

**2021**

**CHEMISTRY — HONOURS — PRACTICAL**

**Paper: CC-12P**

**(Organic Chemistry)**

**Full Marks: 30**

*The figures in the margin indicate full marks.*

1. Carry out the analysis of the supplied  $^1\text{H-NMR}$  and IR spectra (**marked S<sub>P</sub> and S<sub>I</sub>**) and record the following in tabular form:

**[A] For S<sub>P</sub>:**

- (a) Identify each of the given signals marked **A**, **B** and **C** (which  $\delta$ -value corresponds to which).
- (b) Assign the relevant protons responsible for each of the marked signals.
- (c) Mention the splitting pattern of each of the marked signals.
- (d) Mention the number of proton(s) associated with each of the marked signals.
- (e) Provide brief explanation for relative  $\delta$ -values and splitting patterns of the marked signals.

3+3+3+3+6

**[B] For S<sub>I</sub>:**

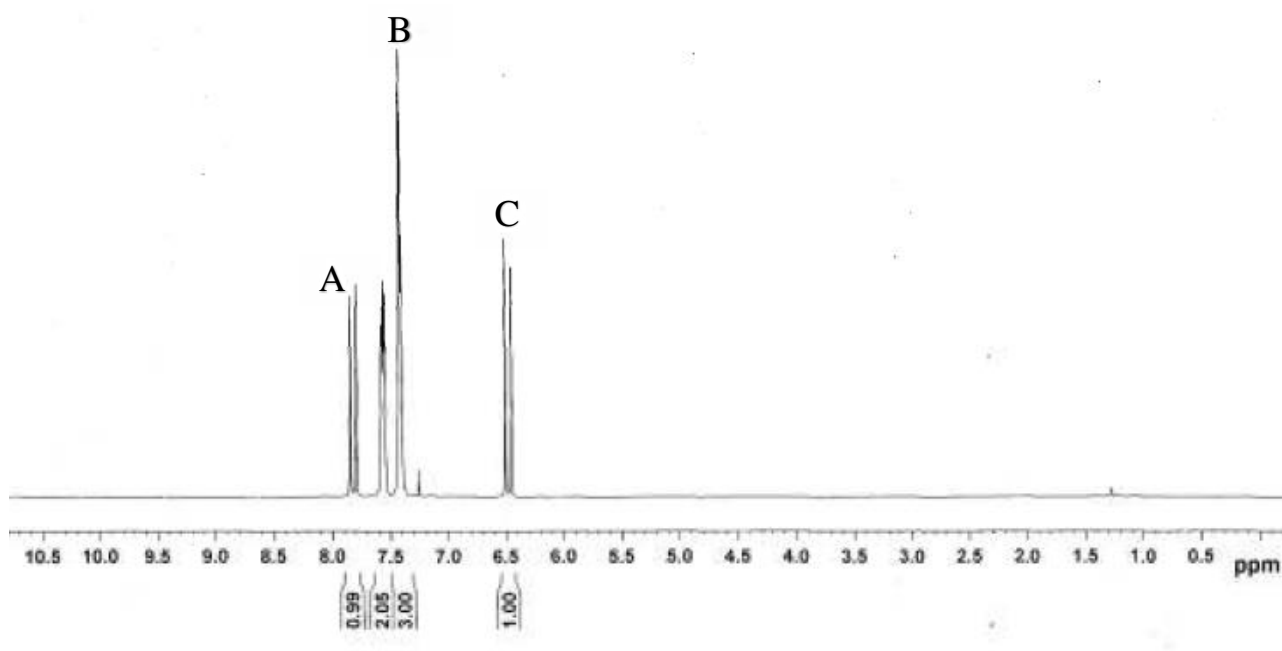
- (a) Identify each of the given signals marked **D**, **E**, **F** and **G**.
- (b) Assign the relevant bond vibrations responsible for each of the marked bands.
- (c) Mention the nature of each of the marked bands.
- (d) Provide brief explanation for relative frequencies of the absorptions of the marked bands.

2+4+2+4

$^1\text{H-NMR}$  Spectrum ( $S_P$ ) of *trans*-Cinnamic acid

*trans*-Cinnamic acid

$\delta$  (in ppm): 7.82, 7.42 and 6.48



IR Spectrum ( $S_I$ ) of *trans*-Cinnamic acid

$\tilde{\nu}$  (in  $\text{cm}^{-1}$ ): 2925, 1680, 1625 and 1445

