CHEMISTRY

BOOKS - MTG IIT JEE FOUNDATION

COAL AND PETROLEUM

Illustrations

1. What are fossil fuels ? Give one example.

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2. How are the fossils converted into fuels?

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3. Define carbonisation.

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4. List some important uses of coal in modern days.

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5. Why is petroleum refined?

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6. Describe characteristics and uses of coke.

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7. What can you say about the boiling point of the liquids which collect at the bottom as

residue in fractionating column?

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8. Why do different gases condense to liquids on different trays in the fractionating column?

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9. What happens to the temperature inside the column starting at the bottom and going to the top?

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10. What are the harmful products formed by burning fossil fuels?

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Solved Examples

1. What is coal tar? What are its uses?

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2. What are renewable and non-renewable resource ? Give one example of each.

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3. How do natural resources maintain a balance in nature?

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4. What are the different types of coal. Describe briefly

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5. Why should coal and petroleum be conserved?

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6. Classify the natural resources on the basis of their availability.

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7. What is a refinery? What is meant by refining of petroleum?

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8. How is coke formed ? Give two uses of coke.

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9. Briefly explain : Water gas

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10. Briefly explain : Producer gas

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11. What are petrochemicals? What are their uses?

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12. How does coal mining affect the environment?

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13. What is global warming?

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14. Is coke a better fuel than coal?

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15. Suggest some ways to conserve coal and petroleum

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16. Are all natural resources inexhaustible?

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Ncert Section

1. What are the advantages of using CNG and LPG as fuels?

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2. Name the petroleum product used for surfacing of roads.

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

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4. Fossil fuels are ..... and .....

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5. Process of separation of different constituents from petroleum is called .....

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6. Tick true/false against the following statements.

Coke is almost pure form of carbon.

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7. Tick true/false against the following statements.

Kerosene is not a fossil fuel.

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8. Explain why fossil fuels are exhaustible natural resources.

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9. Describe characteristics and uses of coke.

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10. Explain the process of formation of petroleum

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11. 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

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Exercise Multiple Choice Question Level 1

1. Natural gas has the main component as

A. carbon dioxide

B. hydrogen

C. methane

D. carbon monoxide.

Answer: C

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2. Out of the following fractions of petroleum, the one having the lowest boiling point is

A. kerosene

B. diesel oil

C. gasoline

D. heavy oil.

Answer: C

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3. The source of kerosene is

A. coal tar

B. wood

C. crude petroleum

D. coal

Answer: C

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4. The gas which is present in the coal mines and is the cause of explosion in coal mines is

A. methane

B. carbon monoxide

C. hydrogen

D. carbon dioxide

Answer: A

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5. Which of the following fuels is expected to last longest?

A. Wood

B. Coal

C. Petroleum

D. Natural gas

Answer: A

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6. Which of the following is true?

A. Our demand for energy has decreased over the years.

B. We must use fossil fuels sparingly.

C. Coal as a fuel will last forever.

D. Fossil fuels do not create any pollution.

Answer: B

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7. Which of the following is a greenhouse gas?

A. Carbon dioxide

B. Carbon monoxide

C. Hydrogen

D. Nitrogen

Answer: A

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8. Coke is not used in the preparation of

A. $CO + H_2$

B. $CO + N_2$

C. iron

D. diamond

Answer: D

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9. Water gas is a mixture of

A. $CO + N_2$

B. $CO + H_2$

C. $CO + CO_2$

D. $CO + N_2 + H_2$

Answer: B

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10. LPG is a mixture of

A. methane and ethane

B. methane and propane

C. propane and butane

D. methane and butane.

Answer: C

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11. Mark the incorrect statement.

A. CNG and LPG are clean fuels.

B. Petroleum is refined in a petroleum refinery.

C. Petroleum products are called petrochemicals.

D. Coal does not cause any pollution when burnt.

Answer: D

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12. Which gas is produced when coal burns in air?

A. Carbon dioxide

B. Oxygen

C. Nitrogen

D. Hydrogen

Answer: A

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13. Coke, coal gas and coal tar are products of

A. destructive distillation of wood

B. destructive distillation of coal

C. dissolving the coal in water

D. burning wood in air.

Answer: B

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14. Synthetic polymers, paints and plastics are obtained from

A. petrochemicals

B. condensed chemicals

C. volatile chemicals.

D. none of these.

Answer: A

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15. Black soot which is deposited on kerosene lamps after burning is called

A. coke

B. lampblack

C. gas carbon

D. charcoal.

Answer: B

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16. Crude petroleum is also called

A. black gold

B. yellow gold

C. brown gold

D. white gold.

Answer: A

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17. Mark the incorrect statement.

