



A-Level Chemistry
Introduction to Organic
Chemistry (Multiple Choice)
Question Paper

Time available: 27 minutes
Marks available: 25 marks

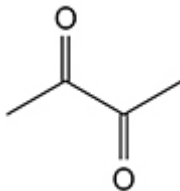
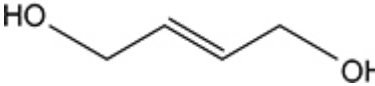

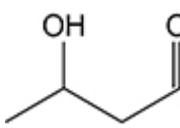
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1. Which compound has *E-Z* isomers?

- A $\text{CH}_2=\text{CHBr}$
- B $\text{CH}_2=\text{CBr}_2$
- C $\text{CHBr}=\text{CHBr}$
- D $\text{CBr}_2=\text{CHBr}$

(Total 1 mark)

2. Which compound has a molecular formula that is different from the others?

- A 
- B 
- C 
- D 

(Total 1 mark)

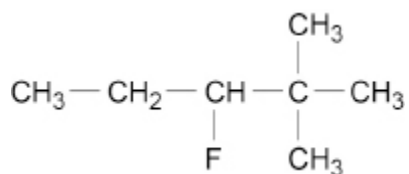
3. Which is the correct general formula for non-cyclic compounds in the homologous series?

- A alcohols $\text{C}_n\text{H}_{2n+2}\text{O}$
- B aldehydes $\text{C}_n\text{H}_{2n+1}\text{O}$
- C esters $\text{C}_n\text{H}_{2n+1}\text{O}_2$
- D primary amines $\text{C}_n\text{H}_{2n+2}\text{N}$

(Total 1 mark)

4.

What is the IUPAC name for this compound?



- A 2-dimethyl-3-fluoropentane
- B 2,2-dimethyl-3-fluoropentane
- C 3-fluoro-2,2-dimethylpentane
- D 3-fluoro-2-dimethylpentane

(Total 1 mark)

5.

Which compound has the lowest relative molecular mass?

- A ethanoic acid
- B 1-fluoropropane
- C propanenitrile
- D propylamine

(Total 1 mark)

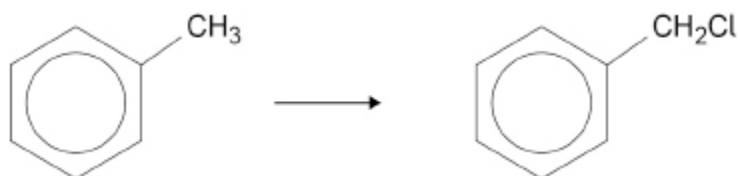
6.

Which has *E-Z* isomers?

- A C₂H₂Br₂
- B C₂H₃Br
- C C₂H₄Br₂
- D C₂H₅Br

(Total 1 mark)

7. Which is the mechanism for this conversion?



- A Addition-elimination
- B Electrophilic substitution
- C Free-radical substitution
- D Nucleophilic substitution

(Total 1 mark)

8. Which compound is **not** an isomer of the following compound?



- A $\text{CH}_3\text{CH}_2\text{COCH}_3$
- B $\text{CH}_3\text{CH}=\text{CHCH}_2\text{OH}$
- C $(\text{CH}_3)_2\text{CHCHO}$
- D $\text{CH}_2=\text{CHCH}_2\text{CHO}$

(Total 1 mark)

9. How many isomers are there of $\text{C}_3\text{H}_9\text{N}$?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

10.

Methylbenzene reacts with a mixture of concentrated nitric acid and concentrated sulfuric acid.

What is the name of the mechanism for this reaction?

- A Electrophilic addition
- B Electrophilic substitution
- C Nucleophilic addition
- D Nucleophilic substitution

(Total 1 mark)

11.

How many structural isomers with an unbranched carbon chain have the molecular formula $C_4H_8Br_2$?

- A 4
- B 5
- C 6
- D 7

(Total 1 mark)

12.

Which can be both an empirical and molecular formula of a stable compound?

- A CH_2O
- B P_4O_{10}
- C NH_2
- D CH_3

(Total 1 mark)

13.

Which compound is a structural isomer of Z-but-2-ene?

A butane B *E*-but-2-ene C cyclobutane D methylbut-2-ene **(Total 1 mark)****14.**

Which equation is a propagation step in the conversion of trichloromethane into tetrachloromethane by reaction with chlorine in the presence of ultraviolet light?



