44-Karanpur, Near Laxmi Narayan Mandir, Dehradun
Contact: 8171000425, 7252022576
Web: www.genesis-tutorials.com
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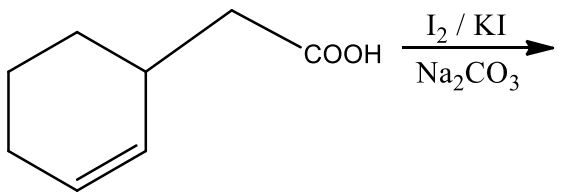
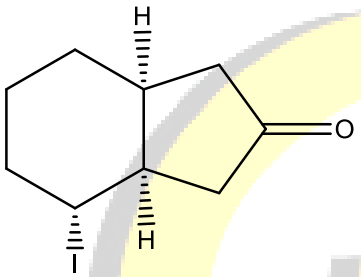
GENESIS TUTORIALS

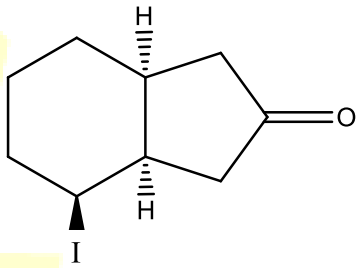
Institute for CSIR-UGC-NET/JRF, GATE & IIT-JAM

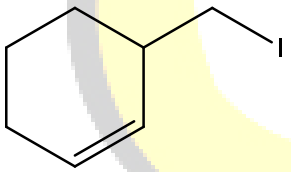
Assignment-I: REACTIVE INTERMEDIATE & REACTIVE MECHANISM

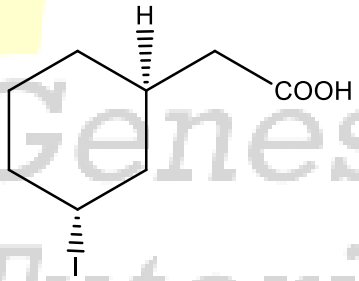
1. The major product formed in the reaction given below is: **[NET June 2011]**



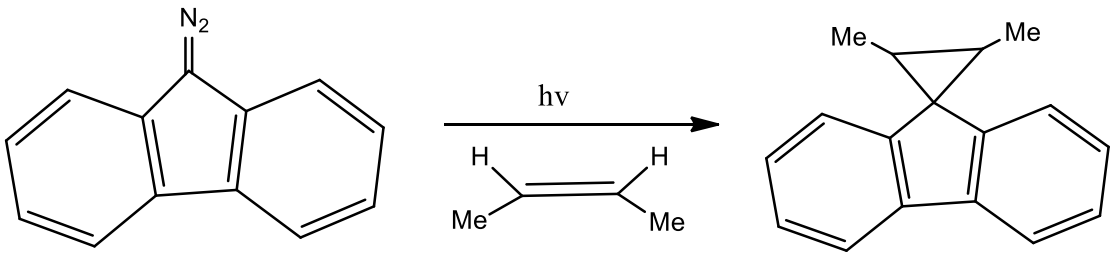
(a)


(b)


(c)


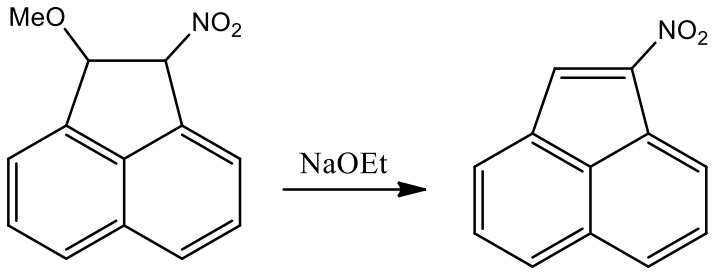
(d)


2. The intermediate involved in the reaction given below is: **[NET June 2011]**



(a) Free-radical (b) Carbocation (c) Carbanion (d) Carbene

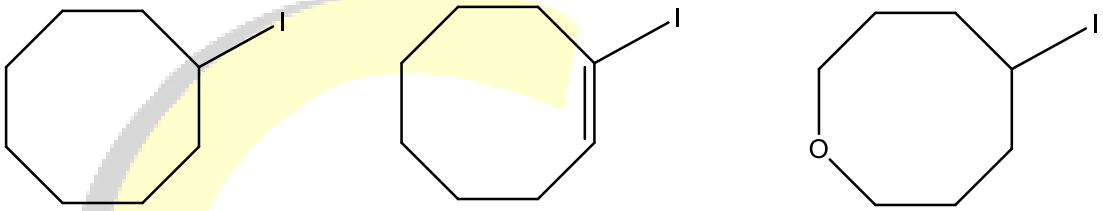
3. The reaction given below is an example of **[NET June 2011]**



(a) E_2-elimination (b) E_1 – elimination

(c) syn-elimination (d) E_1 CB-elimination

4.The relative rates of solvolysis of iodides A-C are **[NET June 2011]**



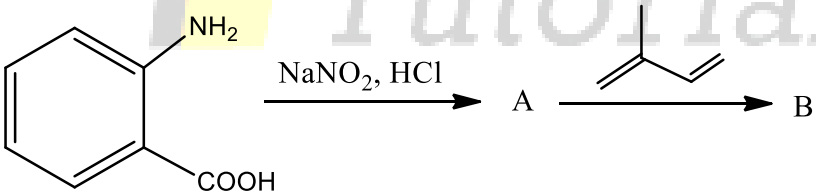
A B C

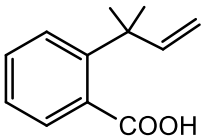
(a) C > A > B (b) C > B > A

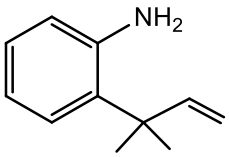
(c) B > C > A (d) B > A > C

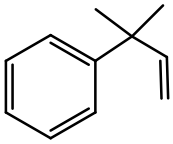
5. The intermediate A and the major product B in the following conversion are

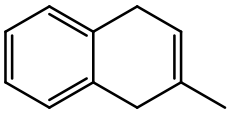
[NET June 2011]



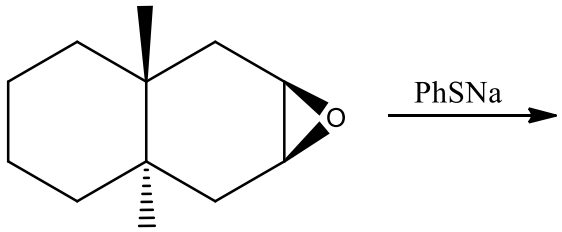
(a) A is carbocation and B is 

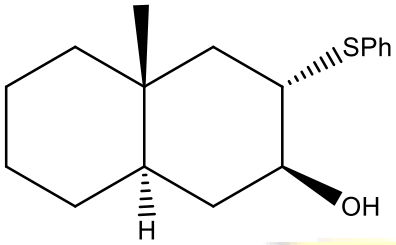
(b) A is a carbanion and B is 

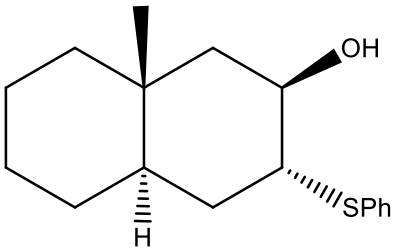
(c) A is a free radical and B is 

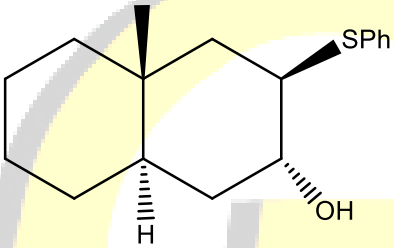
(d) A is a benzyne and B is 

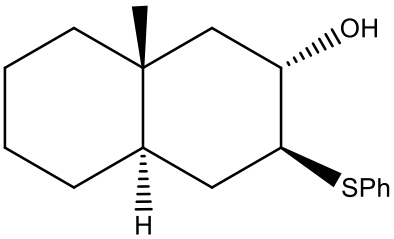
6. The major product formed in the following reaction is: **[NET June 2011]**



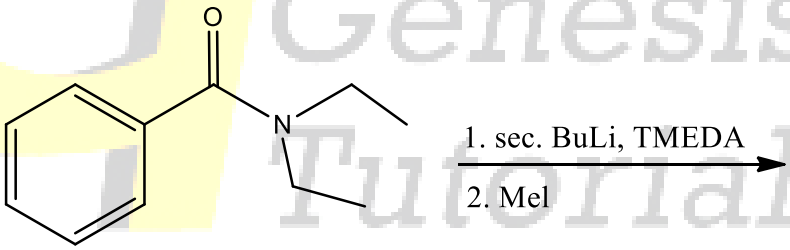
(a)


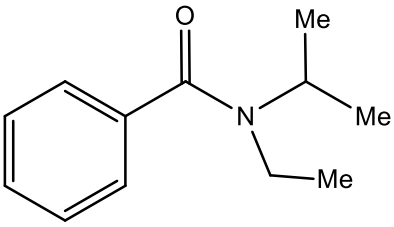
(b)


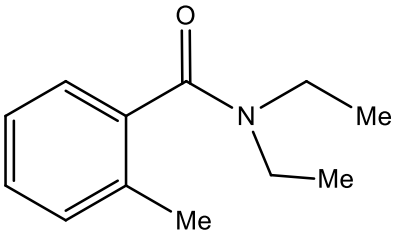
(c)


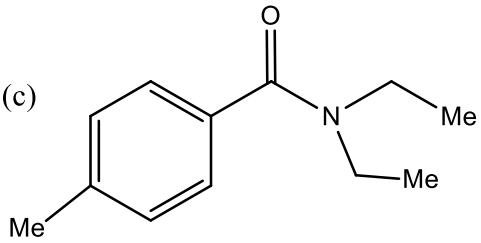
(d)


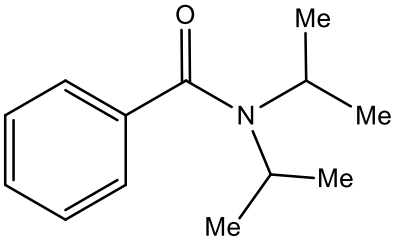
7. The major product formed in the following reaction is: **[NET June 2011]**



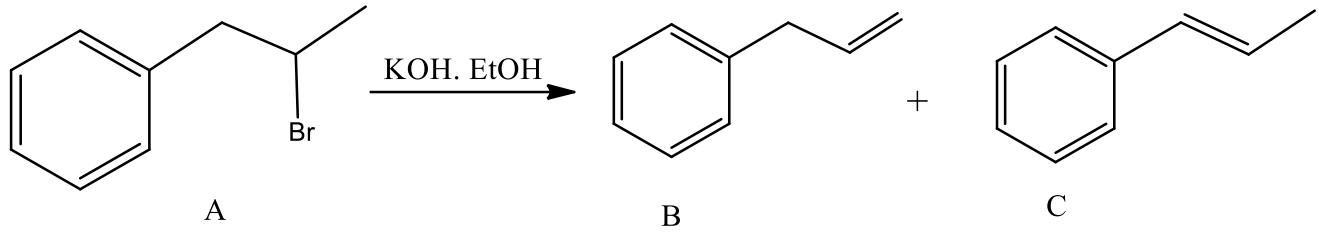
(a)


(b)


(c)


(d)


8. Consider th following reaction: **[NET June 2011]**

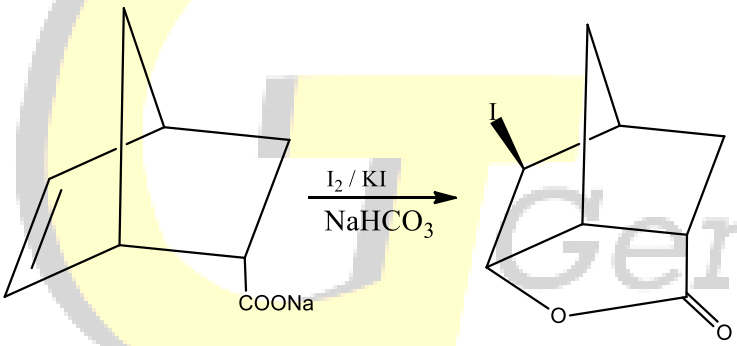


In an experiment, 1.99 g of bromide A on reaction with ethanolic potassium hydroxide gave 1.062 g of a mixture of the olefins B and C. If the ration of olefins B:C formed is 2:1, the yields for their formation, respectively, are

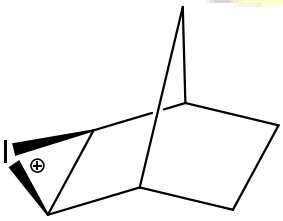
(a) 60 and 30% (b) 50 and 25%

(c) 66 and 33% (d) 54 and 27%

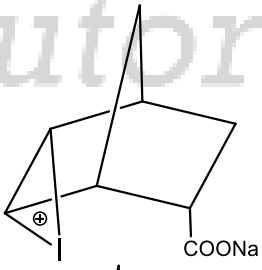
9. The reaction given below proceeds through **[NET Dec 2011]**



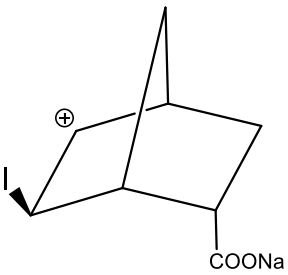
(a)



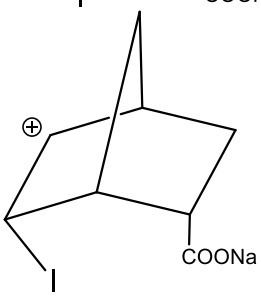
(b)



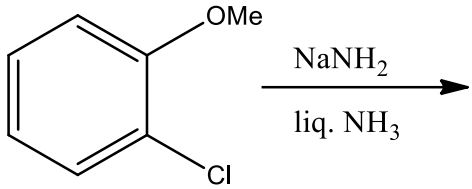
(c)

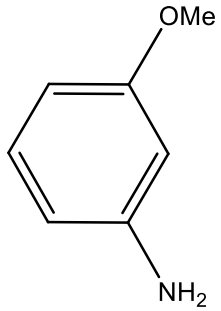


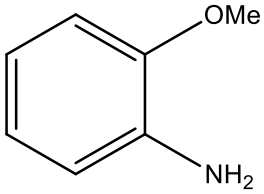
(d)

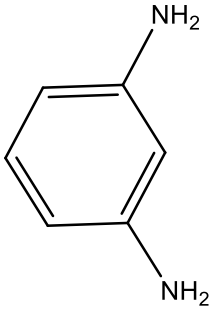


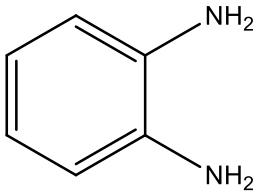
10. The major product formed in the following reaction is **[NET Dec 2011]**



(a) 

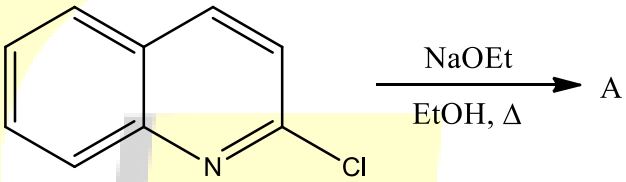
(b) 

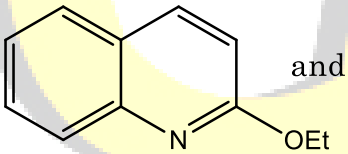
(c) 

(d) 

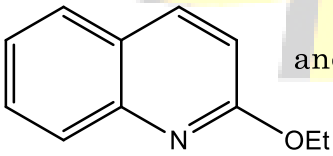
11. In the following reaction, the product formed and the mechanism involved are

[NET Dec 2011]

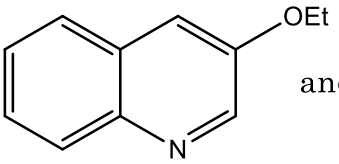


(a) A is 

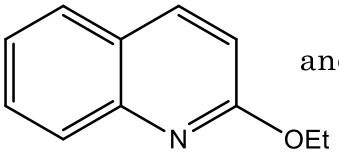
and is formed by addition-elimination mechanism

(b) A is 

and is formed by benzyne mechanism

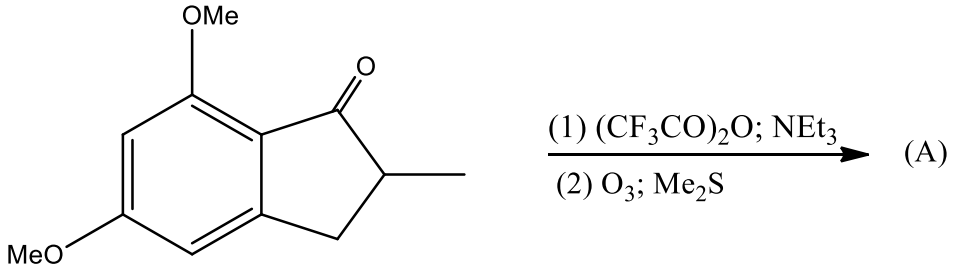
(c) A is 

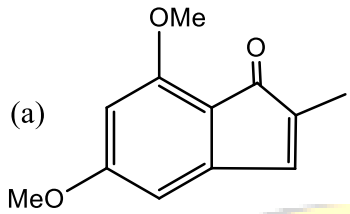
and is formed by benzyne mechanism

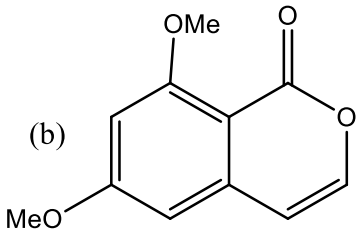
(d) A is 

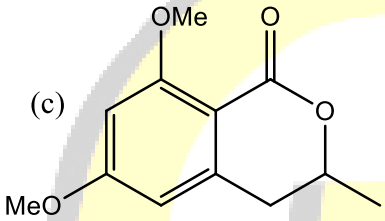
and is formed by S_N2 displacement

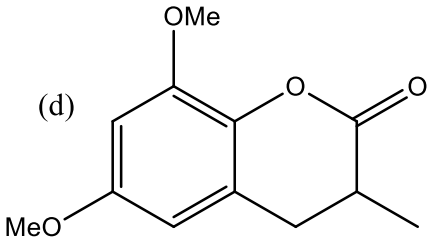
12. The major product fomed in the following reaction sequence is: **[NET Dec 2011]**



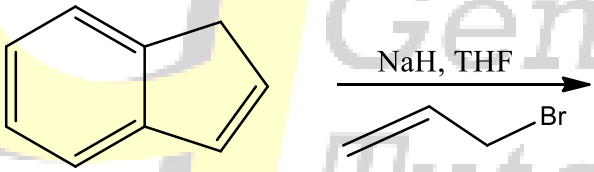
(a)


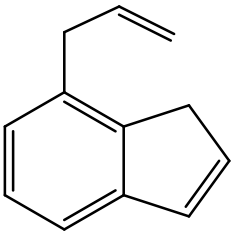
(b)


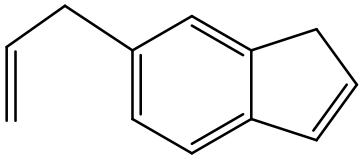
(c)


(d)


13. The major product formed in the following reaction is: **[NET June 2012]**



(a)


(b)


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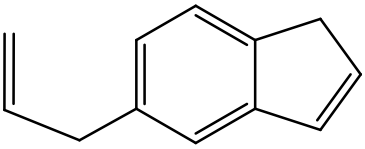
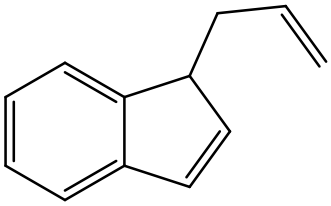
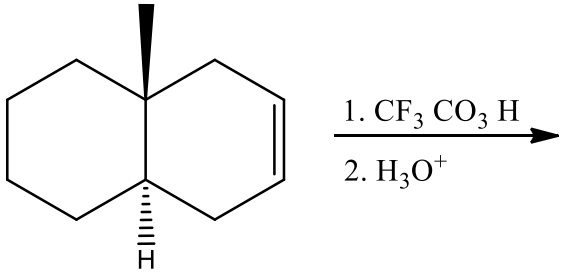
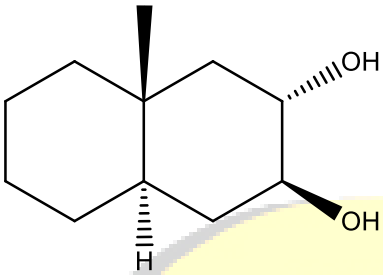
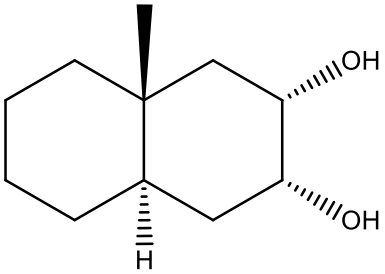


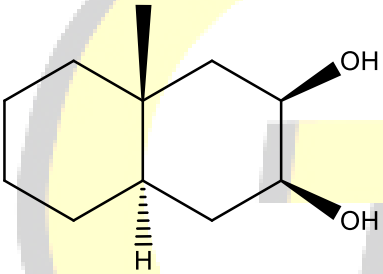
(d)


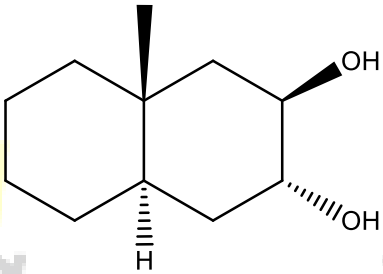
14. The major product formed in the following reaction is: **[NET June 2012]**



(a)


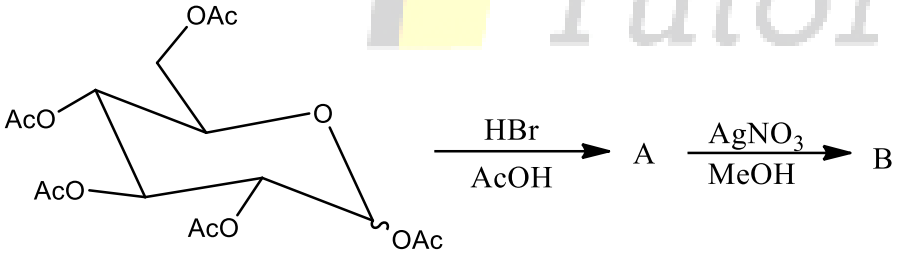
(b)


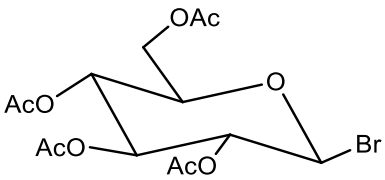
(c)


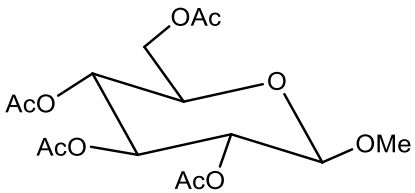
(d)


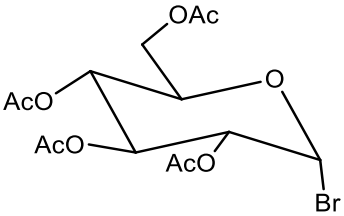
15. In the following reaction sequence, the major products A and B are

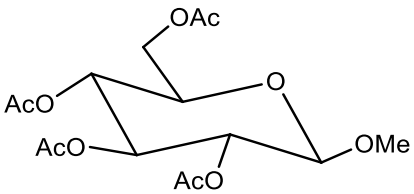
[NET June 2012]

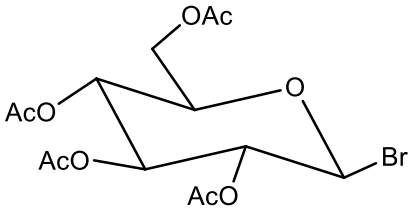


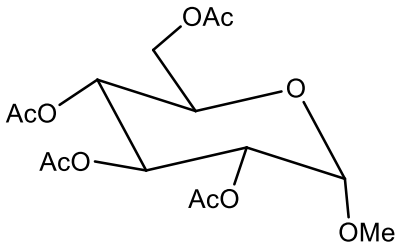
(a) A is


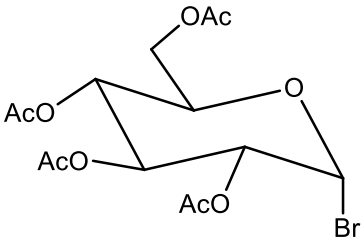
B is


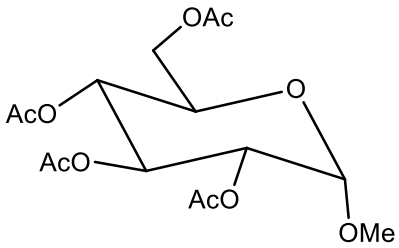
(b) A is


B is


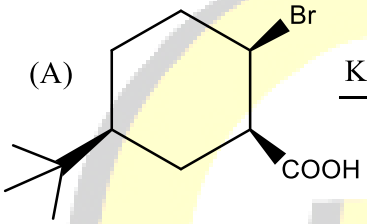
(c) A is 

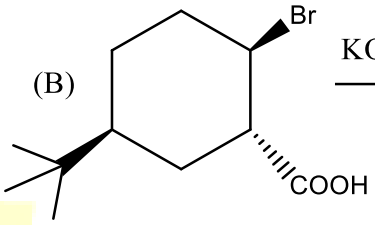
B is 

(d) A is 

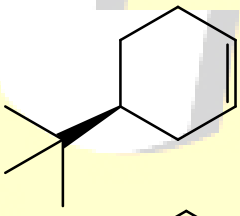
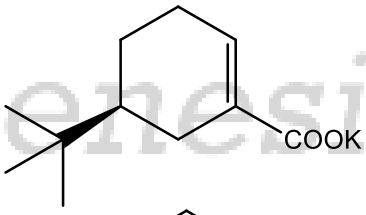
B is 

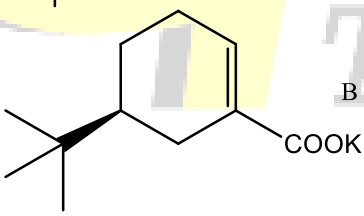
16. For the following two reactions A and B, the correct statement is: **[NET June 2012]**

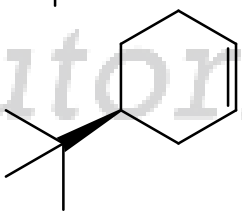
(A) 

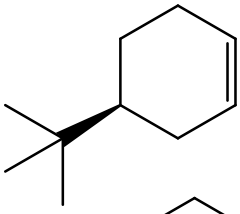
KO'Bu (excess) →
(B) 

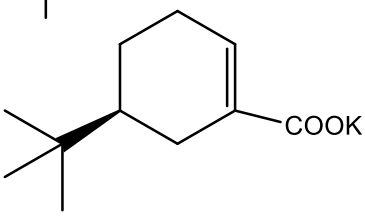
KO'Bu (excess) →

(a) A gives 
B gives 

(b) A gives 

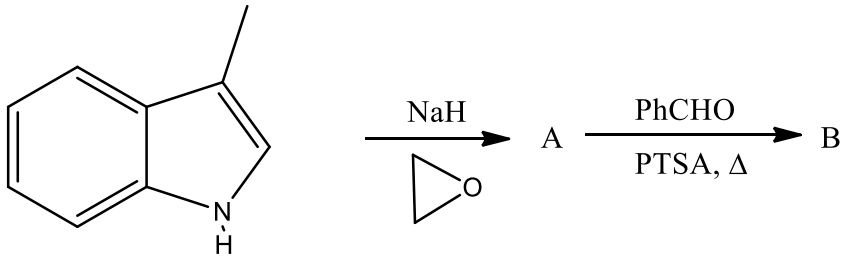
B gives 

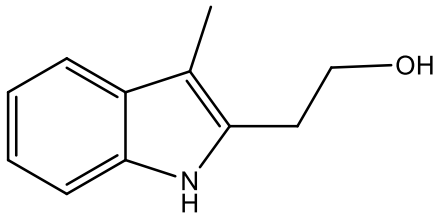
(c) Both A and B 

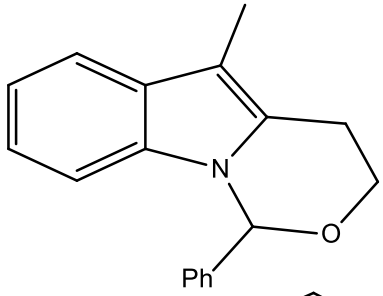
(d) Both A and B give 

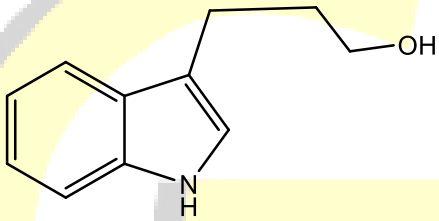
17. The major products A and B formed in the following reaction sequence are

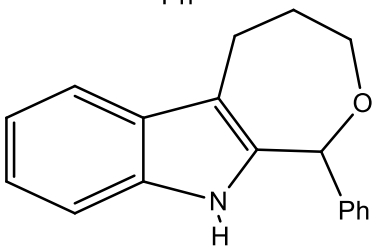
[NET June 2012]