A. Burning of coal in a sufficient amount of oxygen produces carbon dioxide.

B. When coal burns in insufficient amount of oxygen, carbon monoxide is formed.

C. Charcoal is a better fuel than kerosene to be used as fuel for cooking at home.

D. LPG is considered to be a good fuel for domestic use.

Answer: C

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18. Name the fossil fuel which is mostly found in Tripura, Rajasthan, Maharashtra and in Krishna Godavari delta.

A. (i) and (ii) only

B. (i), (ii) and (iii) only

C. (i), (ii), (iii) and (iv)

D. (i), (ii) and (iv) only

Answer: C

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19. Petrol is used as a fuel in light automobiles such as motorcycles, scooters and cars while heavy vehicles like trucks and tractors run on

A. diesel

B. fuel oil

C. lubricating oil

D. petroleum gas.

Answer: A

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20. Coal is used in generating electricity in a

A. nuclear power station

B. thermal power station

C. hydro power station

D. geothermal power station.

Answer: B

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21. Which of the following is not a petroleum product?

A. Petrol

B. Paraffin wax

C. Bees wax

D. Kerosene

Answer: C

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22. Different varieties of coal differ in their

A. moisture

B. volatile nature

C. carbon content

D. number of hydrogen atoms

Answer: C

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23. Which form of coal contains the highest carbon content?

A. Anthracite

B. Peat

C. Lignite

D. All have same carbon content

Answer: A

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24. Which of the following will be obtained first from the fractional distillation of crude oil?

A. Bitumen

B. Lubrication oil

C. Kerosene

D. Fuel gas

Answer: D

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25. Which of the following forms of energy is environmental friendly?

A. Coal

B. Petroleum

C. Wind

D. Peat

Answer: C

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26. Which of the following products is not obtained from fossil fuels?

A. Coal

B. Coke

C. Coal tar

D. Wood

Answer: D

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27. Fossils can be best explained as

A. the remains of dead plants and animals buried under the rocks

B. the remains of plants buried in sand

C. the remains of animals buried in soil

D. the bodies of dead animals and plants.

Answer: A

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28. Mark the correct statement.

A. Fossil fuels can be made in laboratory.

B. CNG is more polluting than petrol.

C. Petroleum is a mixture of various oxides of carbon.

D. Coal tar is a mixture of various substances.

Answer: D

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29. Besides the risk of pollution, fossil fuels also pose a risk of

A. global warming

B. water pollution

C. leakage

D. explosion.

Answer: A

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30. Which petrochemical is used for making ointment and vaseline?

A. Lubricating oil

B. Paraffin wax

C. Bitumen

D. Fuel oil

Answer: B

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Exercise Multiple Choice Question Level 2

1. Which of the following sources of energy can be a good alternative to coal in a power station?

(i) Geothermal energy (ii) Energy from water (iii) Energy from petrol (iv) Energy from plants

A. (i) and (ii) only

B. (iv) only

C. (i), (ii) and (iii) only

D. All of the above

Answer: A

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2. Which amongst the following is not a free state of carbon?

A. Coke

B. Charcoal

C. Petrol

D. Graphite

Answer: C

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3. $C_{12}H_{22}O_{11} \xrightarrow[H_2SO_4]{\text{Conc.}} 12C + 11H_2O$

Which of the following obtained in the above reaction?

A. Animal charcoal

B. Sugar charcoal

C. Coke

D. Wood charcoal

Answer: B

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4. Ethyl mercaptan is added to LPG

A. to give colour to it

B. to give volume to it

C. to give smell to it

D. to make it liquid.

Answer: C

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5. Read the following statements and mark the correct ones from the given options.

(i) Coal, petroleum and natural gas are called fossil fuels.

(ii) Coal and natural gas are two exhaustible substances.

(iii) Coke is used in manufacture of steel.

(iv) Fossil fuels are present in limited quantities.

A. (i) and (ii)

B. (i) and (iv)

C. (i), (ii) and (iii)

D. (i), (ii), (iii) and (iv)

Answer: D

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6. Coal is mainly carbon, also having some other elements like

A. oxygen, hydrogen, nitrogen and sulphur

B. chlorine, nitrogen, sulphur and helium

C. sulphur, phosphorus, iodine and oxygen

D. bromine, nitrogen, phosphorus and hydrogen.

Answer: A

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7. Butane gas is used for filling cylinders to be used as LPG because

A. it is easily available

B. it is easily compressed into a liquid and stored in cylinders

C. it is stored in gaseous state only in the cylinder

D. it is the cheapest gas available.

Answer: B

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8. Arrange the following liquids in decreasing order of boiling points : coal tar, fuel oil, kerosene, petrol

A. coal tar $>$ fuel oil $>$ kerosene $>$ petrol

B. fuel oil $>$ kerosene $>$ petrol $>$ coal tar

C. kerosene > petrol > coal tar > fuel oil

D. petrol > coal tar > fuel oil > kerosene

Answer: A

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9. P is processed in industries to get some useful products such as Q, R and S. S is obtained during the processing of P to get Q,

R is a mixture of about 200 substances. Identify P, Q, R and S.

