

TEST SERIES CSIR-UGC-NET/JRF Dec. 2016

BOOKLET SERIES **C**

Paper Code **01**

Test Type: **TEST SERIES**

CHEMICAL SCIENCES

Duration: 2:00 Hours

Date: 02-12-2016

Maximum Marks: 220

Read the following instructions carefully:

* Single Paper Test is divided into TWO Parts.

Part - A: This part shall carry 30 questions. Each question shall be of 2 marks.

Part - B: This part shall contain 40 questions. Each question shall be of 4 marks.

* Darken the appropriate bubbles with HB pencil/Ball Pen to write your answer.

* There will be negative marking @25% for each wrong answer.

* The candidates shall be allowed to carry the Question Paper Booklet after completion of the exam.

* For rough work, blank sheet is attached at the end of test booklet.



CAREER ENDEAVOUR

Best Institute for IIT-JAM, NET & GATE

South Delhi Centre:

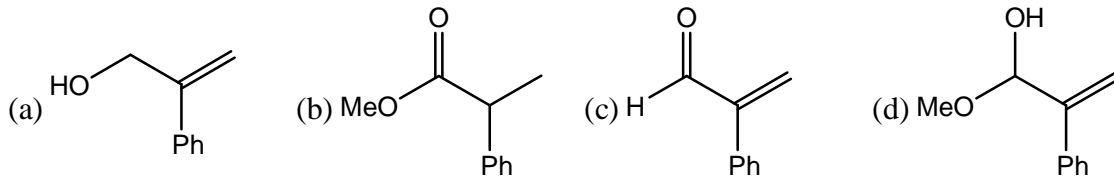
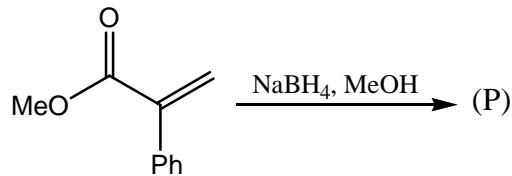
28-A/11, Jia Sarai, Near-IIT Hauz Khas, New Delhi-16
T : 011-26851008, 26861009

North Delhi Centre:

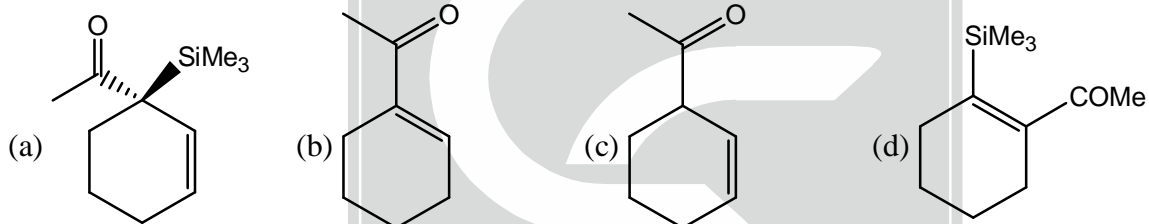
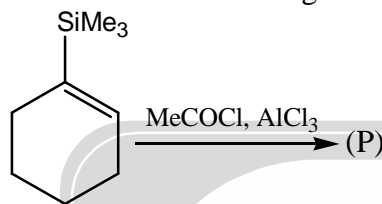
33-35, Mall Road, G.T.B. Nagar (Opp. Metro Gate No.3), Delhi-09
T : 011-65462244, 65662255
E : info@careerendeavour.com, W : www.careerendeavour.com

PART-A

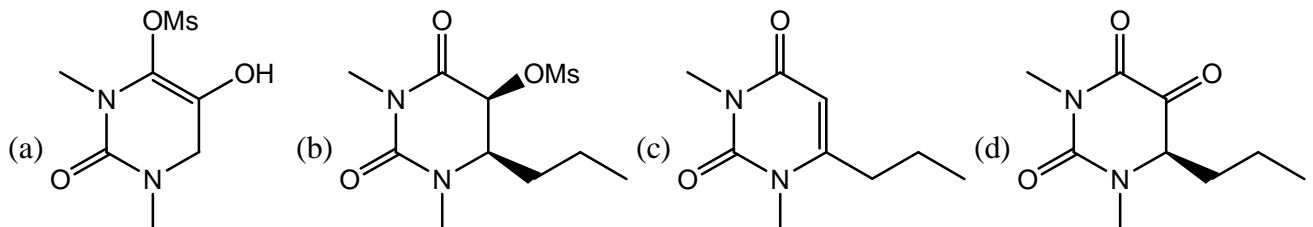
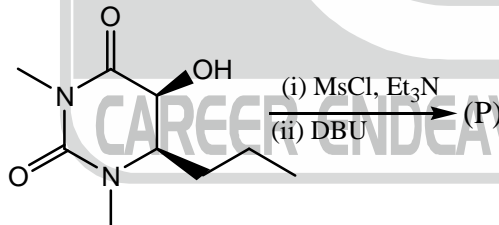
1. The major product formed in the following transformation is



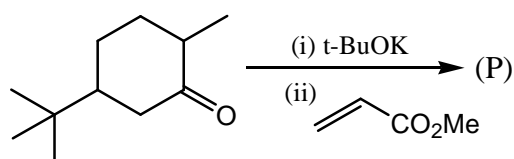
2. Identify the major product formed in the following reaction



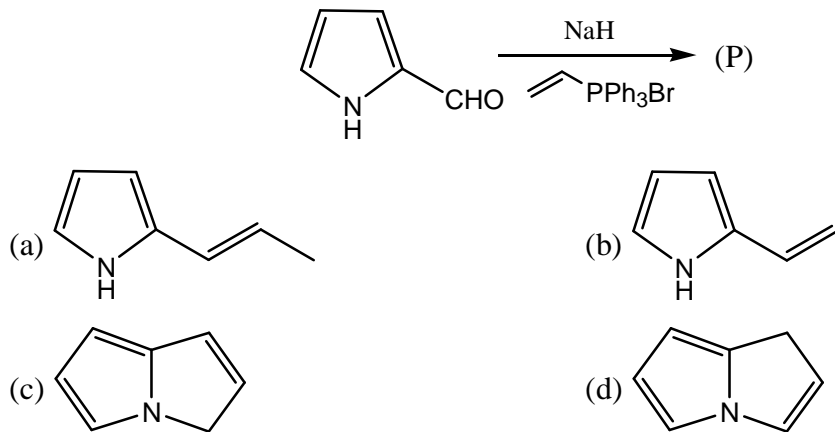
3. The major product formed in the following reaction sequence is



