

نموذج إجابة مادة الكيمياء العضوية الطيفية ٢ (٣١٤ ك)

نصف ورقة إمتحانية – دور يناير ٢٠١٧

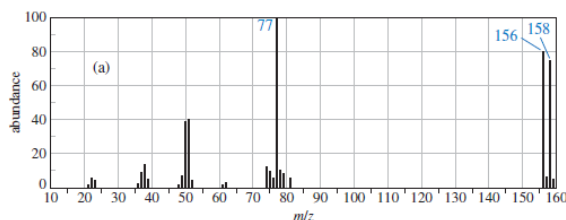
أستاذ المادة: د. بهاء الدين مصطفى عدلى الجندى

**Section II: Mass Spectrometry**

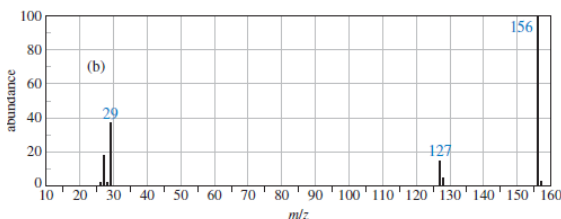
**[40 Marks]**

1. Point out which of these four mass spectra indicate the presence of sulfur, chlorine, bromine, iodine, or nitrogen. Suggest a molecular formula for each. [8 Marks]

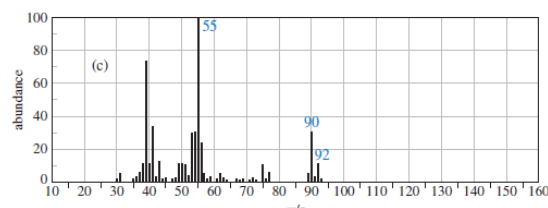
Bromine:



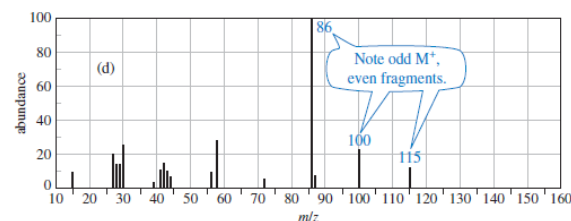
Iodine:



Chlorine:



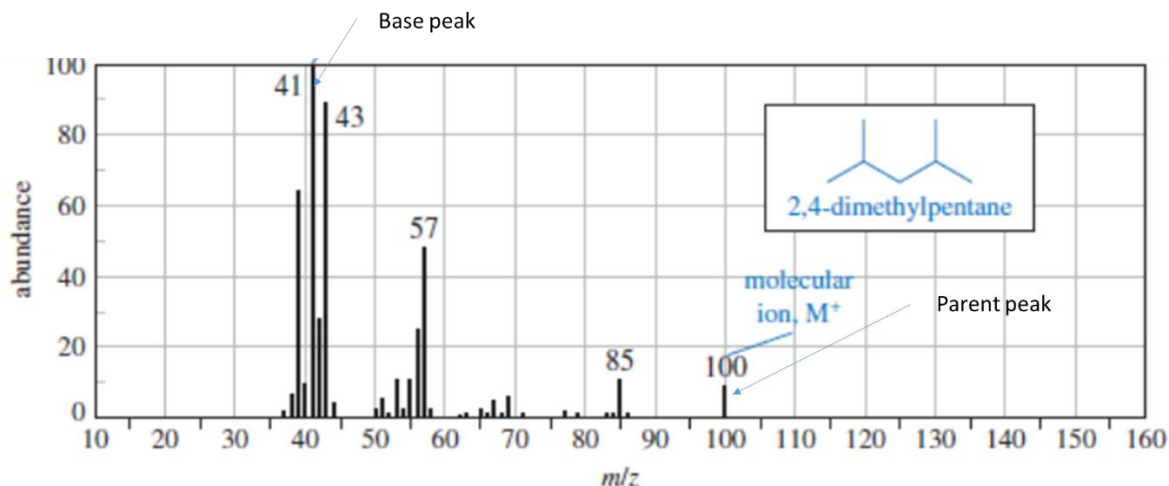
Nitrogen:



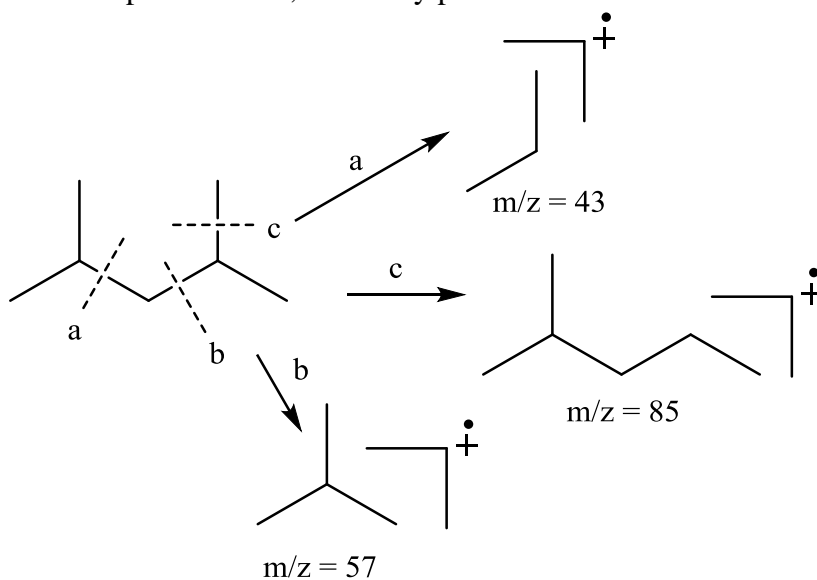
2. A. Assign and define both the parent peak and the base peak in the following spectra. [4 Marks]

Base peak: base peak The strongest peak in a mass spectrum.

Parent peak: is the peak that corresponds to the molecular weight of the compound and usually have the highest m/z value.

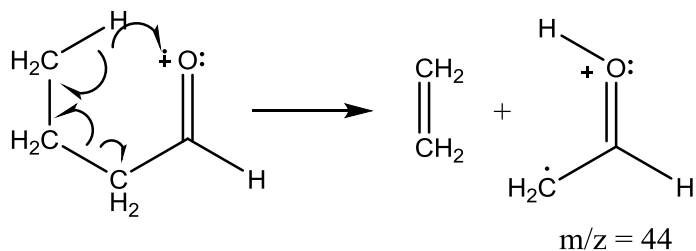


B. Show the fragmentations that give rise to the peaks at m/z 43, 57, and 85 in the mass spectrum of 2,4-dimethylpentane. [6 Marks]



3. What is the mass of the McLafferty ion from the following aldehydes: butanal, pentanal, hexanal and heptanal? (Show mechanism for one of them) [10 Marks]

M/Z = 44 (for all of them and example of butanal is shown below)



4. Predict three major fragmentation/rearrangement pathways for the following compounds: [12 Marks]

All major fragmentations are marked with dashed lines. Most important fragments for a, b, and d are drawn in the following scheme.

