

## Organic Chemistry – 2019 Nov

1. 0620/11,21/O/N/19/No.35,36

Petroleum is separated by fractional distillation.

Which statement about the fractions produced is correct?

- A Bottled gas for heating and cooking is obtained from the naphtha fraction.
- B Diesel oil is used as a fuel for jet aircraft.
- C Substances used to make polishes are obtained from the lubricating fraction.
- D The kerosene fraction contains many useful waxes.

2. 0620/11/O/N/19/No.36

Which compounds have similar chemical properties?

- A butanol and butanoic acid
- B ethane and ethene
- C methane and butane
- D propene and propanol

3. 0620/11/O/N/19/No.37

Which statement about a molecule of ethane is correct?

- A An ethane molecule has at least one double covalent bond.
- B It has C–H and C–O bonds.
- C An ethane molecule has seven covalent bonds.
- D Its bonds are formed by the transfer of electrons.

4. 0620/11,12,13,21,22,23/O/N/19/No.38,37

Which products are obtained by the cracking of an alkane?

	alkene	hydrogen	water
A	✓	✓	✓
B	✓	✓	x
C	✓	x	✓
D	x	✓	✓

5. 0620/11/O/N/19/No.39

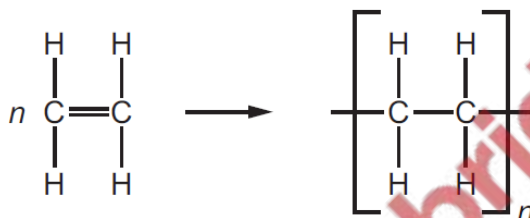
Which statements about aqueous ethanoic acid are correct?

- 1 It has a pH value of 10.
- 2 It reacts with metal carbonates to produce carbon dioxide gas.
- 3 It reacts with magnesium metal to produce hydrogen gas.

**A** 1, 2 and 3      **B** 1 and 2 only      **C** 1 and 3 only      **D** 2 and 3 only

6. 0620/11,12,13,21,22,23/O/N/19/No.40,39

The diagram shows the structure of a monomer and of the polymer made from it.



What are the monomer and polymer?

	monomer	polymer
<b>A</b>	ethane	poly(ethane)
<b>B</b>	ethane	poly(ethene)
<b>C</b>	ethene	poly(ethane)
<b>D</b>	ethene	poly(ethene)

7. 0620/12/O/N/19/No.39

Which statement about an aqueous solution of ethanoic acid is correct?

- A** It reacts with magnesium to form water as one of the products.
- B** It reacts with sodium carbonate to form carbon dioxide.
- C** It reacts with sodium hydroxide to form hydrogen.
- D** It turns red litmus paper blue.

8. 0620/12,22/O/N/19/No.35,36

Some fractions obtained from petroleum are listed.

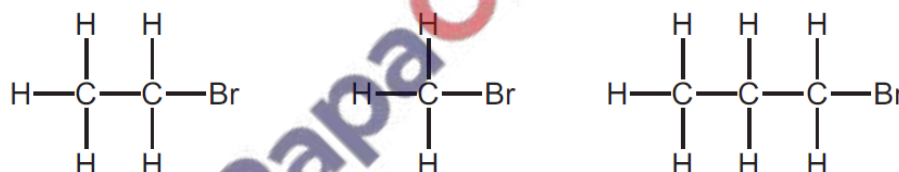
	fraction	use	position collected in the fractionating column
1	gasoline	waxes and polishes	below refinery gas
2	bitumen	making roads	above kerosene
3	kerosene	jet fuel	below gasoline
4	refinery gas	heating and cooking	above gasoline

Which rows are correct?

- A 1, 3 and 4
- B 2, 3 and 4
- C 3 and 4 only
- D 4 only

9. 0620/12/O/N/19/No.36

The structures of three compounds are shown.



Which statement explains why these three compounds have similar chemical properties?

- A They all contain bromine, carbon and hydrogen.
- B They all contain the same functional group.
- C They are all carbon-based molecules.
- D They are all saturated molecules.

10. 0620/12/O/N/19/No.37

Which statement about ethane is correct?

- A It rapidly decolourises aqueous bromine.
- B It does not burn.
- C It forms long-chain compounds called polymers.
- D It only contains single bonds between its atoms.

