CHAPTER: 5- MINERALS AND ENERGY RESOURCES
Assignment

Summary:

Minerals: A homogenous, naturally occurring substance with definable internal structure is called mineral.

Types of Minerals

1. Metallic
    a) Ferrous (containing iron): Iron ore, manganese, nickel, cobalt, etc.
    b) Non-ferrous: Copper, lead, tin, bauxite, etc.
    c) Precious: Gold, silver, platinum, etc.
2. Non-metallic: Mica, salt, potash, sulphur, granite, limestone, marble, sandstone, etc.
3. Energy Minerals: Coal, petroleum and natural gas.

Mode of occurrence of minerals:

In igneous and metamorphic rocks: The smaller occurrences are called veins and the larger occurrences are called lodes. They are usually formed when minerals in liquid/molten and gaseous forms are forced upwards through cavities towards the earth's surface. Examples: tin, copper, zinc, lead, etc.

In sedimentary rocks: In these rocks, minerals occur in beds or layers. Coal, iron ore, gypsum, potash salt and sodium salt are the minerals found in sedimentary rocks

.**By decomposition of surface rocks:** Decomposition of surface rocks and removal of soluble constituents leaves a residual mass of weathered material which contains ores. Bauxite is formed in this way.

As alluvial deposits: These minerals are found in sands of valley floors and the base of hills. These deposits are called placer deposits. They generally contain those minerals which are not corroded by water. Examples; gold, silver, tin, platinum, etc.

In ocean water: Most of the minerals in ocean water are too widely diffused to be of economic importance. But common salt, magnesium and bromine are mainly derived from ocean waters.

Iron Ore

India is rich in good quality iron ores. Magnetite is the finest iron ore with a very high content of iron upto 70%. This iron ore is valuable for the electrical industry because of its excellent magnetic properties. Hematite ore is the most important industrial iron ore; in terms of usage. The iron content of hematite is 50-60%.

Major Iron Ore Belts in India

A. **Orissa Jharkhand Belt:** Badampahar mines in the Mayurbhanj and Kendujhar districts of Orissa have high grade hematite ore. Additionally, hematite iron ore is mined in Gua and Noamundi in Singhbhum district of Jharkhand.

B. **Durg Bastar Chandrapur Betl:** This belt lies in Chhattisgarh and Maharashtra. The Bailadila range of hills in the Bastar district of Chhattisgarh have very high grade hematite ore. This hilly range has 14 deposits of super high grade hematite ore. Iron from these mines is exported to Japan and South Korea via Vishakapatnam port.

C. **Bellary Chitradurga Chikmaglur Tumkur Belt:** This belt lies in Karnataka. The Kudremukh mines located in the Western Ghats are a 100 percent export unit. The ore from these mines is transported as slurry through a pipeline to a port near Mangalore.

D. **Maharashtra Goa Belt:** This belt inculdes the state of Goa and Ratnagiri district of Maharashtra. The ores in these mines are not of very high quality. They are exported through Marmagao port.

Manganese

Manganese is mainly used in the manufacturing of steel and ferro-manganese alloy. It is also used in making bleaching powder, insecticides and paints.

Copper

Copper is mainly used in electrical cables, electronics and chemical industries. The Balaghat mines in Madhya Pradesh produce 52% of India's copper. Rajasthan is the next leading producer with about 48% share. Copper is also produced in the Singhbhum district of Jharkhand.

Aluminium

Aluminium is lightweight yet strong and hence is used in a variety of applications. Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katni are the main areas of bauxite deposits. Orissa is the leading producer of bauxite in India with 45% share. Panchpatmali in Koraput district is the most important centre of bauxite deposit in Orissa.

Mica

Mica is a mineral which is made up of a series of plates or leaves. The mica sheets can be so thin that a thousand of them can be layered into a few centimetre thick mica sheet. Mica has excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage. Mica is widely used in electric and electronic industries.

Mica deposits are found in the northern edge of the Chota Nagpur plateau. Koderma-Gaya-Hazaribagh belt of Jharkhand is the leading producer of mica. Ajmer in Rajasthan and Nellore in Andhra Pradesh are the other important producers of mica.

