have 14 deposits of super high grade haematite iron ore.

(*iii*) Most of the mica deposits are found on the northern edge of Chhotanagpur plateau.

(*iv*) Koderma–Hazaribagh belt of Jharkhand is the leading producer of Mica.

Q6. Give an account of the major iron ore belts in India.

Ans. The major iron ore belts in India are:

(*i*) Odisha-Jharkhand belt: In Odisha high grade haematite ore is found in Badampahar mines in the Mayurbhanj and Kendujhar districts. In the adjoining Singbhum district of Jharkhand haematite iron ore is mined in Gua and Noamundi.

(*ii*) Durg-Bastar-Chandrapur belt lies in Chhattisgarh and Maharashtra. Very high grade haematites are found in the famous Bailadila range of hills in the Bastar district of Chattisgarh. The range of hills comprise of 14 deposits of super high grade haematite from ore. It has the best physical properties needed for steel making. Iron ore from these mines is exported to Japan and South Korea via Vishakapatnam port.

(*iii*) Bellary-Chitradurga-Chikmaglur-Turnkur belt in Karnataka has large reserves of iron ore. The Kudermukh mines located in the Western Ghatas of Karnataka are a 100 per cent export unit. 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 Mangalore.

(*iv*) Maharashtra-Goa belt includes the state of Goa and Ratnagiri district of Maharashtra. Though, the ores are not of very high quality, yet they are efficiently exploited iron ore is exported through Mormugao port.

IV. MAP SKILLS

Q1. On the given political outline map of India, two features A and B are marked. Identify these features with the help of the following information:

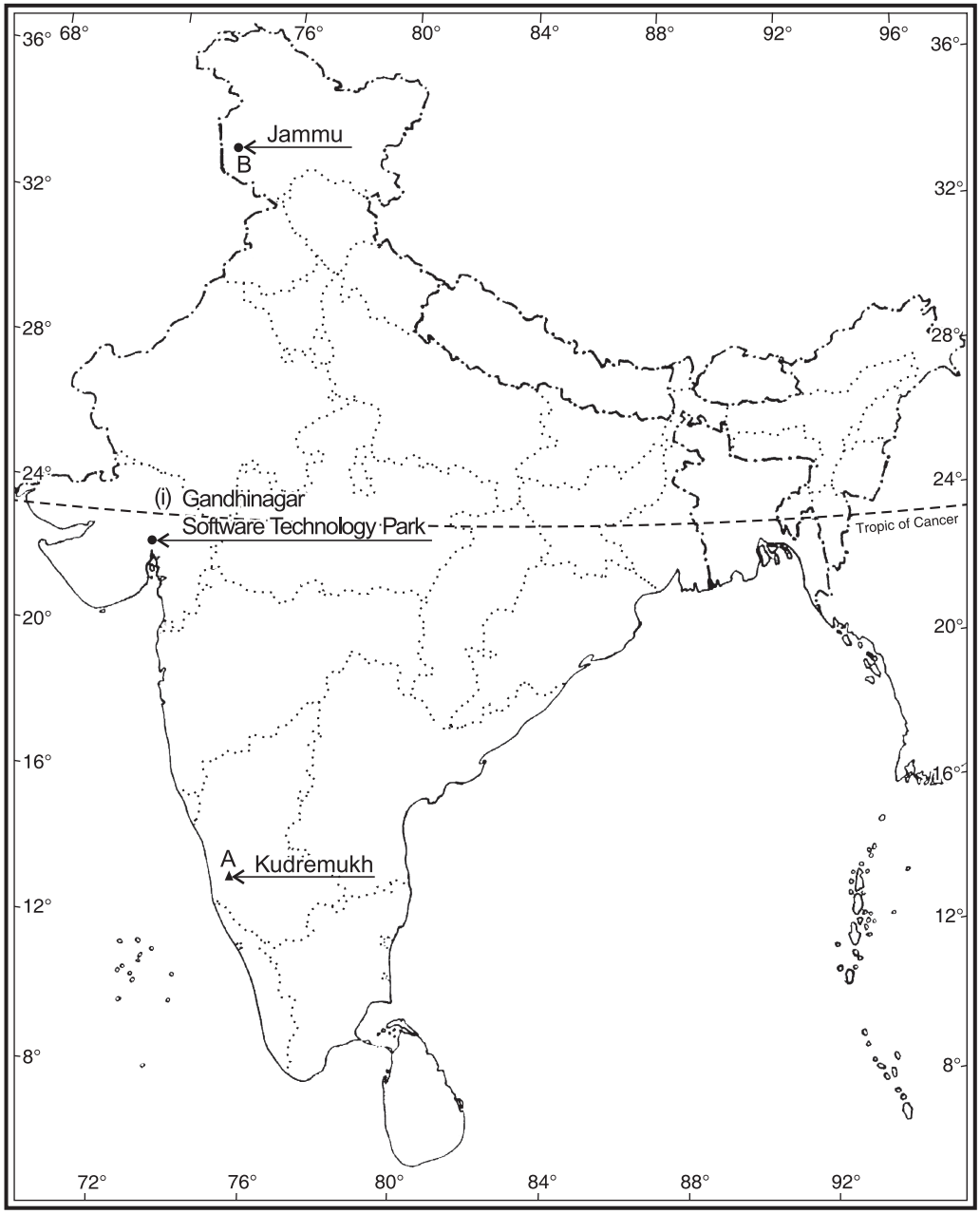
A. Iron-ore mines

B. Terminal station of North-South Corridor