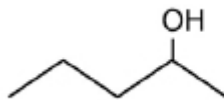
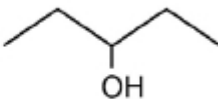
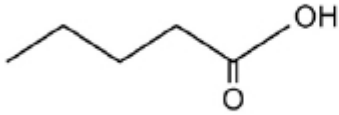
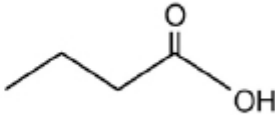
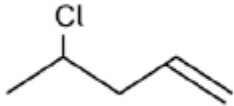
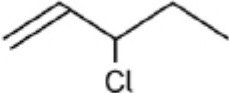
A $\text{CHCl}_3 + \text{Cl}_2 \rightarrow \text{CCl}_4 + \text{HCl}$ B $\bullet\text{CCl}_3 + \bullet\text{Cl} \rightarrow \text{CCl}_4$ C $\text{CHCl}_3 + \bullet\text{Cl} \rightarrow \text{CCl}_4 + \bullet\text{H}$ D $\bullet\text{CCl}_3 + \text{Cl}_2 \rightarrow \text{CCl}_4 + \bullet\text{Cl}$ **(Total 1 mark)****15.**What is the total number of structural isomers with the molecular formula $\text{C}_2\text{HBrClF}_3$?A 2 B 3 C 4 D 5 **(Total 1 mark)**

16. Which compound does **not** show stereoisomerism?

- A 1,2-dichloropropene
- B 1,2-dichloropropane
- C 1,3-dichloropropene
- D 1,3-dichloropropane

(Total 1 mark)

17. Which is a pair of functional group isomers?

- A  
- B  
- C  
- D  

(Total 1 mark)

18. How many isomers have the molecular formula C_5H_{12} ?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

19.How many structural isomers have the molecular formula C₄H₉Br?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)**20.**

The correct systematic name for $\text{CH}_3\text{CH}_2\underset{\text{CH}_3}{\text{C}}=\overset{\text{CH}_2\text{CH}_3}{\text{C}}\text{CH}_3$ is

- A 2,3-diethylbut-2-ene
- B 2-ethyl-3-methylpent-2-ene
- C 4-ethyl-3-methylpent-3-ene
- D 3,4-dimethylhex-3-ene

(Total 1 mark)**21.**How many structural isomers, which are aldehydes, have the molecular formula C₅H₁₀O?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)**22.**

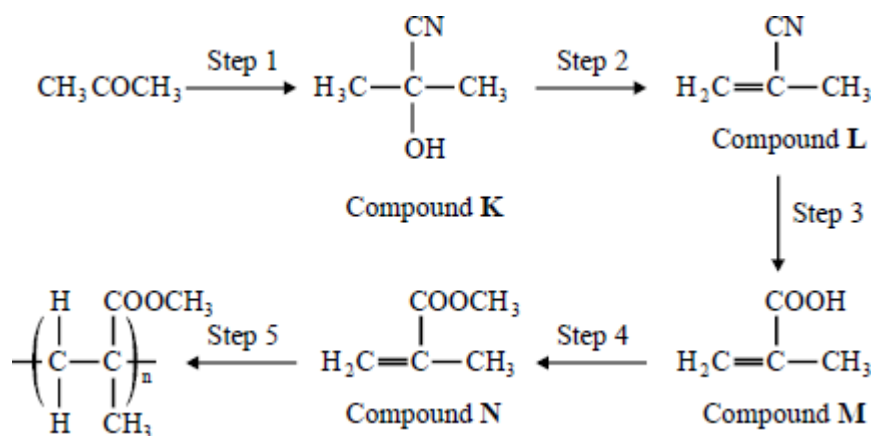
The correct systematic name for $(\text{CH}_3)_2\underset{\text{CH}}{\text{C}}\text{HC}=\overset{\text{CH}_2\text{CH}_3}{\text{C}}\text{CH}_3$ is

- A 2-ethyl-3,4-dimethylpent-2-ene
- B 4-ethyl-2,3-dimethylpent-3-ene
- C 2,3,4-trimethylhex-3-ene
- D 3,4,5-trimethylhex-3-ene

(Total 1 mark)

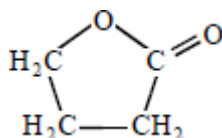
23.

This question concerns the preparation of the plastic poly(methyl 2-methylpropenoate) (*Perspex*), starting from propanone.

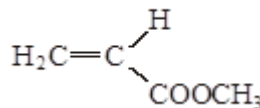


Which one of the following is **not** a structural isomer of Compound **M**?

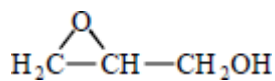
A



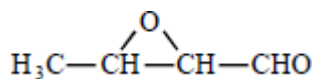
B



C



D



(Total 1 mark)

24.

Which one of the following is a pair of functional group isomers?

- A $\text{CH}_3\text{COOCH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{COOCH}_3$
- B $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2$ and $(\text{CH}_3)_3\text{CCH}_2\text{CH}_3$
- C $\text{CH}_3\text{CH}_2\text{OCH}_3$ and $(\text{CH}_3)_2\text{CHOH}$
- D $\text{ClCH}_2\text{CH}_2\text{CH}=\text{CH}_2$ and $\text{CH}_3\text{CH}=\text{CHCH}_2\text{Cl}$

(Total 1 mark)

25.

Which one of the following can exhibit both geometrical and optical isomerism?

- A $(\text{CH}_3)_2\text{C}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- B $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- C $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_2\text{CH}_3)_2$
- D $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{C}=\text{CH}_2$

(Total 1 mark)