Hazards of Mining

Mining is a hazardous industry; both for the workers and for the residents. The Miners have to work under tough conditions where no natural light is available. There is always a risk of collapse of mine roof, inundation with water and fire. The areas around mines face the problem of too much dust from the mines. Slurry from mines damages the roads and the farmland. Houses and clothes become dirty more often than in other areas. Miners are at great risk of getting afflicted with pulmonary disorders. Cases of respiratory tract diseases are very high in mining areas.

Conservation of Minerals

It takes millions of years for the formation of minerals. Compared to the present rate of consumption, the replenishment rate of minerals is very slow. Hence, mineral resources are finite and non-renewable. Due to this, it is important that we conserve the mineral resources.

Energy Resources

Conventional Energy Resources: Firewood, cattle dung cake, coal, petroleum, natural gas and electricity (both hydel and thermal)

Non-conventional Energy Resources: Solar, wind, tidal, geothermal, biogas and atomic energy.

Firewood and cattle dung cake: As per estimates, more than 70% of energy need in rural households is met by firewood and cattle dung cake. A decreasing forest area is making it difficult to use firewood. Dung cake can be put to better use in the form of manure and hence its use should also be discouraged.

Coal:

India is highly dependent on coal for meeting its commercial energy requirements. Depending on the degree of compression during its formation, there are varieties of coal.

a. **Lignite:** It is a low grade brown coal. It is soft and has high moisture content. Neyveli in Tamil Nadu has the main reserves of lignite coal. This type of coal is used for electricity generation.

b. **Bituminous coal:** Coal which was formed because of increased temperature and was buried very deep is called bituminous coal. This is the most popular coal for commercial use. High grade bituminous coal is ideal for use in metallurgy.

c. **Anthracite coal:** This is the highest quality hard coal.

In India, coal occurs in rock series of two main geological ages. The Gondwana coal was formed over 200 million years ago. The tertiary deposits are about 55 million years old. The major sources of Gondwana coal are located in the Damodar valley (West Bengal-Jharkhan). In this belt; Jharia, Raniganj and Bokaro are important coalfields. Coal deposits are also present in the Godavari, Mahanadi, Son and Wardha valleys.

Tertiary coal is found in the north-eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

Petroleum

After coal, the next major energy resource in India is petroleum. Petroleum is a major source of fuel for various uses. Petroleum also provides raw materials for various manufacturing industries; like plastic, textiles, pharmaceuticals, etc.

Most of the petroleum in India occurs in anticlines and fault traps in the rock formations of the tertiary age. The oil bearing layer is a porous limestone or sandstone through which oil may flow. The intervening non-porous layers prevent the oil from rising or sinking. Petroleum is also found in fault traps between porous and non-porous rocks. Gas usually occurs above the oil because it is lighter than oil.

Mumbai High produces about 63% of India's petroleum, Gujarat produces 18% and Assam 13%. Ankeleshwar is the most important oil field in Gujarat. Assam is the oldest oil producing state of India. Important oil fields of Assam are Digboi, Naharkatiya and Moran-Hugrijan.

Natural Gas

Natural gas is found along with or without petroleum. It is used as fuel and also as industrial raw material. Large reserves of natural gas have been discovered in the Krishna-Godavari Basin. Gulf of Cambay, Mumbai High and Andaman Nicobar islands are also important areas with large reserves of natural gas.

The 1700 km long Hazira-Vijaipur-Jagdishpur pipeline links Mumbai High and Bassein with the fertiliser, power and industrial complexes in western and northern India. Natural gas is mainly used by the fertiliser and power industries. Now-a-days, use of CNG (Compressed Natural Gas) is increasing as vehicle fuel in the country.

Electricity

Electricity is generated mainly by two methods; by running water which drives hydro turbines and by burning other fuels like coal, petroleum and natural gas to drive turbines. Bhakra Nangal, Damodar Valley Corporation, Kopili Hydel Project, etc. are major hydroelectric producers in the country. At present, there are over 300 thermal power stations in India.

Non-conventional Sources of Energy

Nuclear Energy: Nuclear energy is obtained by altering the structure of atom. When the structure of an atom is altered, too much energy is released in the form of heat. This heat is utilised to generate electric power. Uranium and Thorium are used for generating atomic power. These minerals are available in Jharkhand and the Aravalli ranges of Rajasthan. The Monazite sand of Kerala is also rich in Thorium.