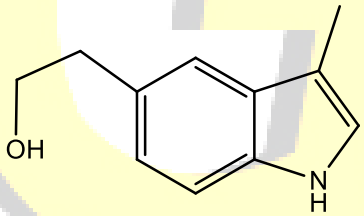


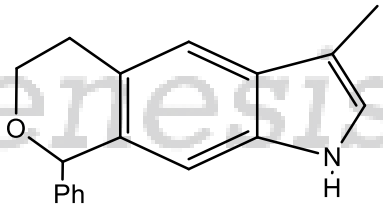
(a) A = 

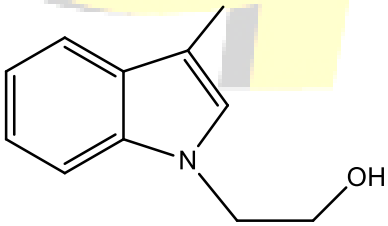
B = 

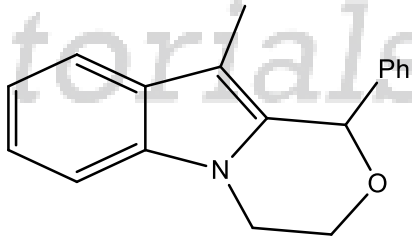
(b) A = 

B = 

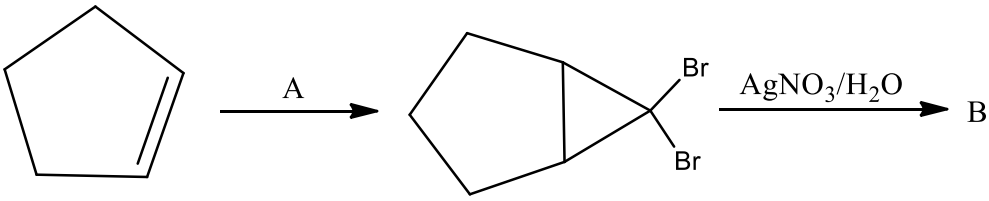
(c) A = 

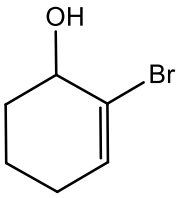
B = 

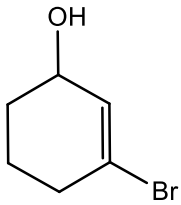
(d) A = 

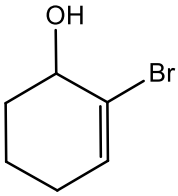
B = 

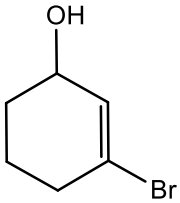
18. The reagent A required, and the major product B formed in the following reaction sequence are **[NET June 2012]**



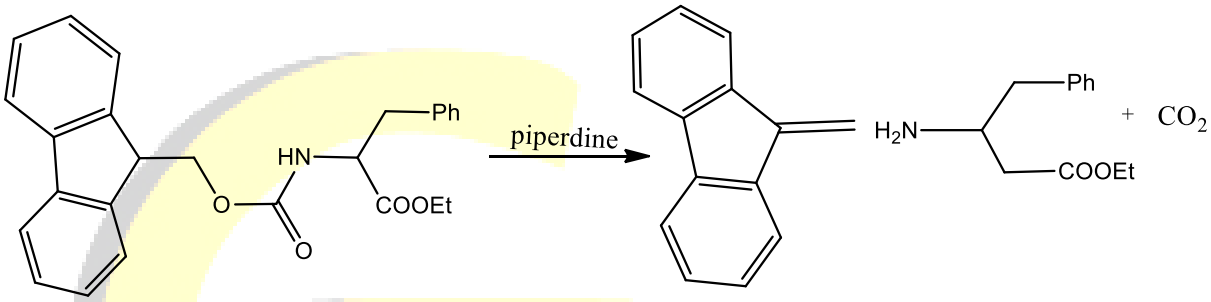
(a) A = CH_2Br_2 and KO'Bu, B = 

(b) A = CH_2Br_2 and KO'Bu, B = 

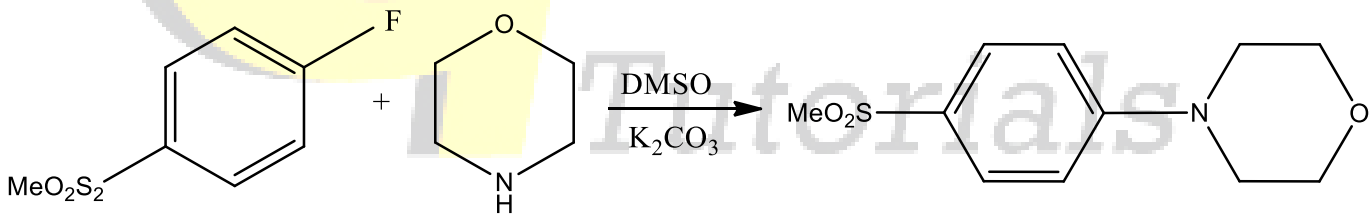
(c) A = $CHBr_3$ and KO'Bu, B = 

(d) A = $CHBr_3$ and KO'Bu, B = 

19. The mechanism involved in the following conversion is: **[NET June 2012]**



20. The correct statement(s)-A-D are given for the following reaction. The correct one(s) is/are **[NET Dec 2012]**



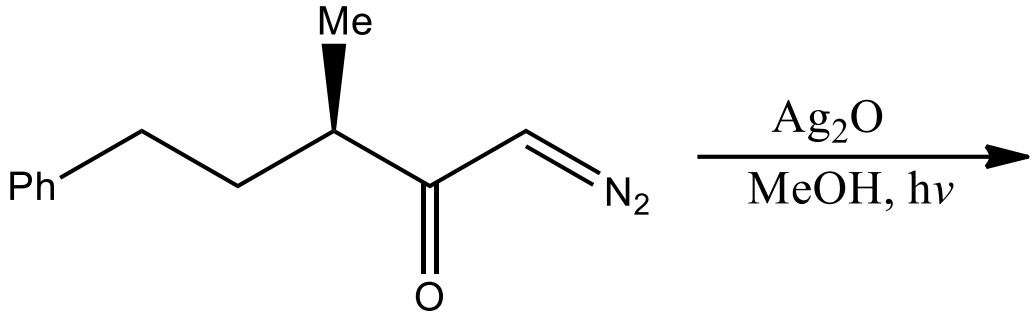
(a) aromatic ipso substitution reaction

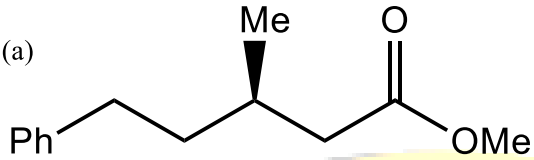
(b) aromatic nucleophilic substitution

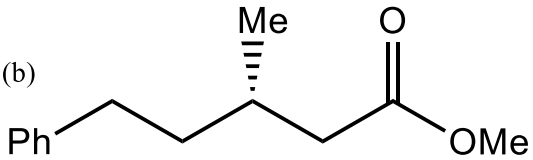
(c) aromatic electrophilic substitution

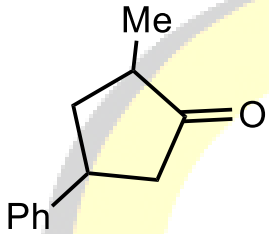
(d) aromatic free radical substitution

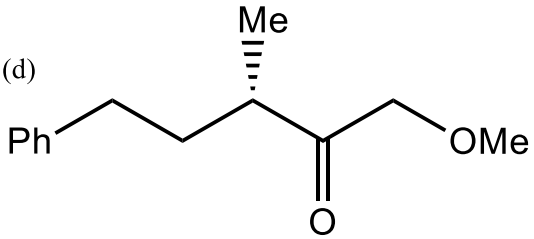
21. The major producet formed in the follwing reaction is **[NET Dec 2012]**



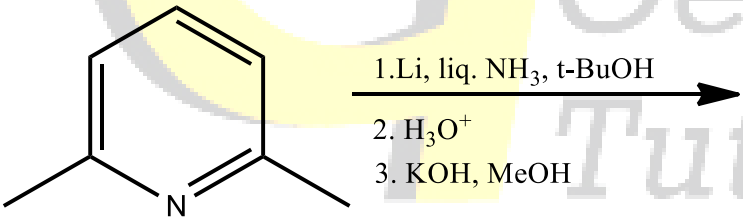
(a)


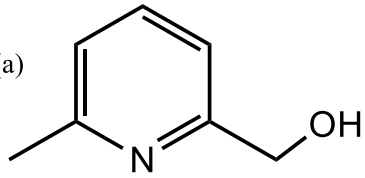
(b)


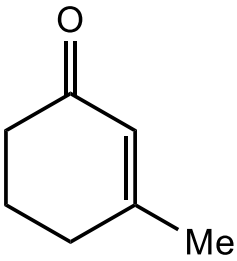
(c)


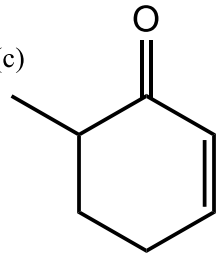
(d)


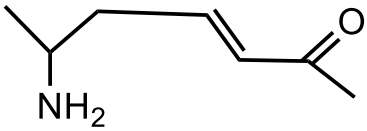
22. The major product formed in the following reaction is: **[NET Dec 2012]**



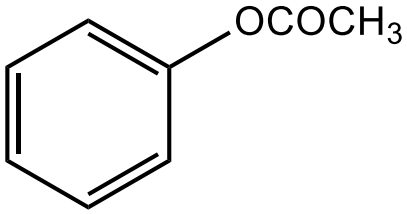
(a)


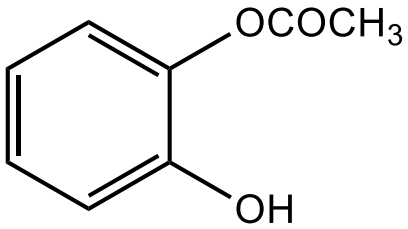
(b)


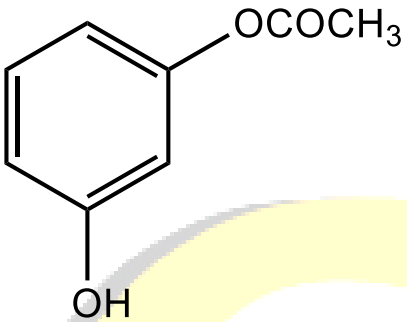
(c)


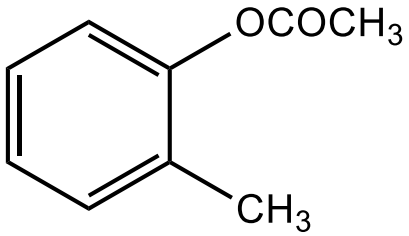
(d)


23. Among the following esters, the one that undergoes acid hydrolysis fastest is **[NET June 2013]**

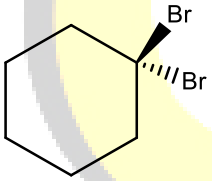
(a) 

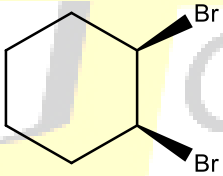
(b) 

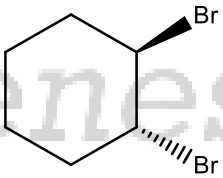
(c) 

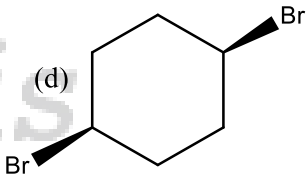
(d) 

24. Among the following dibromocyclohexanes, the one that reacts fastest with sodium iodide to give cyclohexene is **[NET June 2013]**

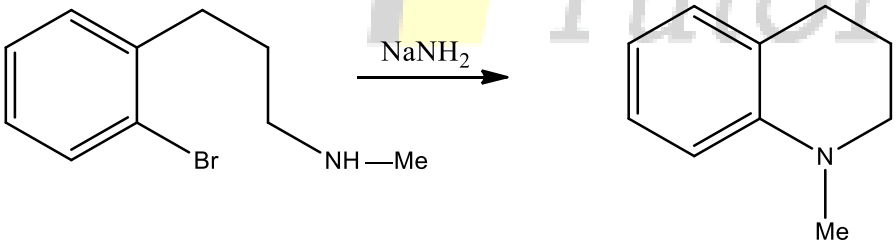
(a) 

(b) 

(c) 

(d) 

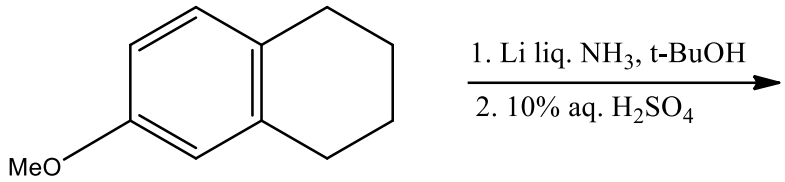
25. The reactive intermediate involved in the following reaction is: **[NET June 2013]**

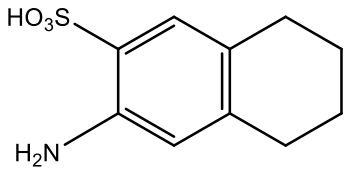


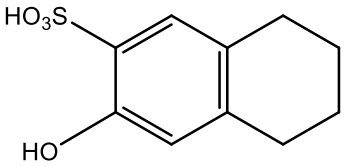
(a) a carbocation (b) a carbanion

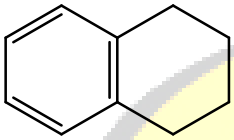
(c) a free radical (d) an aryne

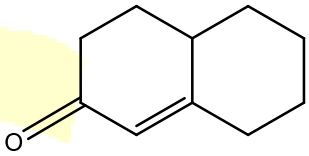
26. The compound formed in the following reaction sequence is. **[NET June 2013]**



(a) 

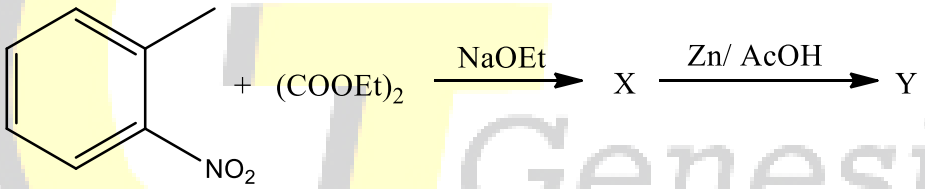
(b) 

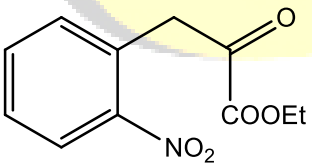
(c) 

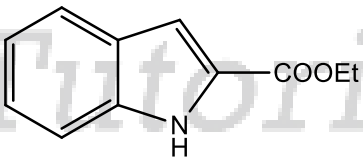
(d) 

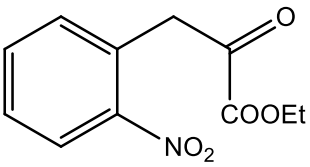
27. In the following reaction sequence, structures of the major product X and Y are

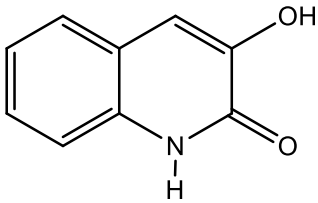
[NET June 2013]

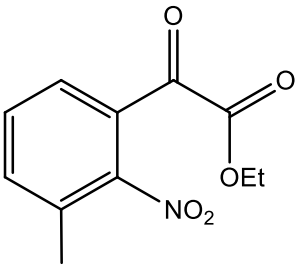


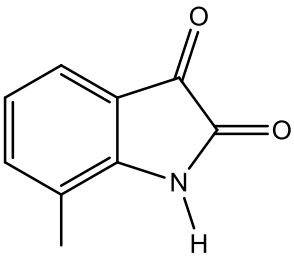
(a) X is 

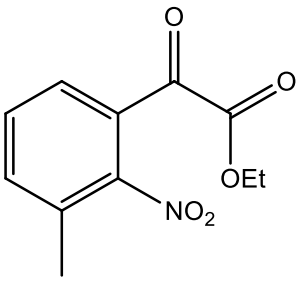
Y is 

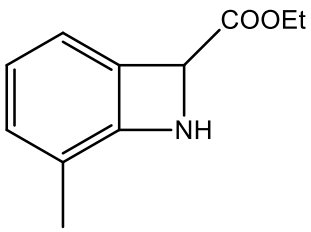
(b) X is 

Y is 

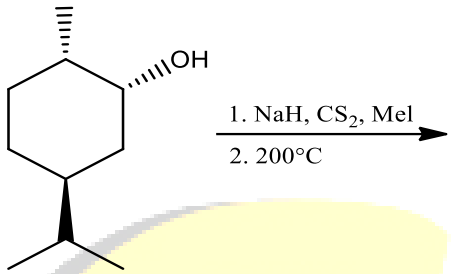
(c) X is 

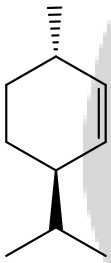
Y is 

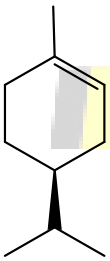
(d) X is 

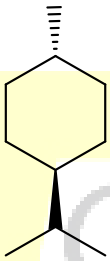
Y is 

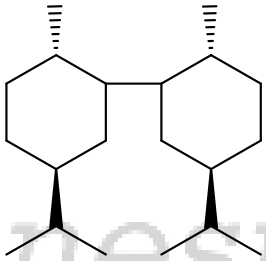
28. The major product formed in the following reaction is **[NET June 2013]**



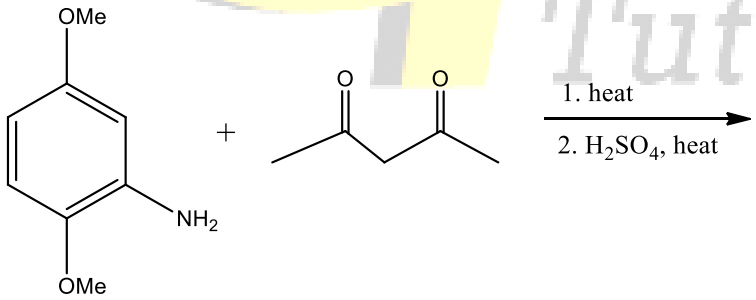
(a) 

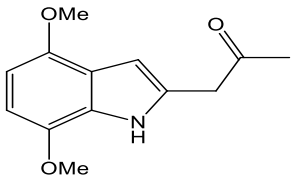
(b) 

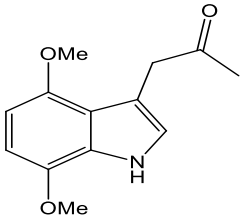
(c) 

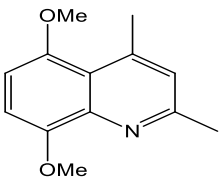
(d) 

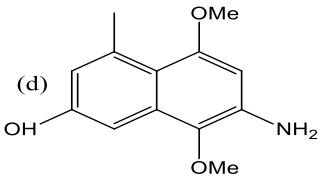
29. The major formed in the following reaction is **[NET Dec 2013]**



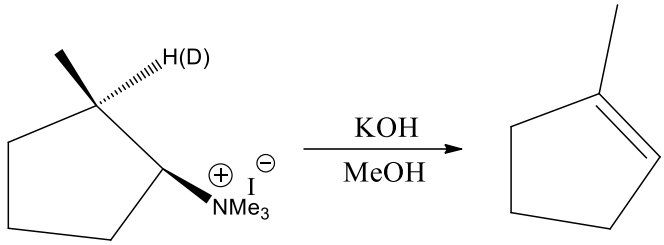
(a) 

(b) 

(c) 

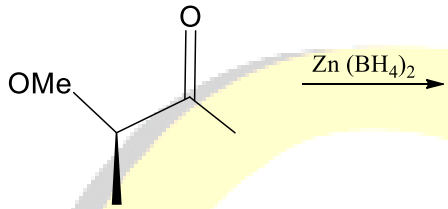
(d) 

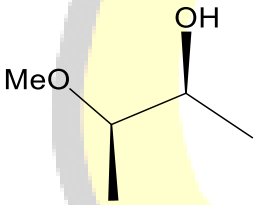
30. Deuterium kinetic isotope effects for the following reaction was found to be 4.0. Based on this information. mechanism of the reaction is **[NET Dec 2013]**

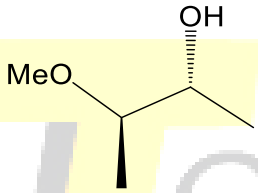


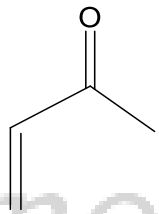
(a) E_1 (b) E_2 (c) E_{1CB} (d) free radical

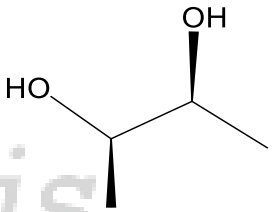
31. The major product formed in the following reaction is **[NET Dec 2013]**



(a) 

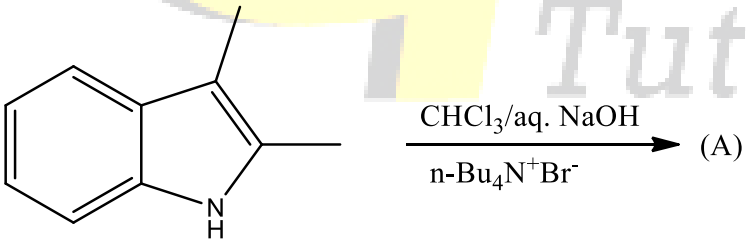
(b) 

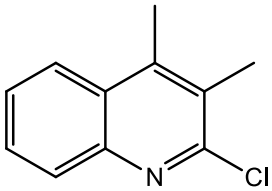
(c) 

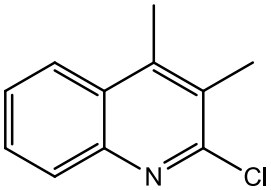
(d) 

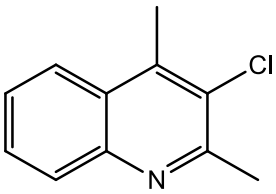
32.In the following reaction, the intermdiate and the major product A are

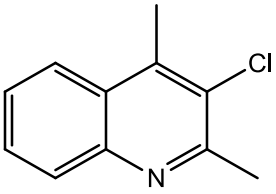
[NET Dec 2013]



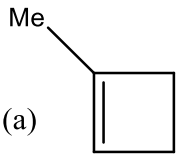
(a) :CHCl and 

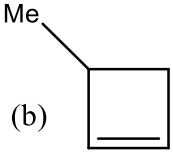
(b) :CCl_2 and 

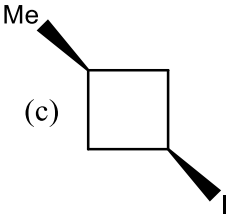
(c) :CHCl and 

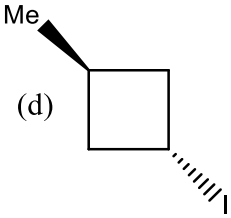
(d) :CCl_2 and 

33. The major product formed in the reaction of trans-1-bromo-3-methylcyclobutane with sodium iodide in DMF is— **[NET June 2014]**

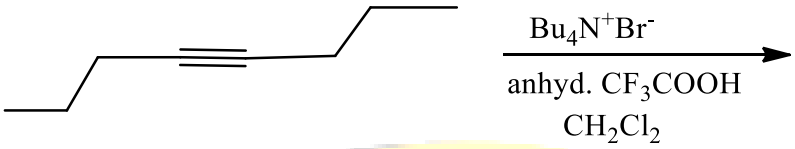
(a) 

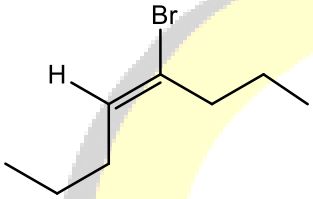
(b) 

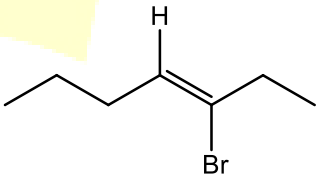
(c) 

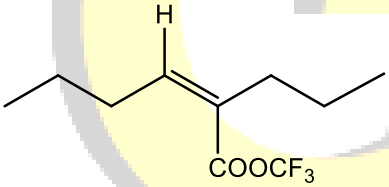
(d) 

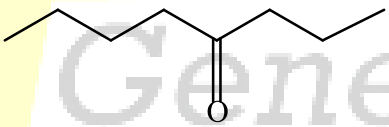
34. The major product formed in the following reaction is **[NET June 2014]**



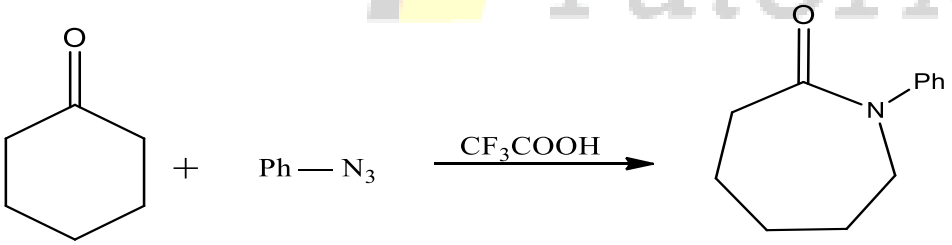
(a) 

(b) 

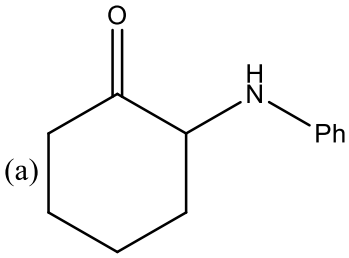
(c) 

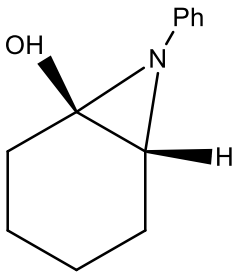
(d) 

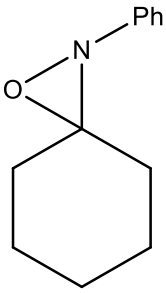
35. Consider the following reaction **[NET June 2014]**

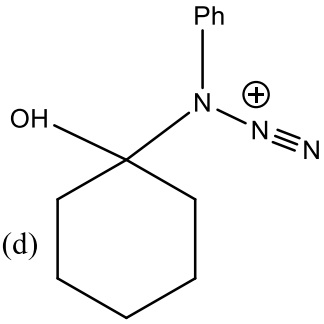


The appropriate intermediate involved in this reaction is

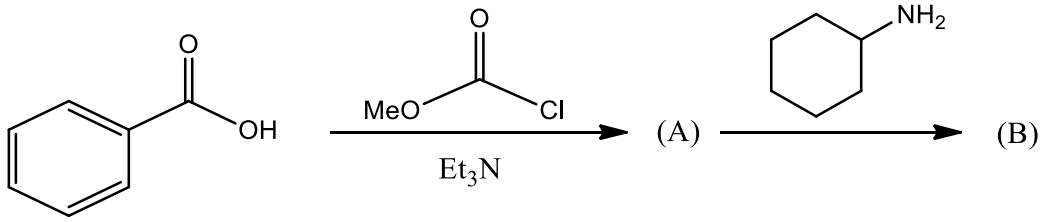
(a) 

(b) 

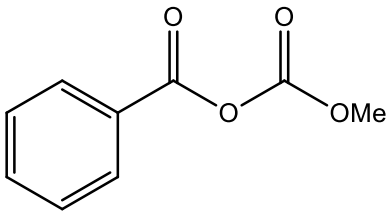
(c) 

(d) 

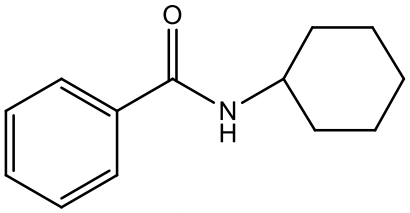
36. The products A and B in the following reaction sequence are **[NET June 2014]**



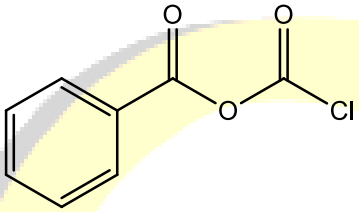
(a) A :



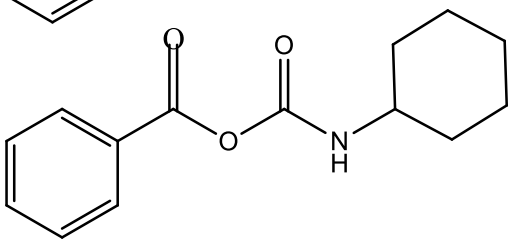
B ;



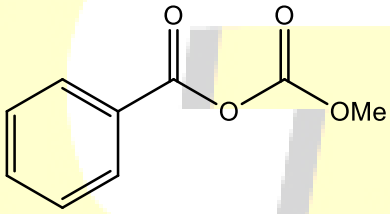
(b) A :



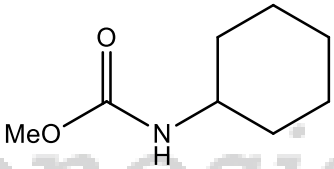
B ;



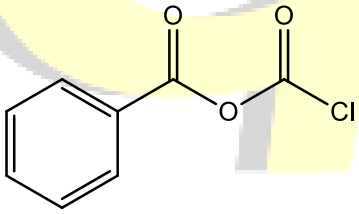
(c) A :



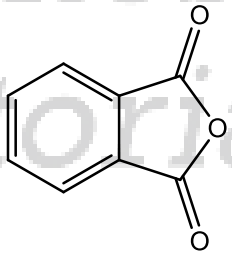
B ;



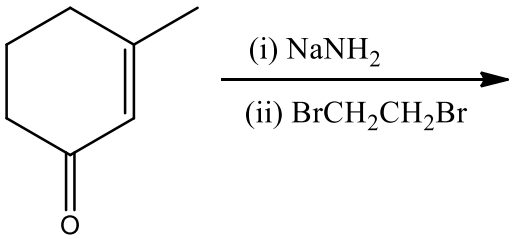
(d) A :

