CBSE Class 12 Geography
NCERT Solutions
Chapter 17
Mineral and Energy Resources

1. Choose the right answer of the following from the given options.

(i) In which one of the following states are the major oil fields located?

1. Assam
2. Bihar
3. Rajasthan
4. Tamil Nadu

Ans. (1) Assam

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

1. Kalpakkam
2. Narora
3. Rana pratap Sagar
4. Tarapur

Ans. (4) tarapur

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

1. Iron
2. Lignite
3. Manganese
4. Mica

Ans. (2) Lignite

(iv) Which one of the following is non-renewable sources of energy?

1. Hydel
2. Solar
3. Thermal
4. Wind power

Ans. (3) Thermal

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2. Answer the following questions in about 30 words.

(i) Give an account of the distribution of mica in India.

Ans. Mica in India is produced in Jharkhand, Andhra Pradesh and Rajasthan followed by Tamil Nadu, West Bengal and Madhya Pradesh.

1. In Jharkhand, high quality mica is obtained in a kelt extending over a distance of about 150 km, in length and about 22 km, in width in lower Hazaribagh plateau.
2. In Andhra Pradesh, Nellore district produces the mica of best quality.
3. In Rajasthan, mica belt extends for about 320 kms from Jaipur to Bhilwara and around Udaipur.
4. Mica deposits are also found in Mysore and Hasan districts of Karanataka, Coimbatore, Tiruchirapalli, Madurai and Kanyakumari in Tamil Nadu, Alleppey in Kerala, Ratnagiri in Maharashtra, Purulia and Bankura in West Bengal.

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

Ans.Nuclear power is the use of nuclear reactions that release nuclear energy to generate heat, which most frequently is then used in steam turbines to produce electricity in a nuclear power plant.

The important nuclear power projects are Tarapur (Maharashtra), Rawatbhata near Kota (Rajasthan), Kalpakkam (Tamil Nadu), Narora (Uttar Pradesh), Kaiga (Karnataka) and Kakarapara (Gujarat).

(iii) Name non-ferrous metal. Discuss their spatial distribution.

Ans. Bauxite, copper,lead and zinc, gold and silver are non-ferrous metals. India is poorly endowed with non-ferrous metallic minerals except bauxite.

Bauxite is the ore which is used in manufacturing of aluminium. Bauxite is found mainly in tertiary deposits.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.

The Copper deposits mainly occur in Singhbhum district in Jharkhand, Balaghat district in Madhya Pradesh and Jhunjhunu and Alwar districts in Rajasthan.Minor producers of Copper are Agnigundalai inGuntur District (Andhra Pradesh), Chitradurga and Hasan districts (Karnataka) and South Arcot district(Tamil Nadu).

(iv) What are non-conventional sources of energy?

Ans. Energy generated by using wind, tides, solar, geothermal heat, and biomass including farm and animal waste as well as human excreta is known as non-conventional energy. All these sources are renewable or inexhaustible and do not cause environmental pollution. Solar energy, wind energy, tidal and wave energy, geothermal energy, biomass are some of the important non conventional sources of energy.

3. Answer the following questions in about 150 words.

(i) Write a detailed note on the petroleum resources of India.

Ans. The word ‘petroleum’ has been derived from two Latin words Petra (meaning rock) and Oleum (meaning oil). Thus petroleum is oil obtained from rocks; particularly sedimentary rocks of the earth. Therefore, it is also called mineral oil.

Oil extracted from the oil wells is in its crude form and contains many impurities. It is refined in oil refineries before use. After refining, various products such as kerosene, diesel, petrol, lubricants,

bitumen, etc. are obtained. Although India's first oil refinery started working way back in 1901 at Digboi in Assam, it remained the only refinery in the whole of India for more than half a century.It was only in 1954 that another refinery at Tarapur (Mumbai) joined the lone refinery of Digboi. Since then oil refining in India has progressed at a rapid pace.

Oilfields of India are of two types, namely On-shore Oil-fields and Off-shore Oil-fields. The list of major Oil Fields in India are given below:

1. On-shore Oil-fields in North-Eastern India:

In Assam there are Digboi (oldest field, 1866), Naharkatiya, Moran, Rudrasagar, Galeki, Hugrijan, Angui and Lakwa fields.

There are oil-fields at Nigreu Oil-fields near Kharasang in Tirap district, in Arunachal Pradesh. In Nagaland oilfields are at Borholla on the border between Nagaland and Assam.

2. On-shore Oil-fields in Western India:

In Gujarat important fields are:

- Anklesh war (largest field in the Khambhat Basin),
- Kalol,
- Navagam ,
- Kosamba,
- Barkol,
- Dholaka,
- Mehsana,
- Kadi,
- Ahmedabad and
- Sanand fields.

3. On-shore Oil-fields in Southern India:

Godavari Basin, Kaveri Basin has become now a prospective oil-field of India. Oilfields are at Narimanam, Kovilappal, etc.

Off-shore Oil-fields is in the Mumbai High region, out in the Arabian Sea, 152 km north-west

of Mumbai City. The name of the rig installed here is Sagar Samrat.