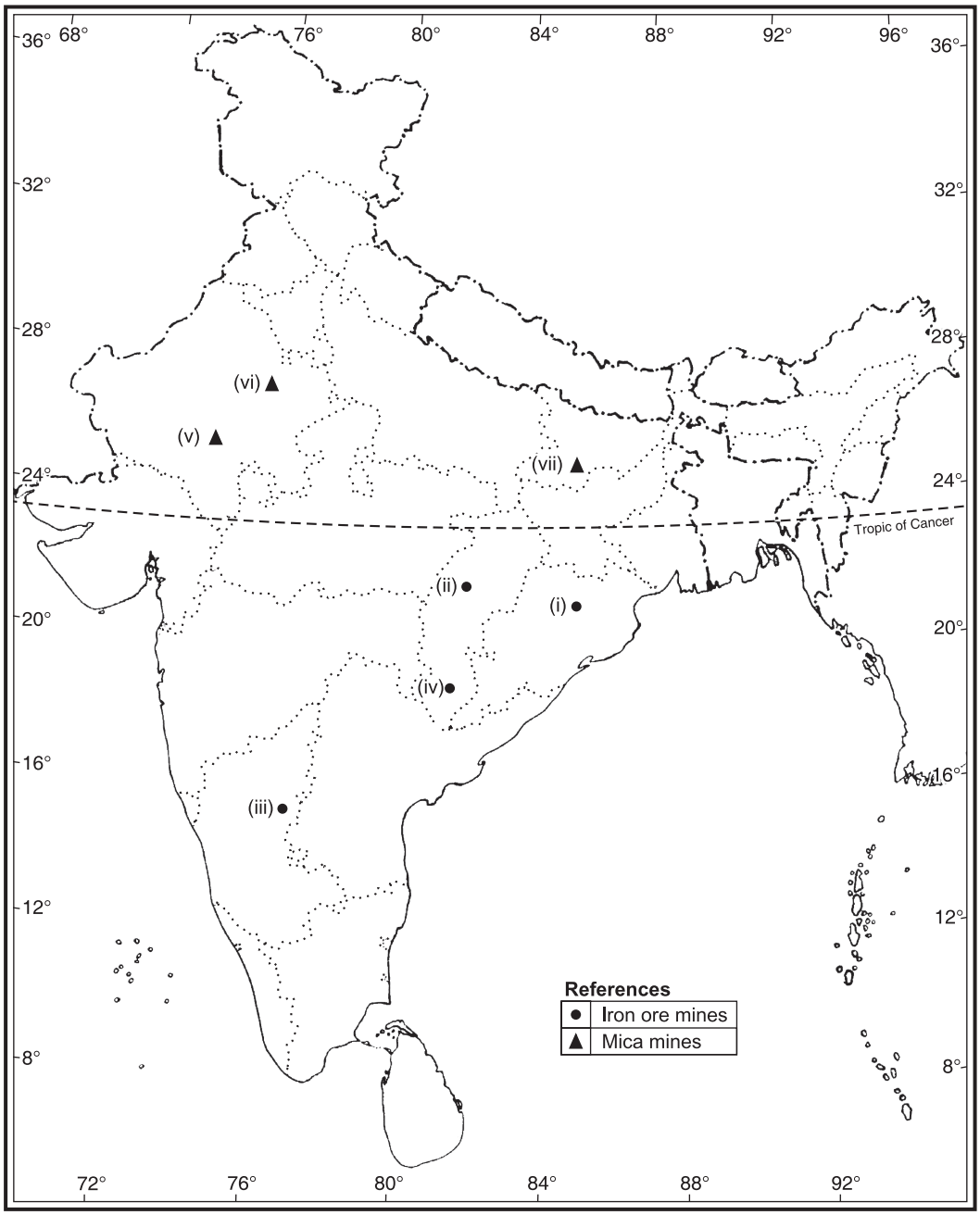
On the same map locate and lable the following:

(*i*) Gandhinagar Software Technology Park. (CBSE 2015)

Ans.



Q2. Identify the following places marked in the given outline political map of India with the help of references:

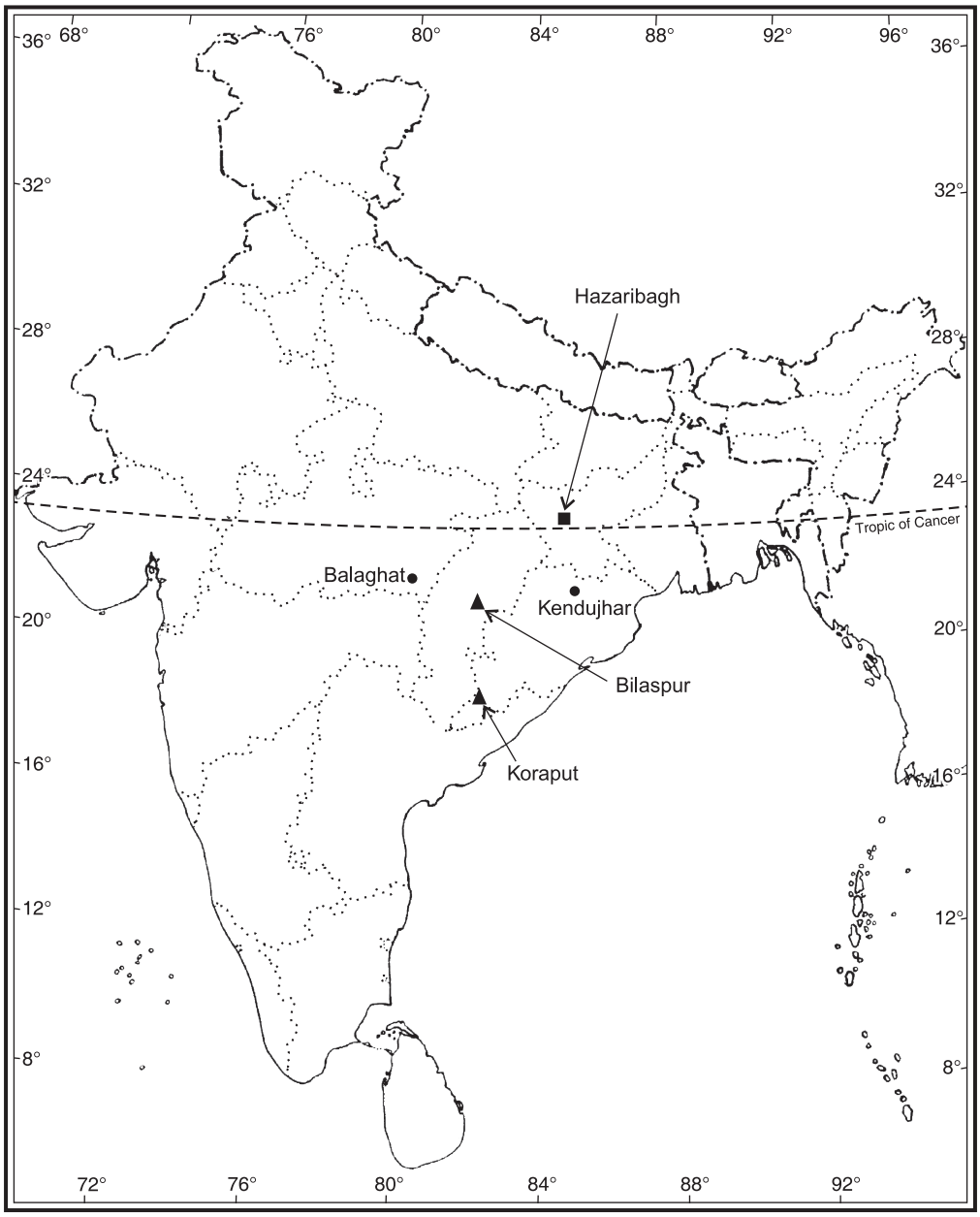


Ans. (*i*) Mayurbhanj
(*ii*) Durg
(*iii*) Bellary
(*iv*) Bailadila
(*v*) Ajmer
(*vi*) Beawar
(*vii*) Gaya.

Q3. Locate and label the following features with appropriate symbols on a political outline map of India.

(*i*) Balaghat — Manganese (*ii*) Kendujhar — Manganese
(*iii*) Koraput — Bauxite (*iv*) Bilaspur — Bauxite
(*v*) Hazaribagh — Mica

Ans.



V. VALUE BASED QUESTIONS

Q1. Why is conservation of minerals important? (CBSE 2011, AI CBSE 2012, 2013)

Ans. (*i*) Minerals are important for the development of a country. Various substances manufactured from minerals industry and agriculture depend on them.

(*ii*) Minerals are already in short supply and their consumption is so fast. We must keep it in mind that the total volume of workable mineral deposits is an insignificant fraction, *i.e.* one per cent of the earth's crust.

(*iii*) 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 present rates of consumption.

(*iv*) Mineral resources are finite and non-renewable continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths along with the decrease in quality.

It has therefore, become essential to conserve minerals.

Q2. Suggest some ways to conserve minerals. (CBSE 2011, AI CBSE 2012, 2013)

Ans. Conservation of minerals is essential ways to conserve them are given below:

(*i*) All natural resources including minerals should be used judiciously so that future generations may also avail their benefits.

(*ii*) Recycling of metals should be done.

(*iii*) Scrap metals and other substitutes should be used.

(*iv*) Minerals resources should be used in a planned and sustainable manner.

(*v*) Wastage of minerals should be stopped.

Q3. How are health and environment affected by the process of mining?

Ans. (*i*) Mining activity is often called a "killer industry" due to high risks involved.

(*ii*) The dust and poisonous fumes inhaled by the miners expose them to pulmonary diseases.

(*iii*) The risk of collapsing mine roofs, inundation and fires in coal mines are a constant threat to miners.

(*iv*) The water sources in the region get contaminated due to mining.

(*v*) Dumping of waste and slurry leads to degradation of land, soil and river pollution.

Q4. Iron ore is the basic mineral of India. How? Which values are associated with it?

Ans. (*i*) Iron ore is considered the backbone of India's industrial development.

(*ii*) They provide a strong base for the development of metallurgical industries in India.

TEST YOUR SKILLS

1. What are the uses of copper? Describe the three copper-producing regions of India.
2. Why is mica considered the most important mineral in electric and electronic industries?
3. What is the necessity of conserving our mineral wealth? What steps should be taken to conserve our mineral wealth?
4. Write a brief note on mode of 'occurrence of minerals'.
5. What do you know about the distribution of copper and bauxite?