

(b) (10 marks) Perform a retrosynthetic analysis for the forward step 4. Identify the disconnection in the product **25**, and draw the two synthons (including + and - signs) that show why the two compounds **23** and **24** are chosen.

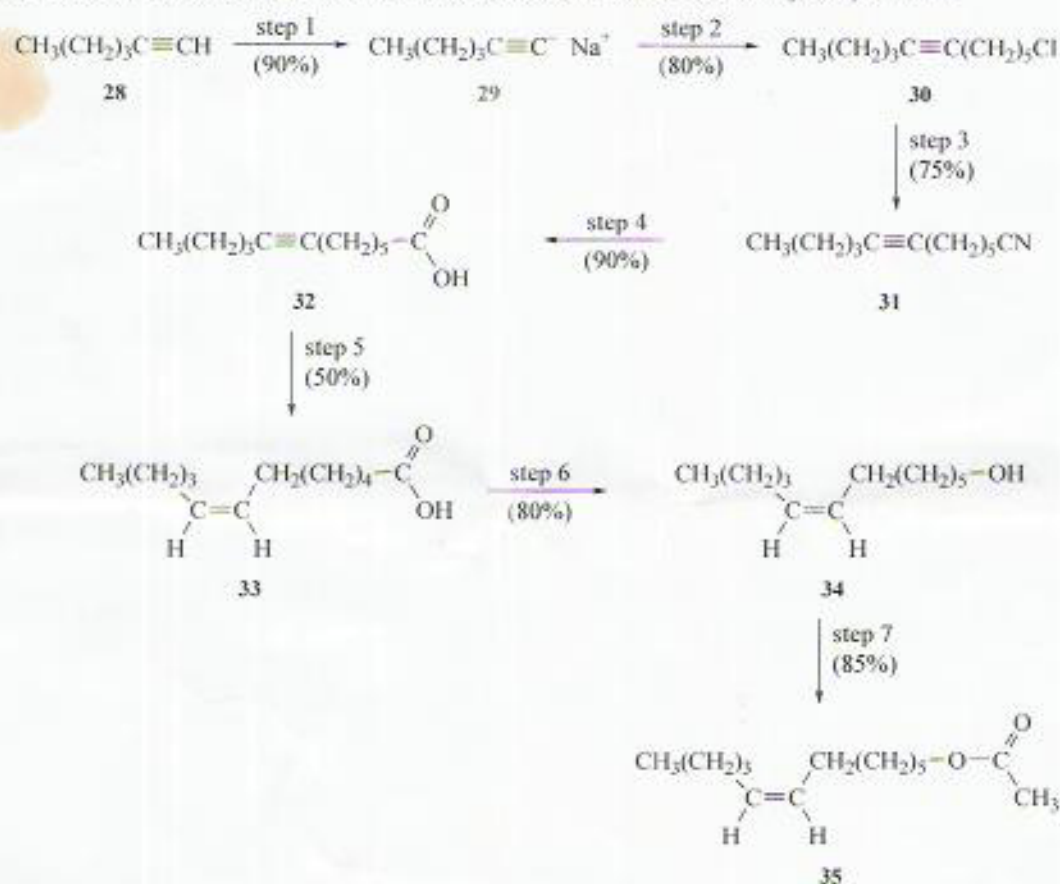
(c) (6 marks) Give an example of a protection and deprotection step in Scheme 1. Explain why they are necessary.

(d) (4 marks) What reagent is needed for step 2? What type of retrosynthetic conversion is involved in this step?

Question 6

This question carries 25 per cent of the marks for this assignment, and tests Learning Outcomes 3, 4, 5, 6, 7 and 9 of Book 10 Part 4.

Scheme 2 shows a synthesis of Compound **35**, a pheromone of the cabbage looper moth.



SCHEME 2

(a) (5 marks) Is the synthesis linear or convergent? Calculate the overall yield of the synthesis.

(b) (5 marks) For the transformation of Compound **29** to Compound **30**, show the retrosynthetic step. Draw the structures of the synthons required, including the + and - signs. What is the structure of the compound that **29** must react with in step 2 to give Compound **30**?

(c) (5 marks) Which step in the reaction sequence is stereoselective? Why is it stereoselective, and what reagent would you need to ensure it is stereoselective?

(d) (10 marks) Retrosynthetic analysis of the synthesis shows that some of the steps involve functional group interconversion (FGI). Identify two steps in the sequence that can be classified as FGI. What are the reagents required for each of these steps?