

CHAPTER -3

COAL AND PETROLEUM

EXERCISES

1 Mark Questions

Q1: Name the petroleum product used for surfacing of roads.

Answer: Bitumen

Q2: What is the slow process of conversion of dead vegetation into coal called?

Answer: Carbonisation.

Q3: Explain why fossil fuels are exhaustible natural resources.

Answer: Fossil fuels are exhaustible natural resources because they will be exhausted by human activities as they are limited in nature

.Q4: What are natural resources?

Answer: Material obtained from nature is called natural resources.

.Q5: Classify the following as exhaustible and inexhaustible natural resources- air, sunlight, water, forests, wildlife, and coal.

Answer: Exhaustible resources – forests, wildlife, coal
Inexhaustible resources – air, sunlight, water.

Q6: Define carbonization

Answer: The slow process of conversion of dead vegetation into coal is called carbonization.

.Q7: What name is given to the process of heating a substance in absence of air?

Answer: Destructive Distillation.

.Q8: How is coke obtained?

Answer: Coke is obtained by heating coal in the absence of air.

2 Mark Questions

Q1: Describe how coal is formed from dead vegetation. What is this process called?

Answer: Millions of years ago, trees, plants, ferns and forests got buried below the rocks, soil and sand due to natural processes like flooding, earthquake, etc. Slowly, as more soil deposited over them, they were compressed. This led to the conditions of high pressure and heat. These conditions along with the anaerobic conditions turned the carbon-enriched organic matter of wood into coal. This slow process of conversion of wood into coal is called carbonisation.

Q2: What are the advantages of using CNG and LPG as fuels?

Answer:

The advantages of using CNG and LPG as fuels are:

- They burn with a smokeless flame and so do not cause any pollution.
- They leave no ash on burning.
- They are easy to handle and convenient to store.

Q3: Explain why fossil fuels are exhaustible natural resources.

Answer: Fossil fuels take millions of years to be formed. They are limited in nature and cannot be replenished easily, once consumed. Hence, they are considered as exhaustible natural resources.

Q4: Describe the characteristics and uses of coke.

Answer: Characteristics of coke: Coke is 98% pure carbon. It is a tough, porous and black substance. It produces a very little smoke.

Uses of coke: Coke is very useful as fuel. It is a good reducing agent. It is widely used in metallurgical processes to reduce metals from their oxides. It is used for producing water gas.

Q5: Explain the process of the formation of petroleum.

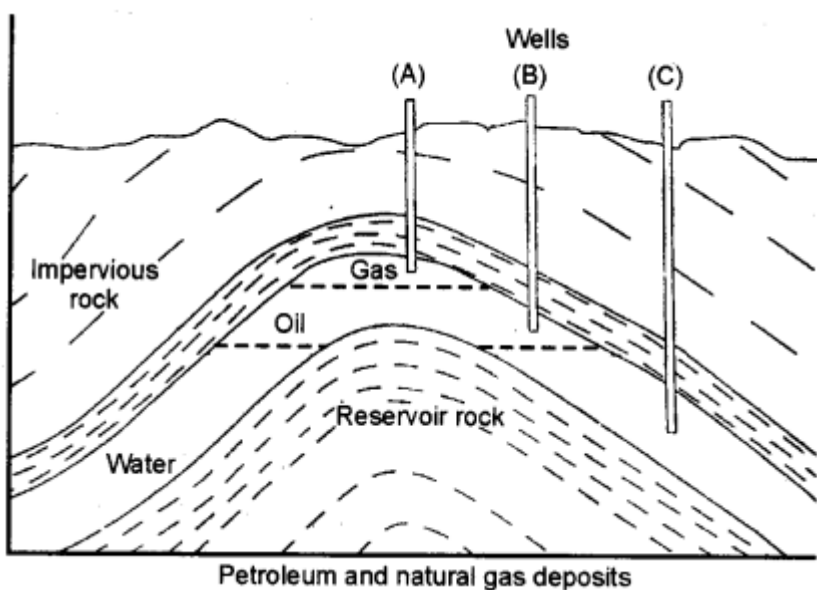
Answer: Petroleum is formed by the burial of aquatic plants and animals below the sea bed. The marine animals and plants died thousands of years ago and settled down in the bottom of sea. In anaerobic conditions, microorganisms decompose this organic matter. Due to high pressure and heat, the dead remains of tiny plants and animals were slowly converted into petroleum.

Q6: Define the term fossil fuel. Name two fossil fuels.