Solar Energy: Photovoltaic technology is used to convert solar energy into electricity. The largest solar plant of India is located at Madhapur near Bhuj. Solar energy holds great promises for the future. It can help in minimizing the dependence on firewood and animal dung cakes in rural areas. This will also help in conservation of fossil fuels.

Wind Power: India now ranks as a "Wind Super Power" in the world. The wind farm cluster in Tamil Nadu (from Nagarcoil to Madurai) is the largest cluster in India. Andhra Pradesh, Karnataka, Gujarat, Kerala, Maharashtra and Lakshadweep are also important centres of wind power production.

Biogas: Biogas can be produced from shrubs, farm waste, and animal and human waste. Biogas is more efficient than kerosene, dung cake and charcoal. Biogas plants can be set up at municipal, cooperative and individual levels. The gobar gas plants provide energy and also manure.

Tidal Energy: Floodgate dams are built across inlets. The water flows into the inlet during high tide and gets trapped when the gate is closed. Once the tide recedes, the gates are opened so that water can flow back to the sea. The flow of water is used to run the turbine to generate electricity. A 900 mw tidal energy power plant is set up by the National Hydropower Corporation in the Gulf of Kuchchh.

Geo Thermal Energy: We know that the inside of the earth is very hot. At some places, this heat is released on the surface through fissures. Groundwater in such areas becomes hot and rises up in the form of steam. This steam is used to drive turbines. Two experimental projects have been set up in India to harness geothermal energy. They are; the Parvati valley near Manikarn in Himachal Pradesh and the Puga Valley in Ladakh.

Note: Please write the following question-answers in the Note Book:

1, 6, 15, 17, 20, 23, 26, 31, 35, , 38, 46, 53, & 58.

Q. No.	***QUESTIONS***	***Mks***
1	"Minerals are an indispensable part of our lives ''Explain.	3
2	From which mineral is fluoride obtained?	1
3	From which compound is toothpaste made white?	1
4	From which mineral does the sparkle in some toothpaste come?	1
5	How do geologists define a mineral?	1
6	What are rocks?	1
7	How many minerals have been identified so far?	1+1
8	Which are the properties used by the geologists to classify minerals?	1+1
9	How do Geographers study minerals?	1
10	How do geographers and geologists differ in their interests of minerals?	1+1
11	How minerals are usually found? Give a general classification of minerals.	5
12	What is Rate hole mining? Pl. refer Box –Interesting fact – pg.52 , 1st col.	3
13	Why are there variations in the distribution of minerals in India?	3
14	*(Note: Question-14 is given on Page-5)*	
15	Define the term 'Ore'. 'The mineral resources in India are unevenly distributed ''. Explain with proper illustrations. (1+4)	5
16	Which factors play an important role in affecting the economic viability of a reserve?	3

14. Explain the various modes of formation of minerals with suitable examples.

In igneous and metamorphic rocks	In sedimentary rocks	As a residual mass	As placer deposits	In ocean waters
Occur in cracks,crevices, faults and joints	Occur in beds or layers	As a residual mass of weathered material	As alluvial deposits in sands of valley floors and base of hills	Ocean waters and ocean beds contain vast quantities of minerals.
Also 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.	1.Formed as a result of accumulation and concentration in horizontal strata und great heat and pressure 2.Formed as result of evaporation in arid regions.	Involves the decomposition of surface rocks, and the removal of soluble constituents, containing ores	Generally contain minerals that are not corroded by water	
Tin, copper, lead and zinc	1. Egs: Coal, some forms of iron ore 2. Egs.: Gypsum, potash and sodium salt	Bauxite	Gold, silver, tin, platinum	Common salt, magnesium, bromine and manganese nodules.

17 Give the two important varieties of iron ore found in India — 1+1

	Magnetite		Haematite
1	Finest ore with 70% iron content	1	50-60% iron content
2	Excellent magnetic qualities, use in electrical industry	2	Important in terms of quantity used

18 A) Name the two ferrous minerals. *Ans*. Iron ore and manganese. — 3
B) Give any two uses of Manganese
Used in steel and Ferro-manganese alloy. Also used in manufacture of bleaching powder, insecticides and paints.