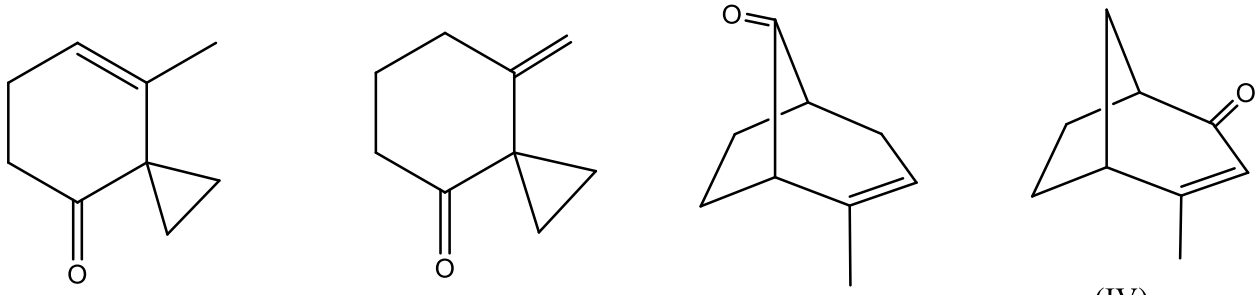


B ;



37. Only two products are obtained in the following reaction sequence. The structures of the products from the list I-IV are **[NET June 2014]**

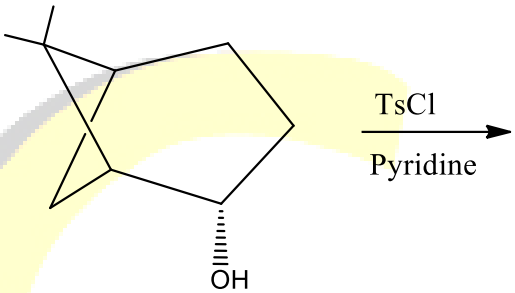




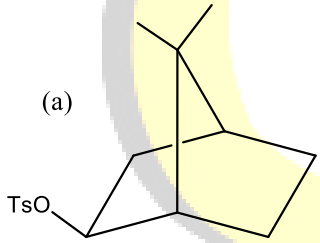
(I) (II) (III) (IV)

(a) I and II (b) II and IV (c) I and III (d) III and IV

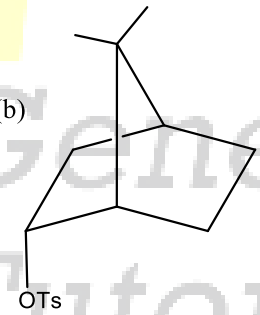
38. The major product formed in the following reaction is **[NET June 2014]**



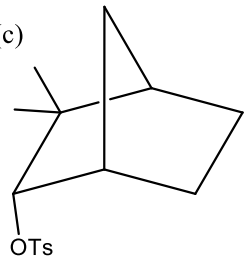
(a)



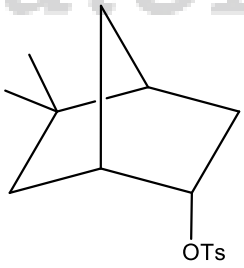
(b)



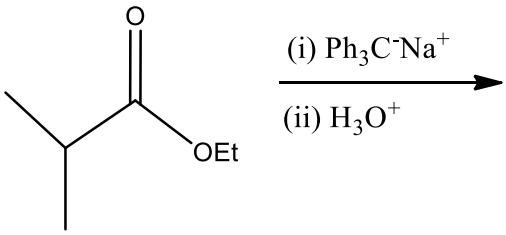
(c)

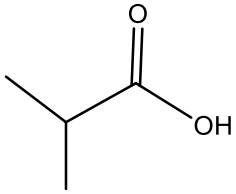


(d)

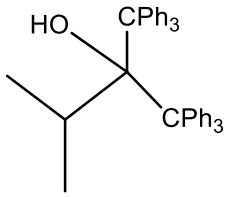


39. The major products formed in the following are **[NET June 2014]**

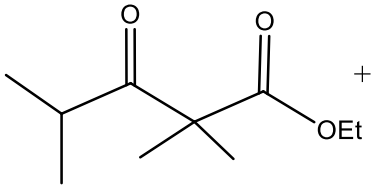


(a) 

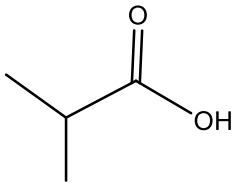
$+ Ph_3C — CH_2CH_3$

(b) 

+ EtOH

(c) 

+ EtOH

(d) 

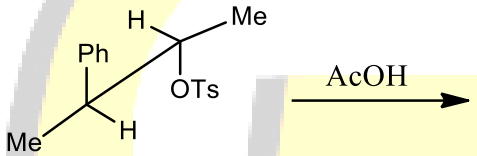
$+ H_2C{=}CH_2$

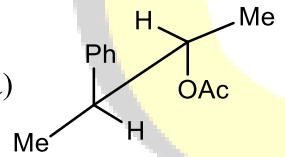
40. The pair of solvents in which PCl_5 does NOT ionize, is **[NET June 2014]**

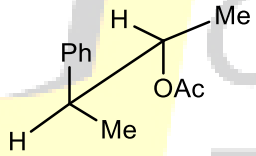
(a) CH_3CN, CH_3NO_2 (b) CH_3CN, CCl_4

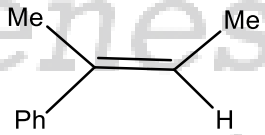
(c) C_6H_6, CCl_4 (d) CH_3CN, C_6H_6

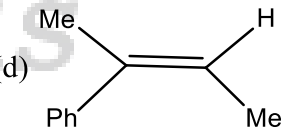
41. The major product formed in the following reaction is **[NET June 2014]**



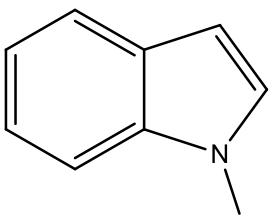
(a) 

(b) 

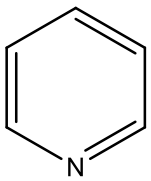
(c) 

(d) 

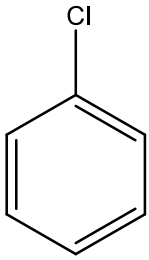
42. The correct order for the rates of electrophilic aromatic substitution of the following compound is **[NET June 2014]**



(I)



(II)

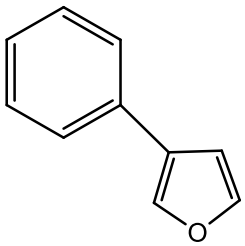


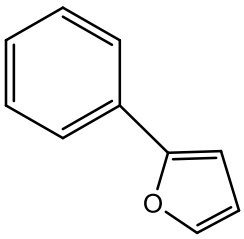
(III)

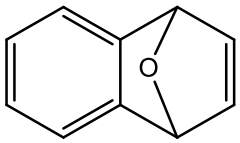
(a) I > II > III (b) II > I > III

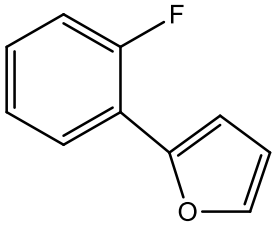
(c) III > II > I (d) I > III > II

43. The reaction of 1-bromo-2-fluorobenzene with furan in the presence of one equivalent of Mg gives **[NET Dec 2014]**

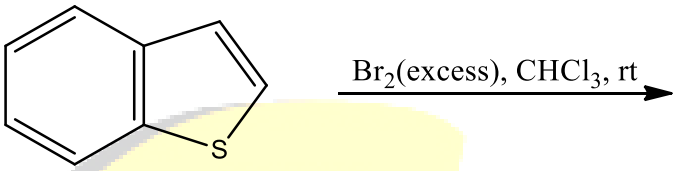
(a) 

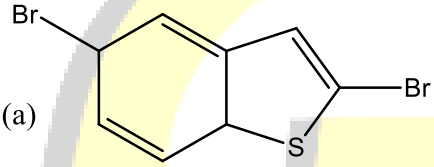
(b) 

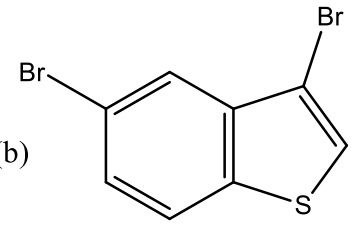
(c) 

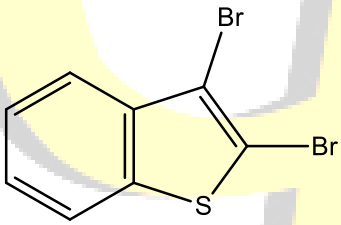
(d) 

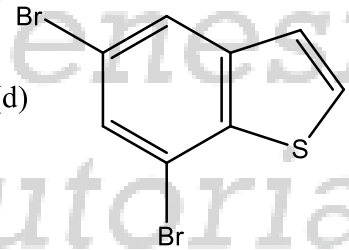
44. The major product of the following reaction is **[NET Dec 2014]**



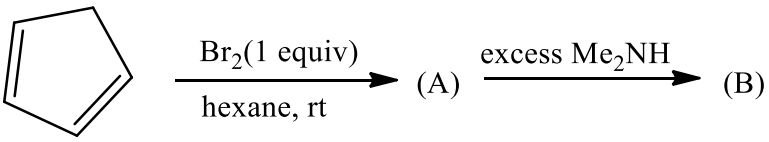
(a) 

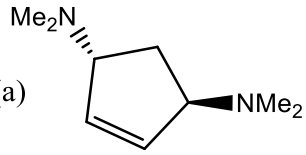
(b) 

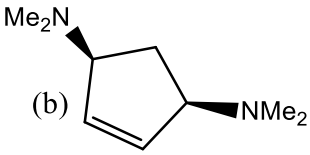
(c) 

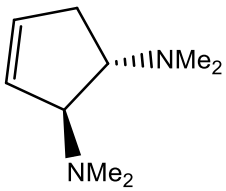
(d) 

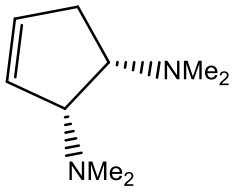
45. The product of B in the following reaction sequnces is **[NET Dec 2014]**



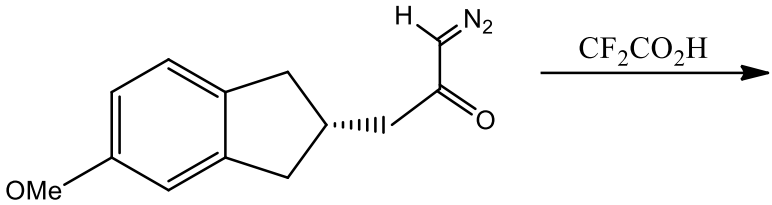
(a) 

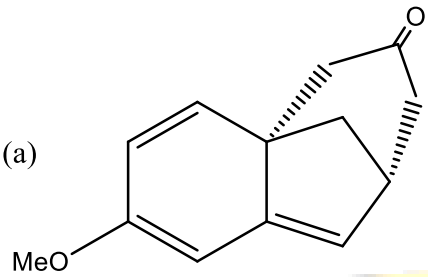
(b) 

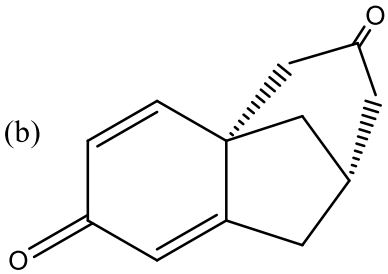
(c) 

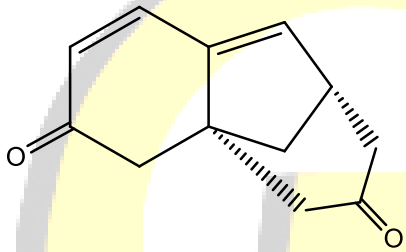
(d) 

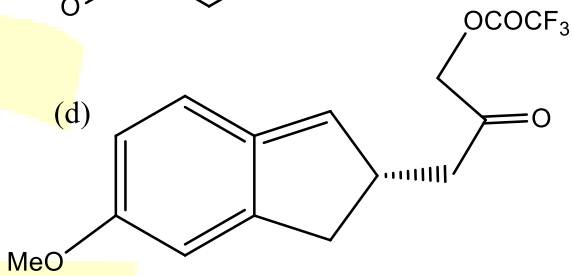
46. The major product of the following reaction is **[NET Dec 2014]**



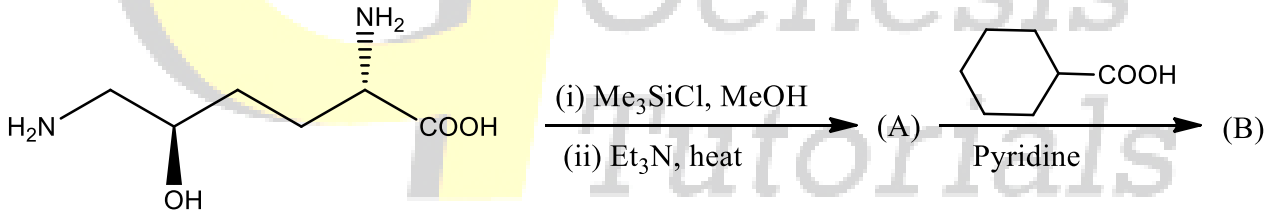
(a)


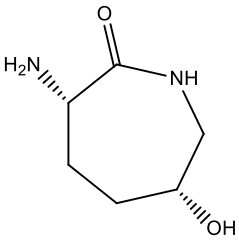
(b)


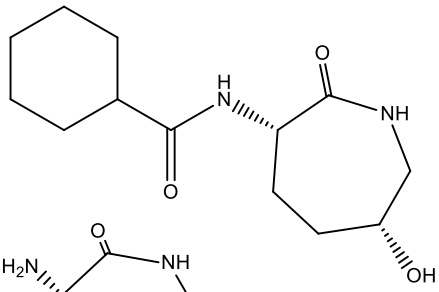
(c)


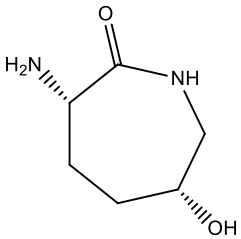
(d)


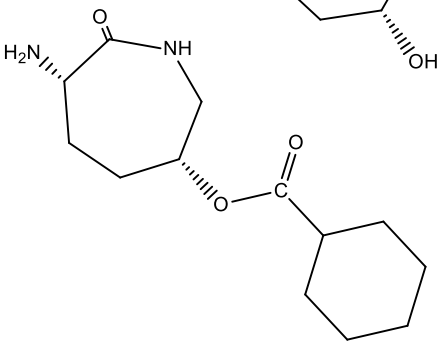
47. The product A and B in the following reaction sequences are **[NET Dec 2014]**

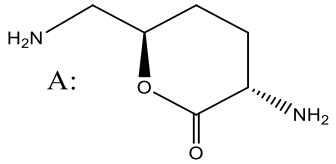


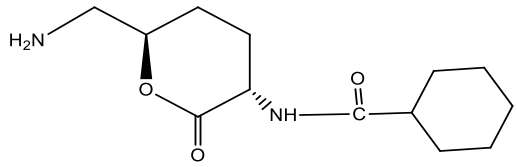
(a) A:


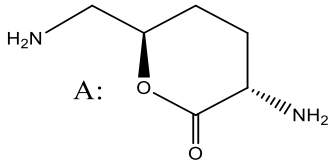
B:


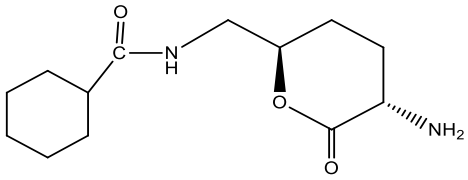
(b) A:


B:


(c) A: 

B: 

(d) A: 

B: 

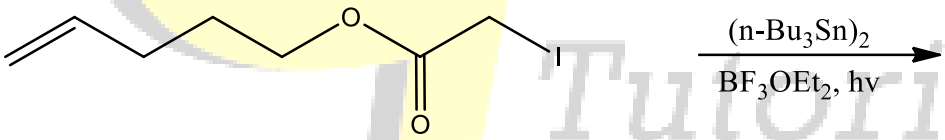
48. The correct combination of the following reactions and their ρ value is **[NET Dec 2014]**

Entry	Reaction	Entry	ρ value
A	$ArNH_2$ + PhCOCl in beneze	P	+ 2.01
B	ArO^- + EtI	Q	– 0.99
C	$ArCO_2Et$ + aq NaOH in EtOH	R	– 2.69
		S	+ 0.78

(a) A-P, B-R,C-P (b) A-R, B-Q,C-P

(c) A-R, B-P,C-Q (d) A-Q, B-R,C-S

49. The reactive intermediate and the product formed in the following reaction are



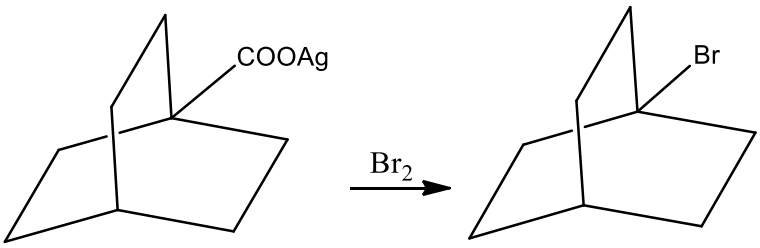
(a) Free radical and 4-iodomethyloxepan-2-one

(b) Free radical and 5-iodooxacan-2-one

(c) Carbene and 3-oxabicyclo [5.1, 0] octane-2-one

(d) Carbene and (E)-5-iodopent-3-en-1-yl acetate **[NET Dec 2014]**

50. Following reaction goes through **[NET June 2014]**

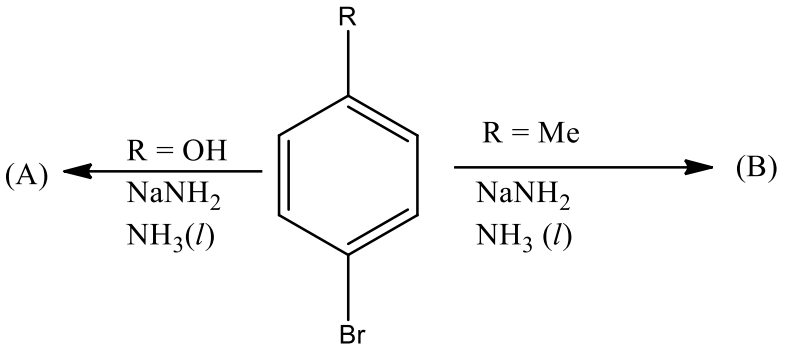


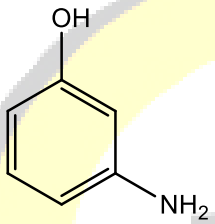
(a) Free radical intermediate (b) carbanion intermediate

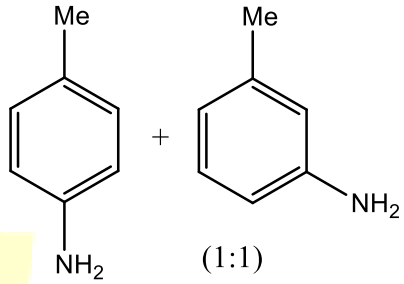
(c) carbocation intermediate (d) carbene intermediate

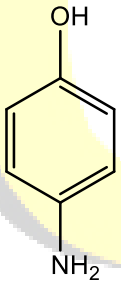
51. The major products A and B in the following reaction sequence are

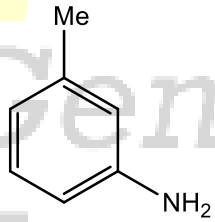
[NET June 2015]

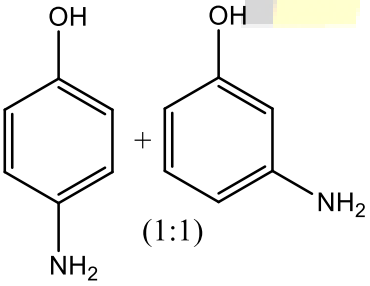


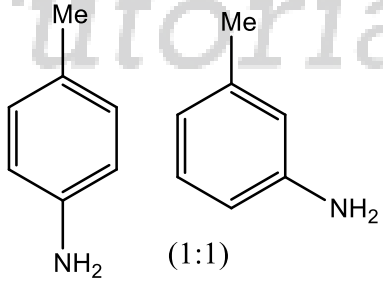
(a) A = 

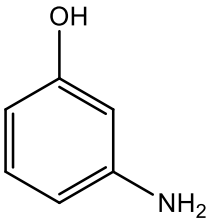
B = 

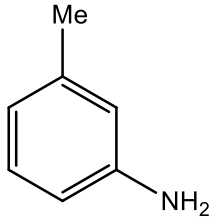
(b) A = 

B = 

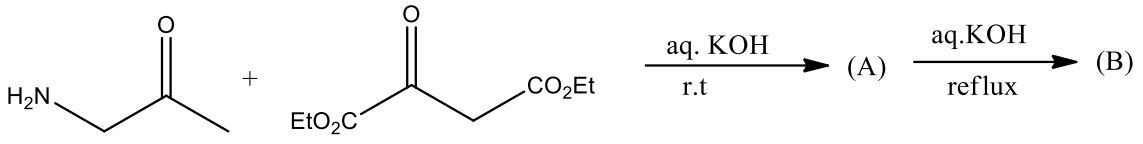
(c) A = 

B = 

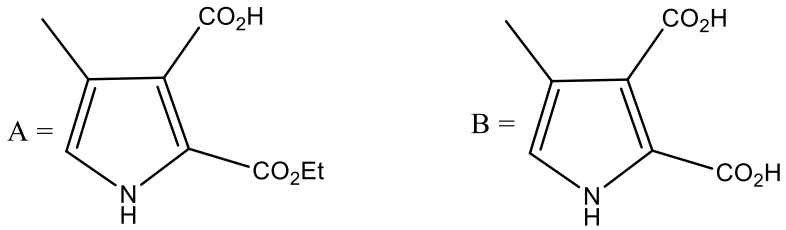
(d) A = 

B = 

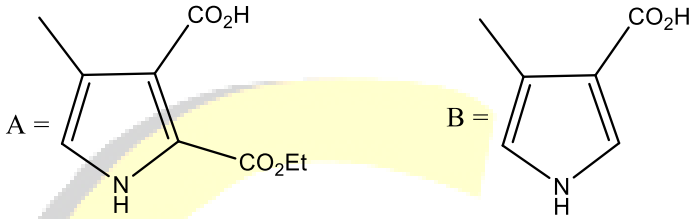
52. The major products A and B in the reactions sequence are **[NET June 2015]**



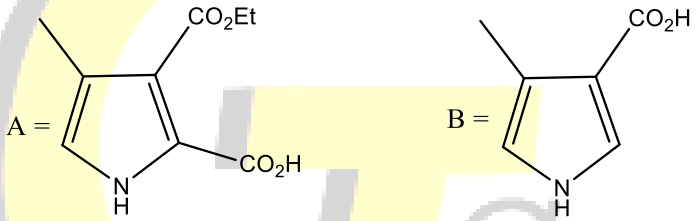
(a)



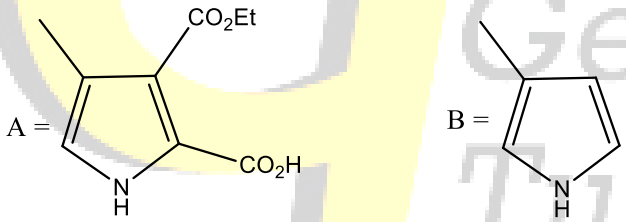
(b)



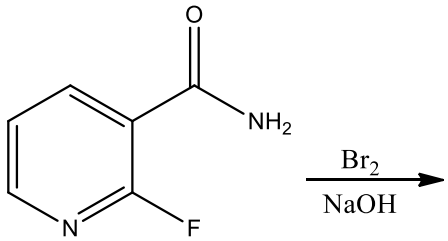
(c)



(d)



53. The corrects statement about the following reaction is **[NET June 2015]**



(a) The products is 2-fluoropyridin-3-amine and reaction involves nitrene intermediate

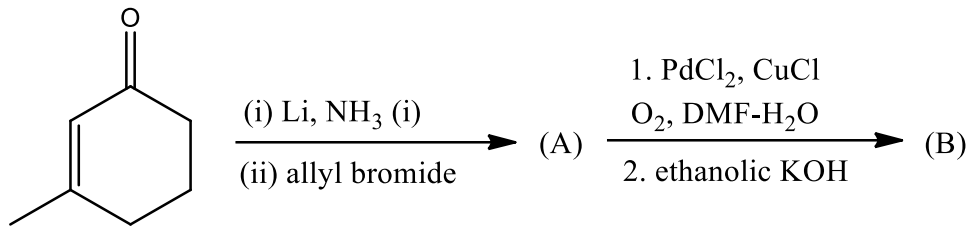
(b) The products is 2-fluoropyridin-3-amine and reaction involves radical intermediate

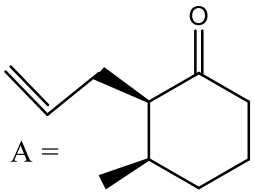
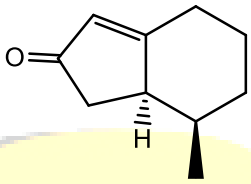
(c) The products is 2-hydroxynicotinamide and reaction involves benzyne-like intermediate

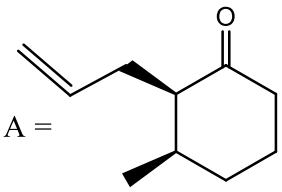
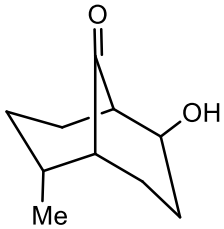
(d) The products is 2- hydroxynicotinamide and reaction involves addition-elemation mechanism

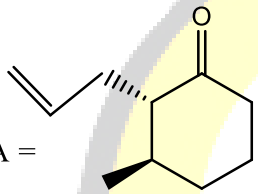
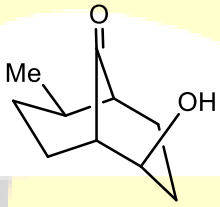
54. The major products A and B formed in the following reactions are

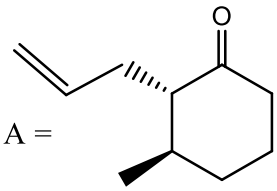
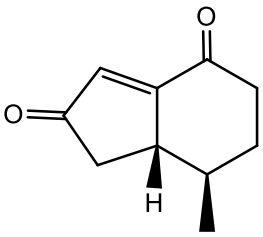
[NET June 2015]



(a) A = 
B = 

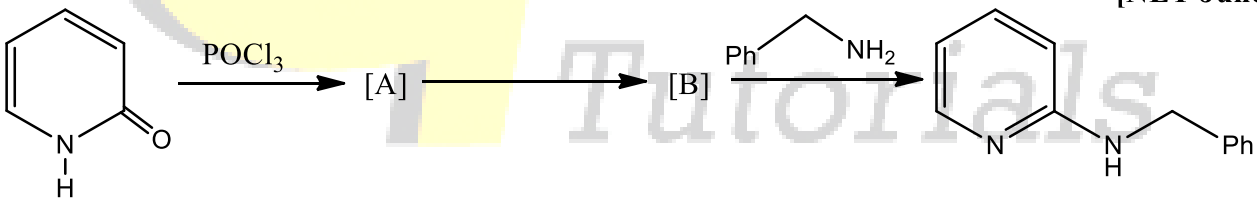
(b) A = 
B = 

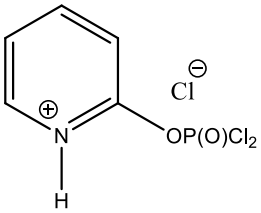
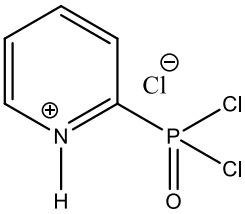
(c) A = 
B = 

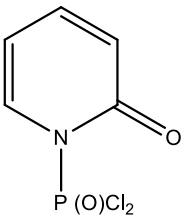
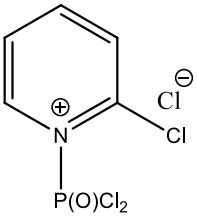
(d) A = 
B = 

55. The corrects structures of the intermediates [A] and [B] in the following reaction are

[NET June 2015]



(a) A = 
B = 

(b) A = 
B = 

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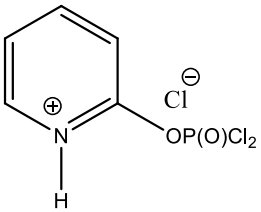
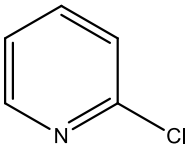
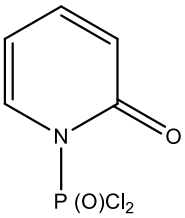
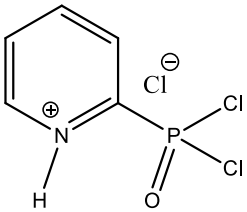
(c) A = 

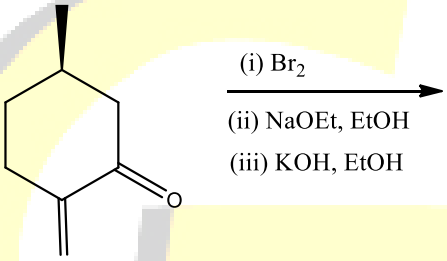
B = 

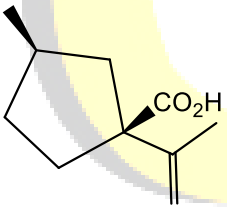
(d) A = 

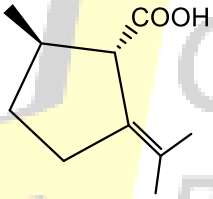
B = 

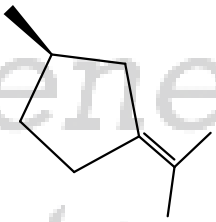
56. Major product formed in the following synthetic sequence on the monoterpene pulegone is