As on 31 March 2016, India had estimated crude oil reserves of 621.10 million tonnes, declining by 2.28% from the previous year. The largest reserves are found in the Western Offshore (39.79%), and Assam (25.89%).

The Indian Strategic Petroleum Reserve (ISPR) is an emergency fuel store of total 5 MMT (million metric tons) or 36.92 Mmbbl of strategic crude oil enough to provide 10 days of consumption which are maintained by the Indian Strategic Petroleum Reserves Limited.

Strategic crude oil storages are at 3 underground locations in Mangalore,Vishakhapatnam and Padur near Udupi are located on the east and west coasts of India are readily accessible to the refineries.

India produced 36.95 MTs of crude petroleum in 2015-16. Production of crude petroleum in India had a CAGR of 0.84% between 2006-07 and 2015-16.

As on 31 March 2016, there were 23 crude oil refineries in India, of which 18 were state-owned, 3 were privately owned and 2 were joint ventures. The total oil refining capacity in India stood at 230 MMT, rising from 215 MT the previous year. Refineries in India processed 232.865 MMT of oil in 2015-16 achieving a capacity utilization of 101.2%. With a total refining capacity of 69.2 MMTY, the state-owned Indian Oil Corporation was the largest refiner in the country. Indian Oil's refineries processed 58.007 MMT of crude oil in 2015-16.

(ii) Write an essay on hydel power in India.

Ans. Hydro power is considered as one of the most economic and non polluting sources of energy. Power generated from water is termed as Hydroelectricity. Hydro electricity means electricity generated by hydropower or from the use of the gravitational force of falling or flowing water. One of the most common forms of power generation since this form of energy neither produces any direct waste matter nor is subjected to exhaustion.

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.

India is the 7th largest producer of hydroelectric power in the world. As of 30 April 2017, India's installed utility-scale hydroelectric capacity was 44,594 MW or 13.5% of its total utility power generation capacity. Additional smaller hydroelectric power units with a total capacity of 4,380 MW (1.3% of its total utility power generation capacity) have been installed.India's hydroelectric power potential is estimated at 84,000 MW at 60% load factor. In the fiscal year 2016-17, the total hydroelectric power generated in India was 122.31 TWh (excluding small hydro) with an average capacity power of 33%.

The hydroelectric power plants at Darjeeling and Shivanasamundram were established in 1898 and 1902, respectively. They were among the first in Asia and India has been a dominant player in global hydroelectric power development.India also imports surplus hydroelectric power from Bhutan.

India's economically exploitable and viable hydroelectric potential is estimated to be 148,701 MW.An additional 6,780 MW from smaller hydro schemes (with capacities of less than 25 MW) is estimated as exploitable. 56 sites for pumped storage schemes with an aggregate installed capacity of 94,000 MW have also been identified.

The public sector accounts for 92.5% of India's hydroelectric power production. The National Hydroelectric Power Corporation(NHPC), Northeast Electric Power Company(NEEPCO), Satluj Jal Vidyut Nigam (SJVNL), THDC, and NTPC- hydro are some of the public sector companies producing hydroelectric power in India. The private sector is also expected to grow with the development of hydroelectric energy in the Himalayan mountain ranges and in the northeast of India.Indian companies have also constructed hydropower projects in Bhutan, Nepal, Afghanistan and other countries.

Bhakta Bea's Management Board(BBMB), a state-owned enterprise in north India, has an installed capacity of 2.9 GW.The generation cost after four decades of operation is about 27 paise (0.42¢ US) per kWh. BBMB is a major source of peaking power and black start capability to the northern grid in India and it's large reservoirs provide wide operational flexibility.

India has transformed from an electricity deficit state to an electricity surplus state. Peak load shortages can be met making use of pumped storage schemes which store surplus power to meet peak load demands. The pumped storage schemes also contribute secondary,

seasonal power at no additional cost when rivers are flooded with excess water. India has already established nearly 4,800 MW pumped storage capacity with the installation of hydropower plants.

Many of the existing hydro power stations on the west-flowing rivers located in the Western Ghats of Kerela and Karnataka are to be expanded to include pumped storage units in an effort to solve the water deficit of east-flowing rivers like the Kaveri, the Krishna, etc.

Some of the large hydro-electric power projects are:

1. Damodar Valley Project — Bihar & W. Bengal
2. Bhakra-Nangal Project — Punjab.
3. Hirakud Project — .Orissa
4. Chambal Project — M.P.
5. Ukai Project — Gujarat
6. Ramganga Project — U.P.
7. Parambikulam — Aliyar — Tamil Nadu.
8. Tunga-Bhadra Project — Karnataka — A.P.

\9. NagarjunSagar Project — Tamil Nadu

10. Mettur Project — Tamil Nadu
11. Idukki Project — Kerala
12. Bhibpuri and Khopli Project — Maharashtra.

These hydro-electric projects have helped in developing industrial and agricultural production. Electricity has been supplied for domestic uses almost throughout the country. It is being used for running trains.

In short, the development of hydro- electricity has revolutionised the economic landscape of the country.