A. P-Coal , Q-Coal tar , R-Coke , S-Coal gas

B. P-Coke , Q-Coal , R-Coal tar , S-Coal gas

C. P-Coal , Q-Coke , R-Coal tar , S-Coal gas

D. P-Coke , Q-Coal , R-Coal gas , S-Coal tar

Answer: C

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10. Y is formed when X is heated in absence of air. Y is tough, porous and black substance. Both X and Y are carbon-rich materials. What could X and Y be?

A. X = Coal, Y = Coke

B. X = Petroleum, Y = Petrol

C. X = Coal, Y = Coal tar

D. X = Petroleum, Y = Diesel

Answer: A

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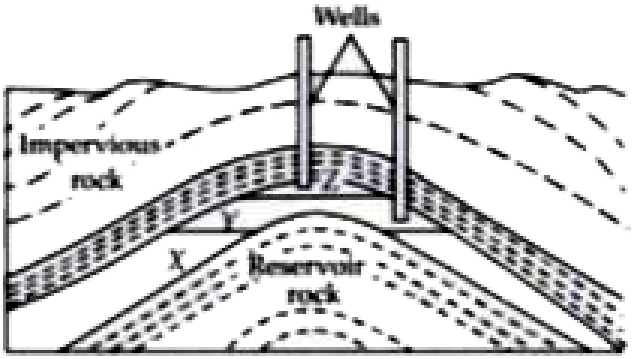
11. What are X, Y and Z?



A. X-Water , Y-Oil , Z-Gas

B. X-Oil , Y-Water , Z-Gas

C. X-Water , Y-Gas , Z-Oil

D. X-Gas , Y-Oil , Z-Water

Answer: A

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12. Which of the following are the constituents of petroleum?

A. Diesel, paraffin

B. CNG, coal tar

C. Coal tar, bitumen

D. Kerosene, coal gas

Answer: A

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13. Identify the sequence and components of crude oil after fractional distillation of

petroleum.

A. p-Residue, q-Gasoline, r-Petroleum gases, s-Kerosene, t-Diesel oil

B. p-Petroleum gases, q-Gasoline, r-Diesel oil, s-Kerosene, t-Residue

C. p-Petroleum gases, q-Gasoline, r-Kerosene, s-Diesel oil, t-Residue

D. p-Petroleum gases, q-Kerosene, r-Gasoline, s-Diesel oil, t-Residue

Answer: C

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14. The gaseous fuels

1. burn without producing smoke

2. have low calorific value

3. are easy to ignite

4. have high calorific value

Select the correct alternative.

A. 1 and 2

B. 2 and 3

C. 3 and 4

D. 4 and 2

Answer: C

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15. Coal is a fossil fuel and it cannot be prepared in a laboratory or industry because the formation of coal

1. is a very slow process

2. need very low pressure and low temperature

3. need very high pressure and high temperature

4. causes air pollution

Select the correct alternative.

A. 1 and 2

B. 2 and 4

C. 1 and 3

D. 4 and 3

Answer: C

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16. Consider the following statements.

1. Natural gas can be supplied to homes and factories through pipes.

2. Natural gas is obtained by fractional distillation of crude oil.

3. Natural gas is a cleaner fuel because on burning only water is produced.

4. Natural gas is an exhaustible source of energy like fossil fuels.

Which alternative has the correct statements?

A. 1 and 3

B. 2 and 3

C. 1 and 4

D. 1, 3 and 4

Answer: D

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17. ..... is renewable source of energy.

A. Coal

B. Oil

C. Diesel

D. Biodiesel

Answer: D

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18. Name the petroleum product which is commonly used for electric generators.

A. petrol

B. diesel

C. LPG

D. lubricating oil.

Answer: B

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19. The coal gas is

A. $H_2 + CO + C_2H_5OH + C_6H_6$

B. $H_2 + CO_2 + CCl_4 + C_6H_6$

C. $H_2 + CO + CH_4 + C_2H_4 + C_2H_2$

D.

$$H_2 + CO_2 + CH_3OH + C_2H_4 + C_2H_2$$

Answer: C

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20. Read the following statements carefully and identify X, Y and Z.

X : Hard as stones, used to cook food and to produce electricity in thermal power plants

Y : A petroleum product, used in place of coal tar for metalling the roads

Z: A pure form of carbon, used in the manufacture of steel and in the extraction of many metals

A. X-Coal , Y-Bitumen , Z-Coke

B. X-Coal tar , Y-Coal , Z-Paraffin wax

C. X-Coal tar , Y-Diesel , Z-Coke

D. X-Coke , Y-Bitumen , Z-Coal

Answer: A

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Exercise Match The Following Level 2

1. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is

correct.