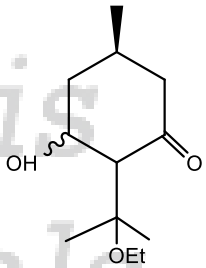
[NET June 2015]



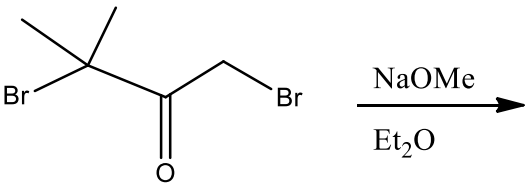
(a) 

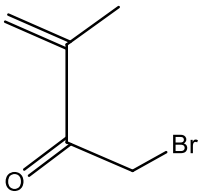
(b) 

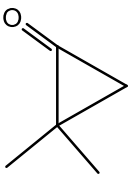
(c) 

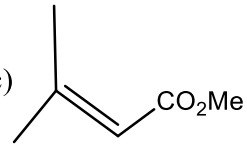
(d) 

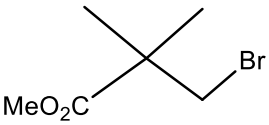
57. The major product formed in the following reaction is **[NET Dec. 2015]**



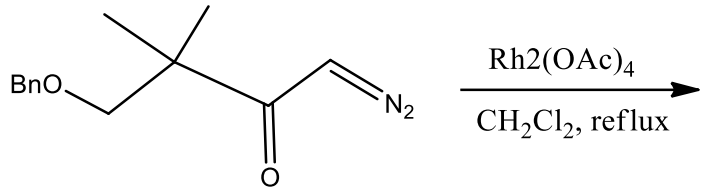
(a) 

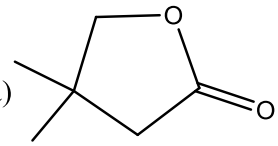
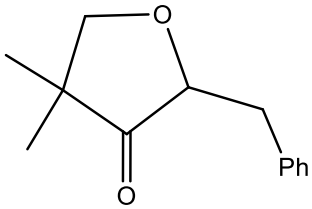
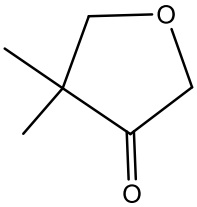
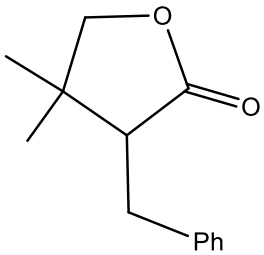
(b) 

(c) 

(d) 

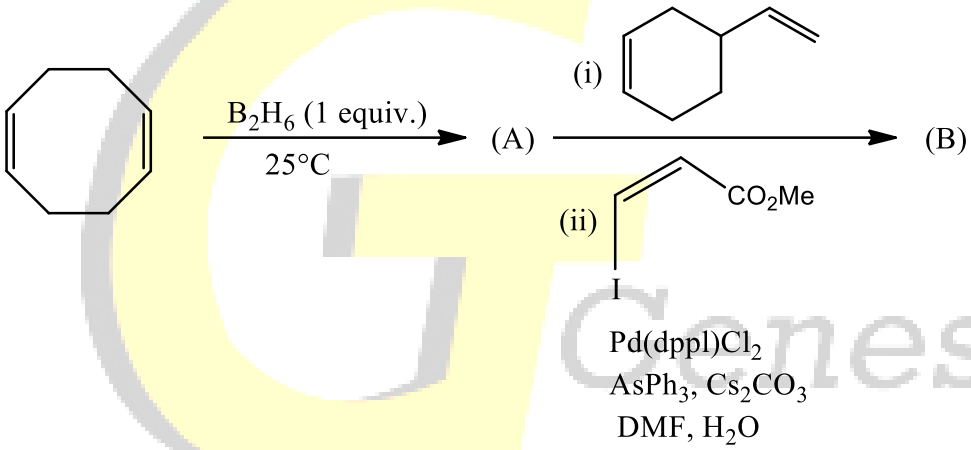
58. The major product formed in the following reaction is

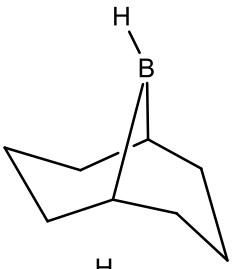
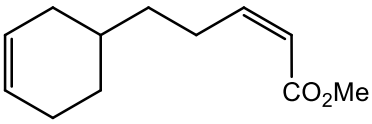


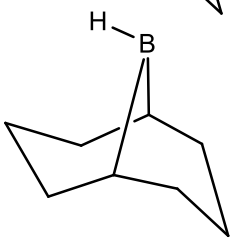
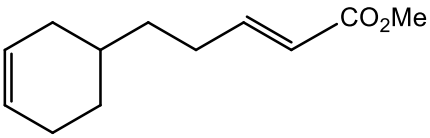
(a) 
(b) 
(c) 
(d) 

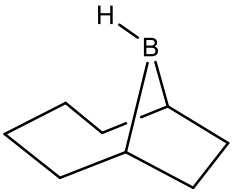
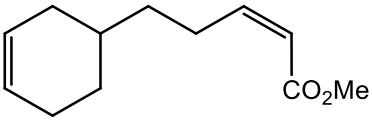
59. The major products A and B in the following reactions sequence are

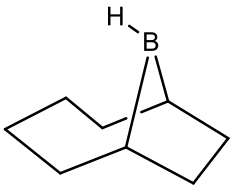
[NET Dec.2015]

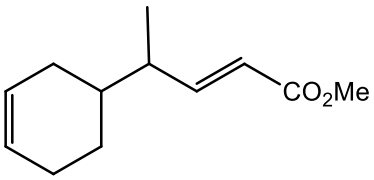


(a) A = 
B = 

(b) A = 
B = 

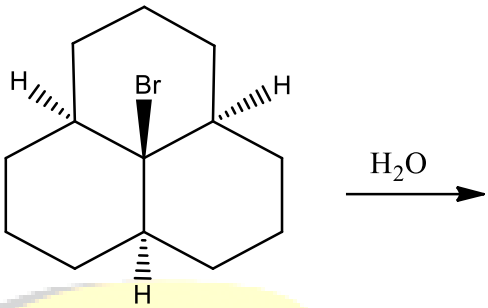
(c) A = 
B = 

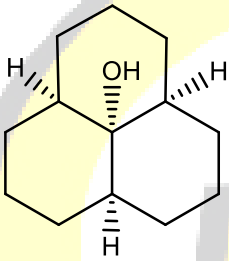
(d) A = 

B = 

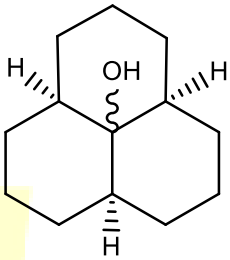
60. The mechanism and the product formed in the following reactions, respectively, are

[NET Dec 2015]

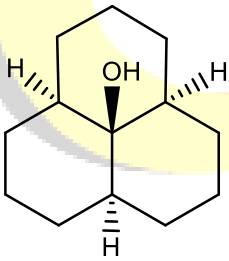


(a) 

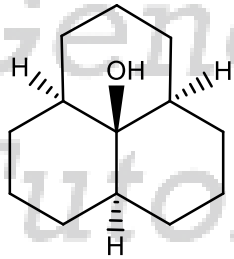
S_N2

(b) 

S_N1

(c) 

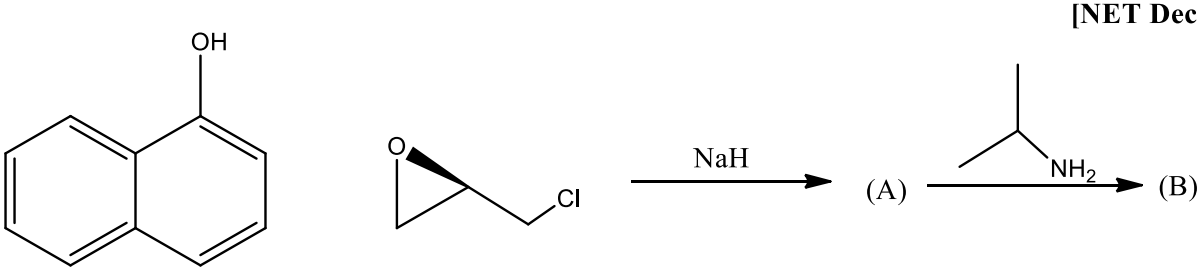
S_N2

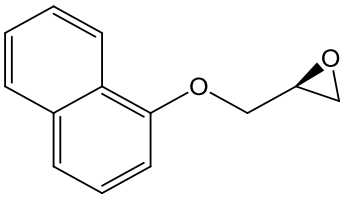
(d) 

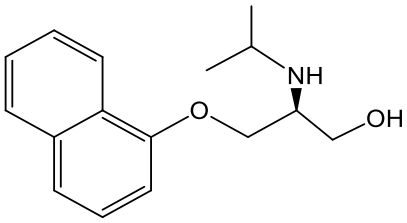
S_N1

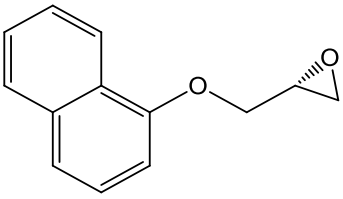
61. The major products A and B in the following reaction sequence are

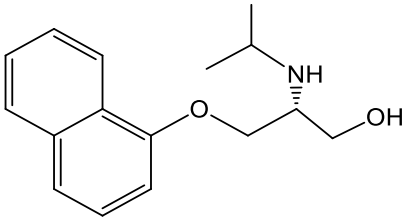
[NET Dec 2015]

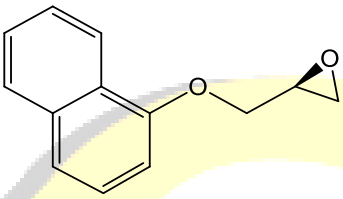


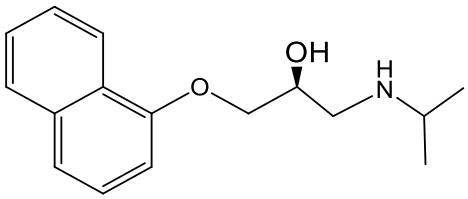
(a) A = 

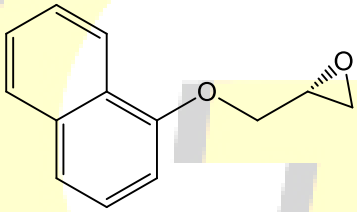
B = 

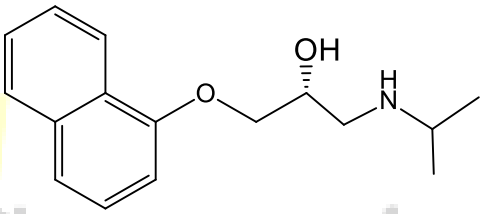
(b) A = 

B = 

(c) A = 

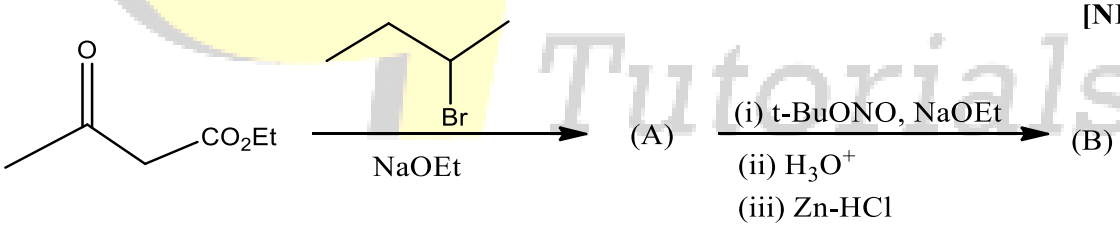
B = 

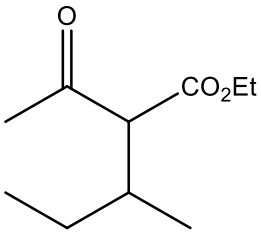
(d) A = 

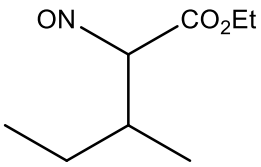
B = 

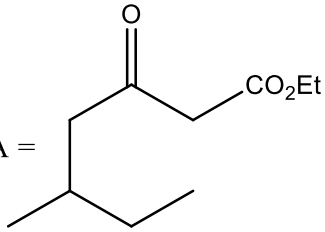
62. The major products A and B in the following reaction sequence are

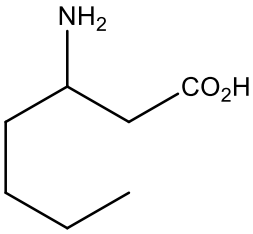
[NET June 2016]

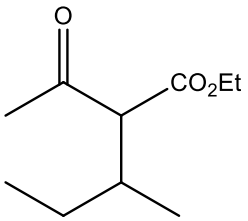


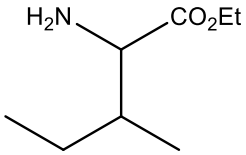
(a) A = 

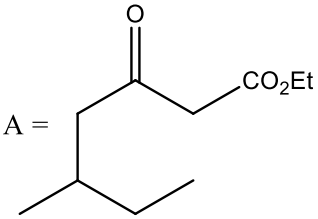
B = 

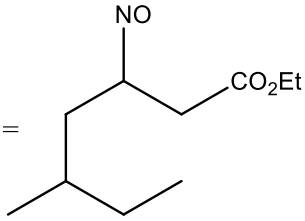
(b) A = 

B = 

(c) A = 

B = 

(d) A = 

B = 

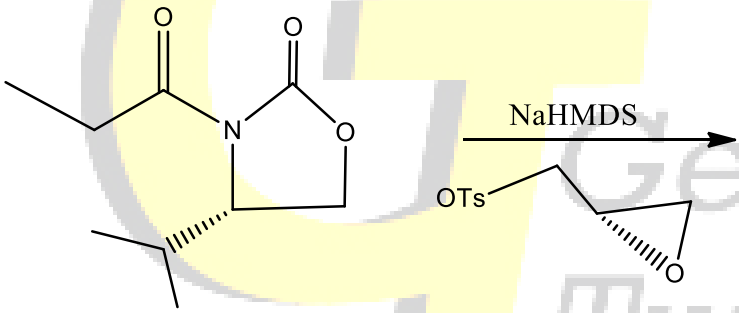
63. The frontier orbital interactions involved in the formation of the carbocation intermediate in the reaction of isobutylene with HCl are **[NET June 2016]**

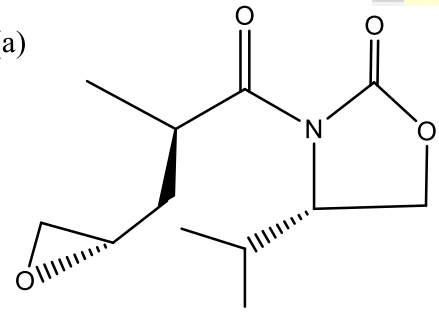
(a) π of olefin and σ* of HCl (b) π of olefin and σ of HCl

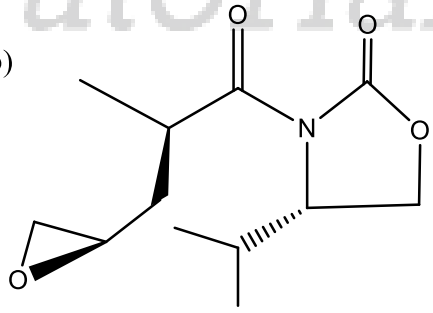
(c) π* of olefin and σ* of HCl (d) π* of olefin and σ of HCl

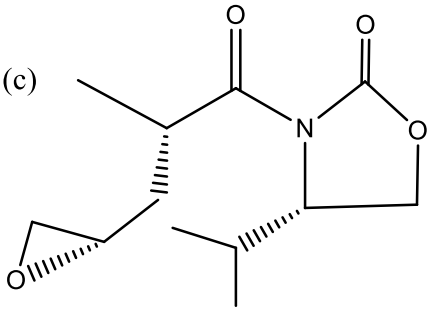
64. The major product formed in the following reaction is

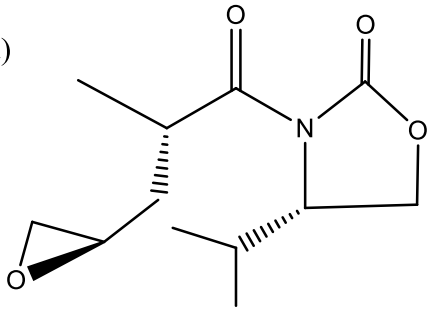
[NET June 2016]



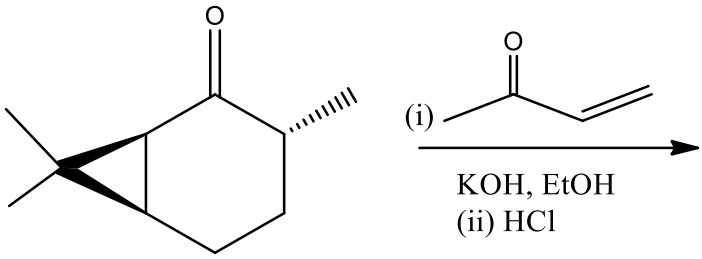
(a) 

(b) 

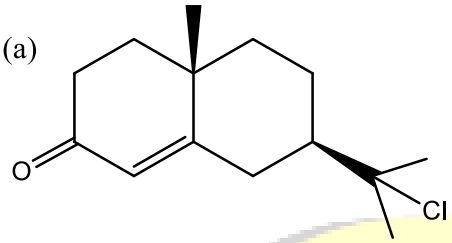
(c) 

(d) 

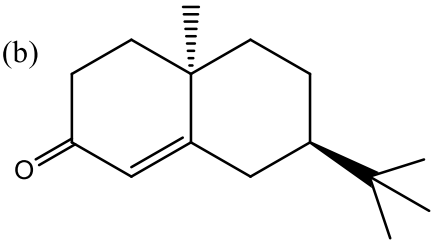
65. The major product formed in the following reaction sequence is **[NET June 2016]**



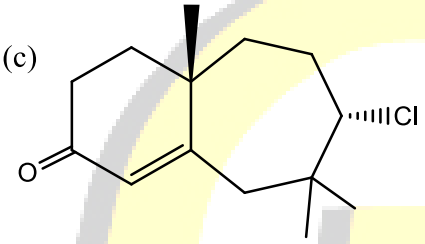
(a)



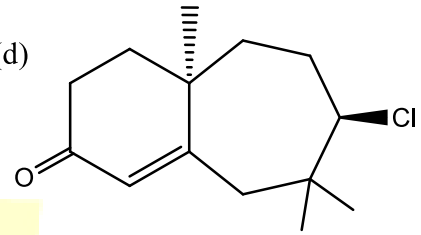
(b)



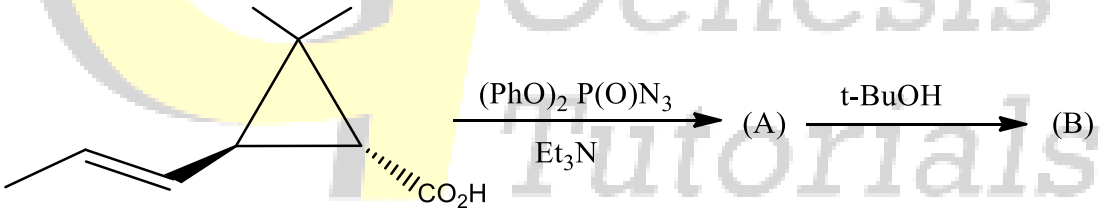
(c)



(d)

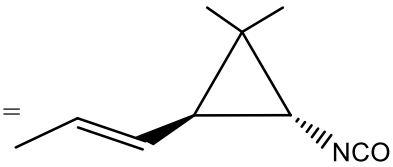


66. Structures of the intermediate A and the major product B in the following reaction sequences are **[NET June 2016]**

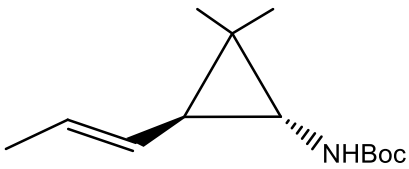


(a)

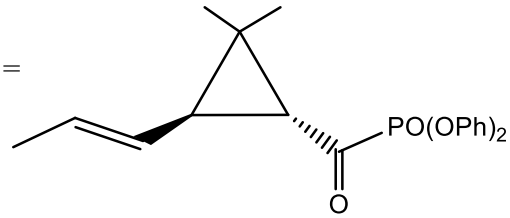
A =



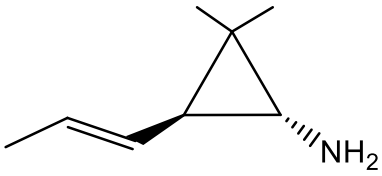
B =

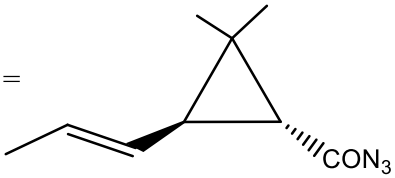


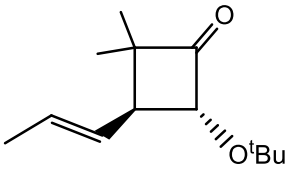
(b) A =

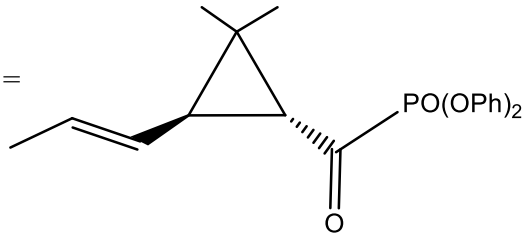


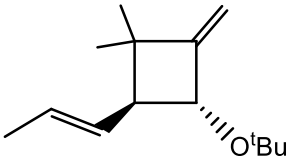
B =



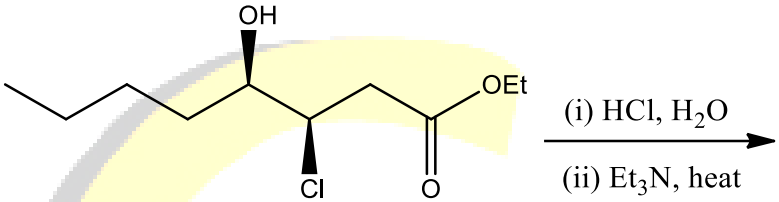
(c) A = 

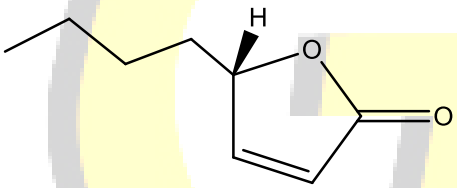
B = 

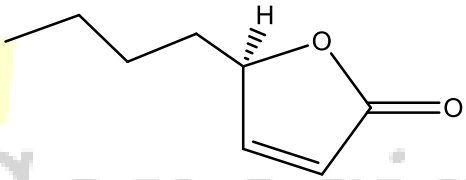
(d) A = 

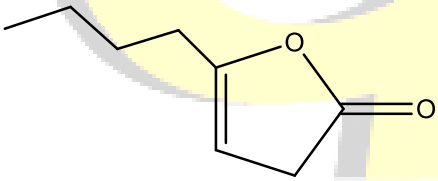
B = 

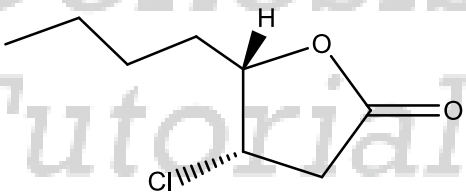
67. The major product formed in the following reaction is **[NET June 2016]**



(a) 

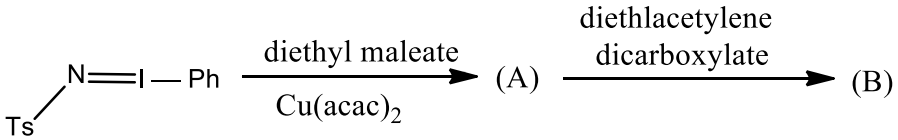
(b) 

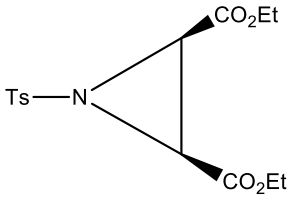
(c) 

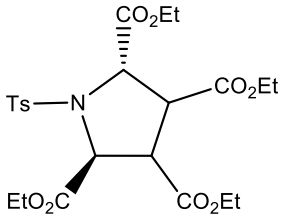
(d) 

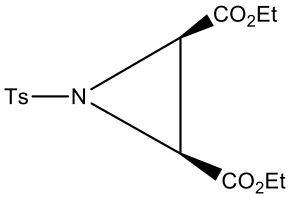
68. The major product A and B formed in the following reaction sequences are

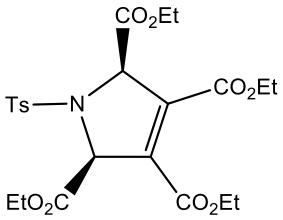
NET June 2016

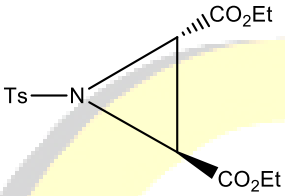


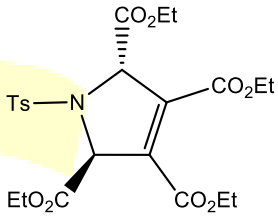
(a) A = 

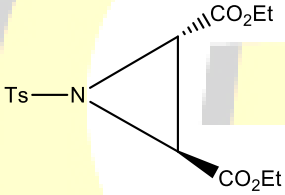
B = 

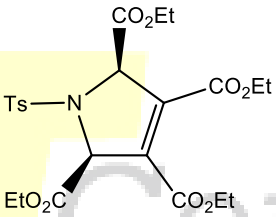
(b) A = 

B = 

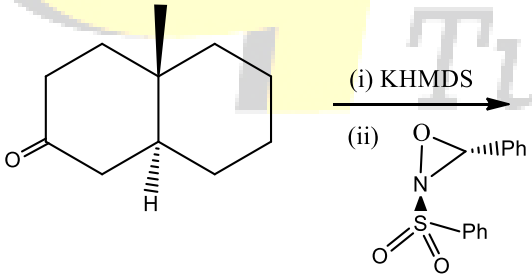
(c) A = 

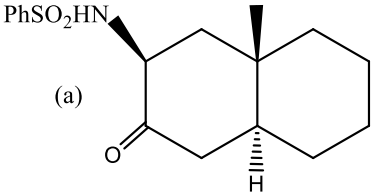
B = 

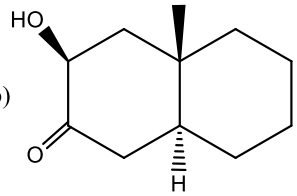
(d) A = 

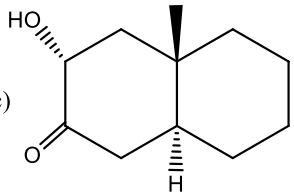
B = 

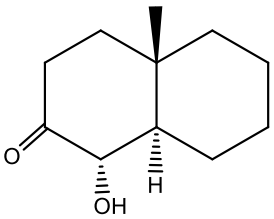
69. The major product formed in the following reaction is **[NET June 2016]**



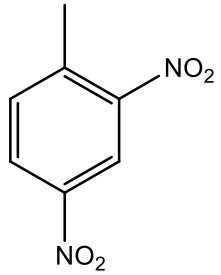
(a) 

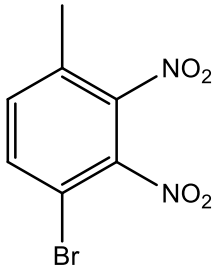
(b) 

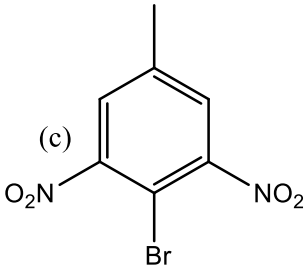
(c) 

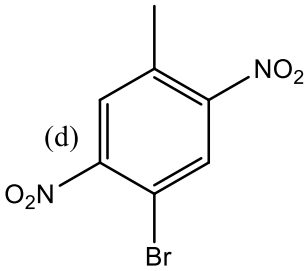
(d) 

70. The major product formed in the dinitration of 4-bromotoluene is **[NET Dec. 2016]**

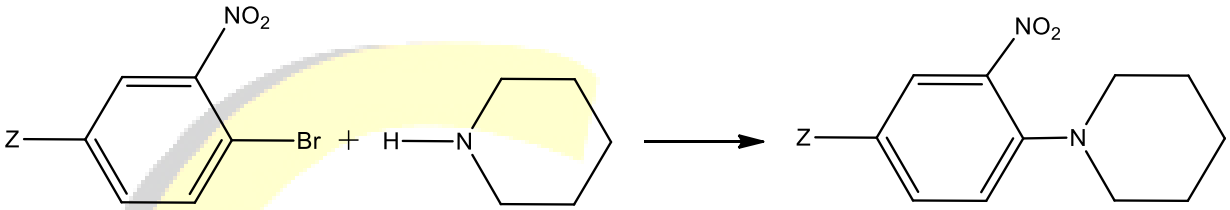
(a) 

(b) 

(c) 

(d) 