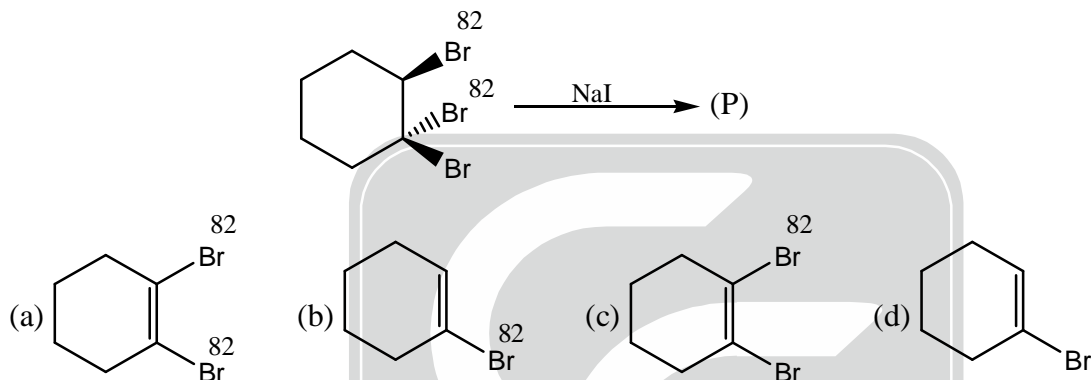
4. The major product formed in the following reaction sequence



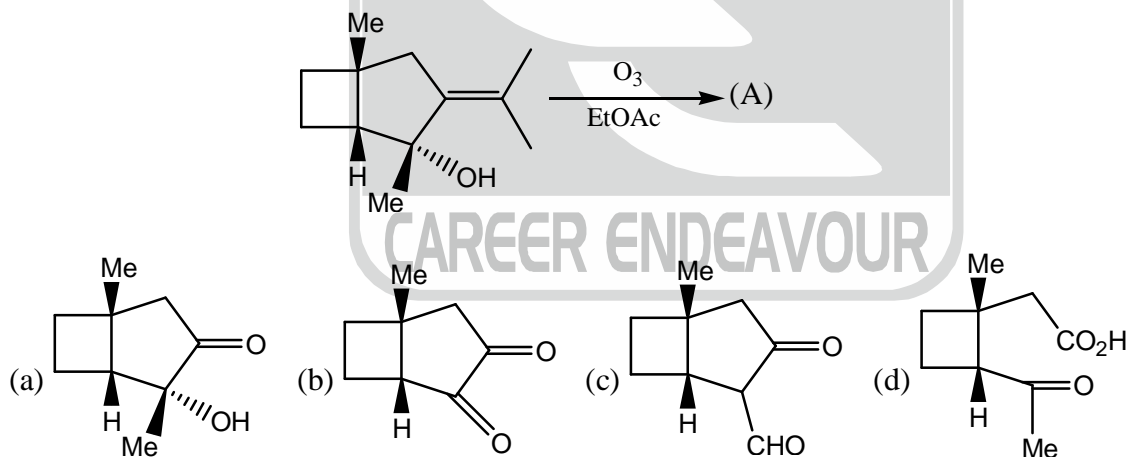
9. The major product formed in the following reaction is



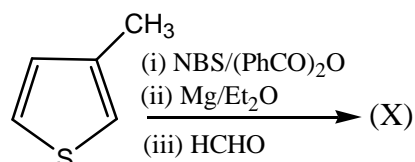
10. Predict the major product in the following reaction



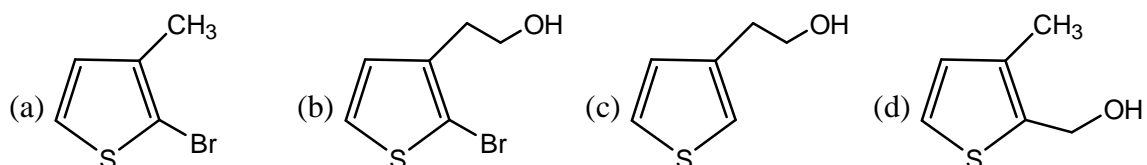
11. The major product formed on ozonolysis of the following alkene



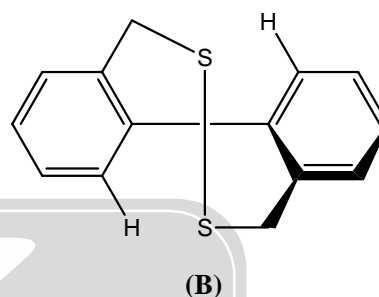
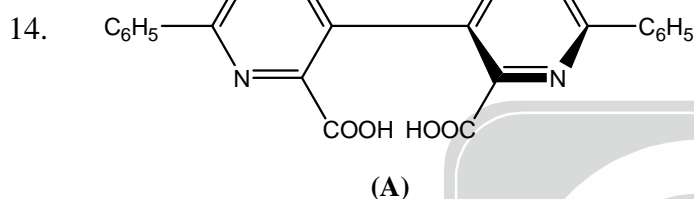
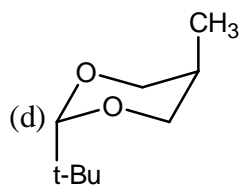
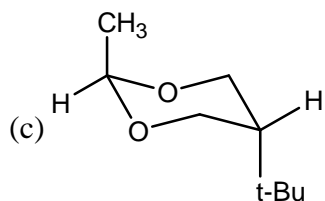
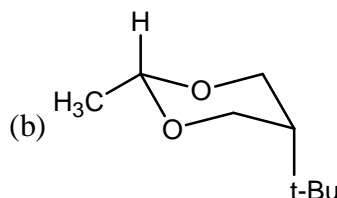
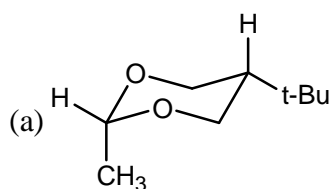
12. In the following reactions sequence



The product (X) is

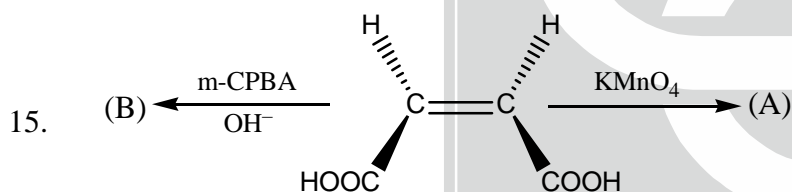


13. The most stable conformation in the following:



The correct statements about the structure (A) and (B)

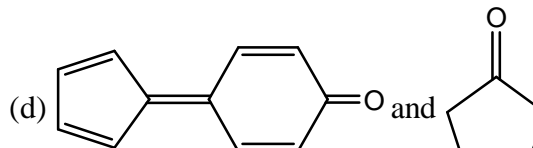
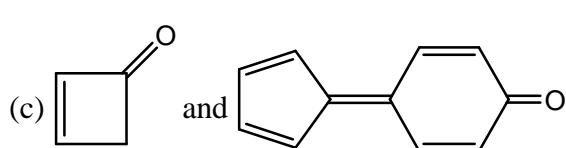
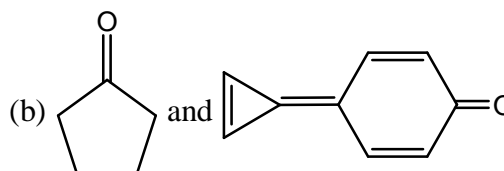
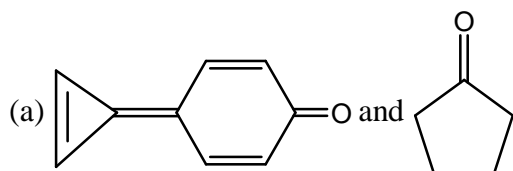
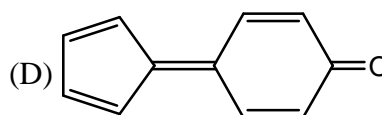
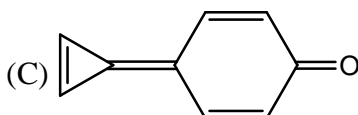
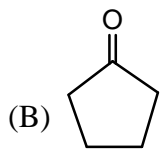
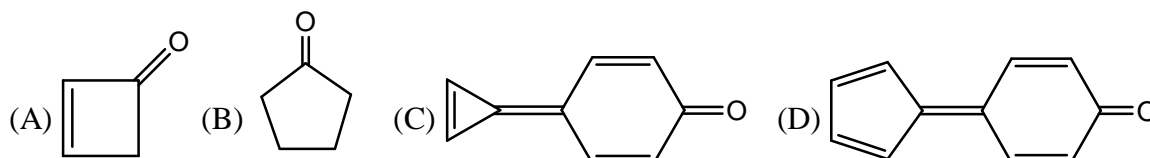
- (a) A and B both are achiral (b) A having (S) and B having (R) configuration
(c) A having (R) and B having (S) configuration (d) both having (R) configuration



