

Crude Oil and Fractional Distillation

Q1. (2018) – 5c

A)

- (c) (i) Use a word from the box to complete each of the sentences about the fractional distillation of crude oil.

condensed	heated	melted	solidified	stirred
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Each word may be used once, more than once, or not at all.

(2)

The separation of crude oil into fractions occurs in a fractional distillation column.

Before crude oil is passed into the column it is

During the distillation, vapour rises up the column until it is cold enough for the vapour to form a liquid. The vapour has been

B)

- (ii) Complete this sentence by underlining the correct answer in the box.

(1)

Compared with the fraction from the top of the column,

the fraction from the bottom of the column

has more carbon atoms per molecule.
has a lower viscosity.
is easier to ignite.

Q2. (2018) – 5d

- (d) When crude oil is separated into fractions, the amount of each fraction obtained rarely matches the demand for that fraction.

Figure 7 shows the relative amounts of four of the fractions obtained from a crude oil and the relative demand for each of these fractions.

fraction	relative amount obtained from the crude oil	relative demand
gases	5	5
petrol	10	25
kerosene	20	25
fuel oil	45	5

Figure 7

State the fraction for which the relative amount obtained exceeds the relative demand.

(1)

Q3. (2019)

A)

- 8 Most of the fuels used today are obtained from crude oil.

- (a) Which statement about crude oil is correct?

(1)

- ☐ A crude oil is a compound of different hydrocarbons
- ☐ B crude oil is a mixture of hydrocarbons
- ☐ C crude oil contains different hydrocarbons, all with the same molecular formula
- ☐ D crude oil is an unlimited supply of hydrocarbons

B)

- (b) Crude oil is separated into several fractions by fractional distillation.
Two of these fractions are kerosene and diesel oil.

(i) State a use for each of these fractions.

(2)

kerosene

diesel oil

C)

- (ii) Figure 13 shows where the fractions kerosene and diesel oil are produced in the fractionating column.

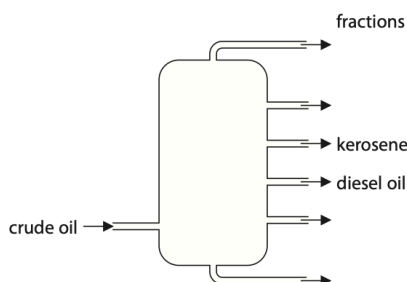


Figure 13

Kerosene is obtained higher up the column than diesel oil.
Kerosene and diesel oil fractions have slightly different properties.

Choose a property.

State how this property for kerosene compares with the property for diesel oil.

(1)

property

comparison

Q4. (2020) – 6b

- (b) Crude oil is a complex mixture of hydrocarbons.
Crude oil can be separated into useful fractions by fractional distillation.

Figure 10 shows a fractional distillation column and the fractions produced when crude oil is distilled.

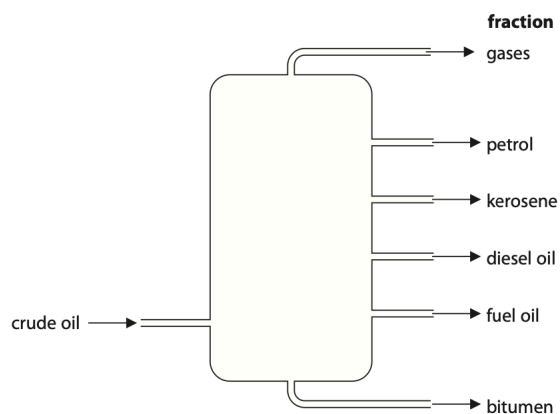


Figure 10

A)

- (i) Name the fraction in Figure 10 that is used to surface roads.

(1)

B)

- (ii) Name the fraction in Figure 10 that contains hydrocarbons with the lowest boiling point.

(1)

Q5. (2020) – 6c

- (c) When crude oil is fractionally distilled, the demand for some fractions is more than the amount produced.

Figure 11 shows the relative amounts of each fraction in a crude oil and the relative demand for each of these fractions.

fraction	relative amount	relative demand
gases	2	6
petrol	12	29
kerosene	16	11
diesel oil	24	29
fuel oil	37	21
bitumen	9	4

Figure 11

Which of the following shows the fractions where the relative demand is greater than the relative amount in the crude oil?

(1)

- ☐ A kerosene, diesel oil, bitumen
- ☐ B gases, petrol, diesel oil
- ☐ C gases, petrol, kerosene
- ☐ D petrol, diesel oil, fuel oil

Q6. (2021)

- 9 Diesel oil is a mixture of hydrocarbons that can be obtained from crude oil.

- (a) State the name of the process used to separate diesel oil from crude oil.

(1)

Q7. (2022) – 5b

- (b) Crude oil can be separated into different fractions.

Draw **one** straight line from each fraction to a use of that fraction.

(3)

fraction		use
		• fuel for aircraft
petrol	•	• fuel for ships
kerosene	•	• fuel for cars
		• making plastic
bitumen	•	• extracting iron
		• making road surfaces

Q8. (2024) – 5b

(b) Figure 10 shows where fractions are produced in the fractional distillation of crude oil.

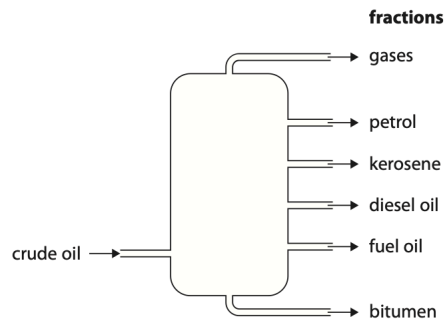


Figure 10

Complete the sentences about fractions obtained from crude oil.

(3)

The fraction with the smallest molecules is called

Compared to petrol, the boiling point of kerosene is

When petrol burns, one product is