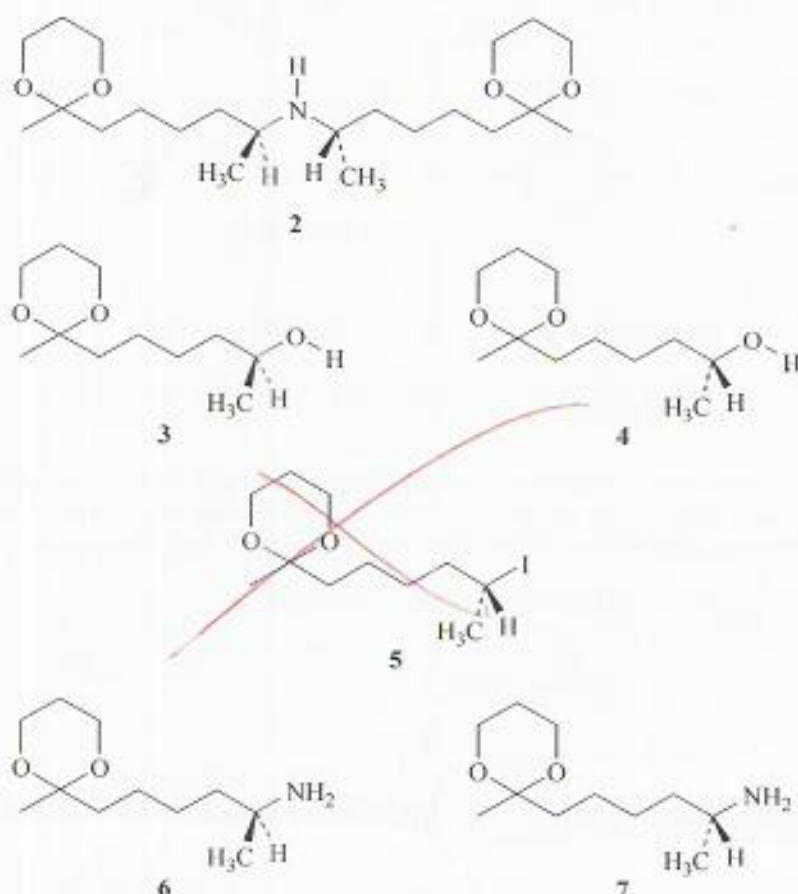


### Question 3

This question carries 20 per cent of the marks for this assignment, and tests Learning Outcomes 1, 3, 4, 6 and 9 of Book 5 Part 2.

The synthesis of Compound 2 is a key step in a synthetic scheme because it introduces chiral centres (marked \*) into the molecule. The reagents 3–7 could be used in this reaction.



(a) (8 marks) Which *two* of the reagents 3–7 would you use to prepare Compound 2 via a nucleophilic substitution reaction? Give the reasons for your choice, as well as details of the reaction conditions, including any other reagents you might need.

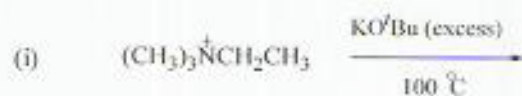
(b) (7 marks) Using curly arrows, draw out the mechanism of the reaction in which Compound 2 is formed from your two chosen reagents, and show the resulting stereochemistry in the product.

(c) (5 marks) Explain your reasons for not choosing the other reagents.

### Question 4

This question carries 20 per cent of the marks for this assignment, and tests Learning Outcomes 1, 3, 5 and 6 of Book 5 Part 3.

(a) (8 marks) For each of the following reactions, indicate whether the major product is formed by a substitution or an elimination process. Give reasons for your answers and draw the reaction profile in each case.



[KO<sup>t</sup>Bu = potassium *tert*-butoxide]