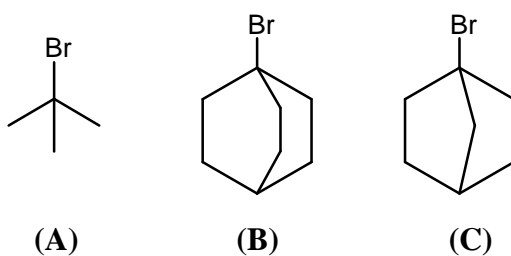
Relation between the major product (A) and (B)

- (a) enantiomers (b) diastereomers (c) homomers (d) constitutional isomers

16. Given compounds A, B, C and D are subjected to IR spectrum analysis. Compounds which will show minimum and maximum ν_{CO} stretching frequency in IR respectively will be



17.



Rate of solvolysis in ethanol (aq)

 k_A k_B k_C

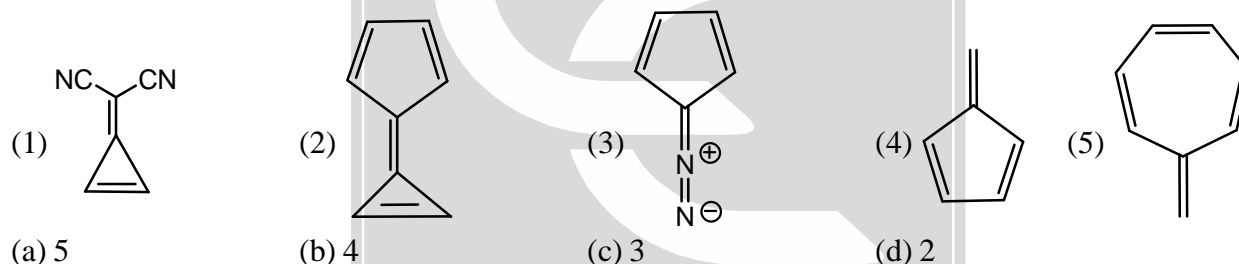
If polarity of solvent is sufficiently increased, then what will happen?

- (a) rate of solvolysis will be increased at equal pace.
 (b) rate of solvolysis will be increased at unequal pace.
 (c) rate of solvolysis will not increased at all
 (d) rate of solvolysis increase, rate will be in order of $k_C > k_A > k_B$.

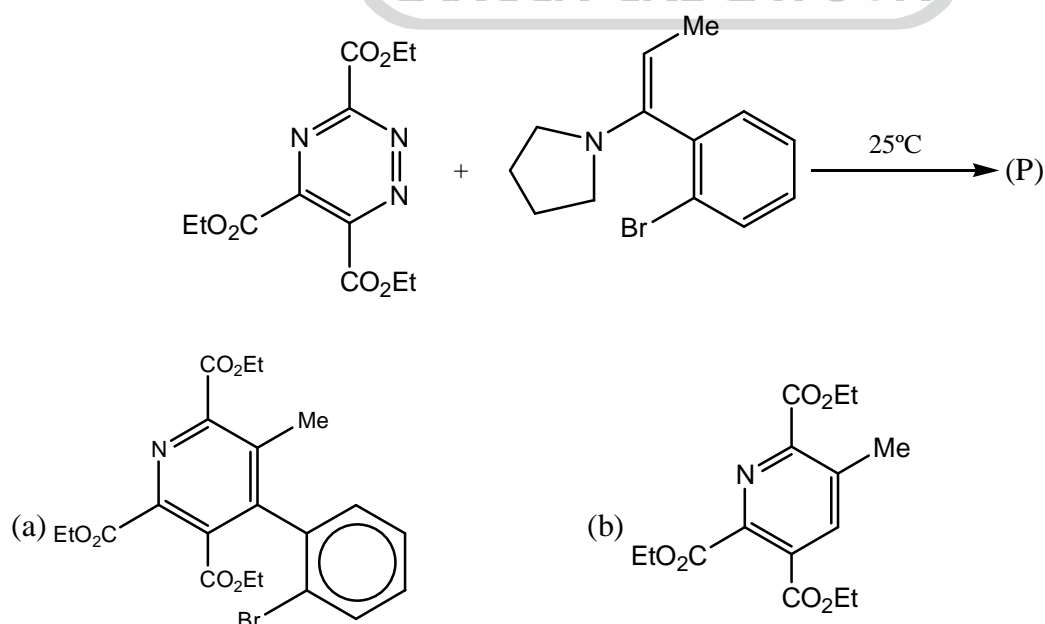
18. Choose the incorrect statement

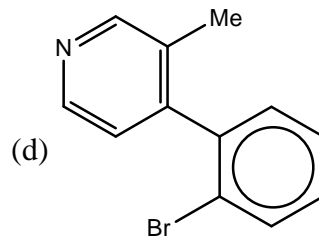
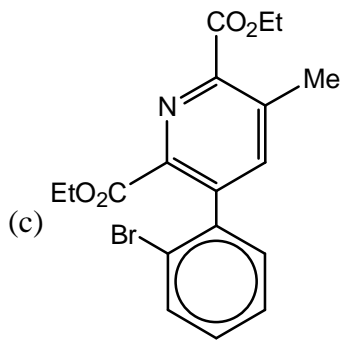
- (a) Anion of the weakest acids are the best nucleophiles
 (b) Anion of the acid having lower pKa value will be better leaving group
 (c) the driving force for rehybridisation is to make unfilled orbital as high in energy and filled orbital as lower energy
 (d) adjacent C = C and C = O increases the rate of S_N1 as well as S_N2 reactions.

