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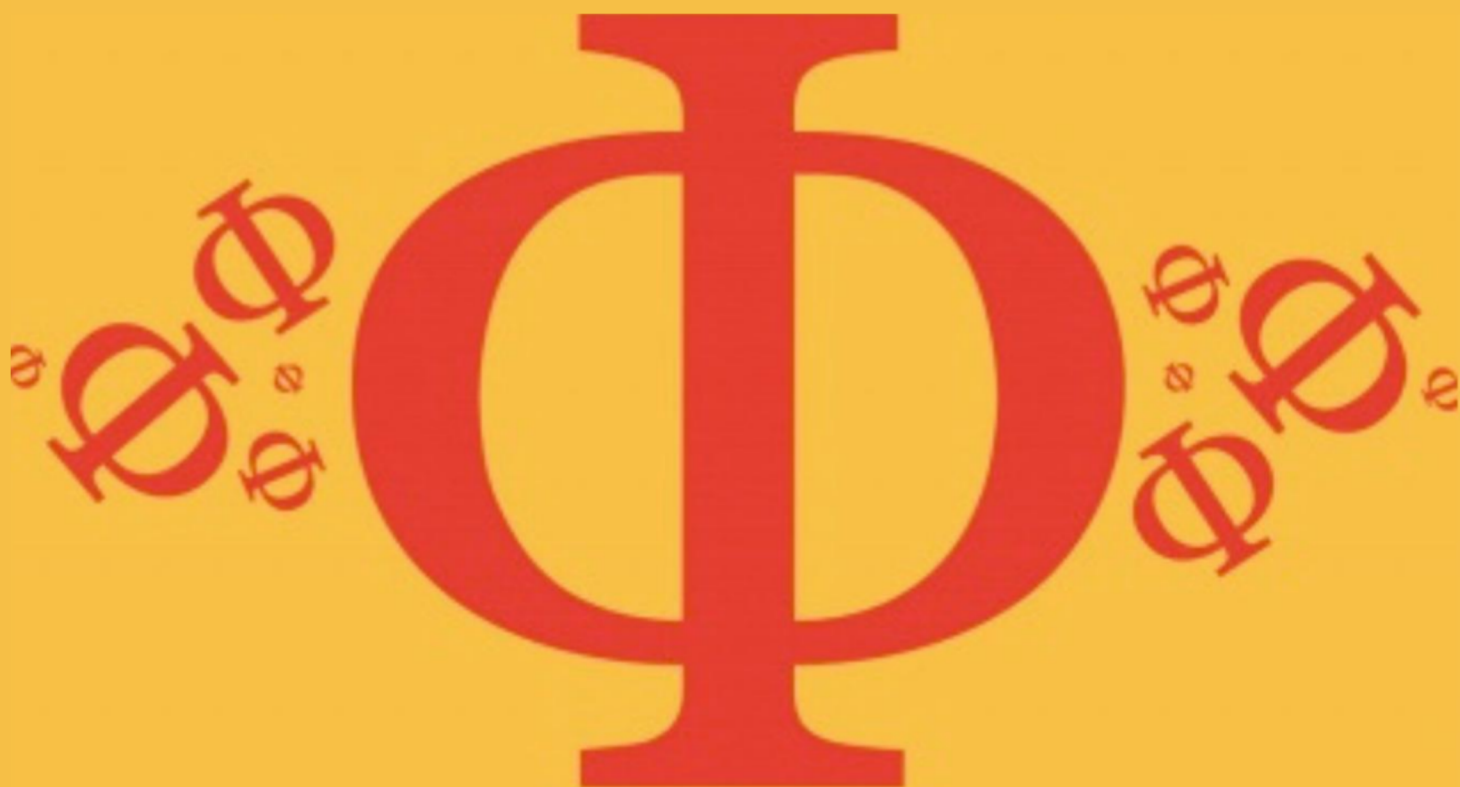
Detailed mark scheme

Suitable for all boards

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IB Chemistry: SL

10.1 Fundamentals of Organic Chemistry



CHEMISTRY

SL

10.1 Fundamentals of Organic Chemistry

Question Paper

Course	DP IB Chemistry
Section	10. Organic Chemistry
Topic	10.1 Fundamentals of Organic Chemistry
Difficulty	Hard

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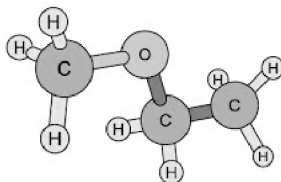
Time allowed: 20

Score: /10

Percentage: /100

Question 1

What is the correct IUPAC name for the molecule shown?