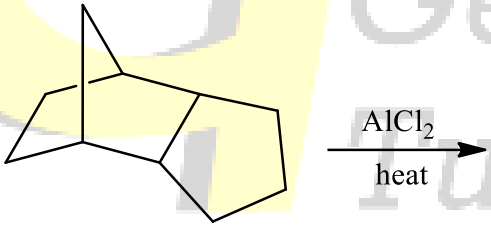
71. The correct order of the rate constants for the following series of reeaction (Z = $CF_3/CH_3/OCH_3$) is **[NET Dec 2016]**

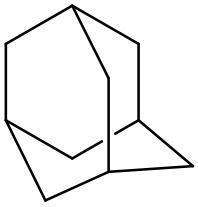


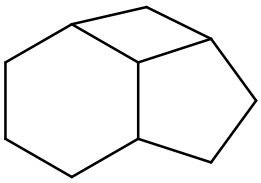
(a) $CF_3 > CH_3 > OCH_3$ (b) $CF_3 > OCH_3 > CH_3$

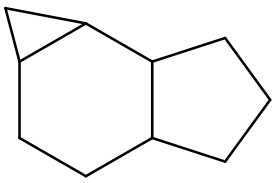
(c) $OCH_3 > CF_3 > CH_3$ (d) $CH_3 > OCH_3 > CF_3$

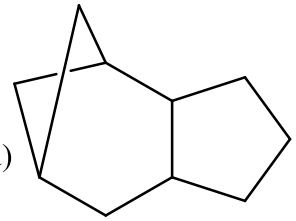
72. The most stable product formed in the following reaction is **[NET Dec 2016]**



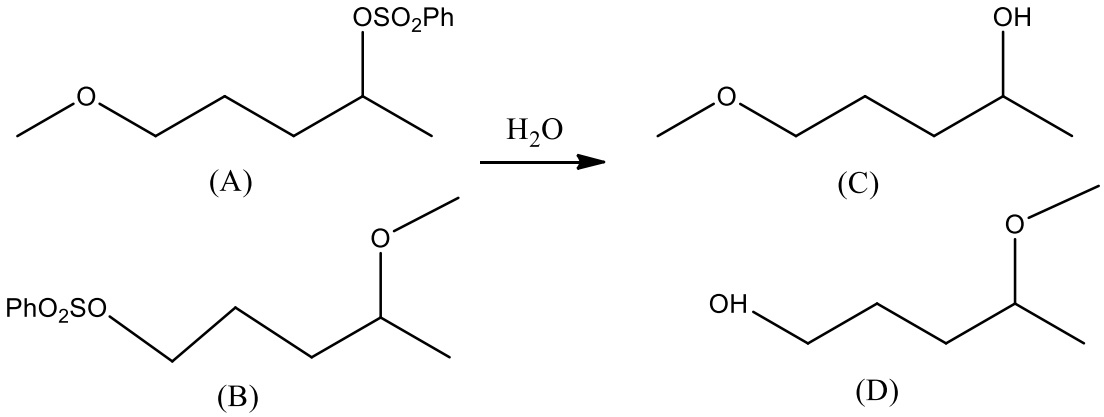
(a) 

(b) 

(c) 

(d) 

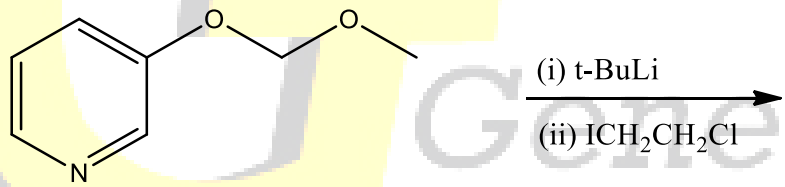
73. The correct statement for the reactants A, B to give products C, D is **[NET Dec 2016]**



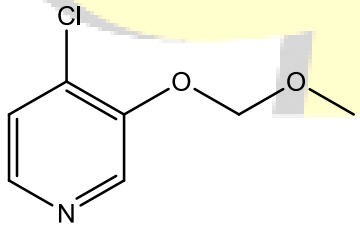
(a) A gives C and B gives D (b) A gives D and B gives C

(c) A and B give identical amounts of C and D (d) A and B give D

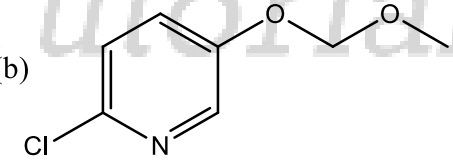
74. The major product formed in the following reaction is **[NET Dec 2016]**



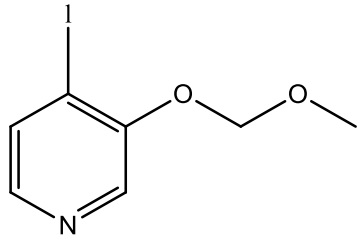
(a)



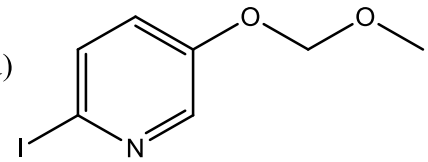
(b)



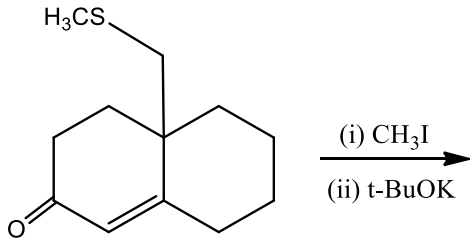
(c)

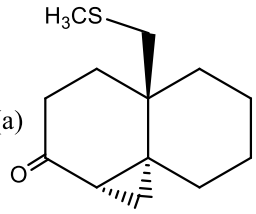


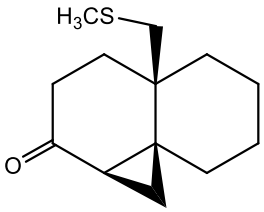
(d)

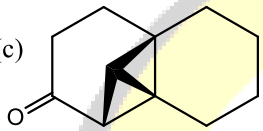


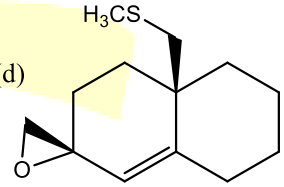
75. The major products formed in the following reaction is **[NET Dec 2016]**



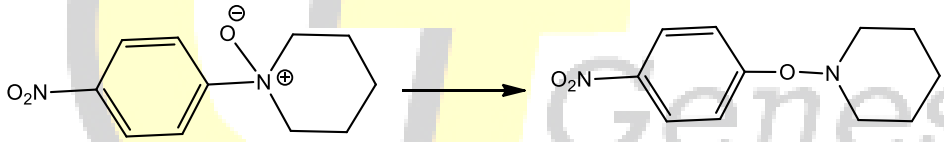
(a)


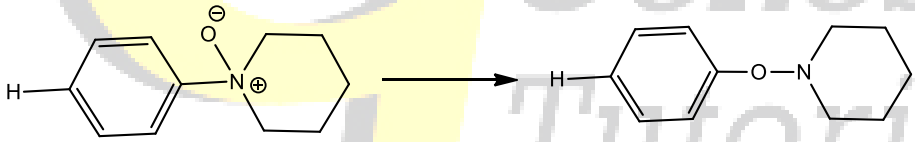
(b)


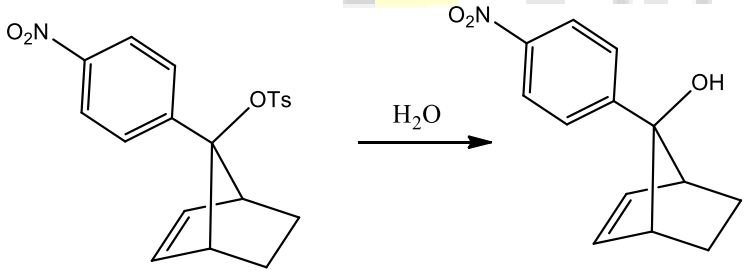
(c)


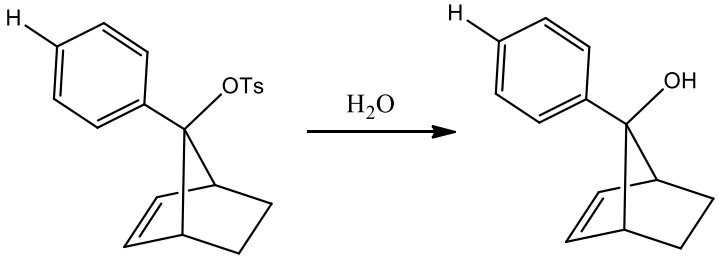
(d)


76. For the four reactions given below, the rates of the reactions will vary as **[NET Dec 2016]**

(a)


(b)


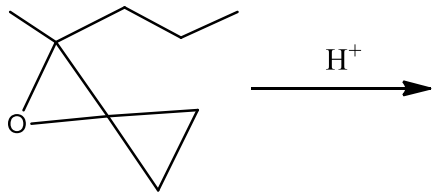
(c)


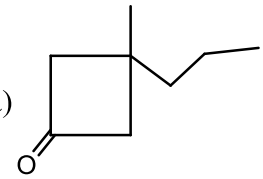
(d)


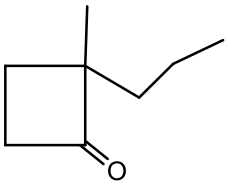
(a) 1 > 2 and 3 > 4 (b) 2 > 1 and 3 > 4

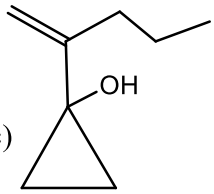
(c) 2 > 1 and 4 > 3 (d) 1 > 2 and 4 > 3

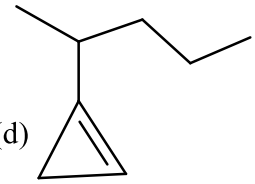
77. The major product formed in the following reaction is **[NET Dec. 2016]**



(a) 

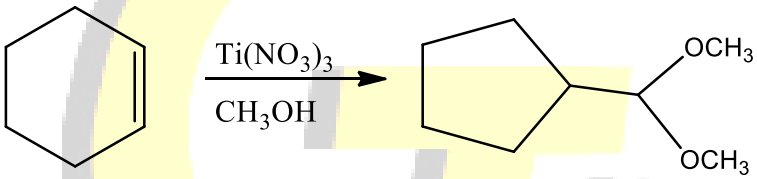
(b) 

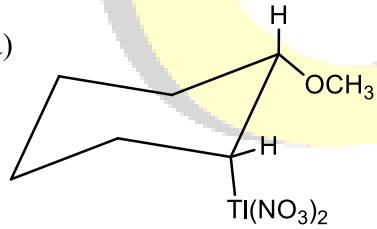
(c) 

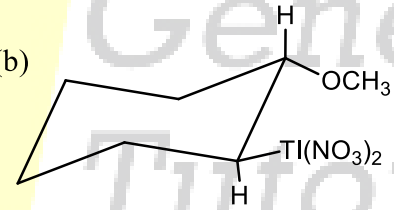
(d) 

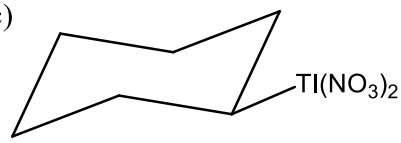
78. The intermediate tht leads to the product in the following transformation

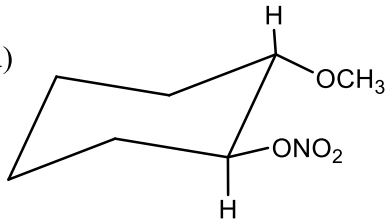
[NET Dec. 2016]



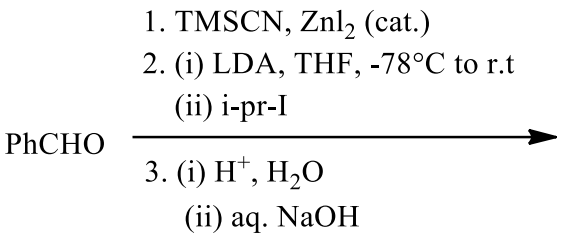
(a) 

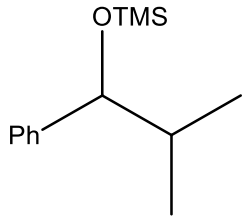
(b) 

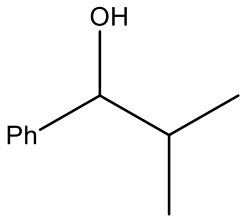
(c) 

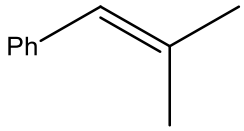
(d) 

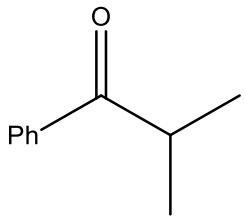
79. The major product formed in the following reaction is **[NET Dec. 2016]**



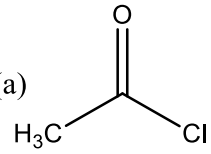
(a) 

(b) 

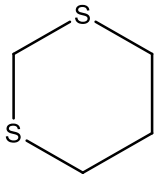
(c) 

(d) 

80. Among the following, the synthetic equivalent of acetyl anion is **[NET June 2017]**

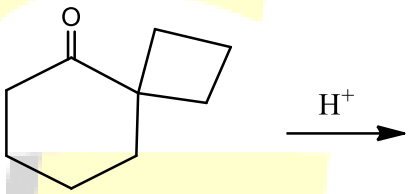
(a) 

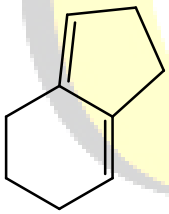
(b) CH_3CN

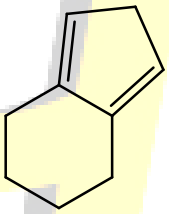
(c) 

(d) $CH_3CH_2NO_2$

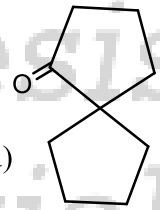
81. The major product of the following reaction is **[NET June 2017]**



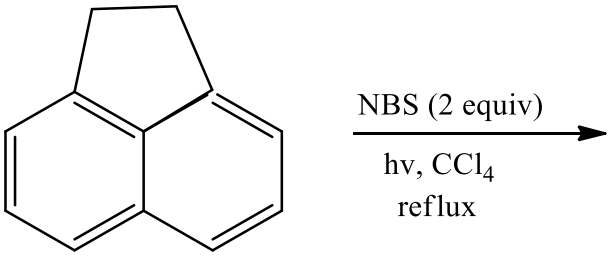
(a) 

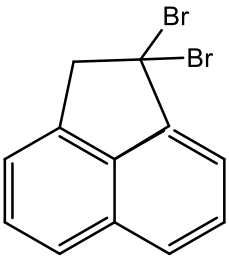
(b) 

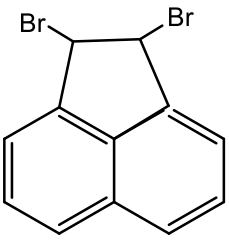
(c) 

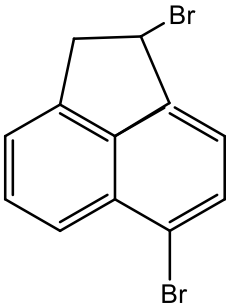
(d) 

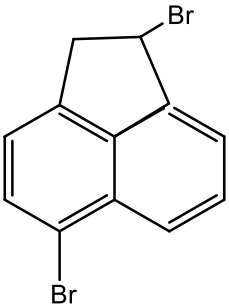
82. The major product formed in the following reaction is **[NET June 2017]**



(a) 

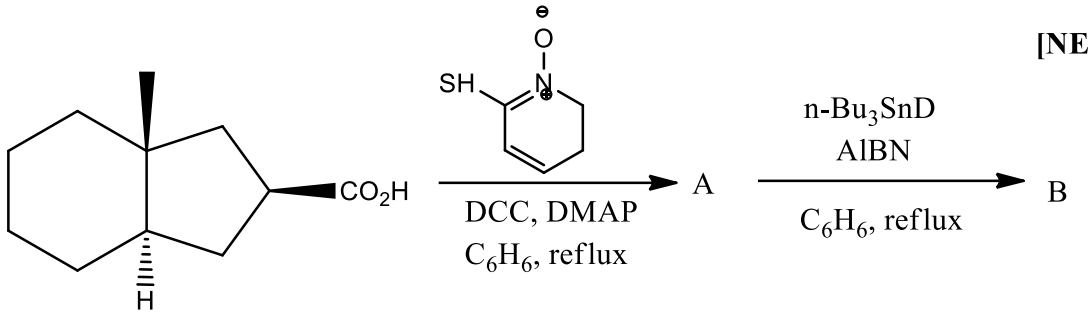
(b) 

(c) 

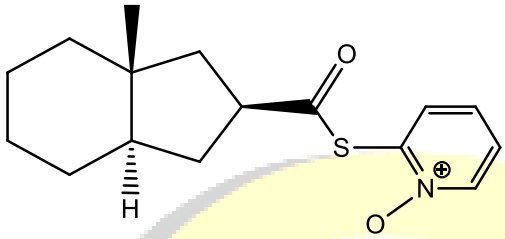
(d) 

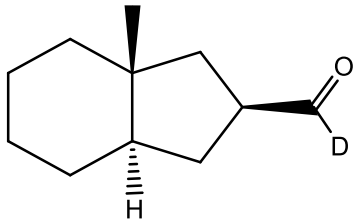
83. The intermediate A and product B formed in the following reaction sequence are

[NET Dec. 2016]

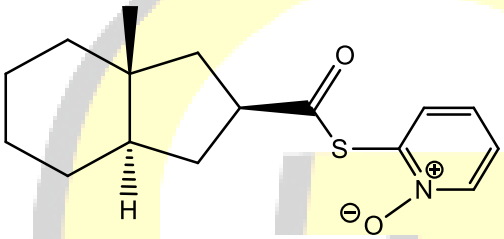


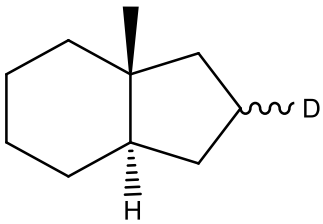
(a)

A = 

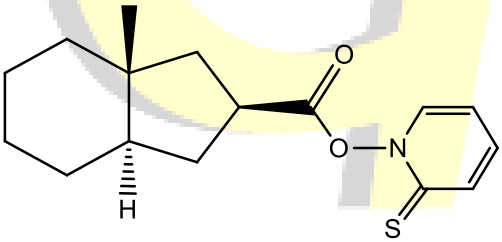
B = 

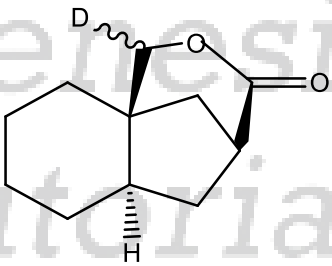
(b)

A = 

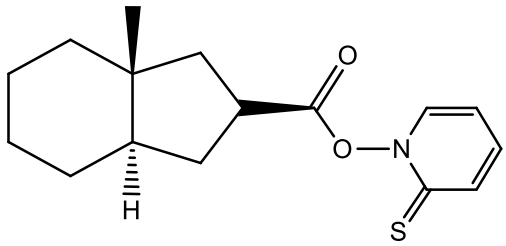
B = 

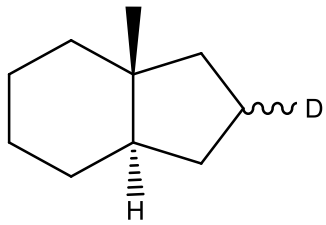
(c)

A = 

B = 

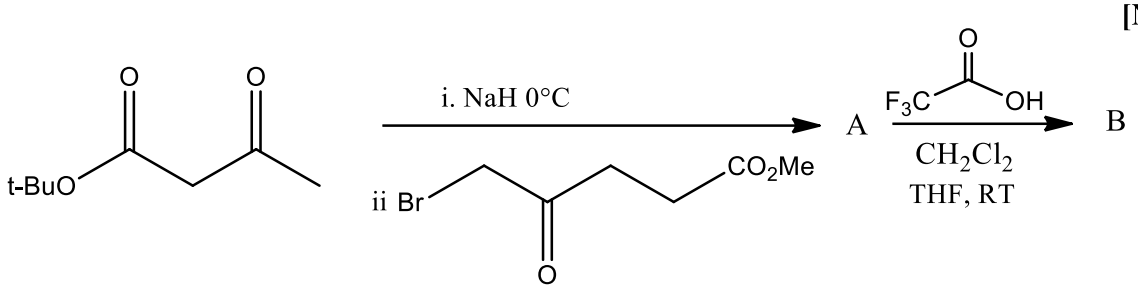
(d)

A = 

B = 

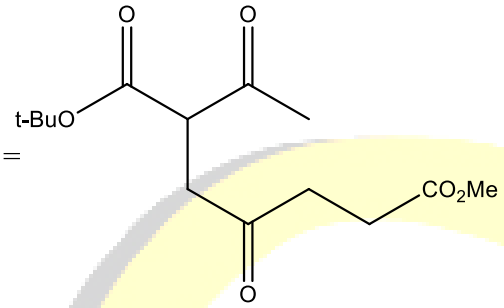
84. The major product A and B formed in the following reaction sequence are

[NET-June-2017]

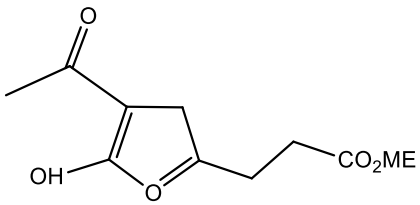


(a)

A =

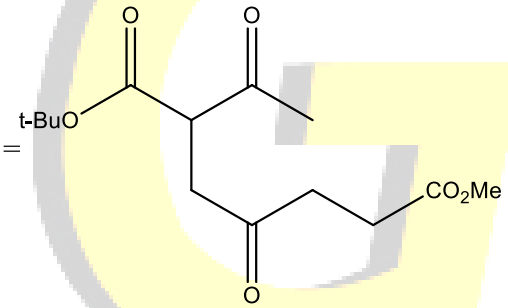


B =

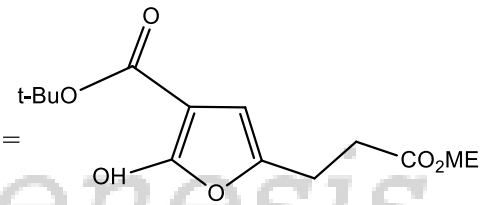


(b)

A =

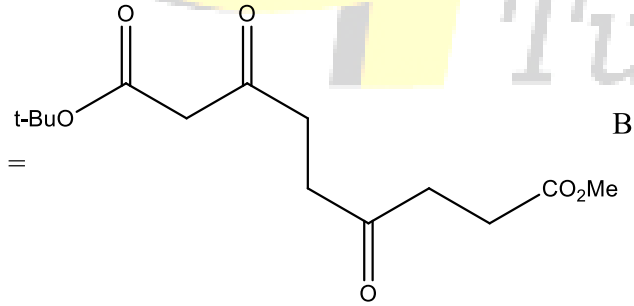


B =

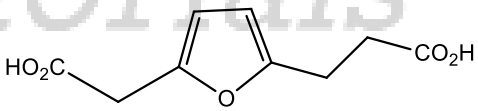


(c)

A =

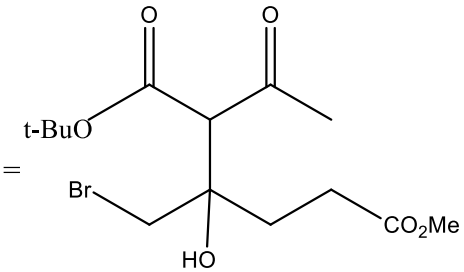


B =

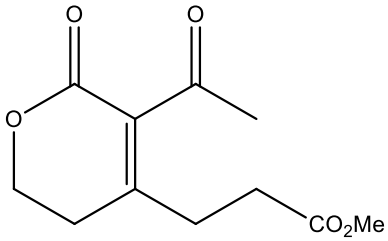


(d)

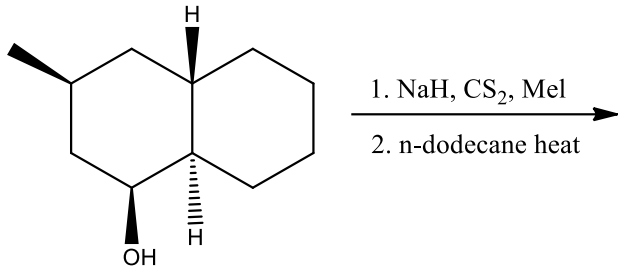
A =

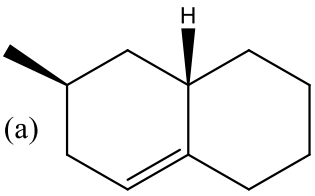


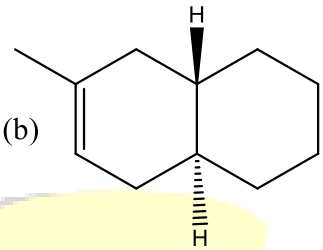
B =

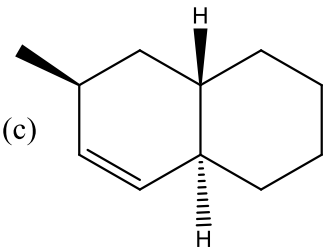


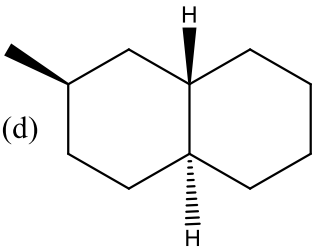
85. The major product formed in the following reaction is **[NET June 2017]**



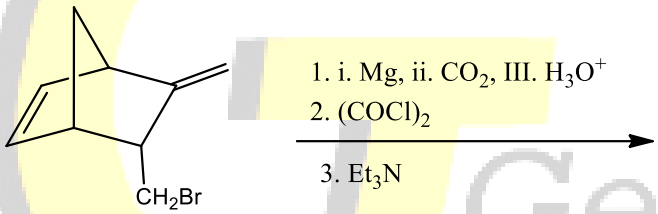
(a)


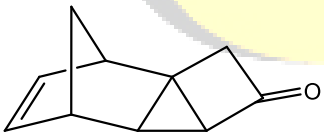
(b)


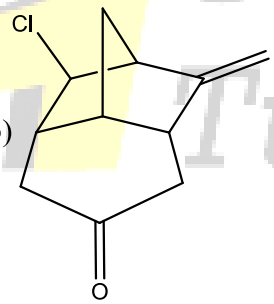
(c)


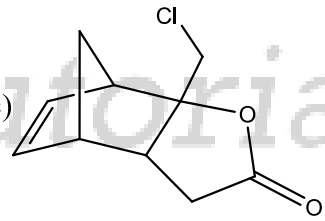
(d)


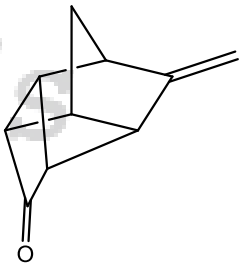
86. The major product formed in the following reaction is **[NET June 2017]**



(a)


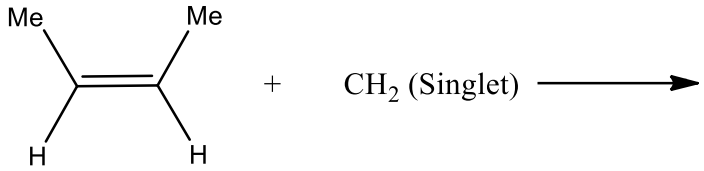
(b)


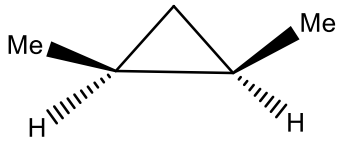
(c)


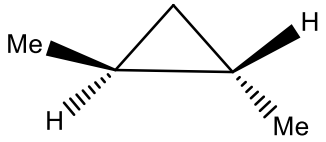
(d)


GATE Previous Years' Questions

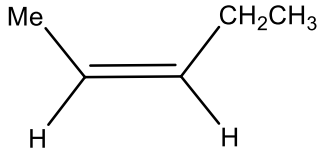
1. The major formed in the following reaction is **[GATE 2000]**



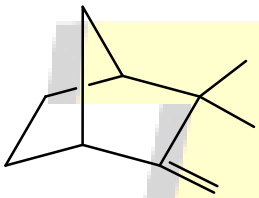
(a)


(b)


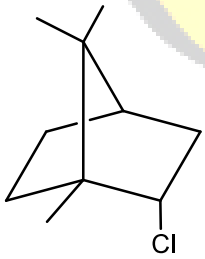
(c) 50 : 50 mixture of above two compounds

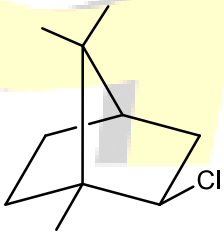
(d)


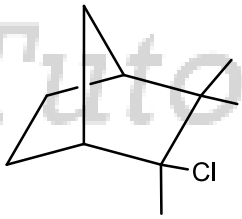
2. The product formed upon heating camphene with HCl is **[GATE 2000]**

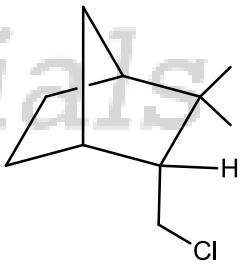


(Camphene)

(a)


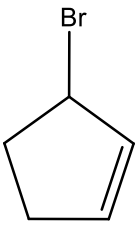
(b)


(c)


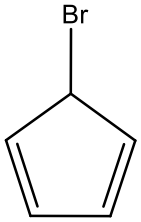
(d)


3. Among the bromides I-III given below, the order of their reactivity in the S_N1 reaction is

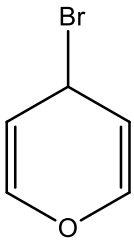
GATE 2002



I



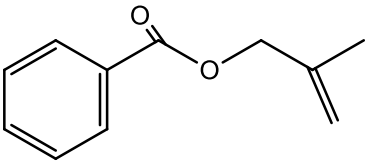
II

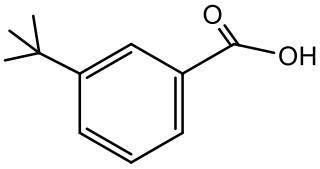


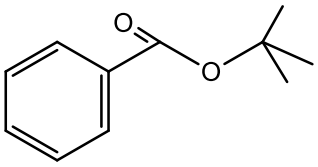
III

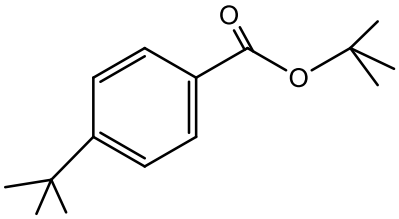
(a) III > II > I (b) II > III > I (c) III > I > II (d) II > I > III

4. The major product formed in the reaction benzoic acid with isobutylene in the presence of a catalytic amount of sulfuric acid is: **[GATE 2002]**

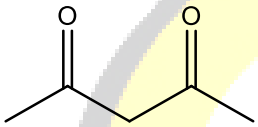
(a) 

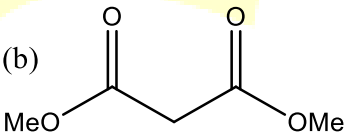
(b) 

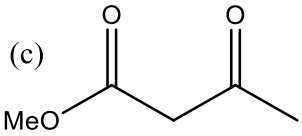
(c) 

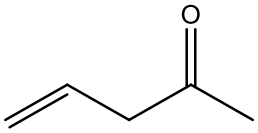
(d) 

5. Among the following compounds, the one that undergoes deprotonation most readily in the presence of a base, to form a carbanion is: **[GATE 2003]**

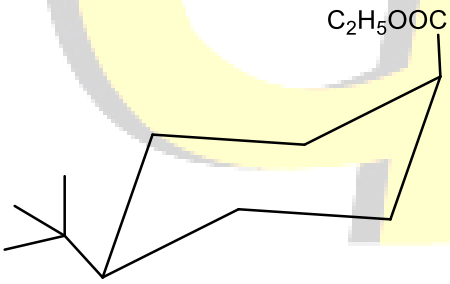
(a) 

(b) 

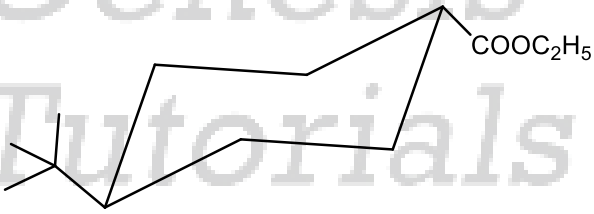
(c) 

(d) 

6. Regarding the saponification of M and N shown below, the correct statement is that **[GATE 2003]**



M



N

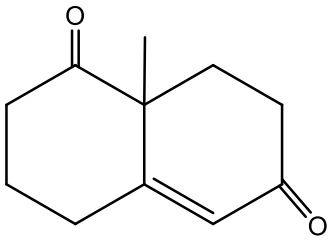
(a) M reacts faster than N because the transition state is less crowded for M than for N.