19. The number of aromatic compound among following will be

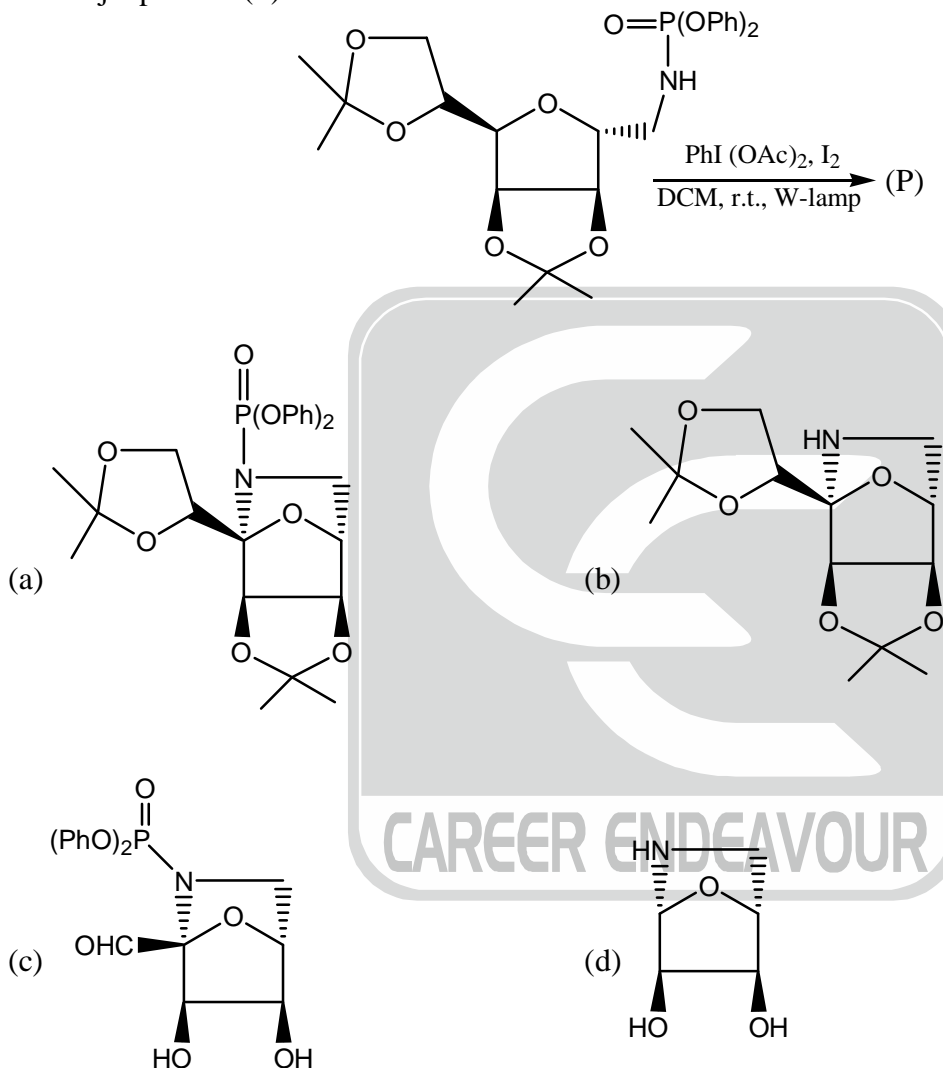


20. The major product (P) is

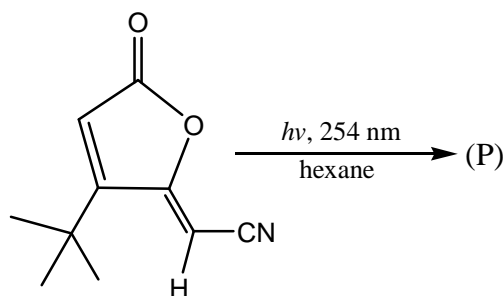


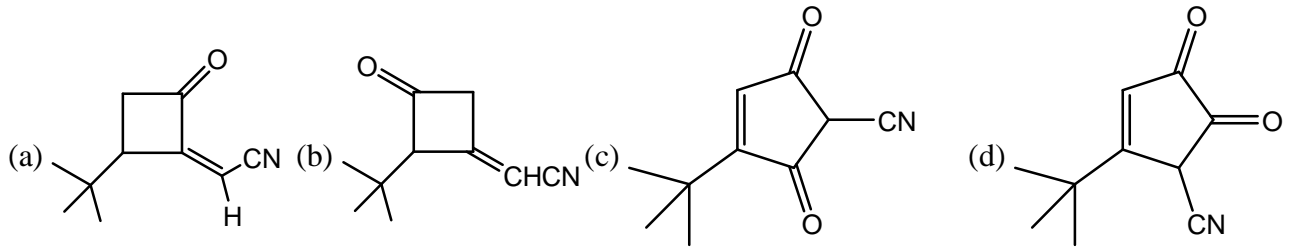


21. The major product (P) is

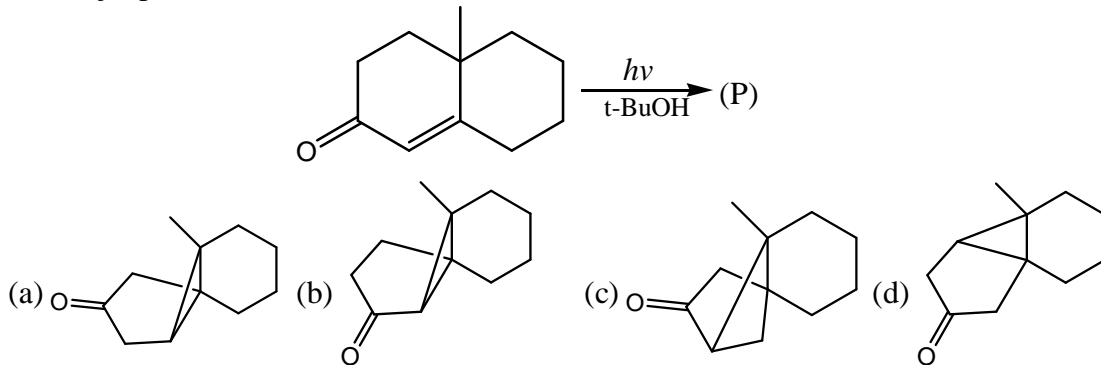


22. The major product (P) is

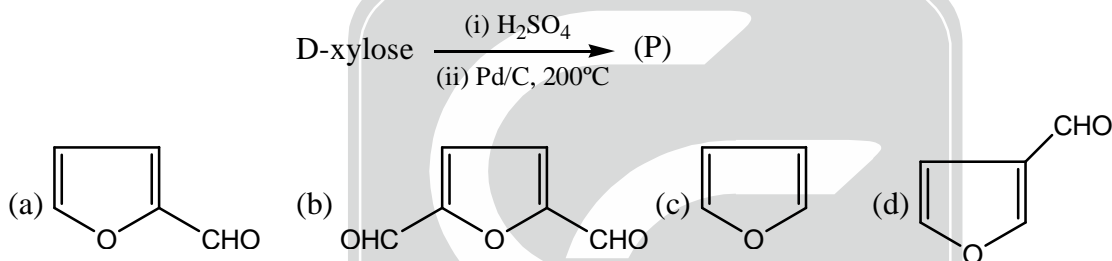




