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Ch 5 - Minerals and Energy Resources.

Answer the following questions in about 30 words :

(i) Distinguished between the following in not more than 30 words.

(a) Ferrous and non - ferrous minerals.

Ferrous minerals	Non - Ferrous Minerals
• Metalic minerals which contain iron are called ferrous minerals.	• Metallic Minerals which do not contain iron are called non-ferrous minerals.
• They have small amounts of other metals or elements added, to give the required properties. Ferrous Metals are magnetic and give little resistance to corrosion.	• They are not magnetic and are usually more resistant to corrosion than ferrous metals.
• Eg - Iron ore, maganese, nickel, cobalt, etc.	• Eg - Coppor, bauxite, tin, etc.

(b) Conventional and non - conventional sources of energy.

Conventional Sources of Energy	Non - Conventional Sources of Energy
1. Conventional sources of energy are those sources which have been in use since the early times.	1. Non - Conventional sources of energy have generally been identified in the recent past.

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Conventional Sources of Energy	Non-Conventional Sources of Energy
2. They are exhaustible except for hydro-energy	2. They are inexhaustible.
3. They cause pollution when used as they emit smoke and ash.	3. Generally, these are pollution free.
4. Their generation and use involve huge expenditure.	4. Low expenditure required.
5. Very expensive to maintain, store, transmit as they are carried over long distances through transmission grids.	5. Less expensive due to local use and easy maintainence.
6. Ex - coal, natural gas, water, fire-wood.	6. Ex - geothermal energy, solar energy, wind energy, tidal energy, biogas energy, nuclear energy.

(ii) What is a Mineral ?

A a) A mineral is a homogeneous, naturally occuring substance with definable interior structure.

b) They are found in varied forms in nature, ranging from the hardest diamond to soft talc.

c) A mineral is a naturally occuring chemical compound, usually of crystalline form and not produced by life processes.

d) A mineral has one specific chemical composition, whereas a rock can be an aggregate of different minerals.

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

A a) In igneous and metamorphic rocks minerals may occurs in the cracks, crevices, faults or joints.

b) They are formed when minerals in liquid / molten and gaseous forms are forced upwards through cavities towards the earth's surface.

c) They then solidify as they rise towards the surface and form veines or loads.

d) Minerals like tin, copper, zinc and lead etc. are obtained from veins and loads.

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

A a) It takes millions of years for the formation of minerals.

b) Compared to the present rate of consumption, the replenishment rate of minerals ~~ver~~ is very slow. Hence, the minerals resources are finite and non-renewable. Due to this, it is important that we conserve the mineral resources.

c) Rich mineral deposits of our country are extremely valuable but short lived possesions. Continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths along with a decrease in quality.

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

Answer the following questions in about 120 words.

1. **Describe the distribution of coal in India.**

A India has the the fifth largest coal reserves in the world, and is the fourth largest producer of coal in the world :-

a) The major resources of metallurgical coal belong to the Godwana age and are located mainly in the ~~west~~ northeastern part of the peninsula.

b) Rich Reserves of coal are found in Damodar Valley region in the States of West Bengal and Jharkhand. Raniganj in West Bengal and Jharia and Bokaro in Jharkhand are important coalfields. One thirds of the total production comes from there.

c) Coal is also found in the Godavari, Mahanadi, Son and Wardha valleys. Korba in Chattisgarh, Singrauli and Penah - Kanhan valley in Madhya Pradesh, Talcher in Orissa, Kamptee and Chandrapur in Maharashtra and Singareni of Andhra Pradesh are important coal mines.

d) Tertiary coal occurs in the north-eastern states of meghalaya, Assam, Arunachal Pradesh and Nagaland.

e) Principle lignite reserves are found in Neyveli in Tamil Nadu. Due to hight demand and poor average quality, India is forced to import high-quality coal to meet requirement of steel plants.

f) Dhanbad city is the largest coal-producing city.

(iii) Why do you think that solar energy has a bright future in India?

A Solar energy has a bright future in India because -

a) India being a tropical country recieves sunlight in abundance throughout the year.

b) Solar plants can be easily established in rural and remote areas.

c) Photovoltaic tenchnology converts sunlight directly into electricity.

d) It will minimize the dependence of rural households on firewood

and dunk cakes which in turn will contribute to environmental conservation and adequate supply of manure in agriculture.