List-I	List-II
(P) Coke	1. Petroleum, natural gas
(Q) Lampblack	2. Global warming
(R) Fossil fuels	3. Smokeless fuel
(S) Carbon dioxide	4. Soot deposited in kerosene lamps

A. P-1,Q-4,R-2,S-3

B. P-2,Q-3,R-4,S-1

C. P-3,Q-4,R-1,S-2

D. P-3,Q-1,R-2,S-4

Answer: C

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2. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

List-I	List-II
(P) Kerosene	1. Road surfacing
(Q) Paraffin wax	2. Fuel for vehicles
(R) Bitumen	3. Manufacturing candles
(S) Gasoline	4. Jet engine fuel

A. P-2,Q-4,R-3,S-1

B. P-3,Q-2,R-4,S-1

C. P-4,Q-2,R-1,S-3

D. P-4,Q-3,R-1,S-2

Answer: D

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3. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is

correct.

List-I		List-II
(P) Water gas	1.	Fuel for vehicles
(Q) Producer gas	2.	$CO + H_2$
(R) Compressed natural gas	3.	$CO + N_2$
(S) Liquefied petroleum gas	4.	Household fuel

A. P-2,Q-3,R-1,S-4

B. P-3,Q-4,R-2,S-1

C. P-4,Q-3,R-1,S-2

D. P-2,Q-1,R-4,S-3

Answer: A

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4. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

List-I	List-II
(P) Peat	1. 98% carbon
(Q) Lignite	2. 80% carbon
(R) Anthracite	3. 70% carbon
(S) Lampblack	4. 60% carbon

A. P-4,Q-2,R-1,S-3

B. P-4,Q-3,R-2,S-1

C. P-1,Q-2,R-4,S-3

D. P-3,Q-1,R-2,S-4

Answer: B

5. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is

correct.

List-I		List-II
(P) Fossil fuel	1.	Oil well
(Q) Coke (carbon)	2.	Methane
(R) Coal mining	3.	Steel
(S) Petroleum extraction	4.	Coal

A. P-2,Q-3,R-4,S-1

B. P-3,Q-4,R-2,S-1

C. P-4,Q-2,R-3,S-1

D. P-4,Q-3,R-2,S-1

Answer: D

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6. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

List-I	List-II
(P) Coal	1. Fuel for vehicles
(Q) Water in a dam	2. Thermal power station
(R) CNG	3. Hydroelectric power station
(S) Wind	4. Domestic fuel
(T) LPG	5. Wind mill

A. P-1,Q-2,R-3,S-4,T-5

B. P-2,Q-3,R-5,S-4,T-1

C. P-2,Q-3,R-1,S-5,T-4

D. P-3,Q-1,R-2,S-5,T-4

Answer: C

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7. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is

correct.

List-I	List-II
(P) Present in Natural gas	1. CO_2
(Q) Carbon dioxide gas	2. CH_4
(R) Present in chalk, marble and limestone	3. Obtained by heating sodium bicarbonate
(S) Used as 'dry ice'	4. Carbon, oxygen and calcium.

A. P-2,Q-3,R-1,S-4

B. P-2,Q-3,R-4,S-1

C. P-3,Q-2,R-1,S-4

D. P-1,Q-3,R-4,S-2

Answer: B

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8. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

List-I	List-II
(P) Paraffin wax	1. Domestic fuel
(Q) Petrol	2. Used for manufacturing steel
(R) LPG	3. Candles
(S) Coke	4. Aviation fuel

A. P-1,Q-2,R-3,S-4

B. P-2,Q-1,R-3,S-4

C. P-4,Q-3,R-1,S-2

D. P-3,Q-4,R-1,S-2

Answer: D

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9. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is

correct.

List-I (fraction of petroleum)	List-II (main uses)
(P) Kerosene	1. Metalling of roads
(Q) Diesel	2. Jet aircraft fuel
(R) Paraffin wax	3. Generation of electricity
(S) Bitumen	4. Lubricants

A. P-1,Q-2,R-3,S-4

B. P-1,Q-3,R-4,S-2

C. P-2,Q-3,R-4,S-1

D. P-4,Q-2,R-3,S-1

Answer: C

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10. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

List-I	List-II
(P) Coke	1. Black, thick liquid with an unpleasant smell
(Q) Coal tar	2. Obtained during the processing of coal to get coke
(R) Coal gas	3. Almost pure form of carbon
(S) Coal	4. Hard as stone and black in colour

A. P-1,Q-2,R-3,S-4

B. P-1,Q-3,R-2,S-4

C. P-3,Q-1,R-2,S-4

D. P-3,Q-4,R-2,S-1

Answer: C

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Exercise Assertion Reason Level 2

1. Assertion : Sugar charcoal is prepared by dehydration of sugar.

Reason : Sulphuric acid is a dehydrating agent.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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2. Assertion: Anthracite is the purest form of coal.

