Chapter 7

Mineral and Energy Resources

1. Choose the right answers of the following from the given options:

Question 1.(i)

In which one of the following States are the major oil fields located?

(a) Assam

(b) Bihar

(c) Rajasthan

(d) Tamil Nadu

Answer:

(a) Assam

Question 1.(ii)

At which one of the following places was the first atomic power station started?

(a) Kalpakkam

(b) Narora

(c) Rana Pratap Sagar

(d) Tarapur

Answer:

(d) Tarapur

Question 1.(iii)

Which one of the following minerals is known as brown diamond?

(a) Iron

(b) Lignite

(c) Manganese

(d) Mica

Answer:

(b) Lignite

Question 1.(iv)

Which one of the following is non-renewable source of energy?

(a) Hydel

(b) Solar

(c) Thermal

(d) Wind power

Answer:

(c) Thermal

2. Answer the following questions in about 30 words:

Question 2.(i)

Give an account of the distribution of mica in India.

Answer:

Mica in India is produced in Jharkhand, Andhra Pradesh and Rajasthan followed by Tamil Nadu, West Bengal and Madhya Pradesh. In Jharkhand high quality mica is obtained in a belt extending over a distance of about 150 km, in length and about 22 km, in width in lower Hazaribagh plateau. In Andhra Pradesh. Nellore district produces the best quality mica. In Rajasthan mica belt extends for about 320 kms from Jaipur to Bhilwara and around Udaipur. Mica deposits also occur in Mysore and Hasan districts of Karnataka, Coimbatore, Tiruchirapalli, Madurai and Kannyakumari in Tamil Nadu, Alleppey in Kerala, Ratnagiri in Maharashtra, Purulia and Bankura in West Bengal.

Question 2.(ii)

What is nuclear power? Mention the important nuclear power stations in India.

Answer:

Nuclear power is the power that is obtained by the energy released from nuclear fission that is splitting of nucleus of radioactive minerals like Uranium and Thorium. The energy released from the nuclear fission is used to heat water, the steam released from it is used to rotate a turbine which generates electricity. The important nuclear power projects are Tarapur (Maharashtra), (Rajasthan), Kalpakkam (Tamil Nadu), Narora (Uttar Pradesh), Kaiga (Karnataka), Rawatbhata near Kota and Kakarapara (Gujarat).

Question 2.(iii)

Name non-ferrous metal. Discuss their spatial distribution.

Answer:

India is poorly endowed with non-ferrous metallic minerals except bauxite and copper. Bauxite: Bauxite is found mainly in tertiary deposits and is associated with laterite rocks occurring extensively either on the plateau or hill ranges of peninsular India and also in the coastal tracts of the country. Bauxite is the ore for Aluminium. Odisha happens to be the largest producer of Bauxite. Kalahandi and Sambalpur are the leading producers.

The other two areas which have been increasing their production are Bolangir and Koraput. The patlands of Jharkhand in Lohardaga have rich deposits. Gujarat, Chhattisgarh, Madhya Pradesh and Maharashtra are other major producers. Bhavanagar, Jamnagar in Gujarat have the major deposits. Chhattisgarh has bauxite deposits in Amarkantak plateau while Katni-Jabalpur area and Balaghat in M.P. have important deposits of bauxite. Kolaba, Thane, Ratnagiri, Satara, Pune and Kolhapur in Maharashtra are important producers. Tamil Nadu, Karnataka and Goa are minor producers of bauxite Copper:

The Copper deposits mainly occur in Singhbhum district in Jharkhand, Balaghat district in Madhya Pradesh and Jhunjhunu and Alwar districts in Rajasthan. It is imperative for electrical industry. Minor producers of Copper are Agnigundala in Guntur District (Andhra Pradesh), Chitradurg and Hasan districts (Karnataka) and South Arcot district (Tamil Nadu).

Question 2.(iv)

What are non-conventional sources of energy?

Answer:

Non conventional sources of energy are those energy which have been recently put to use for commercial purpose. They are generally renewable and non polluting sources of energy. They have initial high cost of installation whereas their long time running cost is low and also they are environment friendly. Eg. Soar energy, wind energy, tidal and wave energy, geothermal energy and bioenergy.