- A. ethoxyethane
- B. methoxyethane
- C. propanone
- D. propanal

[1 mark]

Question 2

Which of the molecules shown below is not an isomer of pentan-2-ol?

- A. pentan-1-ol
- B. 2-methylbutan-2-ol
- C. 2-methylpentan-2-ol
- D. pentan-3-ol

[1 mark]

Question 3

How many isomers, including structural and stereoisomers, with the formula C_5H_{10} have structures that involve π bonding?

- A. 3
- B. 4
- C. 5
- D. 6

[1 mark]

Question 4

Study the formulae shown below and determine which molecules are isomers of each other

- I.
 $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{CH}_3$
- II.
 $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_3$
- III.
 $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CH}_3$

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

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[1 mark]

Question 5

What is the correct condensed structural formula for 2,2-dibromo-4-methylhexane?

- A. $\text{CH}_3\text{CBr}_2\text{CH}(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3)$
- B. $\text{CH}_3\text{CHBrCBr}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CH}_3$
- C. $\text{CH}_3\text{CBrCH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- D. $\text{CH}_3\text{CHBrCH}(\text{CH}_3)\text{CHBrCH}_2\text{CH}_3$

[1 mark]

Question 6

Which of the following pairs are functional group isomers?

- I.
 $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$
- II.
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ and $\text{HCOOCH}_2\text{CH}_2\text{CH}_3$
- III.
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ and $\text{CH}_3\text{OCH}_2\text{CH}_3$

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

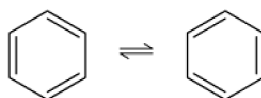
EXAM PAPERS PRACTICE [1 mark]

Question 7

The structure of benzene is often shown as



This is a representation of a resonance hybrid structure that lies between these two possible structures



Evidence for this resonance structure is:

- I. The carbon-carbon bond lengths lie between the value for a single and a double bond
- II. The bond angles are all equal in benzene
- III. The enthalpy of hydrogenation of benzene is less exothermic than expected

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

[1 mark]

Question 8

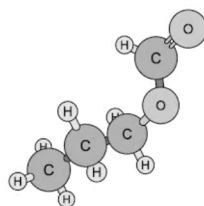
Which row of the table is correct about the trend and explanation in the boiling points of the alcohols CH_3OH , $\text{C}_2\text{H}_5\text{OH}$ and $\text{C}_3\text{H}_7\text{OH}$?

	Trend in boiling points	Explanation
A	$\text{CH}_3\text{OH} > \text{C}_2\text{H}_5\text{OH} > \text{C}_3\text{H}_7\text{OH}$	The London dispersion forces decrease with each additional CH_2
B	$\text{CH}_3\text{OH} > \text{C}_2\text{H}_5\text{OH} > \text{C}_3\text{H}_7\text{OH}$	The strength of the hydrogen bonds decreases with each additional CH_2
C	$\text{C}_3\text{H}_7\text{OH} > \text{C}_2\text{H}_5\text{OH} > \text{CH}_3\text{OH}$	The London dispersion forces increase with each additional CH_2
D	$\text{CH}_3\text{OH} > \text{C}_2\text{H}_5\text{OH} > \text{CH}_3\text{OH}$	The strength of the hydrogen bonds increases with each additional CH_2

[1 mark]

Question 9

What is the correct name of the following molecule using IUPAC rules?

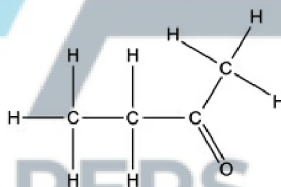


- A. propyl methanoate
- B. methyl propanoate
- C. methoxypropane
- D. butoxymethanal

[1 mark]

Question 10

What types of isomerism can the following molecule show?



- I.
Branch-chain
 - II.
Positional
 - III.
Functional group
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

[1 mark]