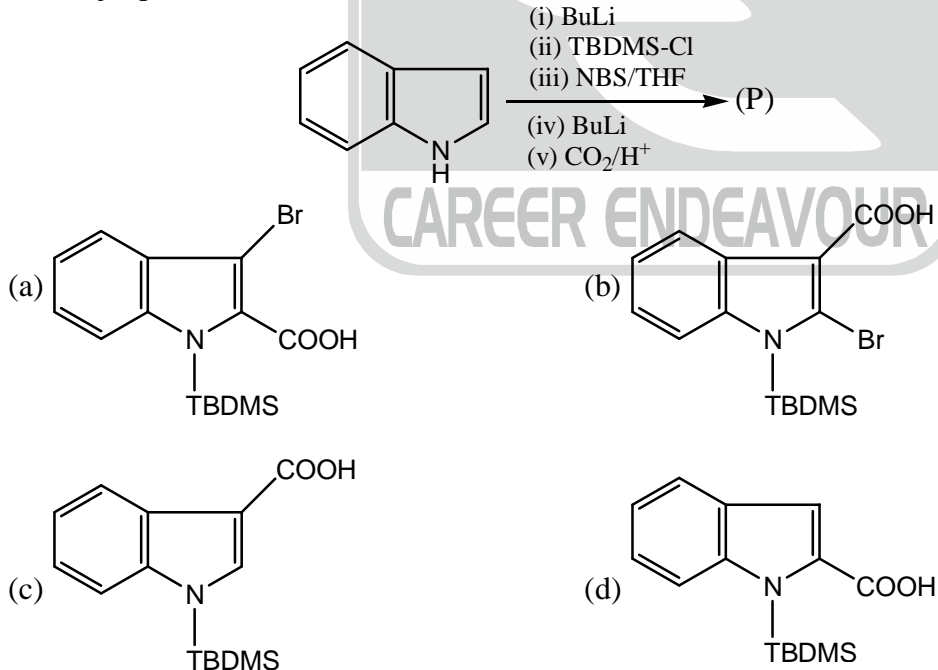
23. The major product (P) is



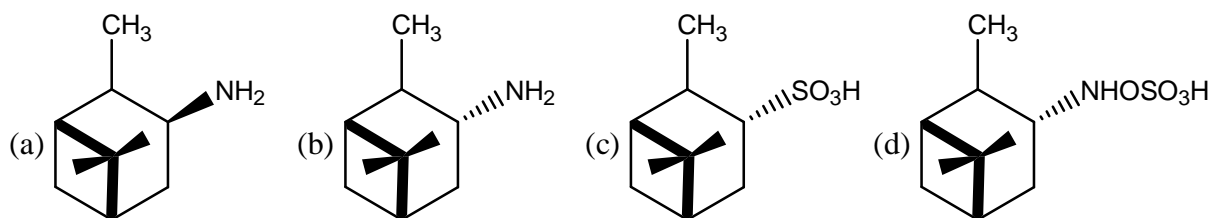
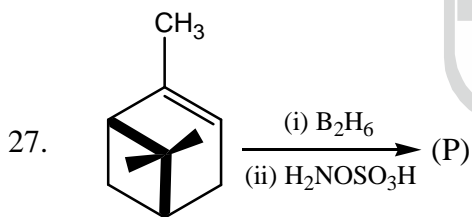
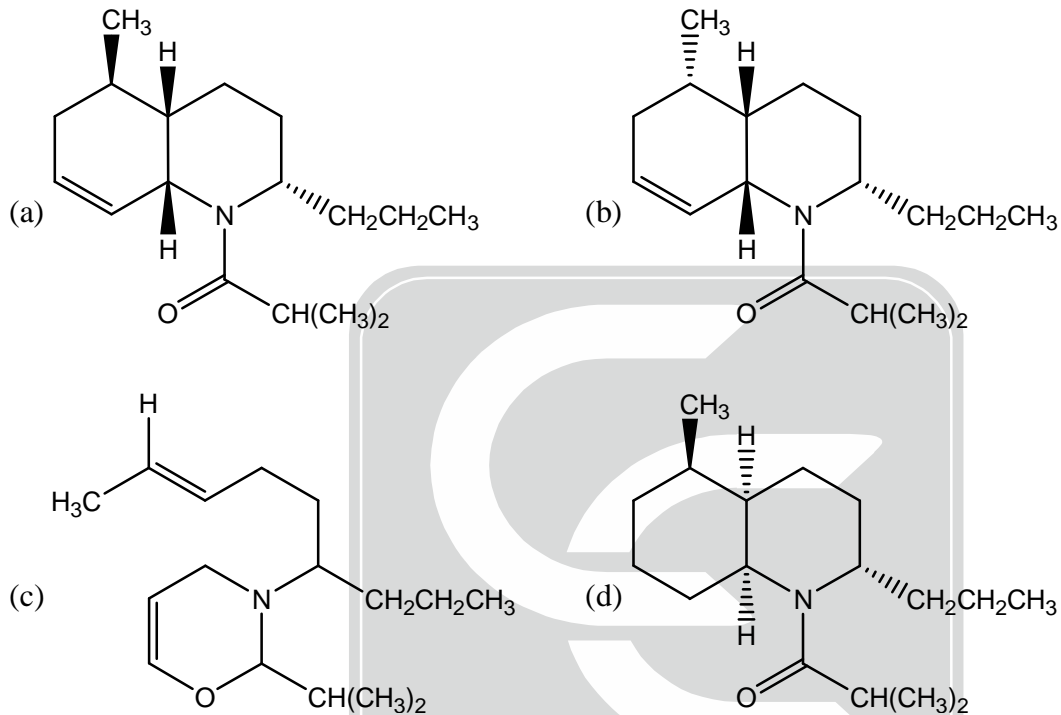
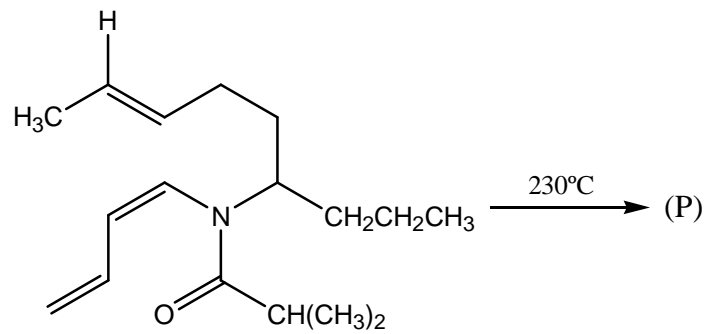
24. The major product (P) is

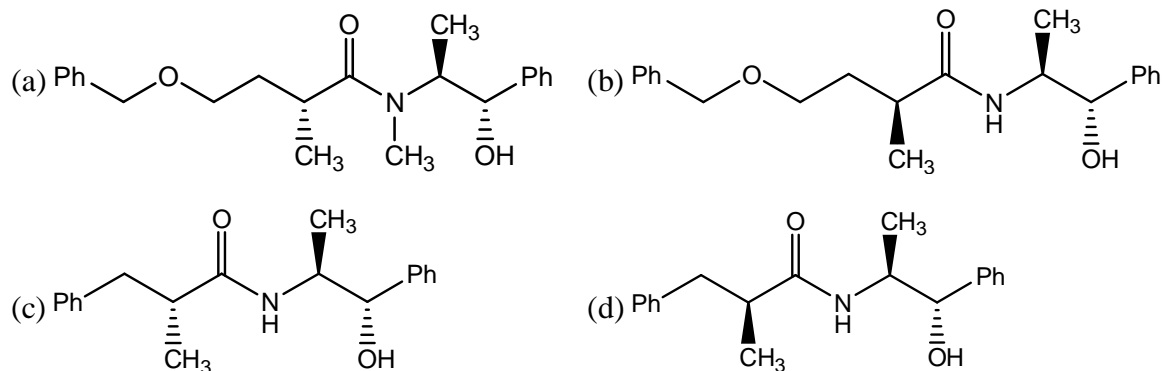
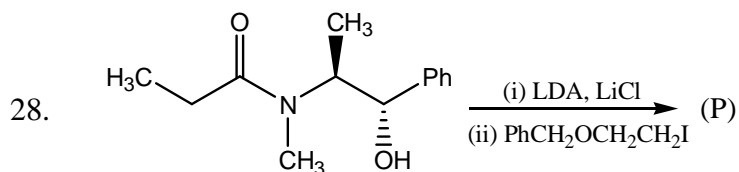