19 Give an account of major iron belts in India under the following headings

Orissa-Jharkhand belt	Durg-Bastar-Chandrapur belt	Bellary-Chitradurga-Chikmanglur-Tumkur belt	Maharashtra- Goa belt
Haematite ore is found in Orissa in Badampahar mines in Mayurbhanj and Kendujhar districts; In Jharkhand, in Singhbhum district, it is mined in Gua and Noamandi.	In Chhattisgarh and Maharashtra , high grade haematites are found in Bailadila range of hills in Bastar dist;14 deposits of super grade ore are used for steel making . Exported to Japan and Korea via Vishakhapatnam port	In Karnataka, has a large reserve of iron ore. Kudremukh mines in western ghats aof Karnataka have 100% export unit - one of the largest in the world. Ore is transported as slurry through a pipeline to a port near Mangalore.	In Goa and Ratnagiri district of Maharashtra. Exported through Marmagao port

<table>
<tr><td>20</td><td>How much manganese is required to produce 1 tonne of steel? Which state is the largest producer of manganese ores in India and how much did it account for the country's production?
Ans. 10 kg. of manganese. Largest Producer- Orissa-33% and it accounted for 1/3rd of India's production.</td><td>3</td></tr>
<tr><td>21</td><td>Name Non-Ferrous minerals found in India and what are their uses?
Ans. A) Copper, bauxite, lead, zinc and gold.
B) They play a vital role in a number of metallurgical, engineering and electrical industries.</td><td>3</td></tr>
<tr><td>22</td><td>Give an account of copper, bauxite, mica and limestone.
<table>
<tr><th>Non-Ferrous mineral</th><th>Non-Ferrous mineral</th><th>Non-metallic mineral</th><th>Rock mineral</th></tr>
<tr><td>Copper</td><td>Bauxite</td><td>Mica</td><td>Limestone</td></tr>
<tr><td>Balaghat mines in M. P. produce 52% of India's Copper. Also found in Singhbhum, Jharkhand and Khetri, Rajasthan</td><td>In Amarkantak plateau, Maikal hills and plateau region of Bilaspur-Katni. Panchpatmali in Koraput are the most impt. deposits.</td><td>Found in northern edge of Chhota Nagpur plateau. Koderma Gaya-Hazaribagh belt of Jharkhand –leading producer. Ajmer in Rajasthan and Nellore in Andhra Pradesh</td><td>Found in association with rocks containing calcium carbonate and or calcium and magnesium carbonates; found in sedimentary rocks of most geological formations.</td></tr>
<tr><td>Used in electrical cables, electronics and chemical industries as it is malleable, ductile and a good conductor.</td><td>Orissa is the largest bauxite producing state with 45% of India's production</td><td>Used in electric and electronic industries.</td><td>Basic raw material in cement industry and essential for smelting iron ore in blast furnace.</td></tr>
</table></td><td>1 mark of each</td></tr>
<tr><td>23</td><td>a) How are bauxite deposits formed?
Ans. They are formed by the decomposition of a wide variety of rocks rich in aluminium silicates.
b) How is aluminium obtained?
Ans. It is from bauxite, a clay-like substance that alumina and later aluminium is obtained.
c) Why is aluminium considered to be an important metal?
Ans. Because it combines the strength of metals as iron, with extreme lightness and also with good conductivity and great malleability.</td><td>3</td></tr>
<tr><td>24</td><td>A) In which colours can mica be found?
Ans. Clear black, green, red yellow or brown.
B) Why is mica one of the most indispensable minerals?
Ans. Due to its excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage.</td><td>3</td></tr>
<tr><td>25</td><td>a) Which two factors are essential to prevent mining from becoming a "killer industry"?
Ans. Stricter safety regulations and implementation of environmental laws.
b) What are the impacts of mining on Health of the Miners Environment
Ans. (Pl. refer Para 'Hazards of mining" pg.56)</td><td>3</td></tr>
<tr><td>26</td><td>Why is it necessary to conserve minerals?
Ans. 1. Mineral resources are finite and non-renewable.
2. Rich mineral resources are our country's extremely valuable but short-lived possessions.
3. Continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths and along with decrease in quality.</td><td>3</td></tr>
<tr><td>27</td><td>What steps or measures need to be taken to conserve minerals?
Ans. 1. Use mineral resources in a planned and sustainable manner.
2. Improved technologies need to be constantly evolved to allow use of low grade ores at low costs.</td><td>3</td></tr>
</table>

