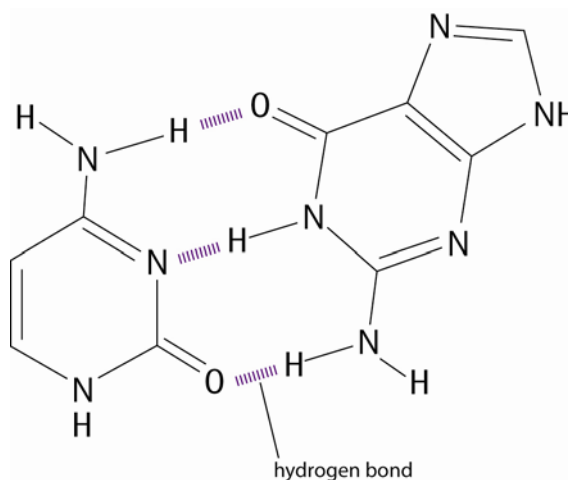


Marking scheme for AHL Worksheet – Option B

- 1 a** provides an alternative pathway for the reaction [1]
with lower activation energy [1]
- b** the enzyme becomes saturated with substrate [1]
no more active sites available for binding substrate [1]
- c** $V_{\max} = 0.85 \times 10^{-3} \text{ mol dm}^{-3} \text{ s}^{-1} / 8.5 \times 10^{-4} \text{ mol dm}^{-3} \text{ s}^{-1}$ [1]
 $K_m = \text{approx. } 2.1 \times 10^{-3} \text{ mol dm}^{-3}$ [1]
- d** V_{\max} remains the same [1]
competitive inhibitor competes with substrate for active site of enzyme therefore at sufficiently high concentrations of substrate essentially all active sites occupied by substrate / competitive inhibitor binds reversibly to active site [1]
- e** V_{\max} decreased [1]
non-competitive inhibitor causes change in shape of active site so that it cannot bind substrate, therefore the concentration of active enzyme is essentially reduced [1]
- 2 a** DNA [1]
the sugar is deoxyribose/no O on carbon 2 [1]
- b**



- hydrogen bonding between N/O and H on different molecules [1]
three correct H bonds [1]