Extra Questions and Answers:

1. Why are there a wide range of colors, hardness, crystal forms, luster and density found in minerals?

A a) A minerals that will be formed from a certain combination of elements depends upon the physical and chemical conditions under which the minerals forms.

b) It is because of these physical and chemical conditions that minerals possess a wide range of colors colours, crystal forms, luster and density.

2. How is energy an indispensable requirement of our mordern life? Explain with three examples.

A a) Mordern life is highly governed by technology and revoles around it.

b) Mordern technology is driven by energy and is highly automated. Every sector of the National economy – agriculture, industry, transport and commerce need greater inputs of energy.

c) In the domestic sector also, energy demands, in the form of electricity, are growing because of increasing use of electronic gadets and appliances. Energy is the basic requirment for economic development.

3. Mention any three charcteristics of ferrous groups of minerals found in India.

A Metallic minerals that have iron in them are called ferrous minerals. For example, iron ore, magnese, nickel, cobalt, etc.

Three characteristics of ferrous groups of minerals found in India are:

- Ferrous minerals account for about three fourths of the total value of the production of metallic minerals.
- They provide a strong base for the development of metallurgical industries.
- India exports substantial quantities of ferrous minerals to Japan and South Korea after meeting her internal demand.

4. Why is there a pressing need to use non-conventional sources of energy in India? Explain any three reasons.

A a) The growing consumption of energy has resulted in India becoming increasingly dependent on fossil fuels such as coal, oil and gas which are found in limited quantities on the earth.

b) Rising prices of oil and gas and their potential shortages have raised uncertainities about the security of energy supply in future, which in turn has serious repercussions on the growth of the national economy.

c) Increasing use of fossil fuels also causes serious environmental degradation like air pollution, water pollution, etc.

So there is an urgent need to use sustainable energy resources like solar, water, wind, tide, biomass, etc.

5. Make a distinction between hydroelectricity and thermal electricity stating three points of distinction.

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What are the two main way of generating electricity?

How are they different from each other? Explain.

A Electricity is generated mainly in two ways:

- By running water which drives hydro turbines to generate hydro electricity.
- By burning other fuels such as coal, petroleum and natural gas to drive turbines to produce thermal power.

Hydro electricity	Thermal electricity
1. Hydroelectricity is generated by fast flowing water which drives turbines to gerate electricity.	1. Thermal electricity is generated by using coal, petroleum and natural gas.
2. It is a renewable resource and is cheap.	2. The thermal powers stations use nonrenewable fossil fuels.
3. India has a number of multipurpose projects like the Bhakra Nangal, Damodar Valley Corperation etc. producing hydroelectric power.	3. There are over 310 thermal power plants in India

6. "Minerals are indispensable part of our lives." Comment.

A a) Almost everything we use, from a tiny pin to a ship, all are made from minerals.

b) All means of transport are manufactured from minerals and run on power sources derived from the earth.

c) Even the food that we eat contains minerals.

d) Human beings have used minerals for their livelihood, decorations, festivities and in all stages of development.

7. Mention any three major iron-ore belts of India? Write any three characteristics of the Southern most iron-ore belt.

A The three major iron-ore belts of India are as follows:

- Orrisa - Jharkhand belt.
- Durg - Bastar - Chandrapur belt in Chattisgarh and Maharashtra
- Bellary - Chitradurga - Chikmagalur - Tumkur belt in Karnataka is the southernmost iron-ore belt.
- Maharashtra - Goa belt.

Characteristics:

- This belt in Karnataka has large reserves of iron ore.
- Kundremukh mines in the Western Ghats are known to be one of the largest in the world.
- Kundremukh is a 100 percent export unit and the ore is transported as slurry through a pipeline to a port near Manglore.

10. What is the use of ~~mag~~ manganese? Name the largest manganese-ore producing state of India.

A Manganese is mainly used in the manufacturing of the following items:

a) Steel (nearly 10 kg of manganese is required to manufacture 1 tonne of steel).
b) Ferro-manganese alloy Bleaching powder, insecticides and paints
c) Odisha (Orissa) is the largest producers of manganese-ore ~~of~~ in India.

