CHEMISTRY 2021

Unit 4

Key Topic Test 1 – Organic Chemistry – structure and nomenclature

Recommended writing time*: 50 minutes

Total number of marks available: 50 marks

SOLUTIONS

SECTION A: Multiple-choice questions (1 mark each)

Question 1

Answer: C

Explanation:

The saturated molecules are C_2H_6, cyclohexane and ethanol.

Question 2

Answer: B

Explanation:

All of the molecules in option B are alcohols.

Question 3

Answer: B

Explanation:

The two isomers are 1,1,1-trichloroethane and 1,1,2-trichloroethane

Question 4

Answer: C

Explanation:

For option A and B the molecule is incorrectly named as the hydroxyl group comes off the second carbon. For option D there are only 4 carbon atoms on the molecule so there cannot be an amino group off a 5^{th} carbon. 2-aminobutan-2-ol is an isomer of 3-aminobutan-2-ol.

Question 5

Answer: D

Explanation:

Carboxyl groups are always assigned as having position 1 in a chain but this number is not included in the name. The hydroxyl group would then be attached to the 3rd carbon.

Question 6

Answer: A

Explanation:

Carboxylic acids always have 2 oxygen atoms and there is always 2 hydrogen atoms for each carbon atom.

Question 7

Answer: D

Explanation:

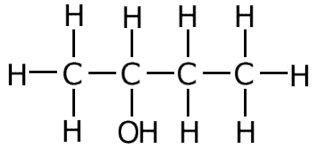
Molecule D has a trans configuration so it has a geometric isomer.

Question 8

Answer: B

Explanation:

The molecule is a secondary alcohol



Question 9

Answer: D

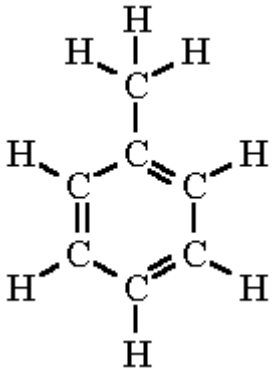
Explanation:

The name of this molecule is methyl propanoate

Question 10

Answer: C

Explanation:



There are 7 carbon atoms and 8 hydrogen atoms.

SECTION B: Short-answer questions

Question 1

a. propan-2-ol

1 mark

b. 2,3-dibromobutanoic acid

1 mark

c. pentyl ethanoate

1 mark

d. cis-3,4-dichlorohex-3-ene

1 mark

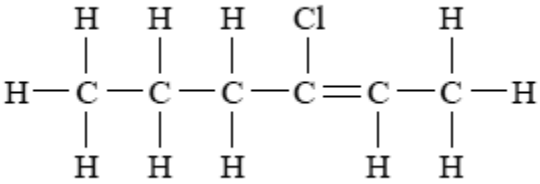
e. 2-methylpropan-1-amine

1 mark

Total 8 marks

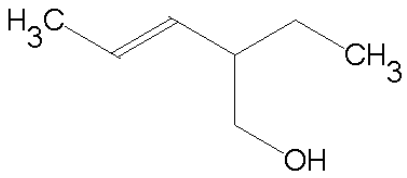
Question 2

a.



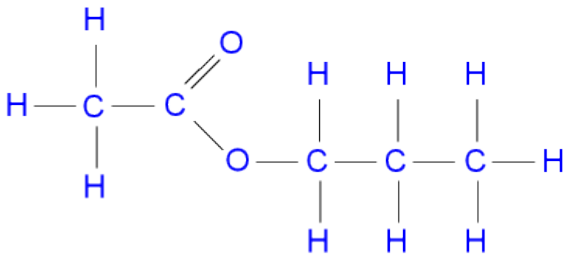
2 marks

b.



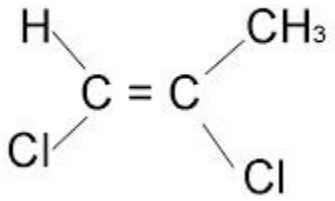
2 marks

c.



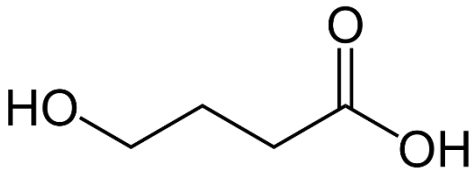
2 marks

d.



2 marks

e.