3. Answer the following questions in about 150 words:

Question 3.(i)

Write a detailed note on the Petroleum resources of India.

Answer:

Crude petroleum consists of hydrocarbons of liquid and gaseous states varying in chemical composition, colour and specific gravity. It is an essential source of energy for all internal combustion engines in automobiles, railways and aircraft. Its numerous by-products are processed in petrochemical industries.

Crude petroleum occurs in sedimentary rocks of the tertiary period. Oil exploration and production was systematically taken up after the Oil and Natural Gas Commission was set up in 1956. Till then, the Digboi in Assam was the only oil producing region but the scenario has changed after 1956. In recent years, new oil deposits have been found at the extreme western and eastern parts of the country. In Assam, Digboi, Naharkatiya and Moran are important oil producing areas. The major oil fields of Gujarat are Ankaleshwar, Kalol, Mehsana, Nawagam, Kosamba and Lunej. Mumbai High which lies 160 km off Mumbai was discovered in 1973 and production commenced in 1976. Oil and natural gas have been found in exploratory wells in Krishna-Godavari and Kaveri basin on the east coast. According to a newspaper report (The Hindu, 05.09.2006) the Oil and Natural Gas Commission has found potential zones of natural gas reserves in Ramanathapuram district. The survey is still in the initial stages. The exact quantity of gas reserves will be known only after the completion of the survey. But the results are encouraging. Oil extracted from the wells is crude oil and contains many impurities. It cannot be used directly. It needs to be refined. There are two types of refineries in India:

(a) field based and

(b) market based. Digboi is an example of field based and Barauni is an example of market based refinery. There are 18 refineries in India.

Question 3.(ii)

Write an essay on hydel power in India.

Answer:

Hydel power is a renewable energy resource because it uses the Earth's water cycle to generate electricity. Water evaporates from the Earth's surface, forms clouds, precipitates back to earth, and flows toward the ocean. The movement of water as it flows downstream creates kinetic energy that can be converted into electricity. 2700 TWH is generated every year. Out of the total power generation installed capacity in India of 1,76,990 MW (June, 2011), hydel power contributes about 21.5%, i.e. 38,106 MW.

A capacity addition of 78,700 MW is envisaged from different conventional sources during 2007-2012 (the 11th Plan), which includes 15,627 MW from large hydro projects. In addition to this, a capacity addition of 1400 MW was envisaged from small hydro up to 25 MW station capacity. The total hydroelectric power potential in the country is assessed at about 150,000 MW, equivalent to 84,000 MW at 60% load factor. The potential of small hydro power projects is estimated at about 15,000 MW.

Technology: A hydroelectric power plant consists of a high dam that is built across a large river to create a reservoir, and a station where the process of energy conversion to electricity takes place. The first step in the generation of energy in a hydro power plant is the collection of run-off of seasonal rain and snow in lakes, streams and rivers, during the hydrological cycle. The run-off flows to dams downstream. The water falls through a dam, into the hydropower plant and turns a large wheel called a turbine.

The turbine converts the energy of falling water into mechanical energy to drive the generator. After this process has taken place electricity is transferred to the communities through transmission lines and the water is released back into the lakes, streams or rivers. This is entirely not harmful, because no pollutants are added to the water while it flows through the hydro power plant.

Potential in India: India is blessed with immense amount of hydro-electric potential and ranks 5th in terms of exploitable hydro-potential on global scenario. As per assessment made by CEA, India is endowed with economically exploitable hydro-power potential to the tune of 148700 MW of installed capacity. The basinwise assessed potential is as under:

Basin/rivers Probable	Installed Capacity (MW)
Indus Basin	33,832

Ganga Basin	20,711
Central Indian River system	4,152
Western Flowing Rivers of southern India	9,430
Eastern Flowing Rivers of southern India	14,511
Brahmaputra Basin	66,065
Total	1,48,701

In addition, 56 number of pumped storage projects have also been identified with probable installed capacity of 94000 MW. In addition to this, hydro-potential from small, mini and micro schemes has been estimated as 6782 MW from 1512 sites. Thus, in totality India is endowed with hydro-potential of about 250000 MW.

Installed Capacity: The total installed capacity of India is 36878 MW