25. The major product (P) is

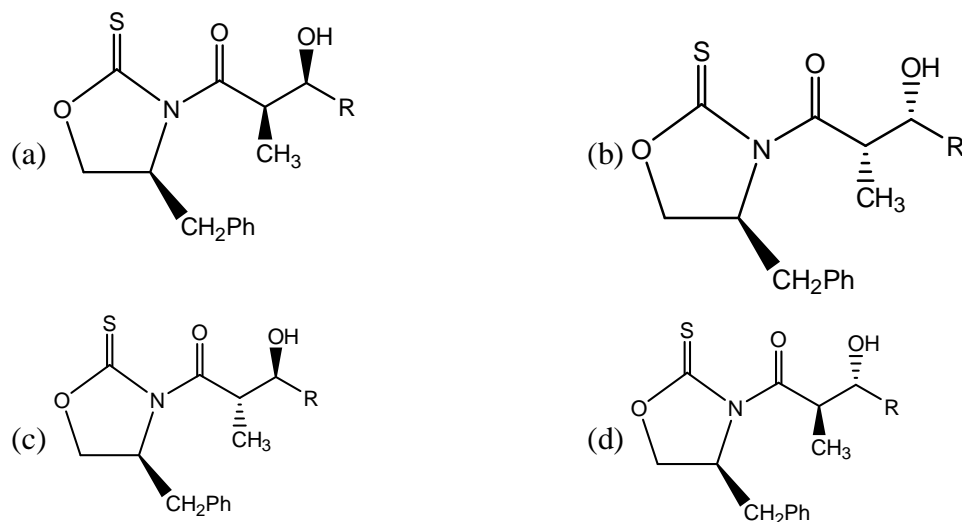
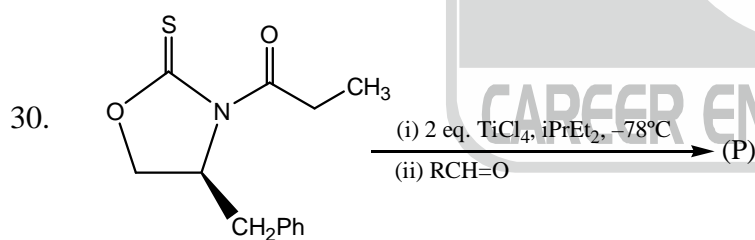
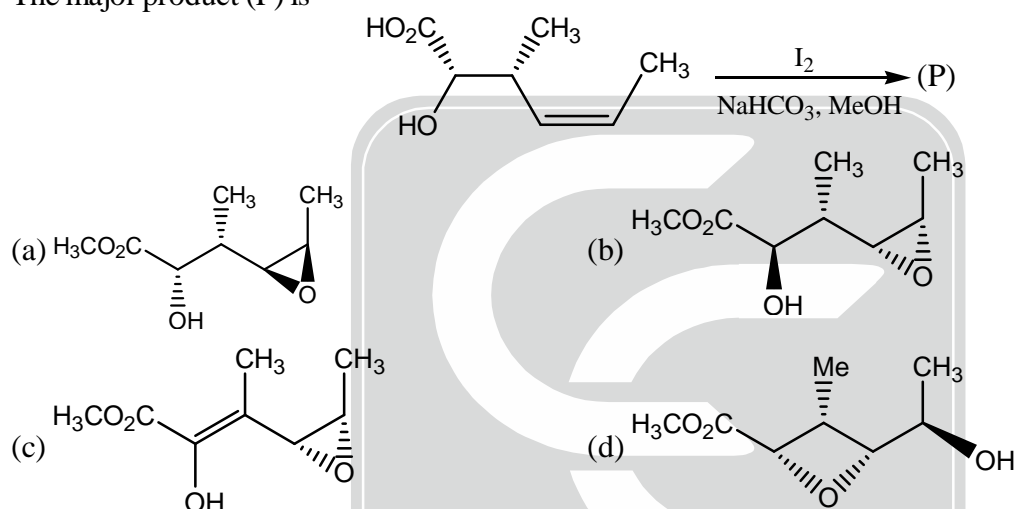


26. The major product (P) formed in the following reactions



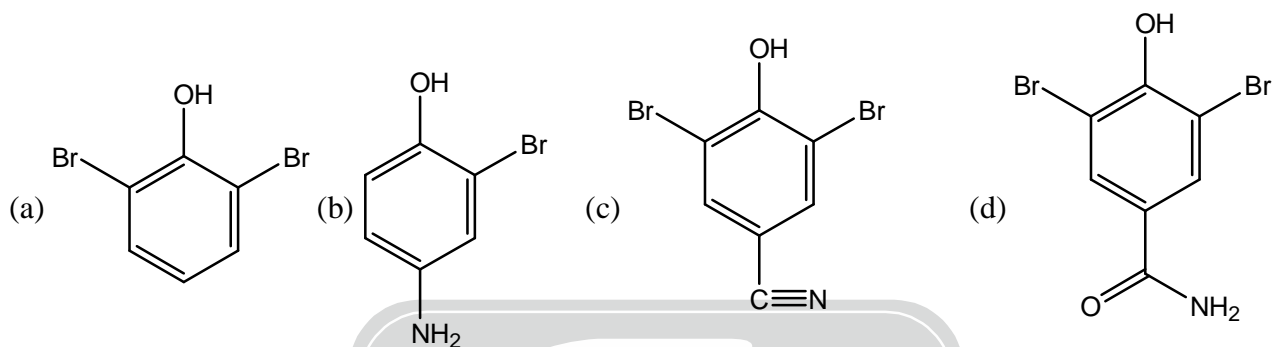
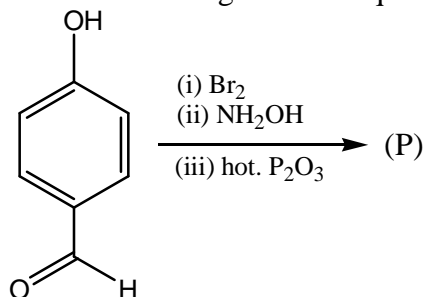


