21.1 Spectroscopic Identification of Organic compounds

Question Paper

Course	DP IB Chemistry
Section	21. Measurement & Analysis (HL only)
Topic	21.1 Spectroscopic Identification of Organic compounds
Difficulty	Medium

Time allowed: 10

Score: /5

Percentage: /100

Question 1

Which spectroscopic technique can be used to determine bond length and angles?

A. Mass spectroscopy

B. IR spectroscopy

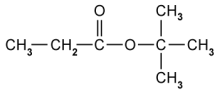
C. X-ray diffraction

D. ^{1}H NMR spectroscopy

[1 mark]

Question 2

Which row correctly describes the splitting pattern observed on the ^{1}H NMR spectrum for each labelled hydrogen?



A. One doublet and four triplets

B. One triplet, one quartet and one singlet

C. One triplet, one doublet and three singlets

D. One triplet, one quartet and three singlets

[1 mark]

Question 3

Tetramethylsilane(TMS) is used as a reference standard in ^{1}H NMR spectroscopy. Which property makes it suitable as a reference standard?

A. It is highly reactive

B. It has no isomers

C. It has 12 identical protons

D. It has a high boiling point

[1 mark]

Question 4

Which of the following produces three peaks in an ^1H NMR spectrum?

I. $CH_3COCH_2CH_3$
II. $C_6H_5NO_2$
III. CH_3CH_2OH

A. I and II only

B. I and III only

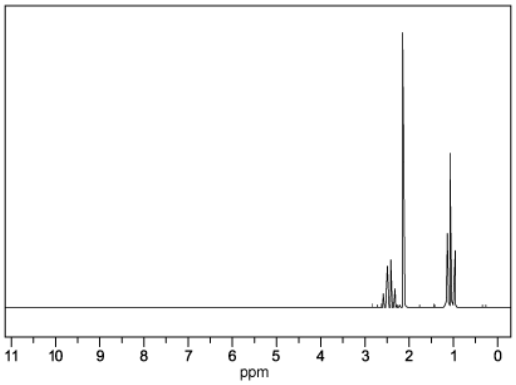
C. II and III only

D. I, II and III

[1 mark]

Question 5

Which molecule could give this NMR spectrum?



A. $CH_3CH_2OCH_2CH_3$

B. $CH_3CH(OH)CH_2CH_3$

C. $CH_3COCH_2CH_3$

D. $CH_3COCH_2CH_2CH_3$

[1 mark]