	3. Recycling of metals, using scrap metals and other substitutes.	
28	**a) What are the uses of Energy resources? (2)** **Ans.** To cook, to provide light and heat, to propel vehicles and to drive machinery in industries. **b) Name the Fuel minerals. (1)** **Ans.** Coal, petroleum, natural gas and uranium.	3
29	**Distinguish between: Conventional and Non-conventional sources of energy.** **Ans.** **Conventional Sources of Energy** a. Sources of energy that are in use for a long period of time. b. Examples: Firewood, cattle dung cake, coal, petroleum, natural gas, hydro and thermal electricity. **Non-Conventional Sources of Energy** a. Sources of energy that have been discovered recently or the newly discovered sources of energy. b. Examples: Solar energy, wind energy, geo-thermal energy, biogas.	1+1
30	**a) Name two most common sources of energy in rural India. Why is the continuation of these becoming increasingly difficult?** **Ans.** 1. Common sources: Firewood and cattle dung. 2. Problem: due to decreasing forest area. b) **Why is using dung cake being discouraged?** **Ans.** Because it consumes most valuable manure which could be used in agriculture.	3
31	**In India, Coal is the most abundantly available fossil fuel. Give reasons.** **Ans. <u>Following points</u>:** 1. It provides a substantial part of the nation's energy needs. 2. It is used for power generation. 3. It is used to supply energy to industry as well as for domestic needs.	3
32	**How was coal formed?** **Ans.** Coal is formed due to the compression of plan material over millions of years.	1
33	**On which three factors is the variety of forms of coal dependent on?** **Ans. <u>Due to the following factors</u>:** a) Degree of compression b) The depth of the coal c) Time of burial	3
34	**Explain the four types of coal found in India.** **Ans. <u>Four types of coal found in India</u>:** **<u>1. Peat coal</u>:** a) Formation: Decaying plants in swamps produce peat. b) It has a low carbon and high moisture contents and low heating capacity. (1) **<u>2. Lignite coal:</u>** a) Lignite is a low grade brown coal, which is soft with high moisture content. b) Use/location: Principle lignite reserve in Neyveli in Tamil Nadu and are used for generation of electricity. (1) **<u>3. Bituminous coal</u>:** a) Formation: Coal that has been subjected to increased temperatures is called bituminous coal. b) It is the most popular coal in commercial use. c) Metallurgical coal is high grade bituminous coal which has special value for smelting iron in blast furnaces. **<u>4. Anthracite coal:</u>** It is the highest quality of hard coal. (1)	5
35	**Distinguish between the Gondwana geological age and Tertiary geological age.** **Ans.** **Gondwana Geological Age** 1. It is 200 million years old. 2. Mainly metallurgical coal located in Damodar valley (West Bengal- Jharkhand). Imp. Coal fields-Raniganj,Jharia and Bokaro. Also found in the godavari, Mahanadi, Son and Wardha valleys. **Tertiary Geological Age** 1. It is 55 million years old. 2. Found in the north eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.	2