29. The major product (P) is

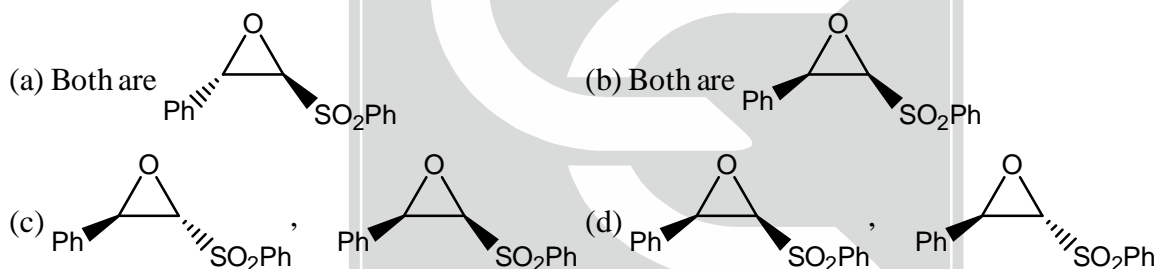
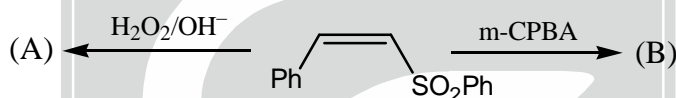


PART-B

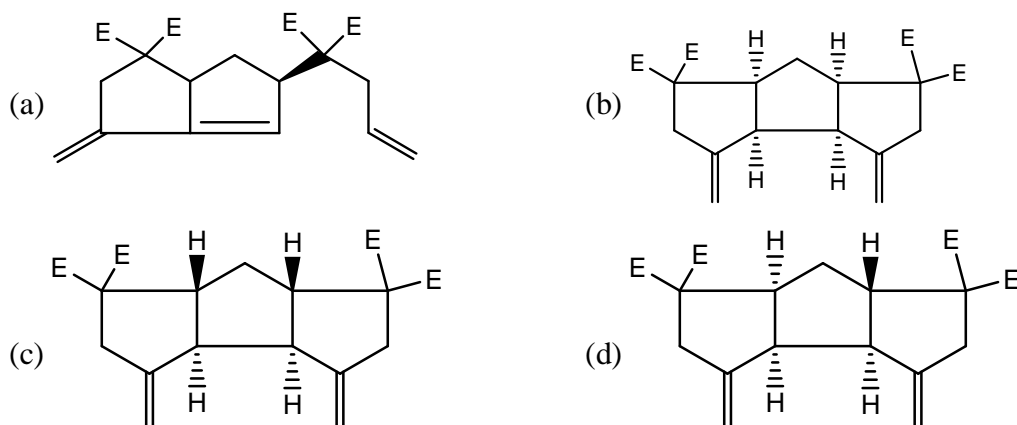
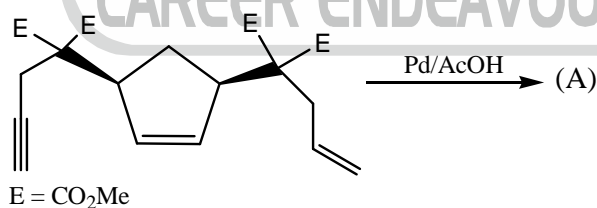
31. The major product formed in the following reaction sequence is



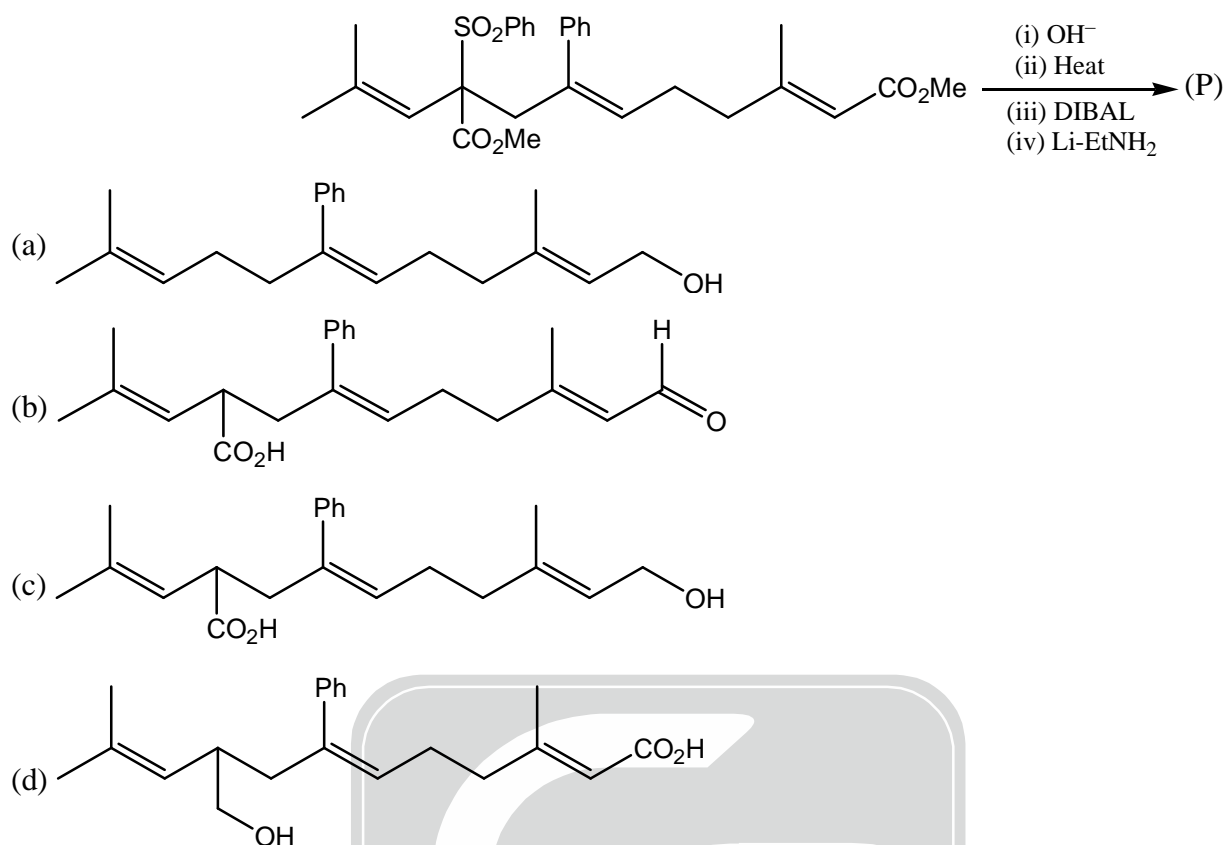
32. Products (A) and (B) in the following reaction sequences are, respectively