Reason: It contains about 50% of carbon.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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3. Assertion : CNG and LPG are clean fuels.

Reason : They do not leave any residue on burning.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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4. Assertion : Petroleum or crude oil pumped out of oil well is not pure.

Reason : Petroleum is refined to get various fractions which can be used for a specific purpose.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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5. Assertion : The temperature increases inside the fractionating column on going form bottom to the top.

Reason : The column is not heated at the bottom.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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6. Assertion : Petrol is more volatile than diesel oil.

Reason : Petrol condenses near the top of the column than diesel oil.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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7. Assertion : Charcoal does not produce any smoke.

Reason : Charcoal contains only carbon.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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8. Assertion : Many industries burn coal to heat their furnaces.

Reason : The burning of coal produces smoke which causes air pollution.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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9. Assertion : Air and sunlight are inexhaustible natural resources.

Reason : Air and sunlight are present in unlimited quantity in nature.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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10. Assertion : Kerosene is a fossil fuel.

Reason : Kerosene is not obtained as a fraction of fractional distillation of petroleum.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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Exercise Comprehension Level 2

1. When superheated steam is passed through white hot coke, it gets reduced to a mixture of X and Y. Y is a highly inflammable gas. The mixture of X and Y is named as Z.

Identify the mixture Z.

A. Producer gas

B. Water gas

C. Coal gas

D. Natural gas

Answer: B

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2. When superheated steam is passed through white hot coke, it gets reduced to a mixture of X and Y. Y is a highly inflammable gas. The mixture of X and Y is named as Z.

Identify X.

A. NO_2

B. CO

C. SO_2

D. CO_2

Answer: B

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3. When superheated steam is passed through white hot coke, it gets reduced to a mixture of X and Y. Y is a highly inflammable gas. The

mixture of X and Y is named as Z.

Identify Y.

A. CO_2

B. SO_2

C. H_2

D. NO_2

Answer: C

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4. LPG is obtained during the process of oil refining. It is compressed under high pressure and supplied to households in cylinders in a liquid form. CNG is obtained along with the mixture of different fuels which is extracted from oil well. CNG is also sold in cylinders, compressed into a liquid form.

What do letters LPG stand for?

A. Liquid photochemical gas

B. Liquid petrochemical gas

C. Liquefied petroleum gas

D. Liquefied petrochemical gas

Answer: C

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5. LPG is obtained during the process of oil refining. It is compressed under high pressure and supplied to households in cylinders in a liquid form. CNG is obtained along with the mixture of different fuels which is extracted from oil well. CNG is also sold in cylinders,

compressed into a liquid form.

What do letters CNG stand for?

A. Carbon and nitrogen gas

B. Compressed nitrogen gas

C. Coal and natural gas

D. Compressed natural gas

Answer: D

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6. LPG is obtained during the process of oil refining. It is compressed under high pressure and supplied to households in cylinders in a liquid form. CNG is obtained along with the mixture of different fuels which is extracted from oil well. CNG is also sold in cylinders, compressed into a liquid form.

Mark the correct statement.

A. LPG burns in liquid form in the kitchen.

B. LPG is mainly used in vehicles.

C. CNG is mainly used to run the vehicles.

D. LPG can be stored in a plastic container.

Answer: C

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7. When petroleum is heated in a fractionating column, various fractions are obtained at various heights of the column. More volatile liquid goes upto the top and least volatile liquid remains at the bottom. Various gaseous fractions are condensed according to their

boiling points.

Which will condense near the top, petrol, diesel oil, fuel oil or kerosene?

A. Petrol

B. Diesel oil

C. Fuel oil

D. Kerosene

Answer: A

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8. When petroleum is heated in a fractionating column, various fractions are obtained at various heights of the column. More volatile liquid goes upto the top and least volatile liquid remains at the bottom. Various gaseous fractions are condensed according to their boiling points.

What can you say about the boiling points of liquids that collect at the bottom as residue?

A. Their boiling points must be very low.

B. Their boiling points must be much higher than the temperature at the bottom of the column.

C. Their temperature is equal to the temperature of column

D. None of the above.

Answer: B

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9. When petroleum is heated in a fractionating column, various fractions are obtained at various heights of the column. More volatile liquid goes upto the top and least volatile liquid remains at the bottom. Various gaseous fractions are condensed according to their boiling points.