36	**What are the uses of Petroleum or Mineral Oil?** **Ans**. It has following uses: 1. It provides fuel for heat and lighting, 2. It provides lubricants for machinery. 3. It provides raw materials for a number of manufacturing industries.	3
37	**A) For which industries do petroleum refineries act as a 'nodal industry'?** **Ans.** Petroleum acts as a 'nodal industry' for synthetic textile, fertilizer and numerous chemical industries. **B) With which geological formations are most of the petroleum occurrences in India located?** **Ans.** 1. Most of the petroleum occurrences in India are associated with **anticlines and fault traps** in the rock formations of the tertiary age. 2. In the regions of **folding, anticlines or domes**, it occurs where oil is trapped in the crest of the upfold. 3. The oil bearing layer is a **porous limestone or sandstone** through which oil may flow. The oil is prevented from rising or sinking by intervening non-porous layers. 4. Petroleum is also found in **fault traps between porous and non-porous rocks**. Gas being lighter usually occurs above the oil.	5
38	**Give an account of the distribution of petroleum in India. State the important oilfields in those regions.** **Ans.** Petroleum is found in the following areas: A) **Mumbai High**: India's 63 percent of petroleum production comes from Mumbai High. B) **Gujarat Region**; It produces about 18 percent of India's petroleum. Ankleshwar is the most important field of Gujarat. C) **Assam Region**: Assam is the oldest oil producing state of India. It produces 16 percent of India's petroleum. Digboi, Naharkatiya and Moran-Hugrijan are the important oil fields of India.	3
39	**Why natural gas is considered as Environment friendly fuel?** **Ans.** Because of low carbon dioxide emissions and is, therefore, the fuel for the present century.	1
40	**What are the uses of natural gas?** **Ans.** It is used as a source of energy as well as industrial raw materials in the petrochemical industry.	1
41	**Give an account of the distribution of natural gas in India.** **Ans.** 1. Large reserves of natural gas have been discovered in the Krishna-Godavari basin. 2. Along the west coast the reserves of the Mumbai High and allied fields are supplemented by finds in the Gulf of Cambay. 3. Andaman and Nicobar Islands are also important areas having large reserves of natural gas.	3
42	**State two characteristics of Hazira-Vijaipur-Jagdishpur (HVJ) gas pipeline.** **Ans.** 1. HVJ gas pipeline is 1700 km longs. (1 mark) 2. It connects Hazira-vijaipur-Jagdishpur cross country gas pipeline links Mumbai High and Bassien with the fertilizer, power and industrial complexes in western and northern India. (2 mark)	3
43	**Name two industries which are the key users of natural gas.** **Ans.** Power and fertilizer industry.	1
44	**Which gas has replaced liquid fuels for vehicles?** **Ans.** Use of Compressed Natural Gas (CNG) for vehicles to replace liquid fuels is gaining wide popularity in the country.	1
45	**How is Electricity generated in India?** **Ans.** Electricity is generated mainly by running water and burning of fossil fuels	1

<table>
<tr><td>46</td><td>Distinguish between the Hydro electricity and Thermal electricity.
Ans. Distinguish between:<table><tr><th>Thermal Electricity</th><th>Hydro-electricity</th></tr><tr><td>1. This type of electricity is generated by burning of fossil fuels such as coal, petroleum and natural gas to drive turbine to produce thermal power.
2. It is generated by non-renewable sources of energy.
3. Examples of thermal power stations: 310 thermal power stations such as Korba, Talcher, Amarkantak, Barauni etc.</td><td>1. Running water drives hydro turbines to generate hydro electricity.
2. It is generated by renewable sources of energy.
3. There are many multi-purpose river valley projects such as Bhakra Nangal, Damodar Valley Corporation, Kopili Hydel Project etc.</td></tr></table></td><td>3</td></tr>
<tr><td>47</td><td>a) How is Nuclear or Atomic energy obtained? (2)
Ans. 1. Nuclear energy is obtained by altering the structure of atoms.
2. When such an alteration is made, much energy is released in the form of heat and this is used to generate electric power.
b) Where are the nuclear minerals found in India? (3)
Ans. 1. Uranium and thorium which are available in Jharkhand and the Aravalli ranges of Rajasthan are used for generating atomic or nuclear power.
2. The monazite sands of Kerala is also rich in thorium.</td><td>5</td></tr>
<tr><td>48</td><td>Why is there a pressing need to use renewable energy resources?
Ans. Following reasons:
1. The growing consumption of energy has resulted in the country becoming increasingly dependent on fossil fuels such as coal, oil and gas. (1 mark)
2. Rising prices of oil and gas and their potential shortages have raised uncertainties about the security of energy supply in future which in turn has serious repercussions on the growth of national economy. (2 marks)
3. Increasing use of fossil fuels also causes serious environmental problems. (1 mark)</td><td>1 or 2 mark of each</td></tr>
<tr><td>49</td><td>I) Name four renewable energy resources blessed by India in abundance. (1)
Ans. Sunlight, water, wing and biomass.
II) Where is the largest solar plant in India located? For what is solar energy used there?
Ans. 1. Madhapur, Near Bhuj (Gujarat) (2)
2. Solar energy is used to sterlise milk cans.</td><td>3</td></tr>
<tr><td>50</td><td>What is the implication of use of solar energy in India?
Ans. It has following implications:
1. It is expected that use of solar energy will be minimize the dependence of rural households on firewood and dung cakes.
2. More use of solar energy will contribute to environmental conservation.
3. It will also ensure adequate supp0ly of manure in agriculture.</td><td>3</td></tr>
<tr><td>51</td><td>Where is the largest wind farm cluster located? Name two areas well known for effective use of wind energy in the country. (1+2)
Ans. A) Located in Tamil Nadu from Nagarcoil to Madurai.
B) Areas:- Andhara Pradesh, Karnataka, Gujarat, Kerala, Maharashtra and Lakshadweep.</td><td>3</td></tr>
<tr><td>52</td><td>Name four raw materials used in the production of biogas for domestic consumption in rural areas. What is the advantage of biogas?
Ans. A) Shrubs, farm waste, animal and human waste.
B) Decomposition of organic matter yields gas, which has higher thermal efficiency in comparison to kerosene, dung cake and charcoal.</td><td>3</td></tr>
<tr><td>53</td><td>i) At what levels are biogas plants set up? (1)
Ans. Municipal, cooperative and individual levels.
ii) What are ‘Gobar Gas plants’? What twin benefits do they give to the farmer?
Ans. 1. The plants using cattle dung are known as ‘gobar gas plants’.
2. Twin benefits-provides energy and improved quality of manure.
iii) Give two reasons to justify that biogas is the most efficient use of cattle dung.</td><td>5</td></tr>
</table>