Answer: Fossil fuels are formed from dead remains of living matter over millions of years when they remained buried under the earth. Coal and petroleum are two fossil fuels.

Q7: Draw diagram to show petroleum and natural gas deposit.

Answer:



Q8: What is meant by fractional distillation? What is the principle on which it is based?

Answer: Petroleum is mixture of various hydrocarbons having different boiling points. As the number of carbon atoms increase, the boiling point also increases. This property is used to separate the different components of petroleum and is known as fractional distillation.

Q9: Give two advantages of judicious use of energy?

Answer:

The advantages of judicious use of energy are:

- It will delay the energy crisis.
- It will give the scientists more time to develop more efficient alternate sources of energy.

Q10: What are 'Petrochemicals'? Give the uses of petrochemicals obtained from petroleum.

Answer:

Petrochemicals are useful substances obtained from petroleum. They are used in the manufacture of detergents, fibers, polyethylene and other plastics.

5 Mark Questions

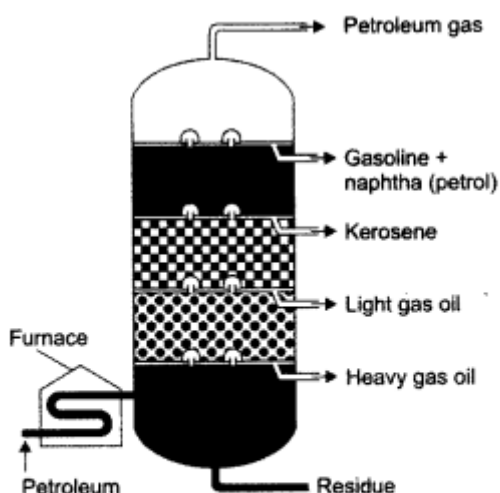
Q1: Name the agency in India who advises people how to save petrol/diesel. What tips are given by them?

Answer: In India, the Petroleum Conservation Research Association (PCRA) advises people how to save petrol/diesel while driving.
Their tips are:

- Drive at a constant and moderate speed.
- Switch off the engine at traffic lights.
- Ensure correct type pressure.
- Ensure regular maintenance of the vehicle.

Q2: Draw a labeled diagram showing the fractional distillation of petroleum. Give the uses of any three fractions.

Answer:



Fractional distillation of Petroleum

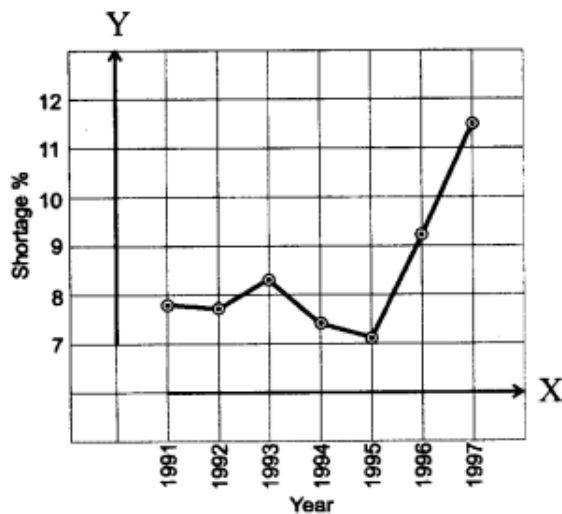
Uses:

- Petrol is used as motor fuel, airtion fuel and as solvent for drycleaning.
- Kerosene is used as fuel at home and in jet aircrafts.
- Diesel is used as fuel for heavy motor vehicles and electric generators.

Q3: The following Table shows the total power shortage in India from 1991–1997. Show the data in the form of a graph. Plot shortage percentage for the years on the Y-axis and the year on the X-axis

S. No.	Year	Shortage (%)
1	1991	7.9
2	1992	7.8
3	1993	8.3
4	1994	7.4
5	1995	7.1
6	1996	9.2
7	1997	11.5

Answer:



Q4: Why do we need to use coal and petroleum judiciously?

Answer: Coal and petroleum have been produced using large amounts of biomass trapped in the earth under great temperature, pressure, and anaerobic conditions. Such situations develop only rarely, like a big upheaval on earth.

– At present, there is no more coal or petroleum being formed. All that is available was formed millions of years ago. Being a rich energy source, coal and petroleum are being consumed in ever-increasing enormous amounts in the industry, transport, kitchens, etc.