11. Which is the most abundantly available fossile fuel in India? Mention its Different forms.

A The most abundantly available fossil fuel is Coal.

There are four types of coal:

Anthracite – It is the highest quality hard coal. It contains more than 80% carbon content. It gives less smoke.

Bituminous – It is the most popular coal in commercial use and has 60 - 80% carbon content. Metallurgical coal is high grade bituminous coal and is of special value for smelting iron in blast furnaces.

Lignite – It is a low grade brown coal. It is soft with high moisture content.

Peat – It has a low carbon and high moisture content. It has low heating capacity and gives off a lot of smoke

12. How is mining activity injurious to the heath of miners and the environment? Explain.

A Adverse effect on heath :-

- The dust and noxious fumes inhaled by ~~fumes~~ miners make them vulnerable to pulmonary diseases.
- The risk of collapsing mine roofs, inundation and fires ~~and~~ in coal mines are a constant threat to miners.

Adverse Effects on the Environment:-

- The water sources in the region get contaminated due to mining.

- Dumping of slurry and waste leads to degradation of land, soil and increase in stream and river pollution.

Stricter safety regulations and implementation of environmental laws are essential to prevent mining from becoming a 'killer industry'.

13. **In the present day energy crisis what steps would you like to take for saving energy?**

Or

Why is energy needed? How can we conserve energy resources? Explain.

A
- 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.
- Energy is the basic requirment for economic development. Every sector of the national economy - agriculture, industry, transport and commerce needs greater inputs of energy.
- In the domestic sector also, energy demands, in the form of electricity, are growing because of increasing use of electrical gadgets and appliances.

We have to adopt a cautious approch for the judicious use of our limited energy resources. So conservation of energy should be done at all levels. Increased use of renewable energy resources, eg., solar energy, hydel power, etc. We, as concerned citizens can help conserve energy in the following ways:

a) Using more of the public transport system instead of individual vehicles.

b) Switching off electrical devices when not in use.

c) Using powes saving devices.
d) Using non-conventional sources of energy such as solar energy, wind energy etc.
e) Getting the power equipment regularly checked to detect damages and leakages.

14. **What are the main types of formations in which minerals occurs?**

A Minerals generally occurs in the following forms :

- Veins and Lodes : In ingneous and metamorphic rocks minerals may occur in the cracks, faults or joints by getting solidified in them. The smaller occurences are called veins and the larger lodes, eg., metallics minerals like tin, copper, zinc and lead etc. are found in ~~loads~~ lodes and veins.
- In Sedimentary Rocks minerals occur in beds or layers. They are formed as a result of decomposition, accumulation and concentration in horizontal strata. Some sedimetary minerals are formed as a result of evaporation, especially in arid regions eg., gypsum, potash and salt.
- Another mode of formation involves decomposition of surfaces rocks and the removal of soluble contents, leaving a residual mass of weathered material containing ores. Bauxite is formed this way.
- Placer deposits : Certain minerals occur as alluvial deposits in sands of valley floors and the base of hills, eg., gold, silver, tin and platinum. These are called placer deposits and contain minerals which are not corroded by water.

- Ocean water contains vast quantities of minerals, eg, common salts, magnesium and bromide are largely derived from the ocean waters. The oceans beds are rich in magnanese nodules.

15. **'Energy saved is energy produced.' Assess the statement.**

A a) Energy saved is energy produced. We cannot keep on producing non-renewable resources like petrol, diesel and electricity. So the need of the hour is the better utilization of exciting resources.

b) Energy depletion has become a global phenomenon at present time. The biggest problem that man has to face in the near future is the energy crisis.

c) The demand of energy is growing manyfold in the ~~fold~~ form of coal, oil, gas or electricity but the energy sources are becoming scarce and costlier.

d) Nearly 97% of the world's consumed energy is comming from fossil fuels, coal, petroleaum and natural gas. Among the various strategies for meetings energy demand, the efficient use of energy and it conservation is the best solution.

Following are some measures to conserve energy resources:

a) We should try to use more and more public transport systems instead of private vehicles.

b) Electronic devices must be switched off when not in use.

c) Reducing the consumption of non-renewable sources of energy.

d) Solar Power should be used to the maximum to generate electricity.

e) Recycling of goods and commodities can also help to conserve energy.