	Ans. 1. It improves the quality of manure. 2. It prevents the loss of trees and manure due to burning of fuel wood cow dung cakes.	
54	**How can ocean tides be used to generate electricity?** **Ans.** a) Floodgate dams are built across inlets. b) During high tide water flows into the inlet and gets trapped when the gate is closed. c) After the tide fall outside the flood gate, the water retained by the floodgate flows back to the sea via a pipe that carries it through power generating turbine.	3
55	**Which region in India provides ideal conditions for utilizing tidal energy? Give a brief account of the energy power plant set up here.** **Ans.**1. The Gulf of Kuchchh. 2. A 900 mw tidal energy power plant is set up here by the National Hydropower Corporation.	1+1
56	**What is geothermal energy? Name two experimental projects located in India to harness geothermal energy. (1+2)** **Ans.** a) Refers to the heat electricity produced by using the heat from the interior of the earth. b) The Parvati Valley near Manikarn in Himachal Pradesh and The Puga Valley, Ladakh.	3
56	**Why does geothermal energy exist?** **Ans. <u>Because of the following reasons</u>**: 1. The earth grows progressively hotter with increasing depth. 2. Where the geothermal gradient is high, high temperatures are found at shallow depths. 3. 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. 4. This steam is used to drive turbines and generate electricity.	1 mark of each
57	**Why the consumption of energy in all forms rising steadily all over the country?** **Ans. Refer pg.63, right column, second paragraph.**	3
58	**Explain the cautious steps that could be adopted for the judicious use of limited energy resources. (Explain the following points in your words)** **Ans. <u>After all 'energy saved is energy produced'. Following steps should be adopted:</u>** a) As concerned citizens we can do our bit by using public transport systems instead of individual vehicles. b) Switching off electricity when not in use. c) Using non-conventional sources of energy d) Using power-saving devices	4

<u>Previous year's Questions</u>

1. Why is energy needed? How can we conserve energy resources? Explain. (2013) 5
2. How do minerals occur in sedimentary rocks? 1 (2013)
3. How can solar energy solve the energy problem to some extent in India ? Give your opinion. 3 (2014)
4. Which is the most abundantly available fossil fuel in India ? Assess the importance of its different forms. 5 (2014)
5. Explain any three values which inspire us to conserve our energy resources. 3 (2015)
6. Why do you think that solar energy has a bright future in India? Give three reasons. 3 (2016)
7. 'Consumption of energy in all forms has been rising all over the country. There is an urgent need to develop sustainable path of energy development and energy saving'. Suggest and explain any three measures to solve this burning problem. 3 (2016)
8. Describe the qualities of two types of iron ore found in India. Mention the major areas known for the production of iron ore. 5 (2016)