Solutions

Each answer shows the steps, then the **result**.

2.1

- in an aldehyde the C=O is on the end of the chain (carries an H, –CHO); in a ketone the C=O is in the middle, between two carbons

2.2

- 2,4-dinitrophenylhydrazine (2,4-DNPH)

3.1 B

- Tollens' reagent gives a silver mirror with an aldehyde only

3.2 B

- Addition of HCN to a carbonyl is nucleophilic addition

3.3

(a)

- the CN^- nucleophile attacks the $\delta+$ carbonyl carbon (curly arrow from the lone pair); the C=O π bond breaks, the electrons going to the oxygen to give O^-; the O^- takes an H^+ (from HCN) to form the hydroxynitrile

(b)

- $NaBH_4$ (or $LiAlH_4$); propan-2-ol (a secondary alcohol)

3.4

- add Tollens' reagent (or Fehling's) and warm; propanal (aldehyde) gives a silver mirror (or brick-red precipitate); propanone (ketone) gives no change