– If this trend continues, soon they will be exhausted. Therefore, they must be conserved and protected by developing more efficient machines and hybrid engines and using hydrogen as a fuel. It is correct that both these natural resources, coal and petroleum, are produced by the biodegradation of plants and animal wastes, but it takes thousands of years to form.

– This is why we need to conserve them for future generations, as we are using them much faster than the rate at which these natural resources are formed.

– We should use them judiciously because-

They are an important source of fuel. Petroleum products like petrol, diesel, etc., are used as fuel in automobiles.

Coal is used in various thermal power plants to generate electricity and as fuel for domestic purposes.

Q5: Explain the use of coal and its products.

Answer:

Uses of coal:

i) Coal is one of most widely used fuel to cook food.

ii) Earlier, it was in use for railway engines for production of steam to run the engine.

iii) It is used in thermal power plants for electricity production.

iv) Coal is used as a fuel in various industries and power plants.

v) Coke is used in the manufacture of steel and the extraction of metals.

vi) Coal gas is used as a fuel in many industries near coal processing plants.

vii) Products obtained from coal tar are used as starting materials for manufacturing various substances used in everyday life and industry, like synthetic dyes, drugs, explosives, perfumes, plastics, paints, photographic materials, roofing materials, etc.

Fill in the blanks

1. Fossils fuels are _____, _____ and _____

Answer: coal, petroleum, natural gas

2. Process of separation of different constituents from petroleum is called _____

Answer: refining

3. Least polluting fuel for vehicle is _____

Answer: CNG

4. The resources that we get from the nature are called _____.

Answer: Natural Resources

5. All types of coal are depended on the _____ of their carbon mixture.

Answer: Percentage

6. The refining of petroleum is a process of separating _____ into usable components.

Answer: Crude Oil

Multiple Choice Questions

1. Which type of coal is dark brown in color and formed due to the death and decaying matter of plants?

- (a) Lignite
- (b) Peat
- (c) Anthracite
- (d) Bituminous

Answer: (b) Peat

2. Which of the following is formed by the process of destructive distillation?

- (a) Petrol
- (b) Kerosene
- (c) Coal tar
- (d) Diesel

Answer: (c) Coal tar

3. What is the boiling point of Naphtha in a Fractionating Column?

- (a) 100- 125°C
- (b) >40°C
- (c) >80°C
- (d) 125- 175°C

Answer: (d) 125- 175°C

4. What do we call the process of converting dead vegetation into coal?

- (a) Carbonization
- (b) Destructive Distillation
- (c) Fractional Distillation
- (d) Ammoniac Liquor

Answer: (a) Carbonization

5. Which type of coal is used to obtain drugs, pesticides and perfumes etc.?

- (a)Coke
- (b)Coal gas
- (c)Ammoniac Liquor
- (d)Coal tar

Answer: (d) Coal tar

True/False

Tick True/False against the following statements:

1. Fossil fuels can be made in the laboratory. (T/F)
2. CNG is more polluting fuel than petrol. (T/F)
3. Coke is almost pure form of carbon. (T/F)
4. Coal tar is a mixture of various substances. (T/F)
5. Kerosene is not a fossil fuel. (T/F)

Answer:

1. False
2. False
3. True
4. True
5. False

SUMMARY

Natural Resources: The resources that are obtained from nature are called natural resources, for example, air, water, soil and minerals.

Inexhaustible Natural Resources: The resources, that are present in unlimited quantity in nature, and cannot be exhausted by human activities, for example, air, sunlight etc.

Exhaustible Natural Resources: The resources, that are present in limited quantity in nature, and can be exhausted by human activities, for example, coal, petroleum, minerals, forests etc.

Fossil: The remains of the part of plants or animals transformed over time, is called fossil.

Some exhaustible natural resources from the dead remains of living organisms are known as fossil fuels, for example, coal, petroleum and natural gas.

Coal is a fossil fuel that was formed by the decay of vegetation, which existed millions of years ago. It is a non-crystalline form of carbon.

Carbonization: The slow process of conversion of dead vegetations into coal is called carbonization.

Coke is an amorphous form of carbon, which is harder and denser than charcoal and is used as a fuel. It is obtained by heating soft coal in the absence or little supply of air. It is black in color. It is used in the manufacture of steel.

- Fossil fuels were formed from the dead remains of living organisms millions of years ago. And they are exhaustible resources. Examples are Coal, petroleum and natural gas
- Coke, coal tar and coal gas are the products of coal.
- Petroleum gas, petrol, diesel, kerosene, paraffin wax, lubricating oil are obtained by refining petroleum.