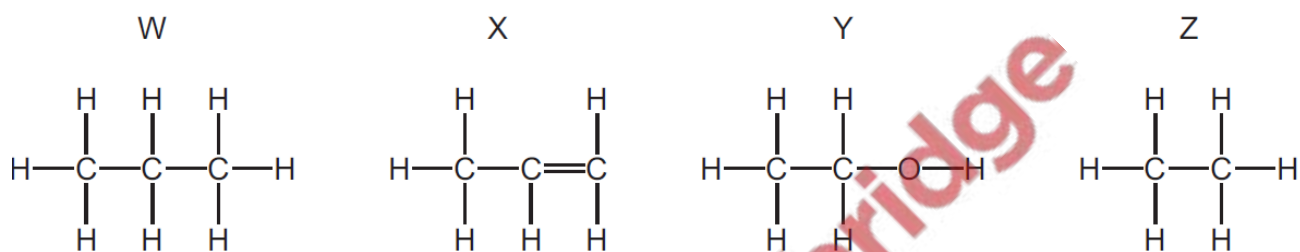
11. 0620/13/23/O/N/19/No.36

Which statement is correct?

- A Bitumen is used as a fuel for ships.
- B Coal, natural gas and oxygen are all fuels.
- C Hydrogen is the main constituent of natural gas.
- D Petroleum is separated into useful substances by fractional distillation.

12. 0620/13/O/N/19/No.36

The structures of four organic compounds, W, X, Y and Z, are shown.



Which compounds are members of the same homologous series?

- A W and X
- B W and Z
- C X and Y
- D Y and Z

13. 0620/13/O/N/19/No.37

How many different types of bonds are present in ethanoic acid,  $\text{CH}_3\text{COOH}$ ?

	type of bond		
	C-H	C-C	C=O
A	3	1	1
B	3	0	2
C	4	0	2
D	4	1	2

14. 0620/13/O/N/19/No.39

Which statement about aqueous ethanoic acid is correct?

- A It reacts with magnesium to form oxygen gas.
- B It reacts with sodium carbonate to form carbon dioxide gas.
- C It turns red litmus paper blue.
- D It turns methyl orange yellow.

15. 0620/21/O/N/19/No.38

Ethanol is manufactured by the catalytic addition of steam to ethene and by fermentation.

Which statement describes an advantage of fermentation compared to the catalytic addition of steam to ethene?

- A Fermentation is a more rapid reaction.
- B Fermentation produces a purer product.
- C Fermentation uses a higher temperature.
- D Fermentation uses renewable resources.

16. 0620/21/O/N/19/No.40

Which polymers possess the same linkage?

- A nylon and protein
- B protein and starch
- C starch and nylon
- D nylon and *Terylene*

17. 0620/22/O/N/19/No.38

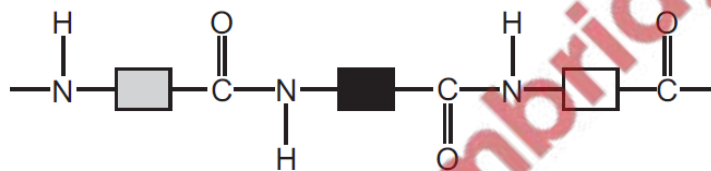
Ethanol is produced by fermentation or by the reaction of ethene with steam.

Which row is correct?

	by fermentation	from ethene
<b>A</b>	uses a temperature of 100 °C	uses a temperature of 350 °C
<b>B</b>	needs yeast as a catalyst	does not need a catalyst
<b>C</b>	very slow reaction	very fast reaction
<b>D</b>	high yield of ethanol	low yield of ethanol

18. 0620/22/O/N/19/No.40

The structure of a naturally occurring polymer, X, is shown.



What is X?

- A** an amino acid
- B** a carbohydrate
- C** a protein
- D** a sugar

19. 0620/23/O/N/19/No.38

Ethanol is made by fermentation of sugars and by the catalytic addition of steam to ethene.

What are two advantages of making ethanol by the catalytic addition of steam to ethene rather than by fermentation of sugars?

- A** faster reaction and renewable raw materials
- B** purer product and faster reaction
- C** renewable raw materials and continuous process
- D** uses more energy and forms a purer product

Proteins and starch are both natural polymers.

Both proteins and starch are hydrolysed by dilute acids.

What are the products of hydrolysis of proteins and of starch?

	products of hydrolysis of proteins	products of hydrolysis of starch
<b>A</b>	amines and carboxylic acids	simple sugars
<b>B</b>	amines and carboxylic acids	alcohols and carboxylic acids
<b>C</b>	amino acids	simple sugars
<b>D</b>	amino acids	alcohols and carboxylic acids