As the gas reaches at the height where temperature is equal to or just below its boiling point it will

A. condense to form a liquid

B. remain in gaseous state

C. condense to form a solid

D. escape from the column.

Answer: A

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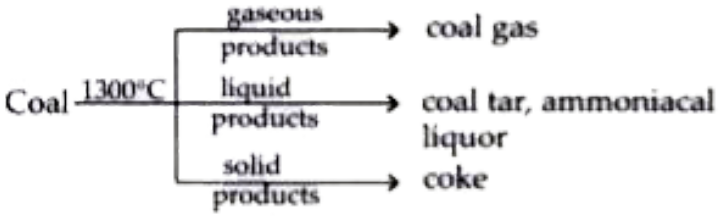

10.

Coke burns without smoke and does not cause

air pollution because

A. products other than carbon are removed from it.

B. it is porous and solid.

C. it is light and black in colour.

D. it has lot of impurities in it.

Answer: A

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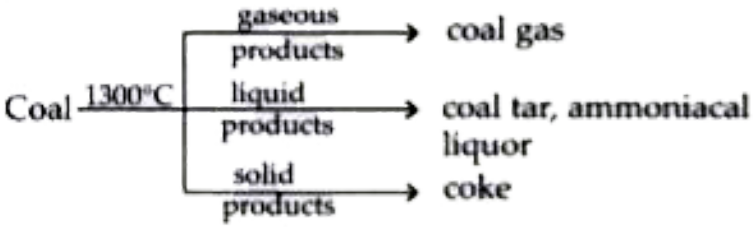

11.

Mark the correct statement.

A. Coal gas can be condensed back to give coal.

B. Coal gas is obtained as a gaseous product during destructive distillation of coal.

C. Coal tar and ammoniacal liquor are useless products.

D. Coke starts burning when exposed to air.

Answer: B

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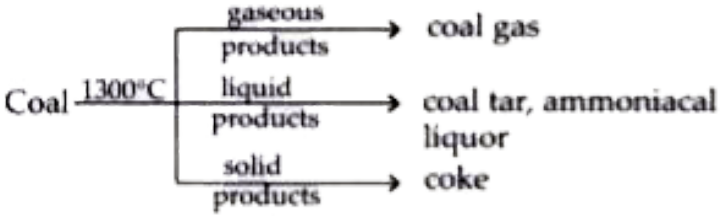

12.

The most important use of coal tar is

A. it is a source of aromatic hydrocarbons

B. it is a good reducing agent for extraction of iron

C. it is used as a fuel

D. it is used for making shoe polish.

Answer: A

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Exercise Very Short Answer Level 2

1. Name the fuels that are found in earth's crust.

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2. What are the harmful products formed by burning fossil fuels?

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3. Name the products formed by destructive distillation of coal.

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4. Give name of a non-polluting fuel which can be used in vehicles.

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5. In which form is petroleum present in nature?

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6. Why is petroleum called black gold?

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7. Name the petroleum product used for surfacing of roads.

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8. Justify that water is a limitless resource.

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9. Name the gas which is produced when coal is heated in absence of air.

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10. What is the purest form of carbon?

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11. The first oil well was drilled in

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12. Name two fractions of petroleum which are used as fuel.

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13. Name the places where natural gas is found in our country.

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14. Which gas is produced when coal burns in air?

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15. Is kerosene a fossil fuel?

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Exercise Short Answer Level 2

1. Why is there a rapid increase in our energy consumption?

2. How is the balance of natural resources in nature disturbed?

3. Why do different gases condense to liquids on different trays in the fractionating column?

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4. Why does the fraction left at the bottom of the fractionating column not boil?

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5. What do you mean by emission standard used in automobiles?

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6. Name some non-conventional or alternative sources of energy.

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7. What are the measures given by PCRA for saving petrol and diesel?

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8. State some uses of solar energy. What is the disadvantage of using solar energy?

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9. Why is depletion of coal, petroleum and forest a matter of concern?

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10. Give two examples where coke is used in preparation of metals from their oxides.

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Exercise Long Answer Level 2

1. Describe the process of formation of coal

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2. Describe the process of formation of petroleum

View Text Solution

3. Write names of a few products obtained by fractional distillation of petroleum and

mention their uses.

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4. Give the characteristics and uses of coal tar.

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5. What do you mean by sustainability of natural resources?

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6. Discuss some important methods to conserve our natural resources.

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7. Sunlight, mind and water are inexhaustible natural resources. How can they help in saving exhaustible resources?

