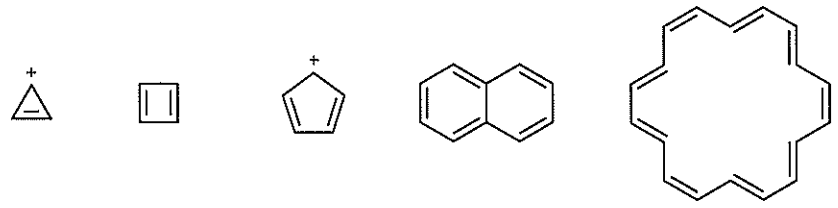
Organic Chemistry I

I −a

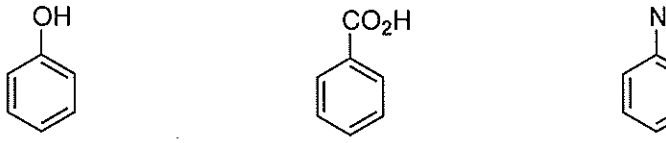
Answer the number of π electrons in the following compounds and choose the aromatic ones.

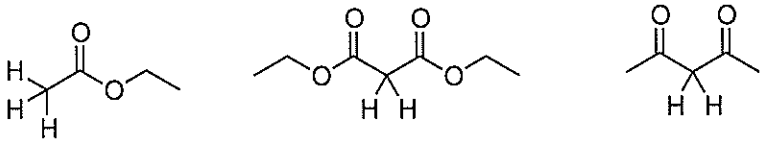


1 **2** **3** **4** **5**

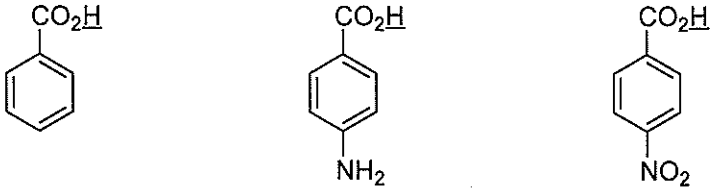
I −b

Show the order of the following molecules from strong to weak acids.

(A) 

(B) 

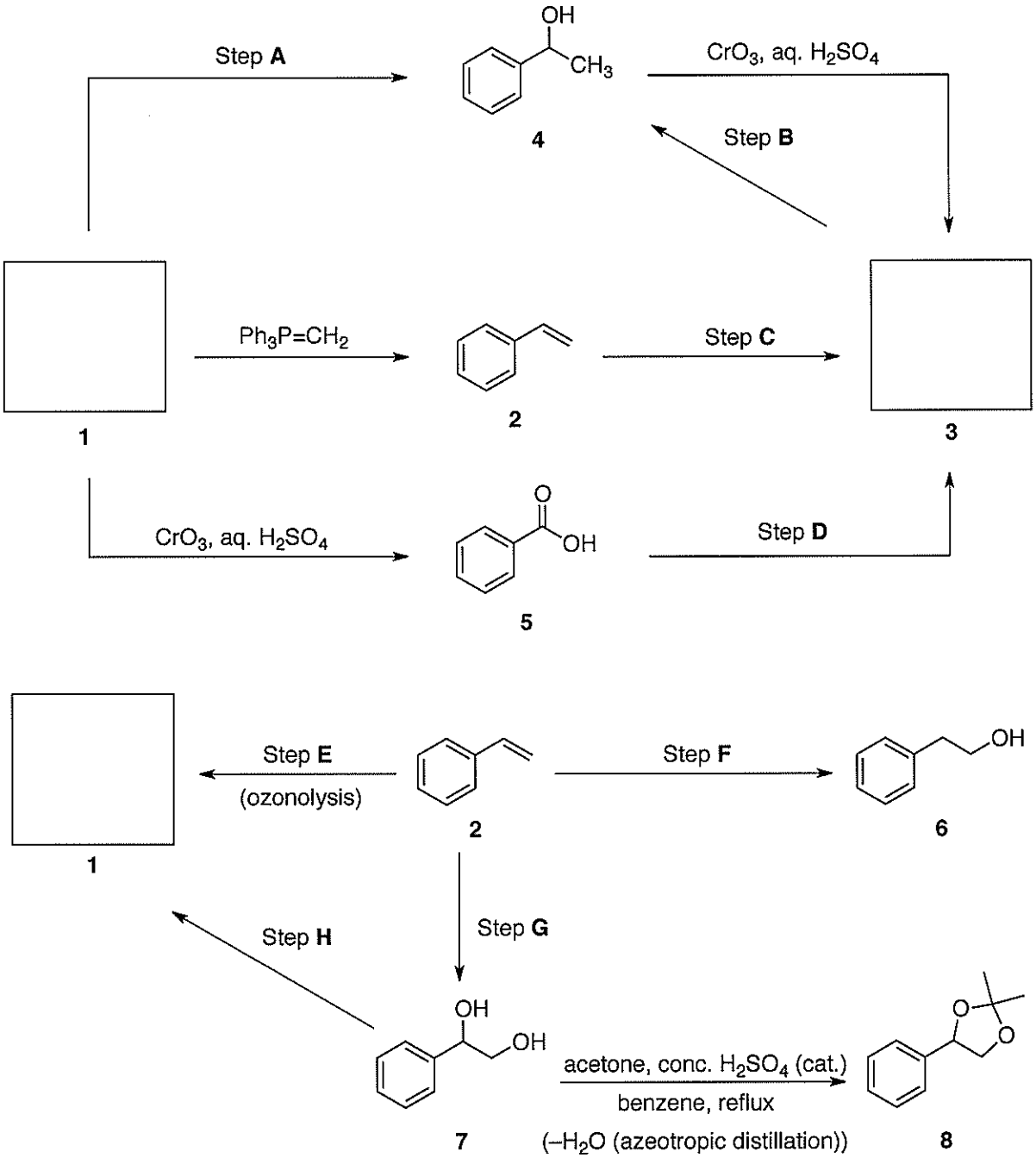
(C) H_3C-CH_3 

(D) 

(E) CH_3COOH $CH_2ClCOOH$ $CHCl_2COOH$

I –c

Answer the following questions in the molecular transformations shown below.