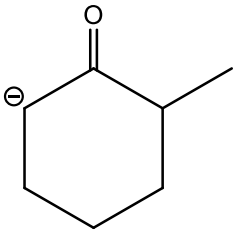
(b) M reacts Slower than N because the transition state is more crowded for M than for N.

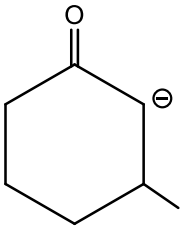
(c) N and M react at the same rate because of formation of tetrahedral intermediate in both cases.

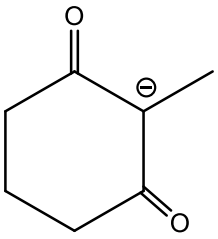
(d) N reacts slower than M beacuse of its greater thermodynamics stability

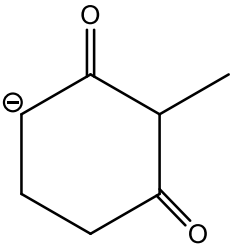
7. The enolate ion that reacts with 3-buten-2-one to form (Y) is: **[GATE 2004]**



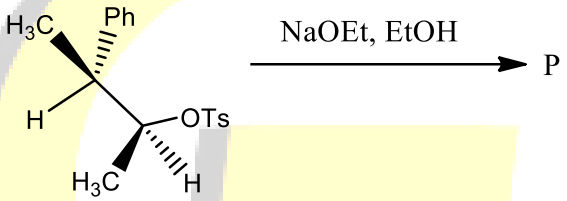
(a) 

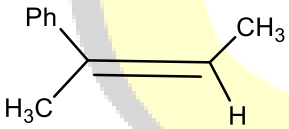
(b) 

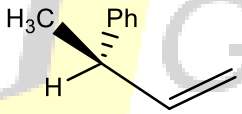
(c) 

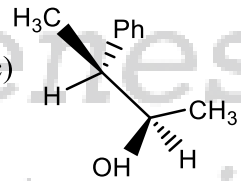
(d) 

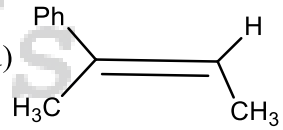
8. The ajor product P formed in the given **[GATE 2005]**



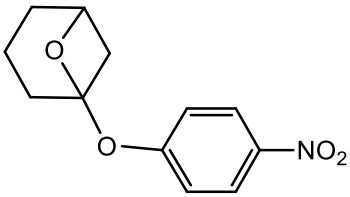
(a) 

(b) 

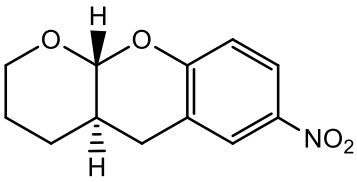
(c) 

(d) 

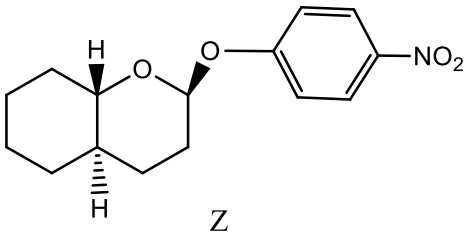
9. The order of recativity towards acid catalyzed hydrolysis of the following cyclic acetals is



X



Y



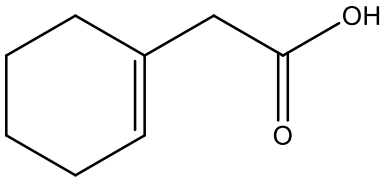
Z

(a) Z > Y > X (b) X > Y > Z

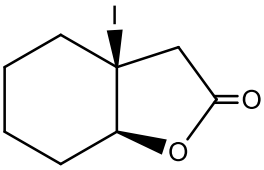
(c) X > Z > Y (d) Z > X > Y **[GATE 2005]**

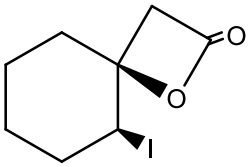
10. Iodo-lactonization of β, γ –unsaturated carboxylic acid X with I_2 and $NaHCO_3$ gives

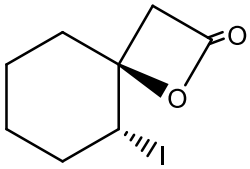
[GATE. 2005]

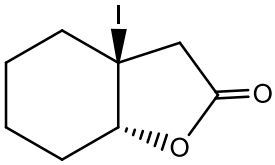


X

(a) 

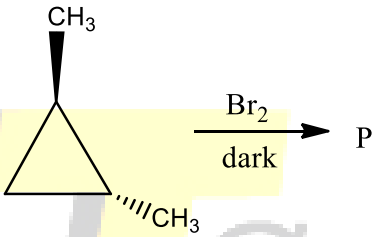
(b) 

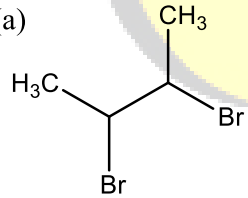
(c) 

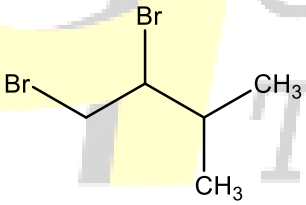
(d) 

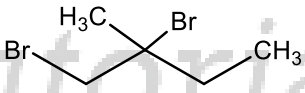
11. The major product P of the following reaction is:

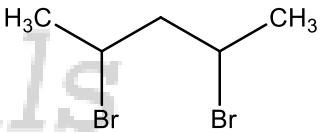
[GATE. 2005]



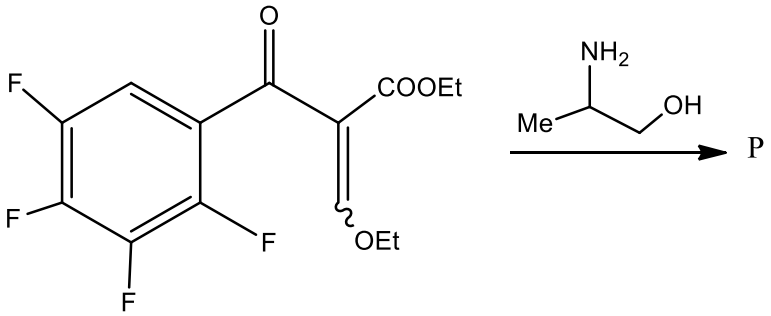
(a) 

(b) 

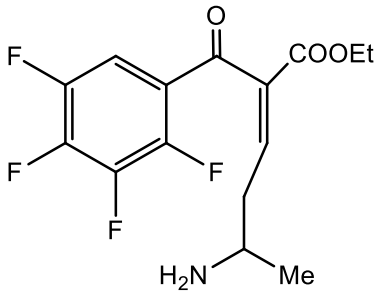
(c) 

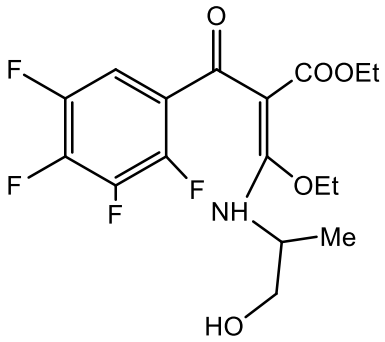
(d) 

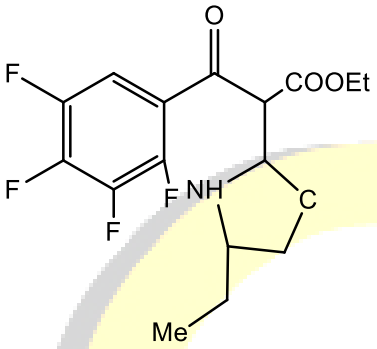
12. The major product P of the following reaction is:



[GATE 2005]

(a)


(b)


(c)


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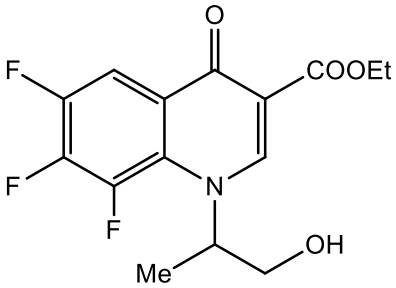
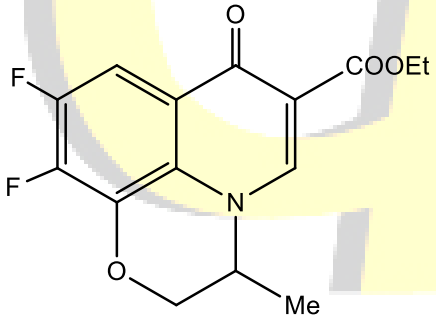
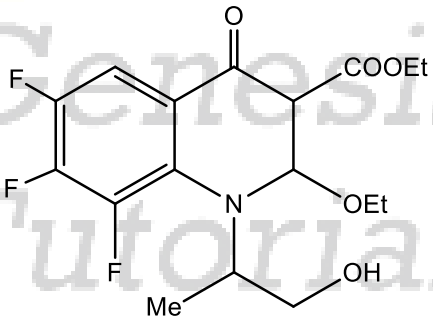
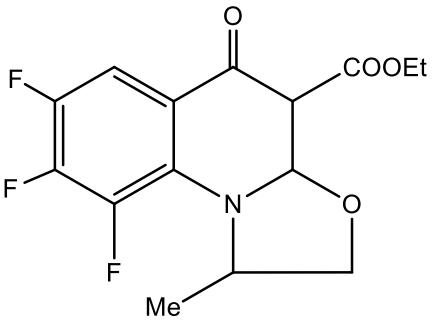


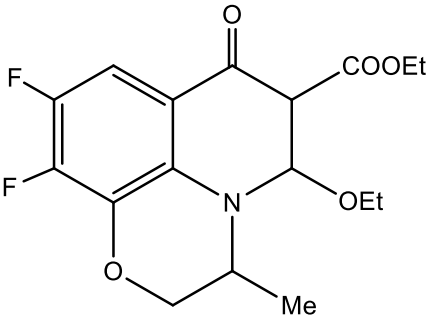
13. Major compound Q obtained on reaction of P with NaH in DMF is:

[GATE 2005]

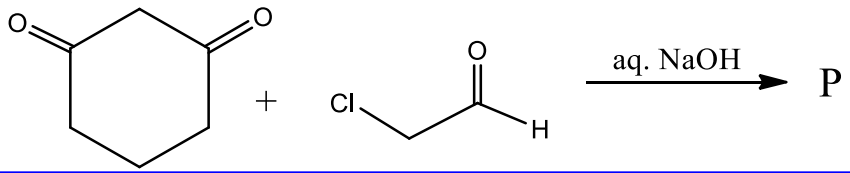
(a)


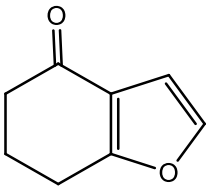
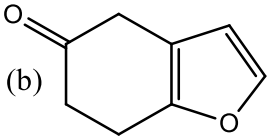
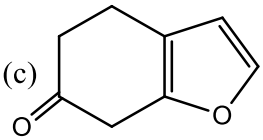
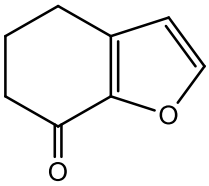
(b)


(c)


(d)


14. Identify the major product P in the following reaction. **[GATE 2006]**



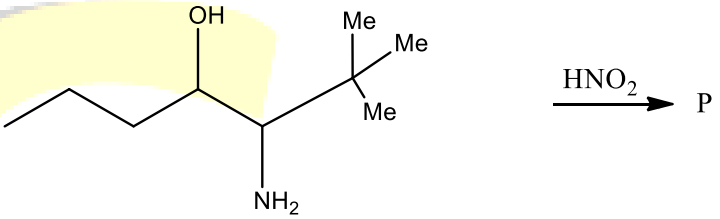
(a) 
(b) 
(c) 
(d) 

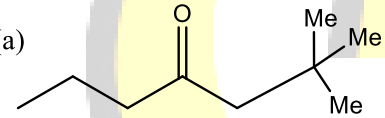
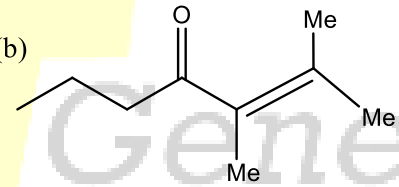
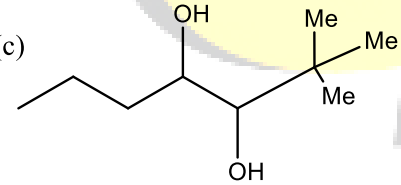
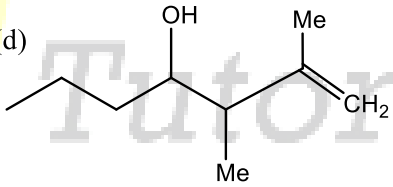
15. On heating with dilute sulfuric acid, naphthalene-I sulfonic acid gives predominantly

(a) naphthalene (b) naphthalene-2-sulfonic acid

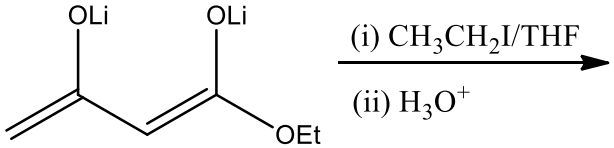
(c) I-naphthol (d) 2-naphthol **[GATE 2006]**

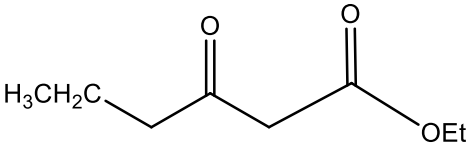
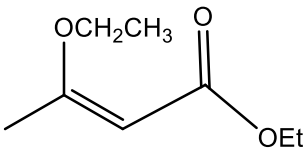
16. Predict the major product P inthe following reaction **[GATE 2006]**

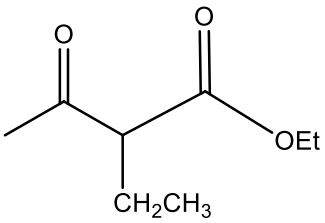


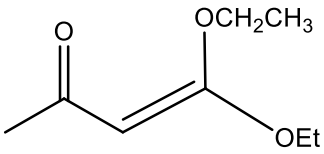
(a) 
(b) 
(c) 
(d) 

17. Identify the major product P in the following reaction **[GATE 2006]**

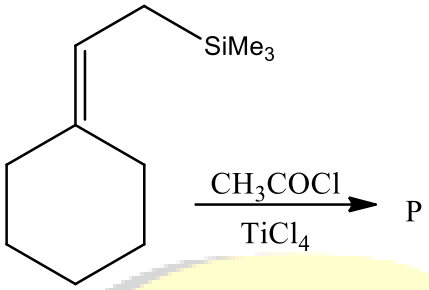


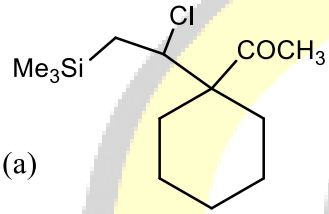
(a) 
(b) 

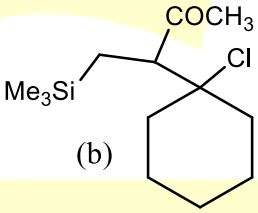
(c) 

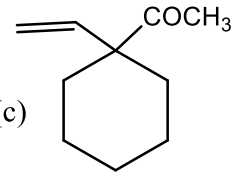
(d) 

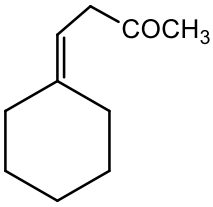
18. Identify the major product P in the following reaction **[GATE 2006]**



(a) 

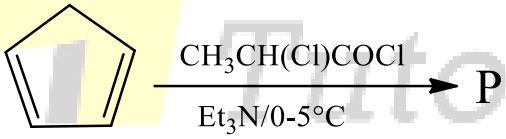
(b) 

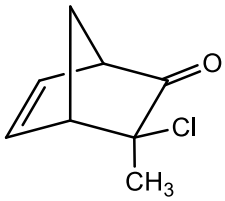
(c) 

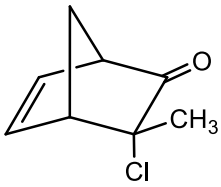
(d) 

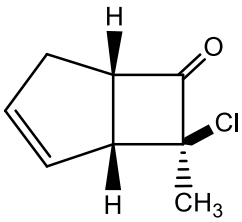
Linked Answer Q.19 and Q.20 **[GATE 2006]**

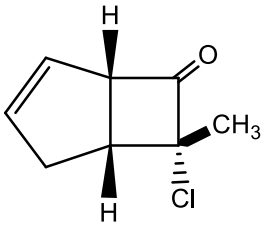
19. Identify the major product P in the following reaction



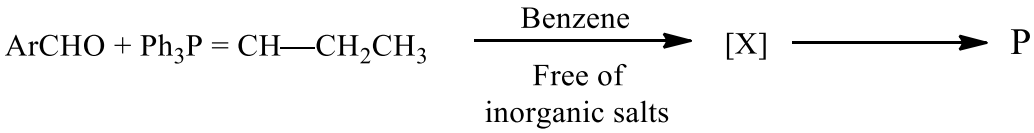
(a) 

(b) 

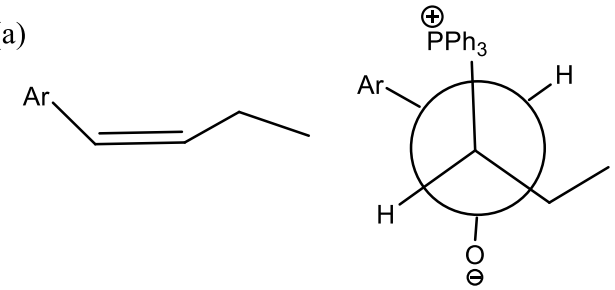
(c) 

(d) 

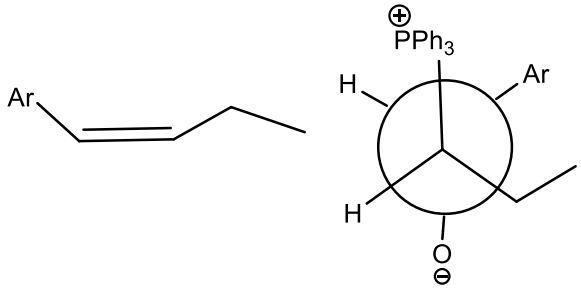
20. In the following wittig reaction, the structure of the major product P and the intermediate [X], respectively, are



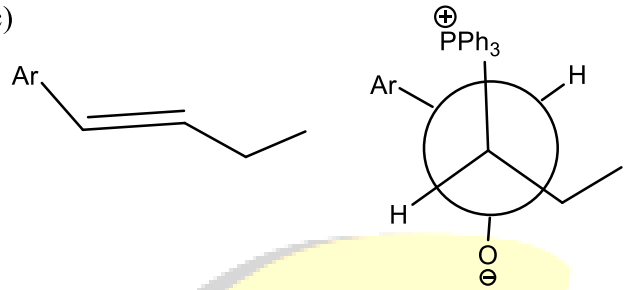
(a)



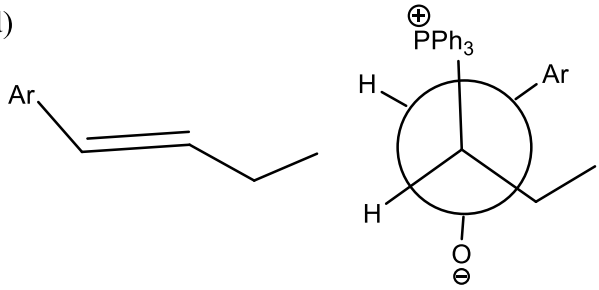
(b)



(c)



(d)



21. Match he reactions of some p-substituted benzene derivatives (a) –(d) given in **List I** with the Hammett's p-values (i)-(iv) in **List II** and identify the correct match.

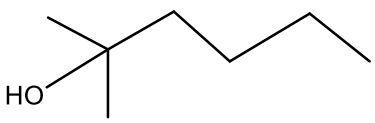
	List - I	**List - II**
(a)	$ArCH_2—Cl \xrightarrow[70°C]{\text{aq. acetone}} ArCH_2–OH–HCl$	(i) + 8.50
(b)	$ArCH_2—CO_2H \underset{25°C}{\overset{H_2O}{\rightleftharpoons}} ArCH_2 – COO^- + H^+$	(ii) + 1
(c)	$Ar – Cl \xrightarrow[50°C]{\text{MeONa/MeOH}} Ar – OMe + Cl^-$	(iii) + 0.49
(d)	$Ar – CO_2H \underset{25°C}{\overset{H_2O}{\rightleftharpoons}} Ar – COO^- + H^+$	(iv) - 1.88

(a) a-i, b-iv, c-iii, d-ii (b) a-iv, b-i, c-ii, d-iii

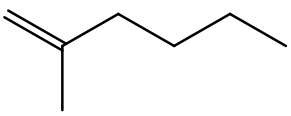
(c) a-i, b-ii, c-iv, d-iii (d) a-iv, b-iii, c-i, d-ii

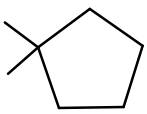
22. The major product obtained upon treatment of compound X with H_2SO_4 at 80°C is:

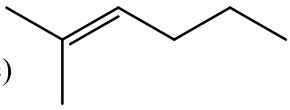
[GATE 2007]

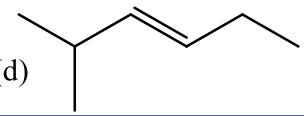


(X)

(a) 

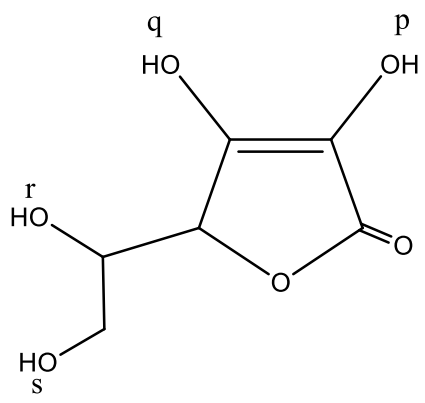
(b) 

(c) 

(d) 

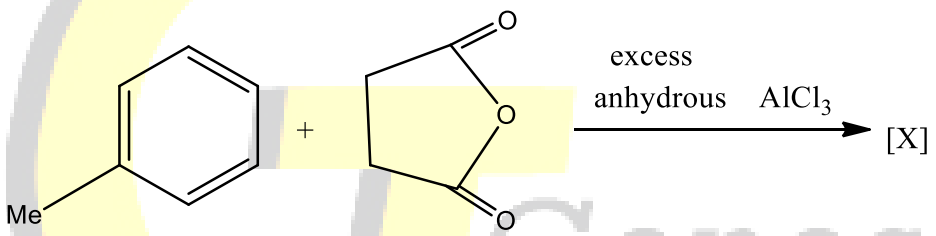
23. In the following compound, the hydroxy group that is most readily methylated with CH_2N_2 is:

[GATE 2008]



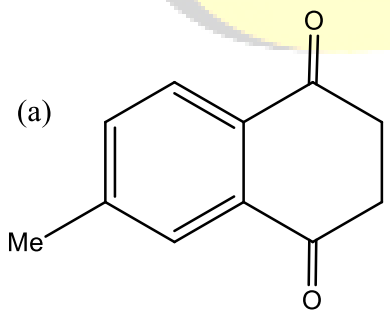
(a) p (b) q (c) r (d) s

24. In the reaction **[GATE 2009]**

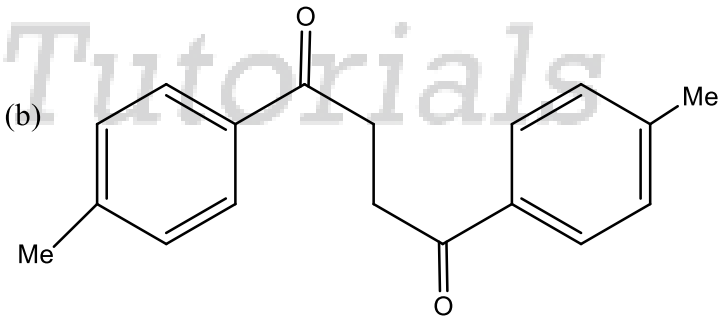


the major product X is:

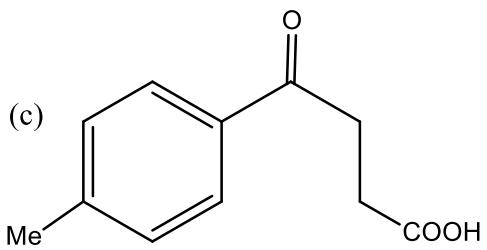
(a)



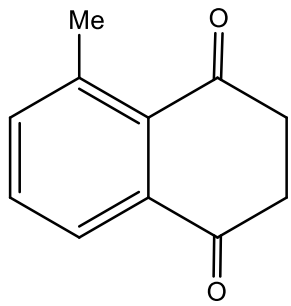
(b)



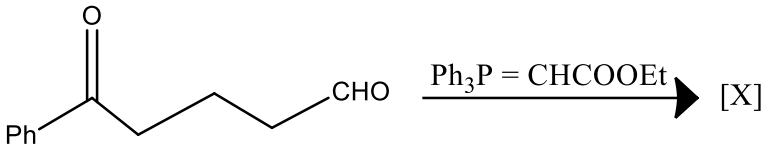
(c)



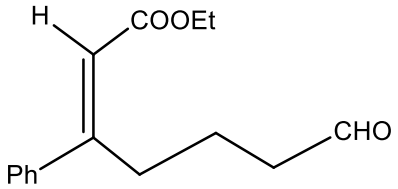
(d)



25. In the reaction **[GATE 2009]**



the major product X is

(a)


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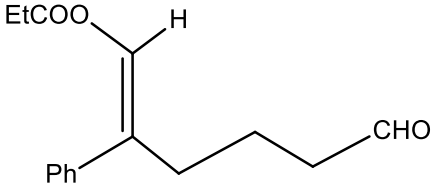
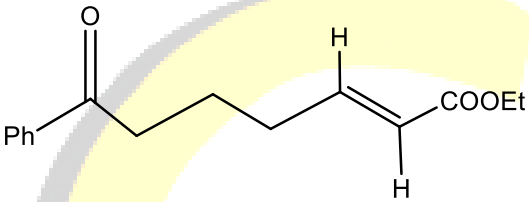
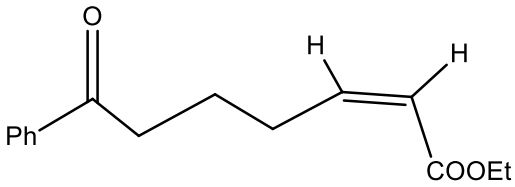
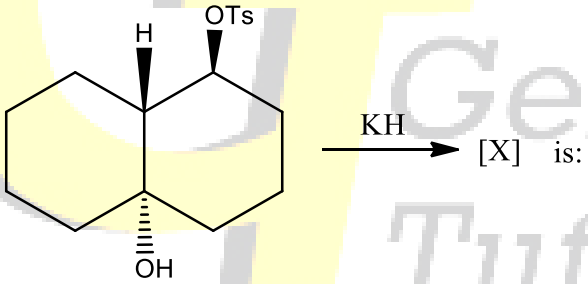