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Exercise Integer Numerical Value Level 2

1. Number of inexhaustible resources among the following is Air, forests, wind, coal, sunlight, soil

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2. Total types of coal are

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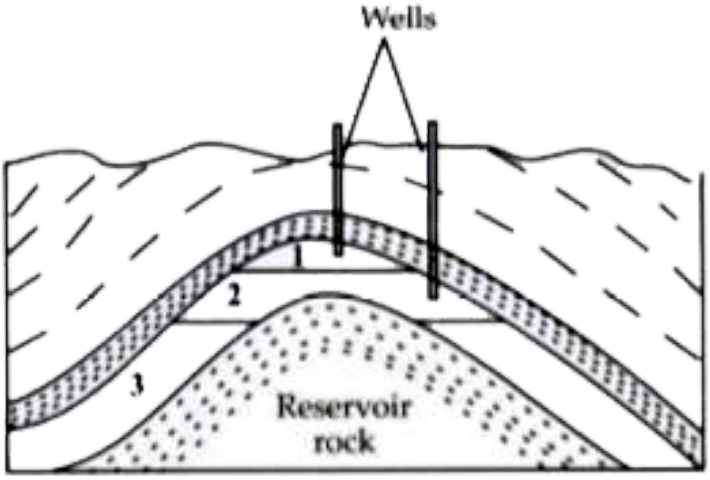
3. Observe the given figure carefully. Layer in which petroleum present is



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4. Out of the following, number of amorphous forms of carbon is Graphite, lampblack, coke,

coal, fullerene, sugar charcoal, gas carbon, wood charcoal, diamond.

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5. The given reaction represents formation of iron from its oxide.

$Fe_2O_3 + xC \rightarrow 2Fe + xCO$

Here, x is

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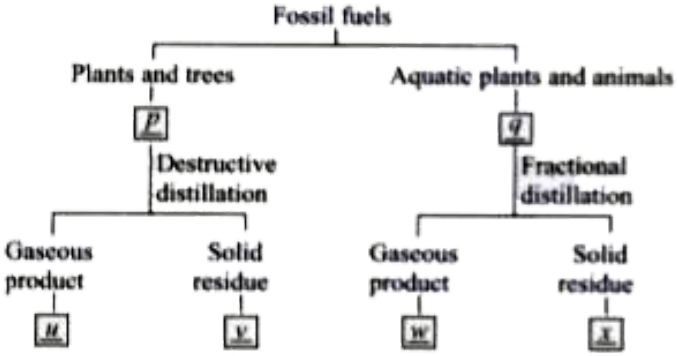
Olympiad Hots Corner

1. Fill in the blanks left in the classification of the fossil fuels.



	p	*q*	*u*	*v*	*w*	*x*
(a)	Petro-leum	Coal	Petro-leum	Bitumen	Coal gas	Coke
(b)	Coal	Petro-leum	Coal gas	Coke	Petro-leum gas	Bitu-men
(c)	Coal	Petro-leum	Coal gas	Charcoal	Gasoline	Coal tar
(d)	Petro-leum	Coal	Gaso-line	Bitumen	Natural gas	Coke

A. p-Petroleum , q-Coal , u-Petroleum , v - Bitumen , w-Coal gas , x-coke

B. p-Coal , q-Petroleum , u-Coal gas , v-Coke , w-Petroleum gas , x-Bitumen

C. p-Coal , q-Petroleum , u-Coal gas , v-Charcoal , w-Gasoline , x-Coaltar

D. p-Petroleum q-Coal , u-Gasoline , v-Bitumen , w-Natural gas, x-Coke

Answer: B

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2. Fill in the blanks by choosing an appropriate option.

___I ___ are used in the manufacture of detergents, fibres, polythene and other man-made plastics. ___II___ obtained from natural gas, is used in the production of fertilisers (urea). Petroleum is also called __III____ due to its great commercial importance.

A. I-Fossil fuels , II-Petroleum gas , III-Black gold

B. I-Petrochemicals , II-Coal gas , III-Diesel

C. I-Petrochemicals , II-Hydrogen gas , III-Black gold

D. I-Coal products , II-CNG, III-Paraffin wax

Answer: C

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3. Select the incorrect statements among the following:

(i) Bitumen is used for metalling the roads.

(ii) Some inexhaustible natural resources like coal, petroleum and natural gas formed from the dead remains of living organisms are known as fossil fuels.

(iii) Many useful substances are obtained from coal so, it is also called 'black gold'.

(iv) Natural gas is used as a starting material for the manufacture of a number of chemicals and fertilisers.

A. (i) and (ii)

B. (ii) and (iii)

C. (ii) and (iv)

D. (i) , (ii) and (iv)

Answer: B

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4. Statement-1 : Petroleum is called 'black gold'.

Statement-2 : Petroleum is a dark oily liquid.

A. Both statements 1 and 2 are true but statement 2 is the correct explanation of

statement 1.

B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

C. Statement 1 is true but statement 2 is false.

D. Both statements 1 and 2 are false.

Answer: B

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5. Match the Column-I with Column-II and select the correct option given below.