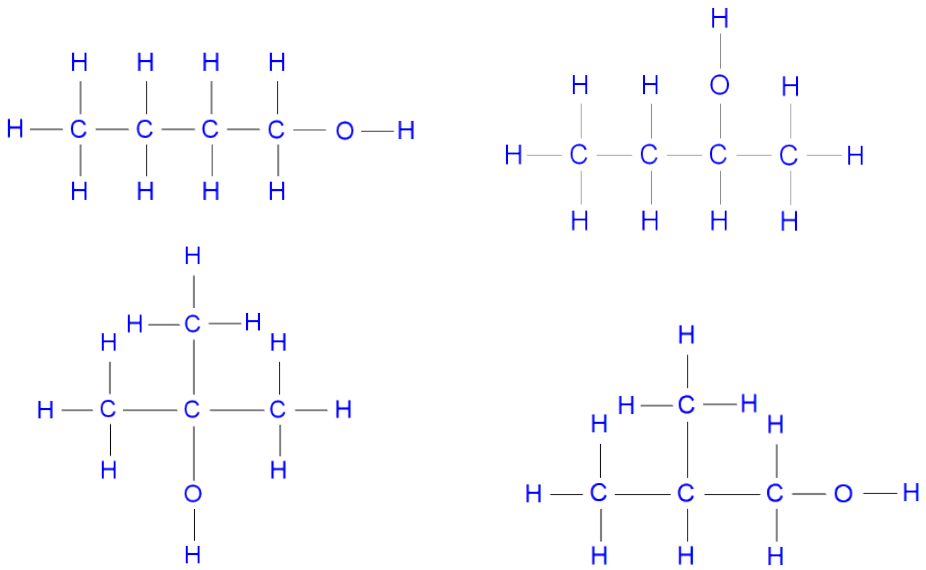
2 marks
Total 10 marks

Question 3

a. **i.** C_4H_{10}
ii. $C_4H_{11}N$
iii. C_4H_8O
iv. C_4H_8O
v. $C_4H_8O_2$
vi. $C_4H_8O_2$
vii. C_4H_9NO

7 marks

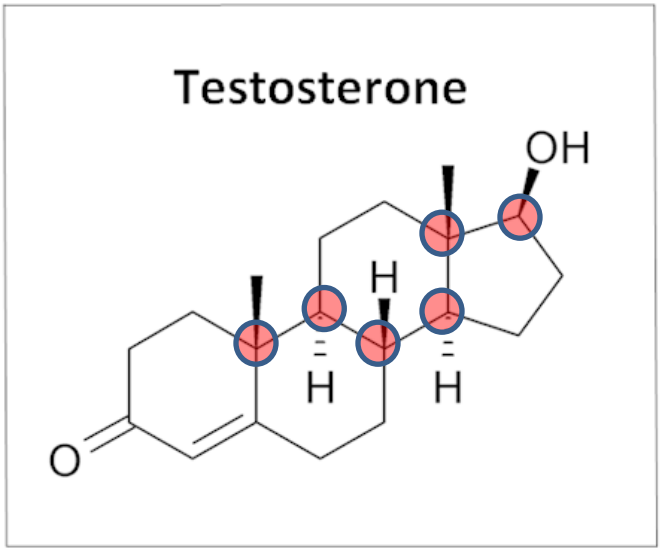
b.



4 marks
Total 11 marks

Question 4

a.



6 correct = 2 marks then 0.5 marks off for each incorrect answer.

2 marks

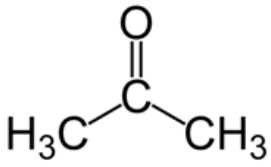
b. Hydroxyl, carbonyl

2 marks

Total 4 marks

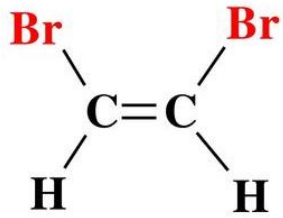
Question 5

a.



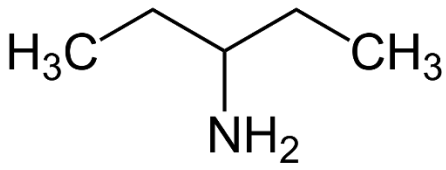
2 marks

b.



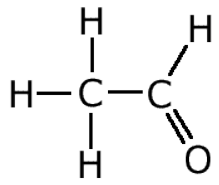
2 marks

c. For example;



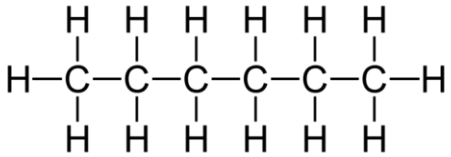
2 marks

d.



2 marks

e. For example;



2 marks
Total 10 marks