

Examination questions:

Q1 (5 points max)

Attached Proton Test, APT. Draw the pulse sequence, explain with vector diagrams the behavior of different carbon atoms signals (quaternary ^{13}C , ^{13}CH , $^{13}\text{CH}_2$, $^{13}\text{CH}_3$).

Q2 (3 points max)

One-dimensional ^{13}C NMR with and without ^1H -broadband decoupling. Draw the pulse sequence, explain the effect of ^1H -broadband decoupling on the intensity and multiplicity of ^{13}C signals.

Q3 (2 point max)

^1H -NMR Spectrum 1. Determine and draw the structure of the compound. Mark the corresponding protons and peaks in the spectrum.

Q4 (2 point max)

^1H -NMR Spectrum 2. Determine and draw the structure of the compound. Mark the corresponding protons and peaks in the spectrum.

Q5 (2 point max)

^1H -NMR Spectrum 3. Determine and draw the structure of the compound. Mark the corresponding protons and peaks in the spectrum.