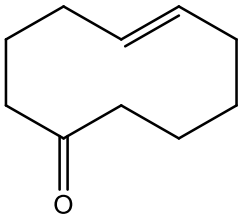
(c)


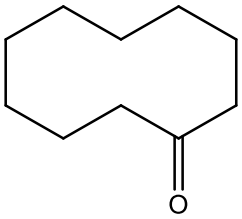
(d)


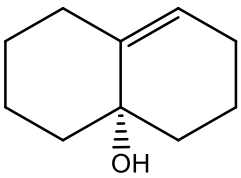
26. The major product X (based on the preferred conformation) in the reaction **[GATE 2009]**

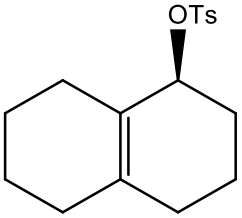


is:

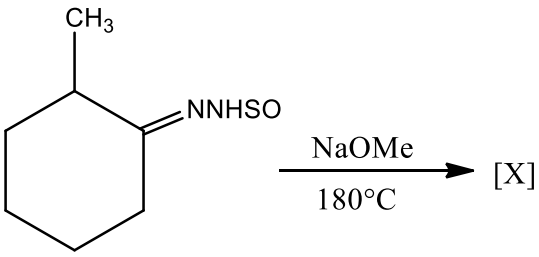
(a)


(b)


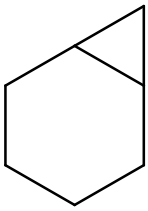
(c)


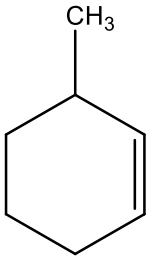
(d)


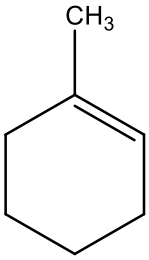
27. In the reaction **[GATE 2010]**

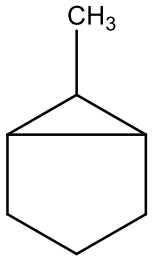


the major product [X] is

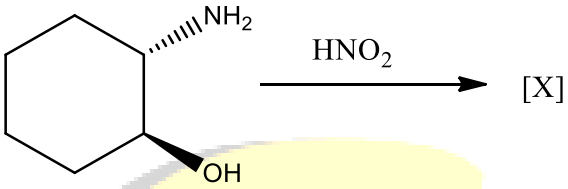
(a) 

(b) 

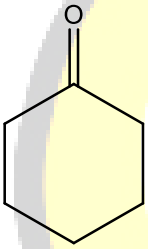
(c) 

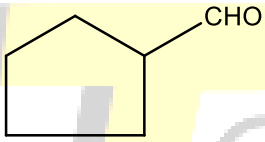
(d) 

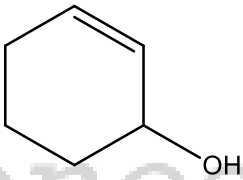
28. In the reaction, **[GATE 2010]**

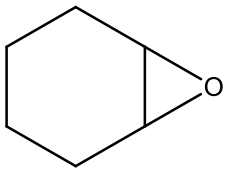


the major product [X] is:

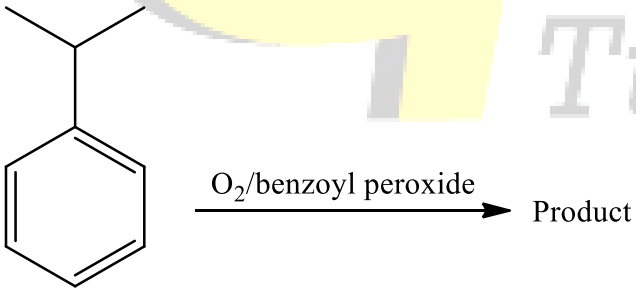
(a) 

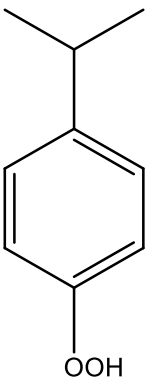
(b) 

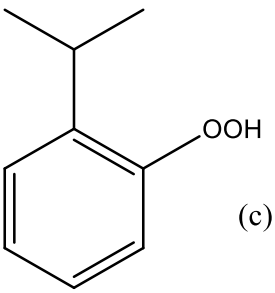
(c) 

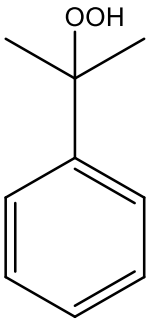
(d) 

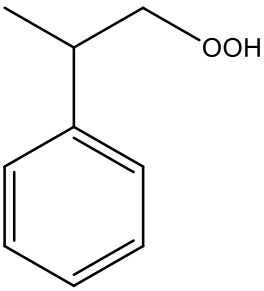
29. Identify the most probable product in the given reaction **[GATE 2012]**



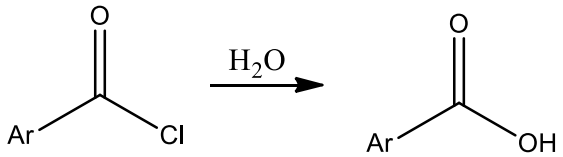
(a) 

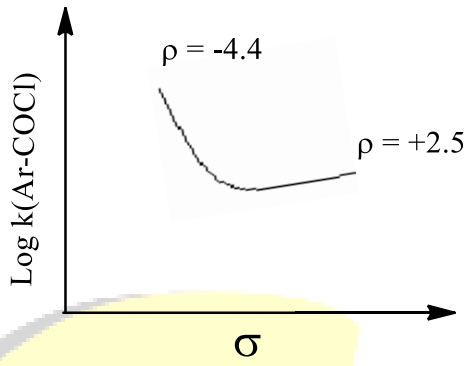
(b) 

(c) 

(d) 

30. Show below is a Hammett plot obatined for the reaction **[GATE 2012]**





The change in slop of the plot indicated that

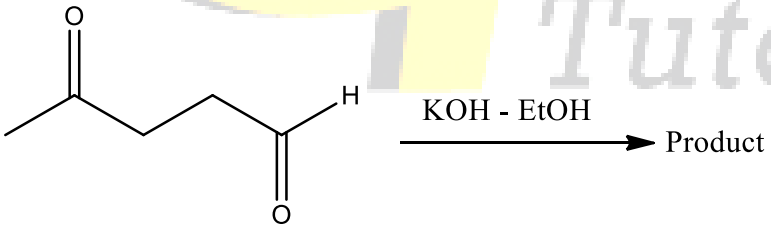
(a) The reaction does not follow linear free energy relationship

(b) electrons are being withdrawn from the transition state in the mechanism

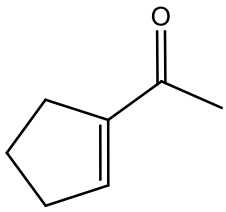
(c) electrons are being donated to the transition state in the mechanism

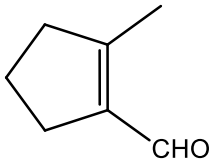
(d) the mechanism of the reaction is changing

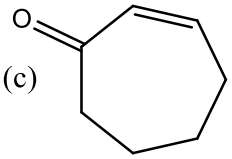
31. In the reaction **[GATE 2012]**

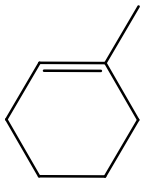


the product formed is

(a)


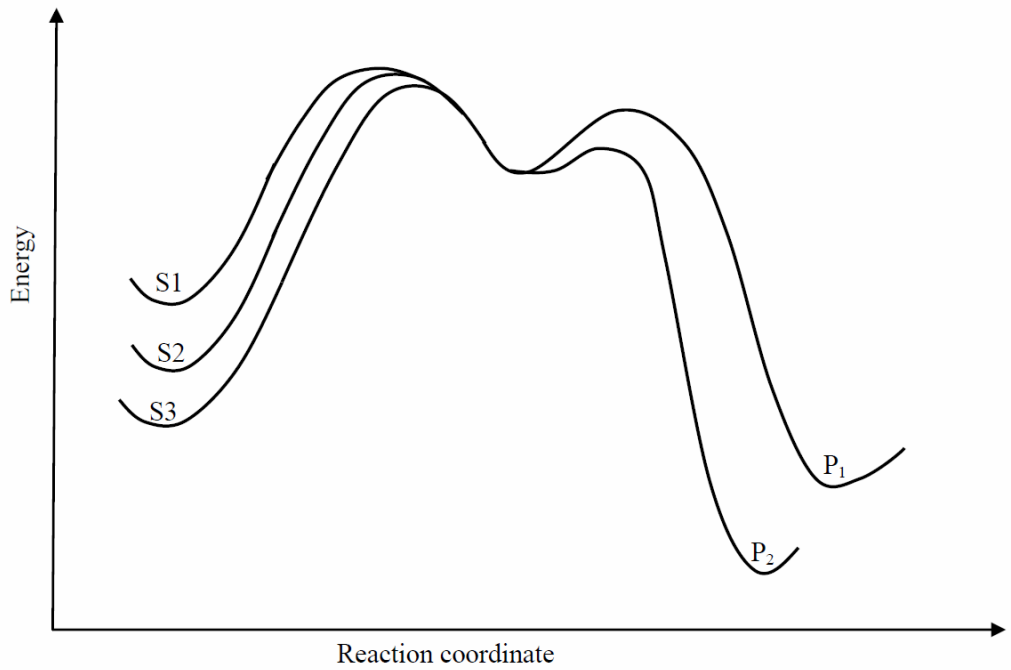
(b)


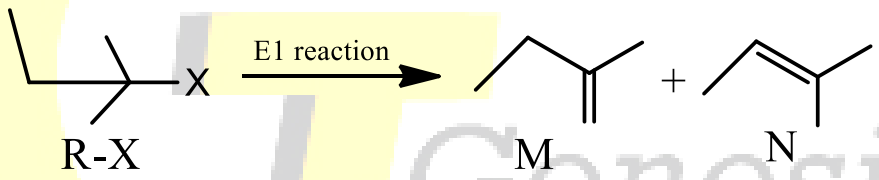
(c)


(d)


Common data for Questions 32 and 33. **[GATE 2012]**

Consider the E1 reaction of *tert-amyl* halides from the energy profile diagram





32. In the above reaction, X Cl, Br or I. Based on the graph, identify the alkyl halides (R-X) as S1, S and S3

(a) S1 = R-Cl, S2 = R-Br and S3 = R-I

(b) S1 = R-I, S2 = R-Br and S3 = R-Cl

(c) S1 = R-Cl, S2 = R-I and S3 = R-Br

(d) S1 = R-I, S2 = R-Cl and S3 = R-Br

33. Identify the product P_1 and its yield relative to P_2.

(a) P_1 is M and is the major product

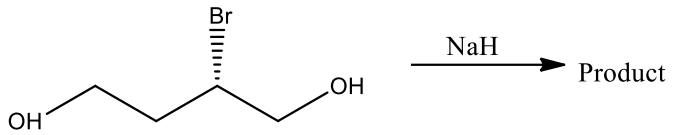
(b) P_1 is N and is the minor product

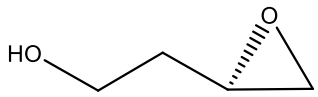
(c) P_1 is N and is the major product

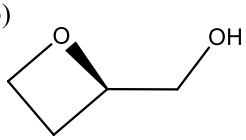
(d) P_1 is M and is the minor product

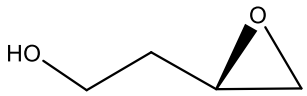
34. In the cyclization reaction given below, the most probable product formed is

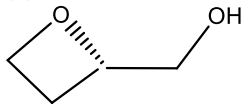
[GATE 2012]



(a)


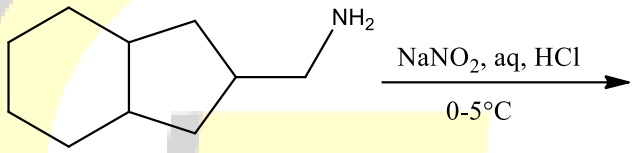
(b)


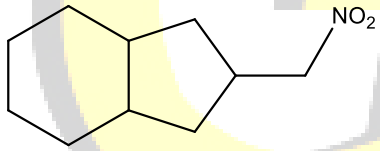
(c)


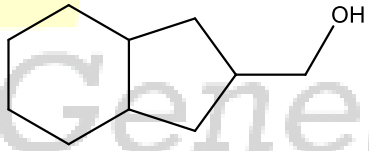
(d)


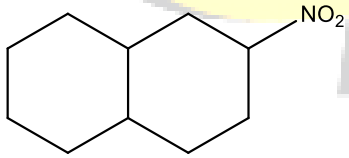
35. The major product formed in the reaction given below is

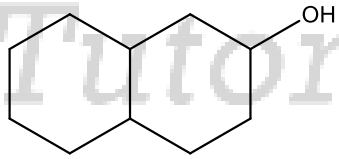
[GATE 2013]



(a)


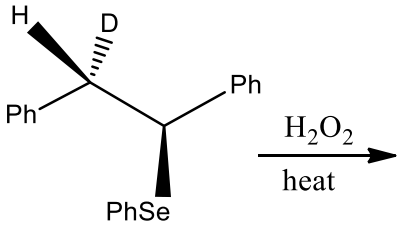
(b)


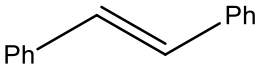
(c)


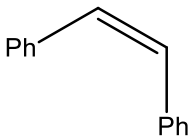
(d)


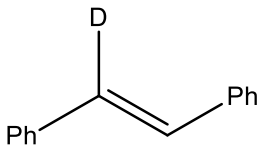
36. The major product formed in the following reaction is

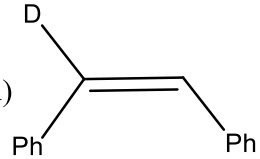
[GATE 2014]



(a)


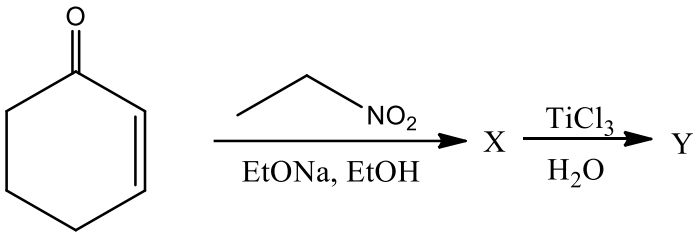
(b)


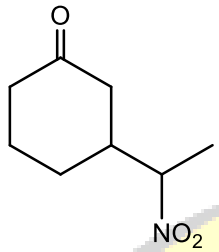
(c)


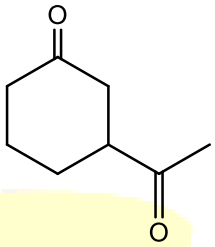
(d)


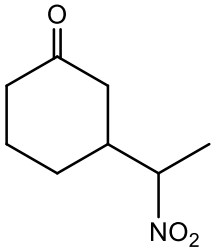
37. The major product X and Y formed in the following reaction sequence are

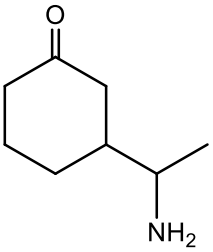
[GATE 2014]

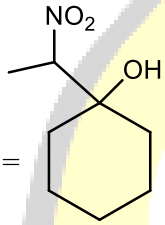


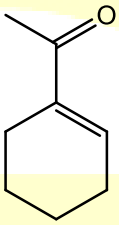
(a) X = 

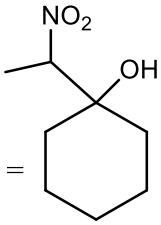
Y = 

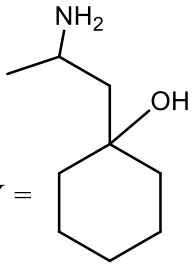
(b) X = 

Y = 

(c) X = 

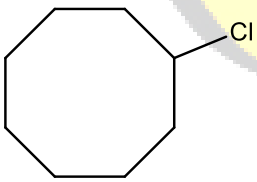
Y = 

(d) X = 

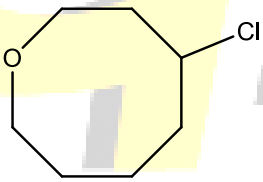
Y = 

38. The corrects order of the solvolysis for the following chlorides in acetic acid is

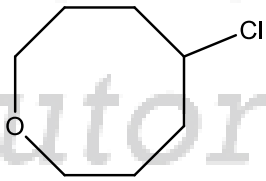
[GATE 2014]



(I)



(II)

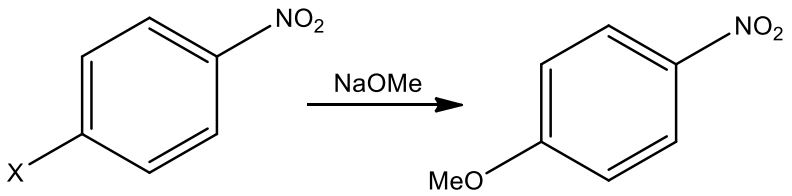


(III)

(a) II > I > III (b) III > III > I (c) III > I > II (d) I > III > II

39. The correct order of reactivity of p-halonitrobenzenes in the following reaction is

[GATE 2015]



(a) p-chloronitrobenzene > p-iodonitrobenzene > p-fluoronitrobenzene > p-bromonitrobenzene

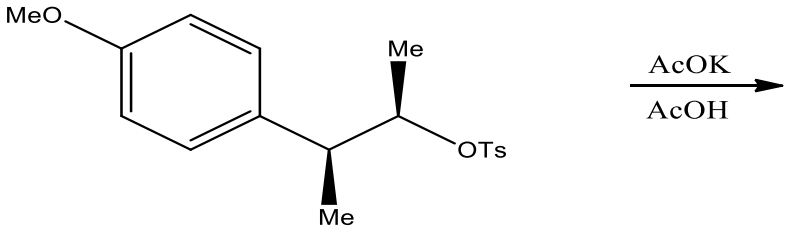
(b) p-fluoronitrobenzene > p-chloronitrobenzene > p-bromonitrobenzene > p-iodonitrobenzene

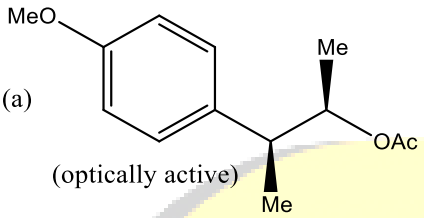
(c) p-iodonitrobenzene > p-bromonitrobenzene > p-chloronitrobenzene > p-fluoronitrobenzene

(d) p-bromonitrobenzene > p-fluoronitrobenzene > p-iodonitrobenzene > p-chloronitrobenzene

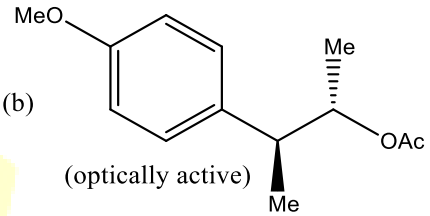
40. Solvolysis of the optically active compound X gives, mainly

[GATE 2015]

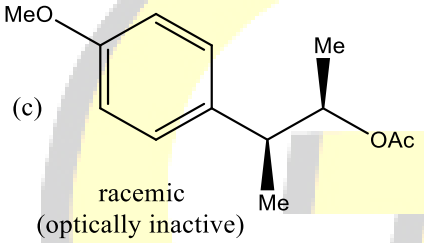


(a)


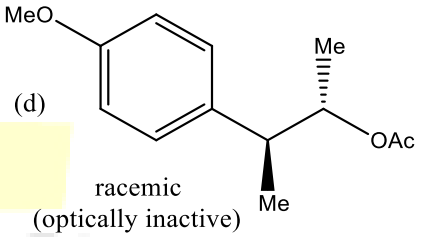
(optically active)

(b)


(optically active)

(c)


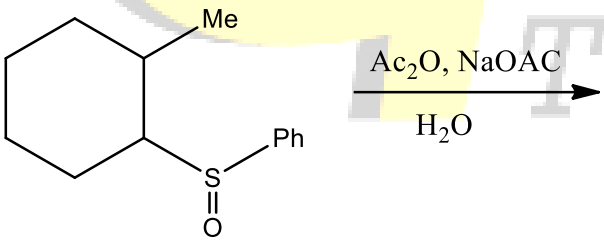
racemic
(optically inactive)

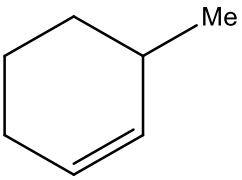
(d)


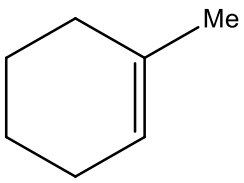
racemic
(optically inactive)

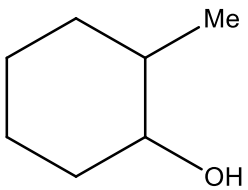
41. The major product formed in the following reaction is

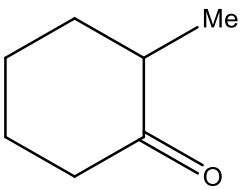
[GATE 2015]



(a)


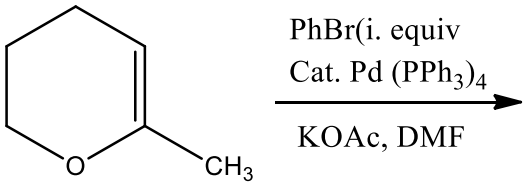
(b)


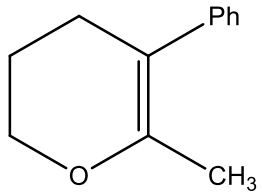
(c)


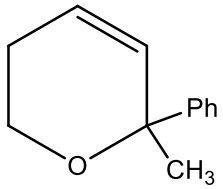
(d)


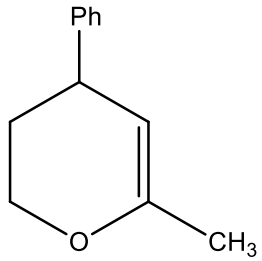
42. The major product formed in the following reaction is

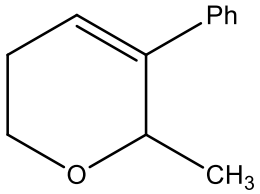
[GATE 2016]



(a) 

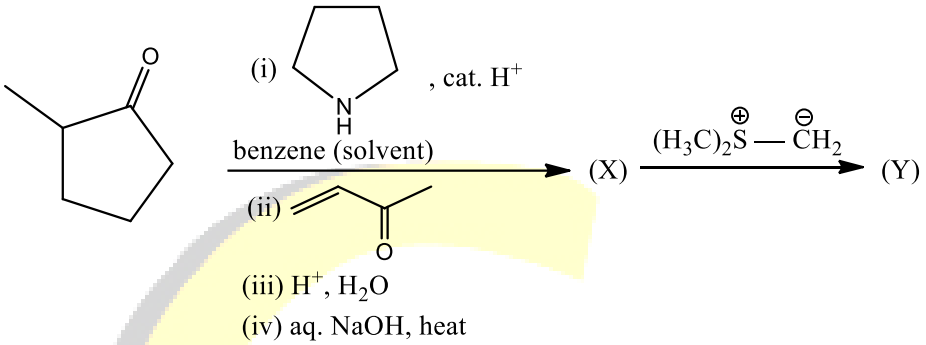
(b) 

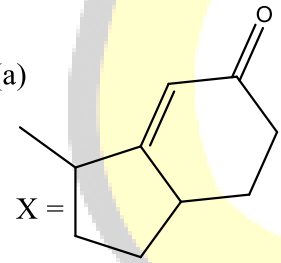
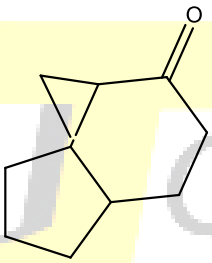
(c) 

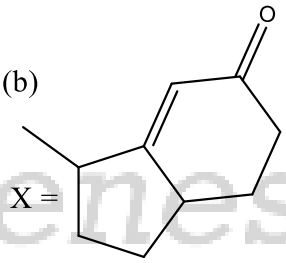
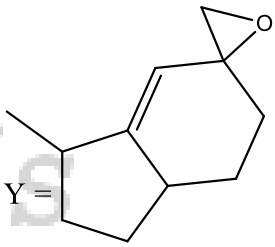
(d) 

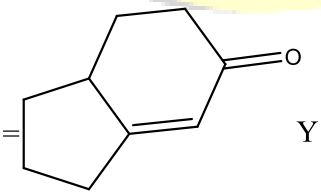
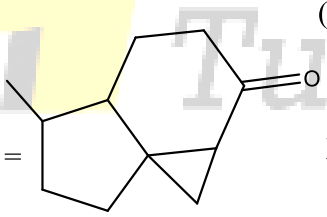
43. The major products X and Y formed in the following formed in the following synthetic scheme, are;

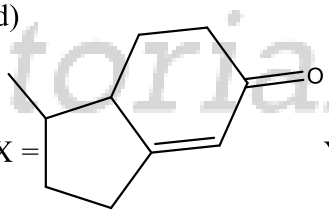
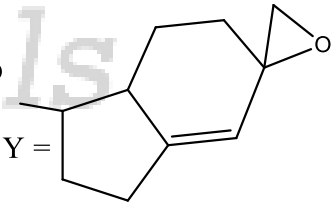
[GATE 2016]



(a) X =  Y = 

(b) X =  Y = 

(c) X =  Y = 

(d) X =  Y = 

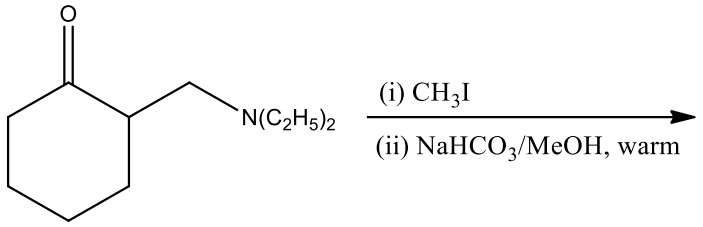
44. The major product obtained in the following reaction, is

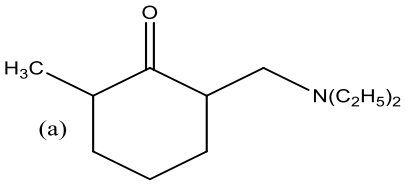
$$H-C\equiv C-CH_2OH \xrightarrow[\text{(ii) } C_2H_5Br(1\text{ equiv.})]{\text{(i) } LiNH_2\text{ (2equiv.) liq.}NH_3}_{\text{(iii) } H_3O^+}$$

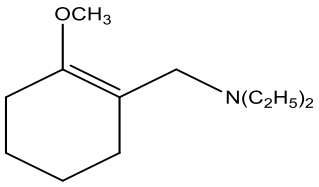
(a) $H_3CH_2C—C\equiv C—CH_2OH$ (b) $H—C\equiv C—CH_2OCH_2CH_3$

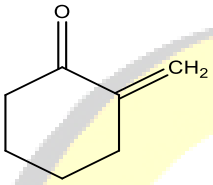
(c) $H_3CH_2C—C\equiv C—CH_2NH_2$ (d) $H—C\equiv C—CH_2NH—CH_2CH_3$

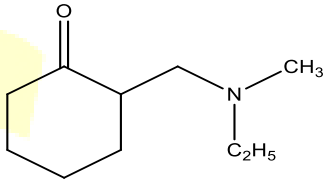
45. The major product formed in the following reaction, is **[GATE 2016]**



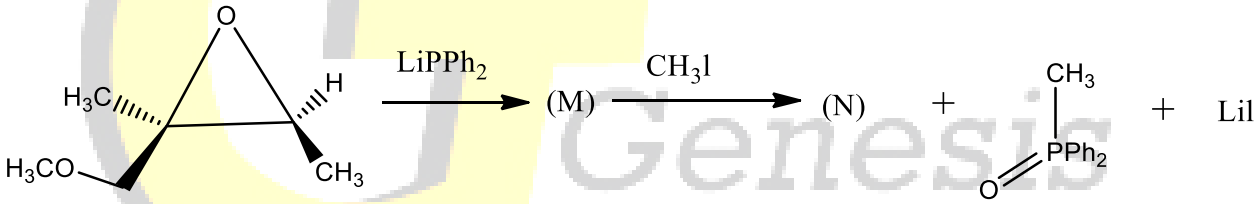
(a) 

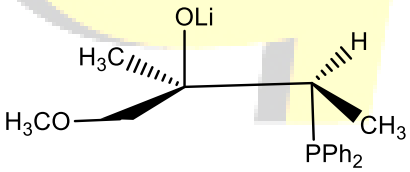
(b) 

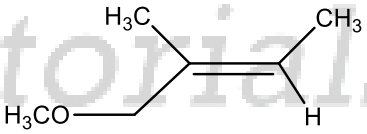
(c) 

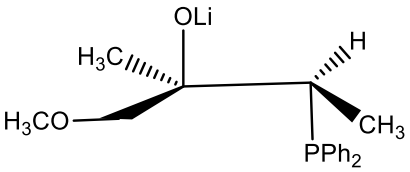
(d) 