(1) Show the structures of the compounds **1** and **3**.

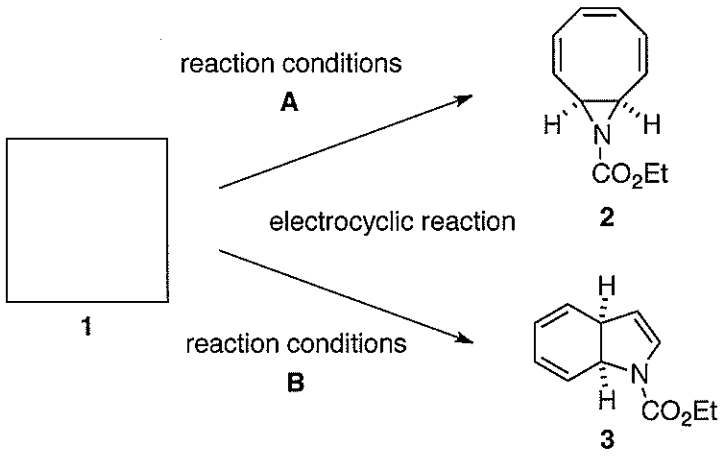
(2) Show the reagents and/or conditions for the steps **A**–**H**.

(3) Show the reaction mechanism to give compound **8** from **7**.

Organic Chemistry II

II－a

The electrocyclic reaction of compound **1** under reaction conditions **A** selectively gives compound **2**. The electrocyclic reaction of compound **1** under reaction conditions **B** selectively provides compound **3**. Answer the following questions.



(1-i) Show the structure of compound **1**.

(1-ii) Answer whether compound **1** is aromatic or not and explain the reason.

(2) The following table describes the conditions **A** and **B** for the electrocyclic reaction of compound **1**. Answer which is the correct combination, (i) or (ii).

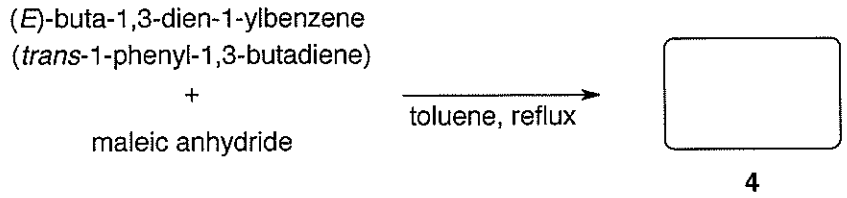
	reaction conditions	
	A	**B**
(i)	thermal conditions	photochemical conditions
(ii)	photochemical conditions	thermal conditions

(3) Based on the Woodward-Hoffmann rules, explain the reason why the selective electrocyclic reaction of compound **1** to compound **2** proceeds under conditions **A**.

(4) Based on the Woodward-Hoffmann rules, explain the reason why the selective electrocyclic reaction of compound **1** to compound **3** proceeds under conditions **B**.

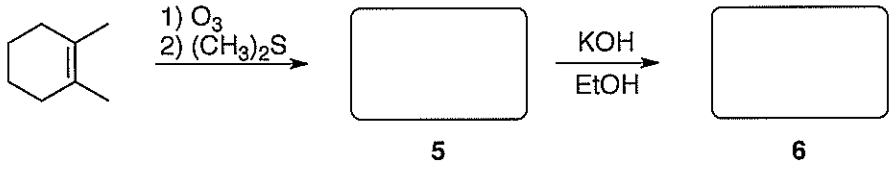
Ⅱ－b

Show the structure of the compound **4** with stereochemistry.



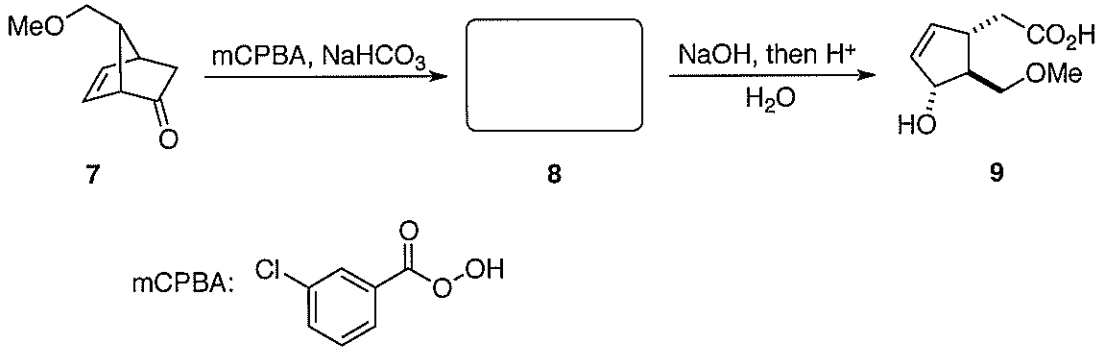
Ⅱ－c

Show the structures of compounds **5** and **6**.



Ⅱ－d

Answer the following questions in the molecular transformations shown below.



(1) Show the structure of the compound **8**.

(2) Show the reaction mechanism to give compound **9** from **7**.