	Column-I		Column-II
a.	Coal tar	(i)	Metalling the roads
b.	Petrol	(ii)	Manufacture of steel
c.	Coal gas	(iii)	Source of heat
d.	Bitumen	(iv)	Vaseline
e.	Coke	(v)	Naphthalene balls
f.	Paraffin wax	(vi)	Dry cleaning

A. a-(v), b-(vi), c-(iii), d-(i), e-(ii), f-(iv)

B. a-(i), b-(iv), c-(iii), d-(ii), e-(v), f-(vi)

C. a-(iii), b-(v), c-(i), d-(iv), e-(ii), f-(vi)

D. a-(iv), b-(i), c-(vi), d-(iii), e-(v), f-(ii)

Answer: A

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6. Read the following statements carefully and identify P, Q and R.

P: Obtained from petroleum and natural gas and used in the manufacture of man-made plastics.

Q : Due to its great commercial importance, it is also called 'black gold'.

R: Obtained from natural gas and used in the production of fertilizers.

A. P-Petrochemicals , Q-Petroleum, R-Hydrogen gas

B. P-Coke , Q-Coal , R-Coal tar

C. P-Paraffin was , Q-Coal tar, R-Diesel

D. P-Bitumen , Q-Coke , R-Coal gas

Answer: A

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7. Few characteristics of three fuels X, Y and Z are given below.

X	Y	Z
Not easily stored or transported	Can be stored in tanks and transported through pipes	Can be stored in tanks and transported through pipes
Extremely polluting	Produce almost no pollutants	Moderately polluting

Identify X, Y and Z respectively.

A. LPG, Biogas, Coal

B. Coal, Natural gas, Petroleum

C. Petroleum, LPG, Coal

D. Natural gas, Cow dung cake, LPG

Answer: B

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8. Fill in the blanks by choosing an appropriate option. In an oil refinery, crude oil is heated to about 673 K and passed into the ___ (i)__. As the vapours rise towards the top, the different hydrocarbons ___(ii)___ at different heights and are withdrawn separately. Substance with

_____(iii)___ boiling point is collected at the ____(iv)_____ of the column.

A. (i)-Distillation flask , (ii)-Condense , (iii)-Lowest , (iv) Top

B. (i)Chromatographic column , (ii)Melt , (iii)-Highest , (iv)Top

C. (i)-Fractionating column, (ii)Condense , (iii)Highest , (iv) Bottom

D. (i)Fractionating column , (ii)Condense , (iii)Lowest , (iv) Bottom

Answer: C

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9. Statement 1: During fractional distillation of petroleum, the temperature increases inside the fractionating column on going from bottom to the top.

Statement 2: The fraction with the lower boiling point condenses first.

A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.

B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

C. Statement 1 is true but statement 2 is false.

D. Both statements 1 and 2 are false.

Answer: C

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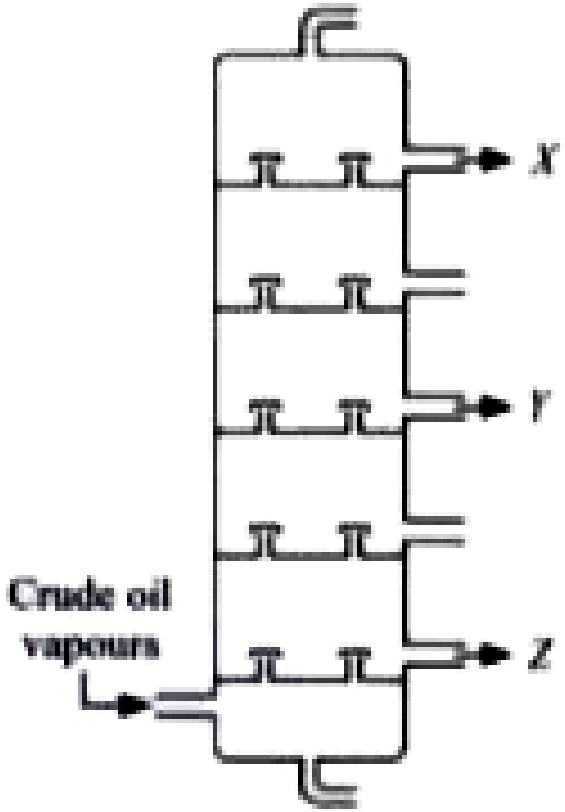
10. The given diagram represents a fractionating column where petroleum is separated into various fractions. Arrange the fractions X, Y, Z in order of decreasing boiling point range and identify the fraction that

condenses first.



A. $Z > Y > X, X$

B. $Z > Y > X, Z$

C. $X > Y > Z, Y$

D. $Y > Z > X, Z$

Answer: B

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