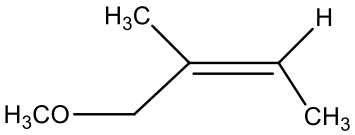
46. The major products M and N in the following reaction sequence are **[GATE 2016]**

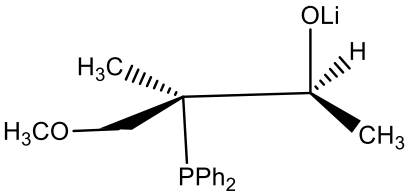


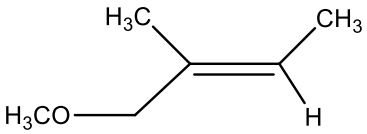
(a) M = 

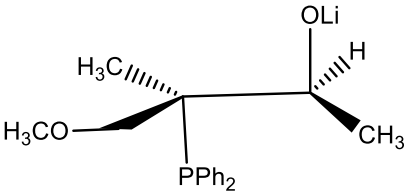
N = 

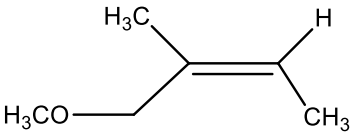
(b) M = 

N = 

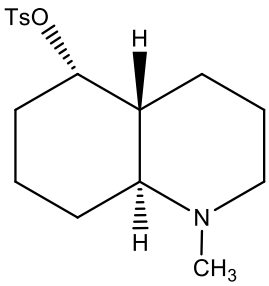
(c) M = 

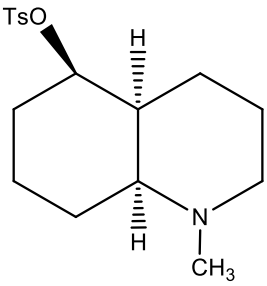
N = 

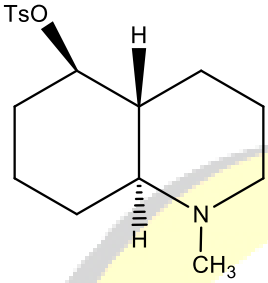
(d) M = 

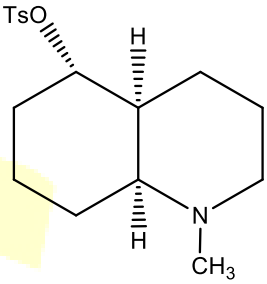
N = 

47. Among the following decahydroquinoline toluenesulfonates (Ts), the one that yields 9-methylamino-E-non-5-enal as a major product upon Aqueous solvolysis is **[GATE 2017]**

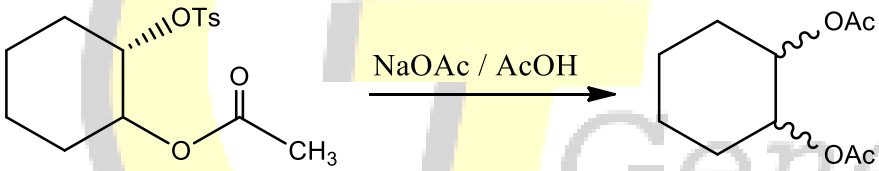
(a)


(b)


(c)


(d)


48. The product obtained in the following solvolysis reaction is **[GATE 2017]**



Enantiomerically pure compound

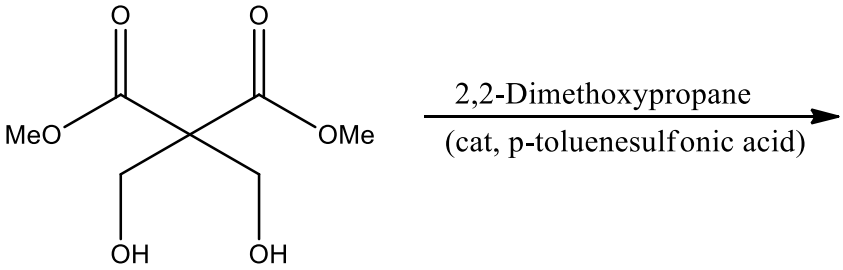
(a) a racemic mixture of trans 1,2-diacetoxycyclohexane

(b) enantiomrically pure trans 1,2-diacetoxycyclohexane

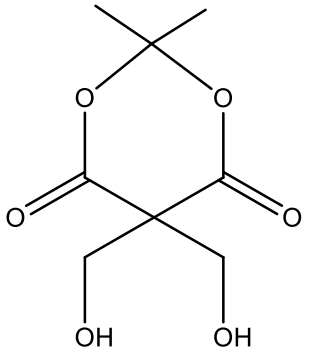
(c) racemic cis 1,2-diacetoxycyclohexane

(d) a mixture of cis and trans 1,2-diacetoxycyclohexane

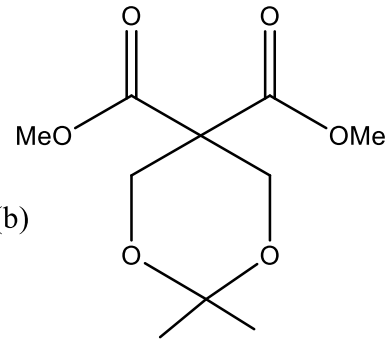
49. The major product obtained in the following reaction is **[GATE 2017]**



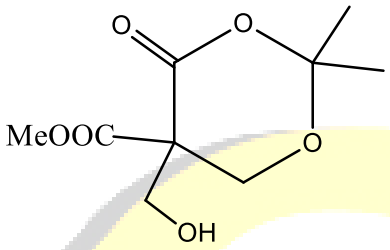
(a)



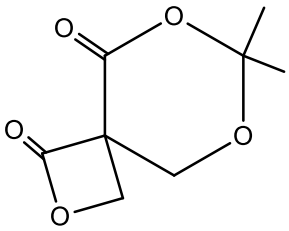
(b)



(c)



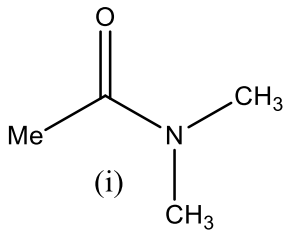
(d)

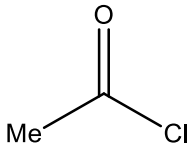


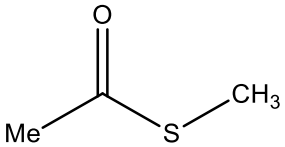
Genesis Tutorials

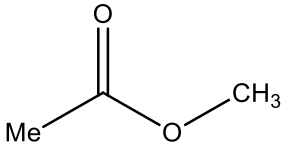
TIFR Previous Years' Question

1. Rank the following molecules in order of electrophillicity (from most to least electrophiilic) **[TIFR 2010]**


(i)

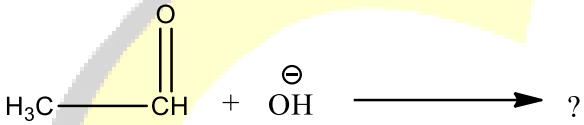

(ii)

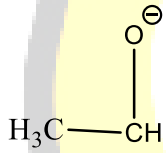

(iii)

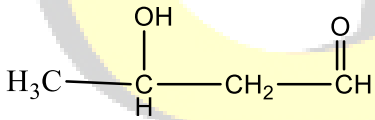
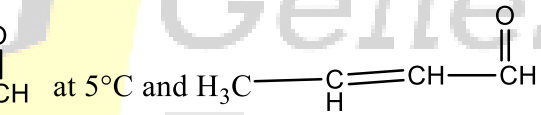

(iv)

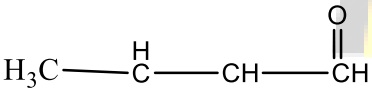
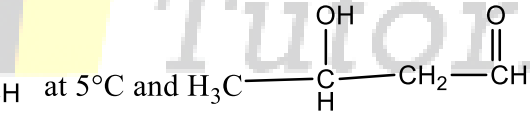
(a) ii > iii > iv > I (b) I > iv > iii > ii (c) ii > iv > iii > i (d) I > iii > iv > ii

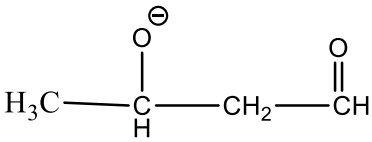
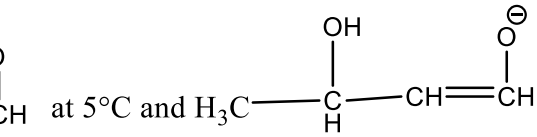
2. What would be the final major product of the following chemical reaction if it is carried out twice, once at 5°C and the second time at 45°C? **[TIFR 2010]**



(a)  at the both the temperature

(b)  at 5°C and  at 45°C and

(c)  at 5°C and  at 45°C

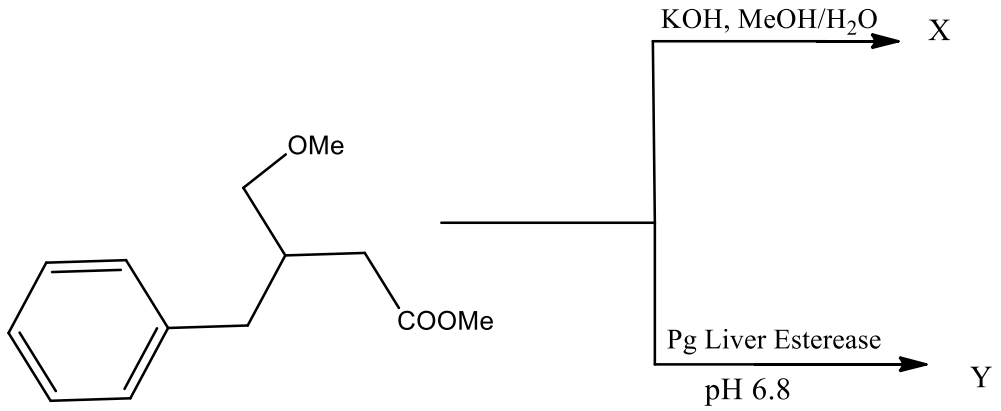
(d)  at 5°C and  at 45°C

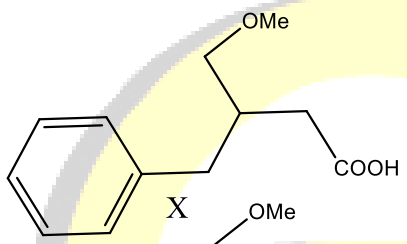
3. What is the major product if HBr (in excess) is added to $H_2C = CH – CH_2 – OH$ **[TIFR : 2011]**

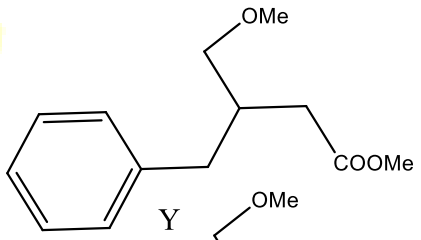
(a) $CH_3 – CH(Br) – CH_3 – Br$ (b) $H_2C – CH – CH_2 – Br$

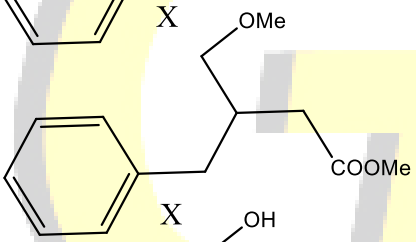
(c) $CH_3 – CH(Br) – CH_2 – OH$ (d) $CH_3 – CH(OH) – CH_2 – OH$

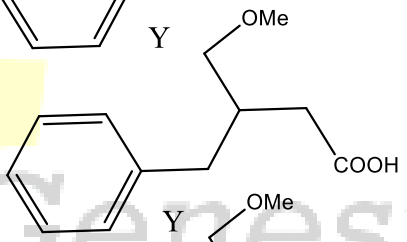
4. Predict the product X and Y for the following de-protection reactions **[TIFR : 2014]**

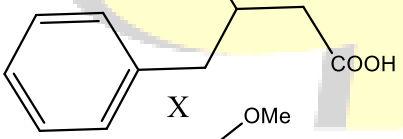


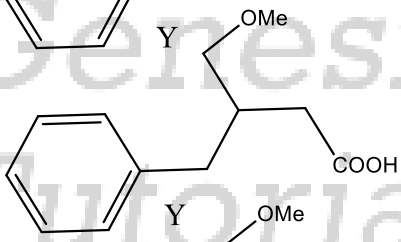
(a)


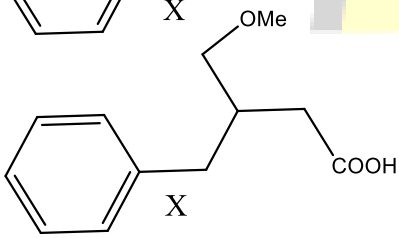


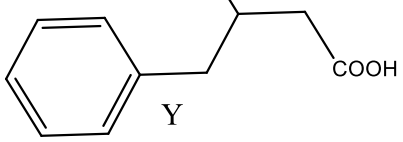
(b)




(c)




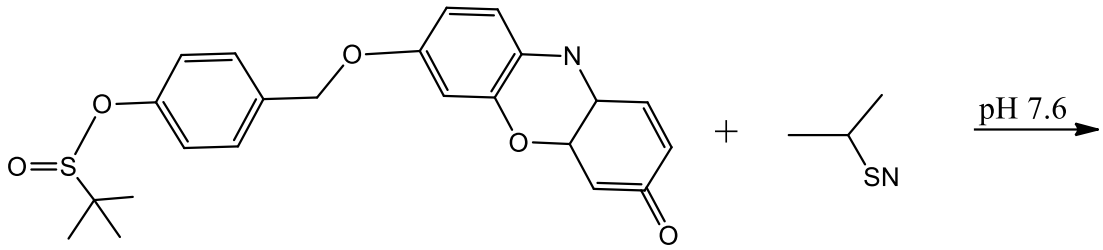
(d)




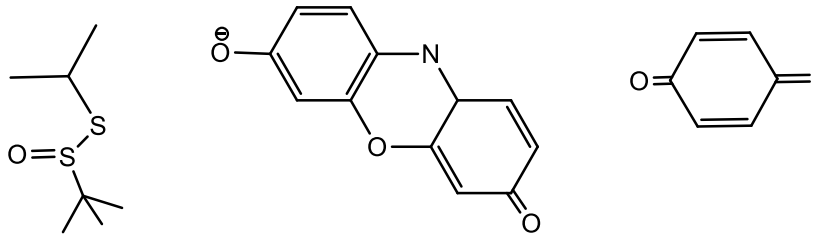
5. When 10 mL of each liquid of liquid pairs listed below ae mixed and then allowed to stand, which pair is most likely to separate into two layers? **[TIFR 2014]**

(a) carbon tetrachloride and hexane
(b) ethanol and methanol
(c) carbon tetrachloride and methanol
(d) hexane and pentane

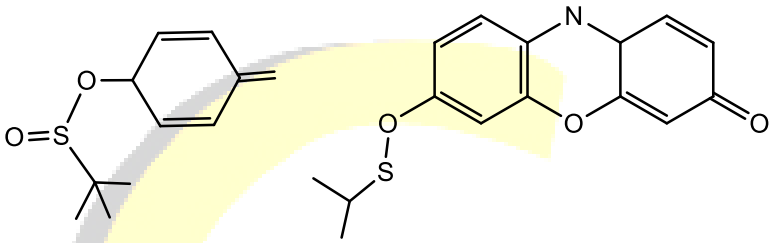
6. Thiols are important molecular species present in cells and can mediate cell signalling processes. A procedure for detecting thiols has been recently reported based on the following reaction. Predict the structures of reaction products **[TIFR 2015]**



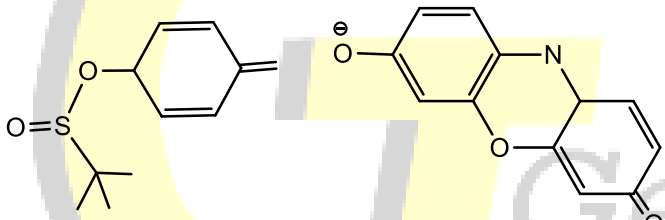
(a)



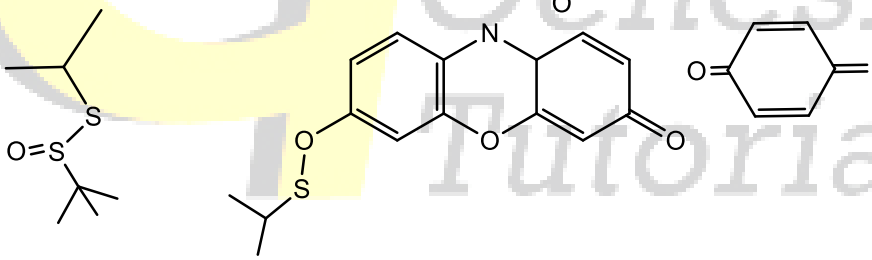
(b)



(c)



(d)



7. A catalyst: **[TIFR 2015]**

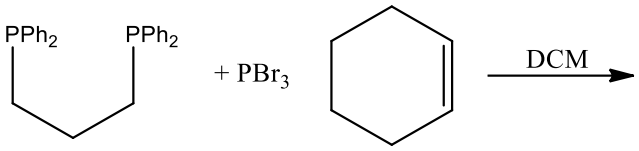
(a) Participates in the reaction

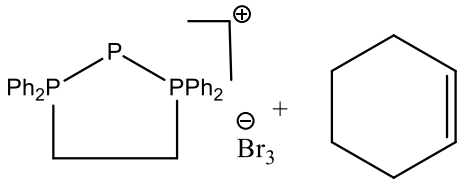
(b) Does not effects a reaction energy path

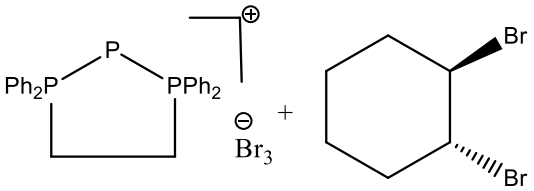
(c) Always decreases the rate for a reaction

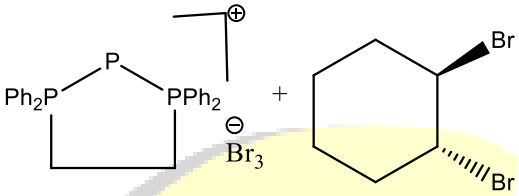
(d) Always increases the activation energy for a reaction

8. What is the product of the following reaction? **[TIFR 2016]**



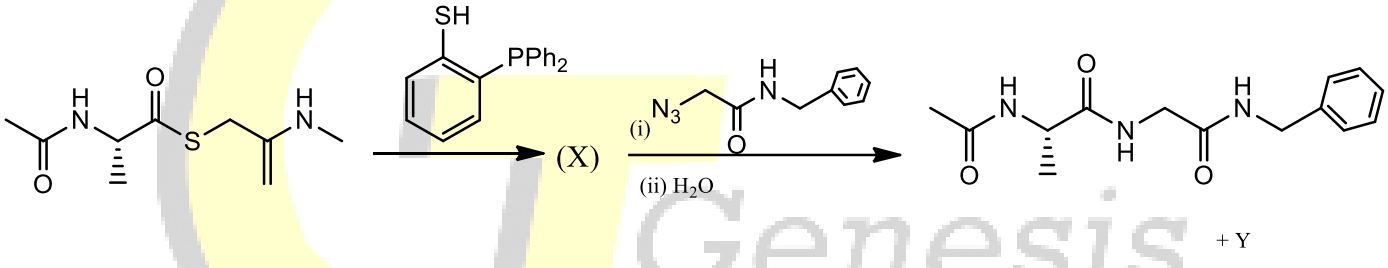
(a) 

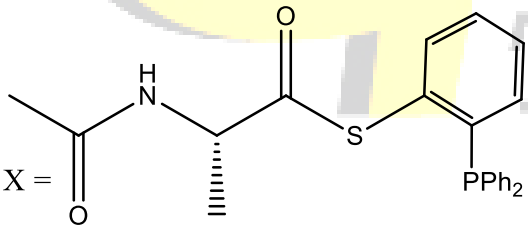
(b) 

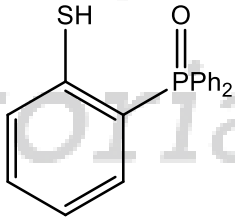
(c) 

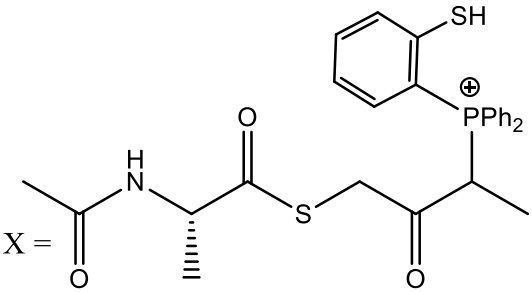
(d) none of the above

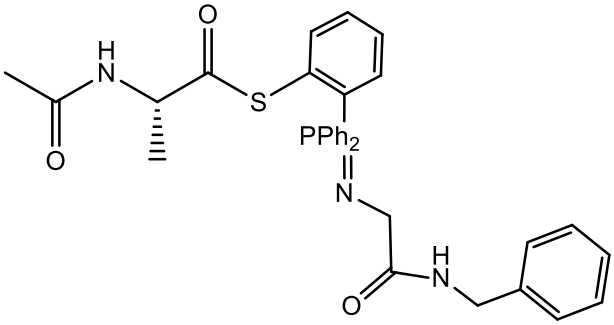
9. Predict the products X and Y of the following peptide ligation reaction. **[TIFR 2016]**

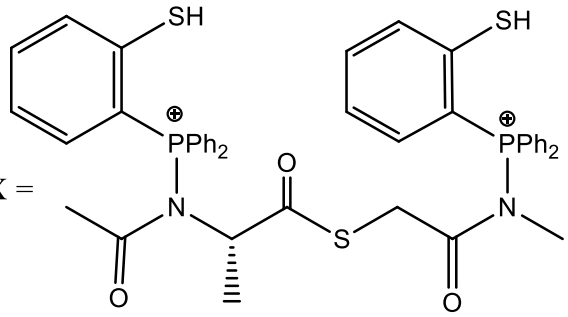


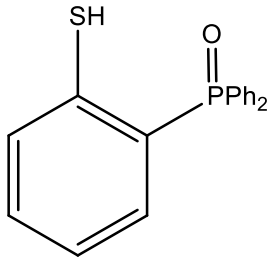
(a) X = 

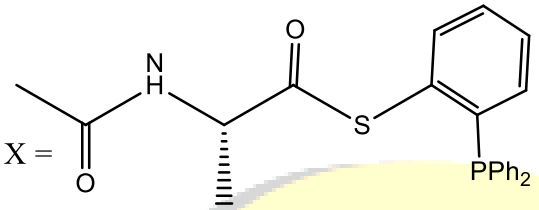
Y = 

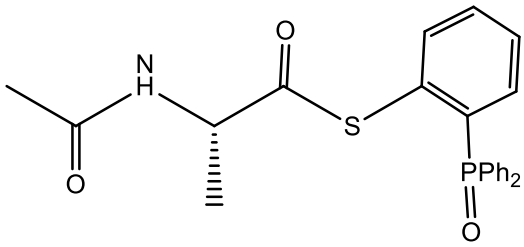
(b) X = 

Y = 

(c) X = 

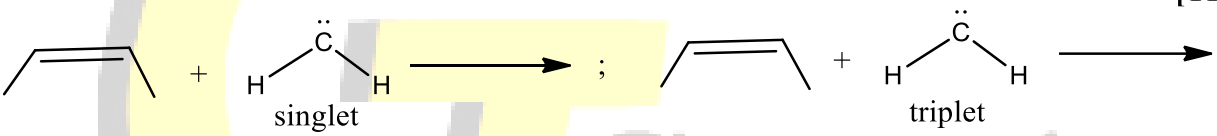
Y = 

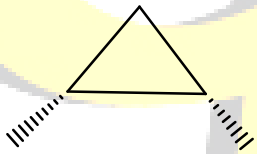
(d) X = 

Y = 

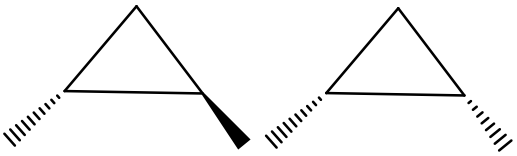
10. Predict the products of the following reactions between cis-2-butene and singlet and triplet methylenes

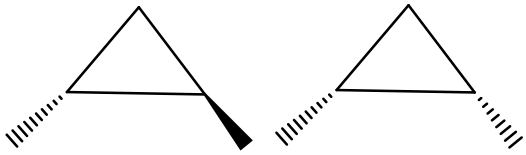
[TIRF 2016]

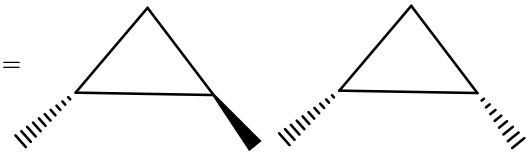


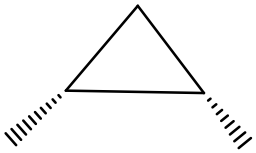
(a) singlet = 

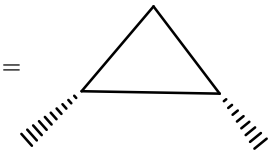
triplet = 

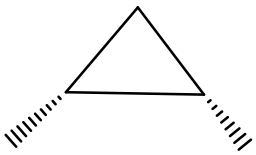
(b) singlet = 

triplet = 

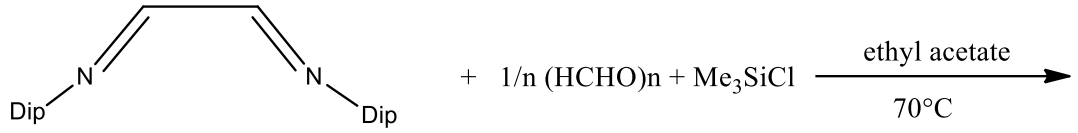
(c) singlet = 

triplet = 

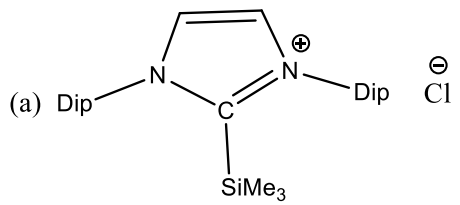
(d) singlet = 

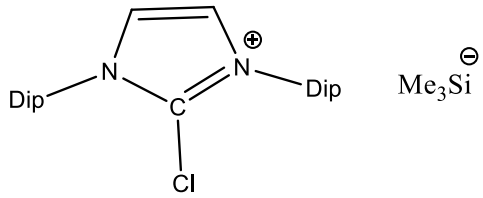
triplet = 

11. What is the product of the following reaction? **[TIFR 2016]**



Dip = 2, 6-diisopropylphenyl

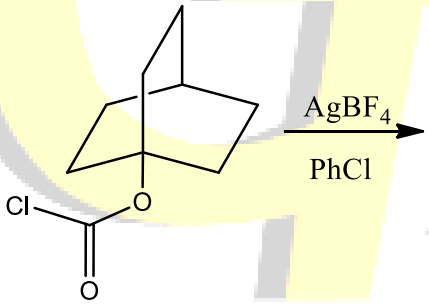
(a) 

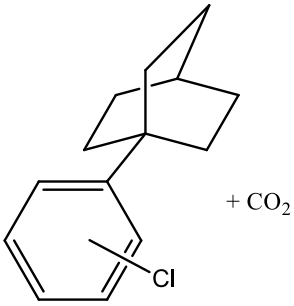
(b) 

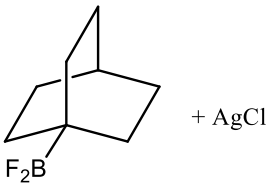
(c) 

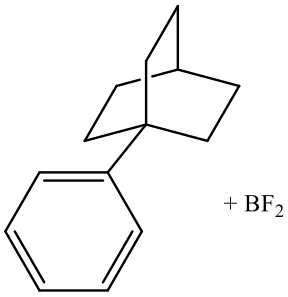
(d) None of the above

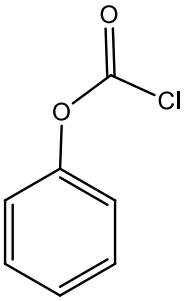
12. What is the product of the following reaction? **[TIFR 2016]**



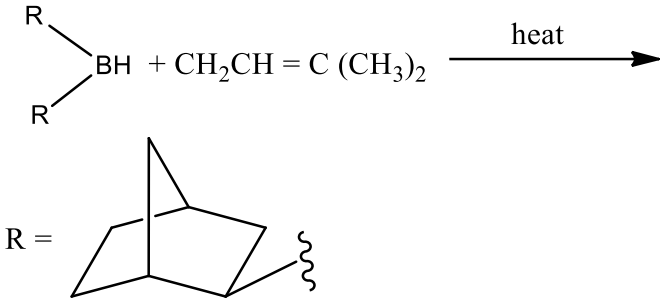
(a) 

(b) 

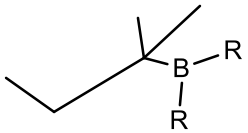
(c) 

(d) 

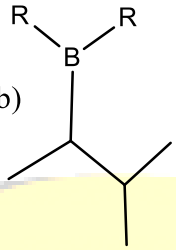
13. Predict the major product of the following hydroboration reaction **[TIFR 2017]**



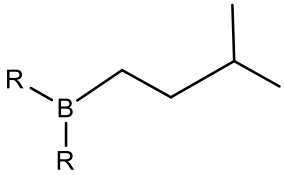
(a)



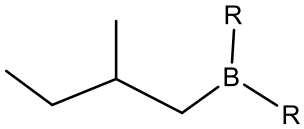
(b)



(c)



(d)



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