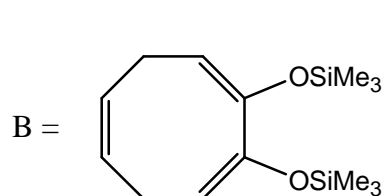
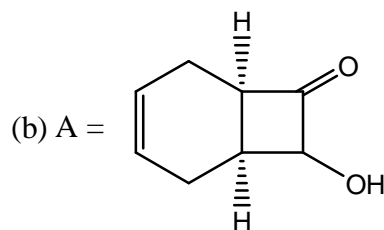
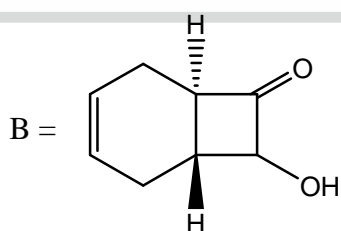
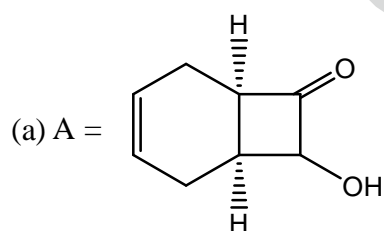
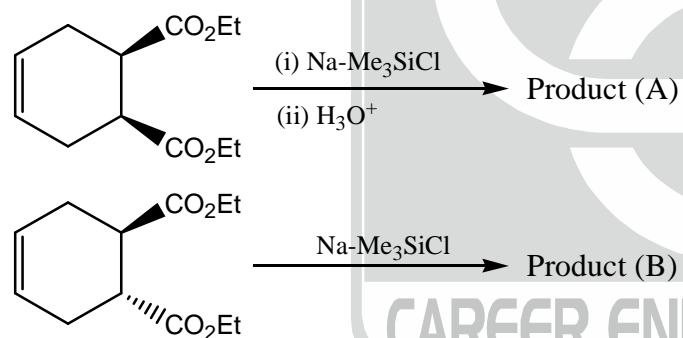
33. In the following reaction, product (A) is

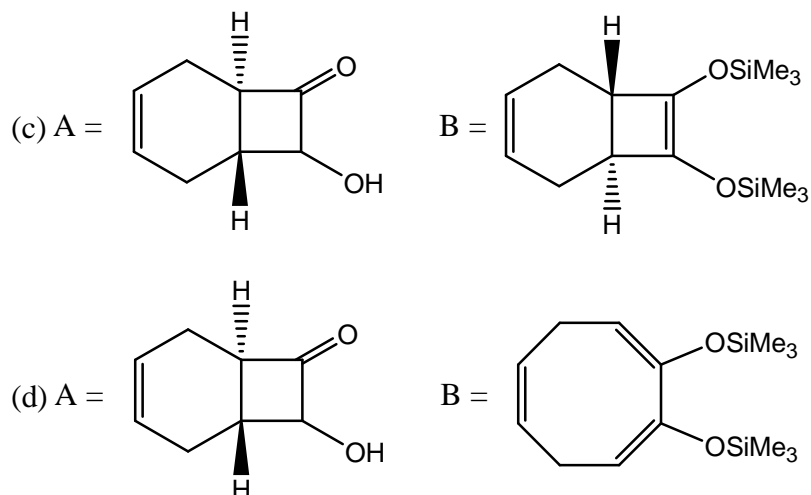


34. The major product formed in the following reaction sequence is

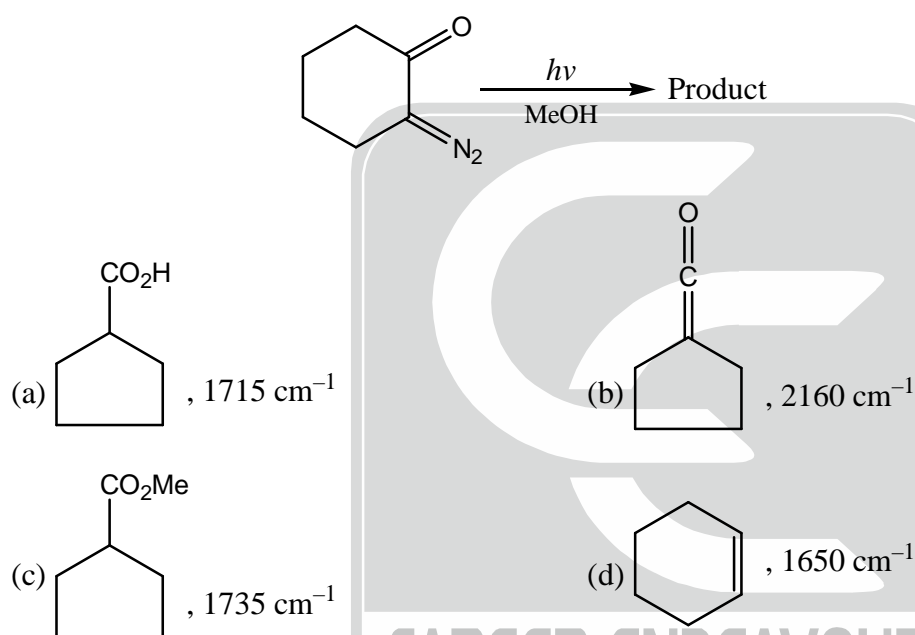


35. Predict the products A and B in the following reactions

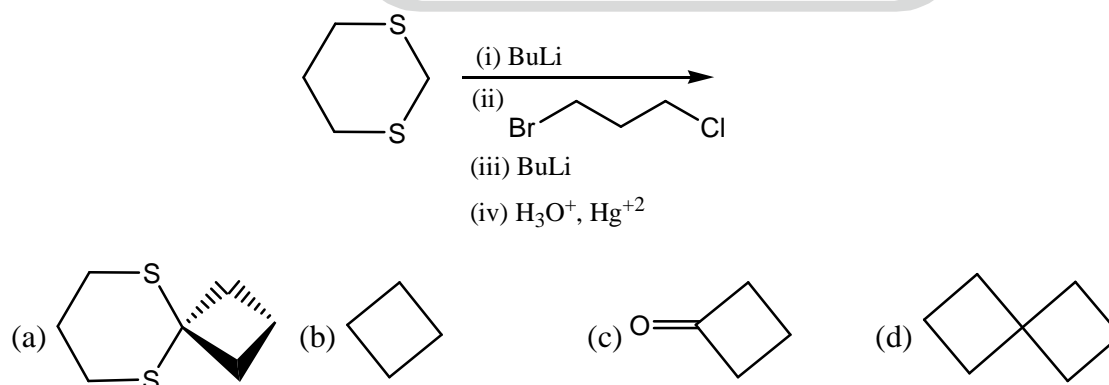




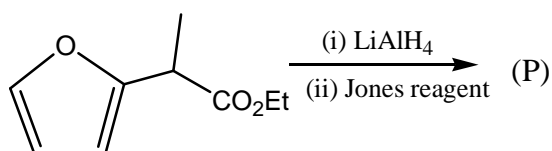
36. In the following reaction, the structure of major product and characteristic IR absorption frequency (cm^{-1}) are respectively.

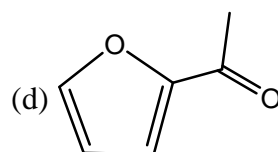
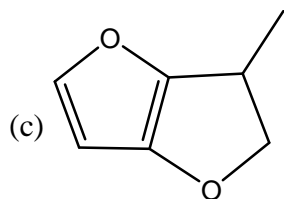
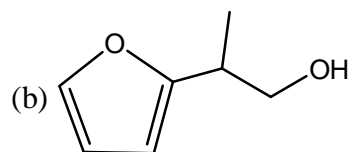
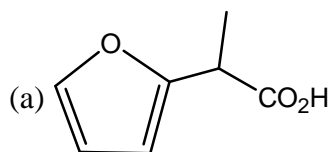


37. Predict the major product of the following reaction,

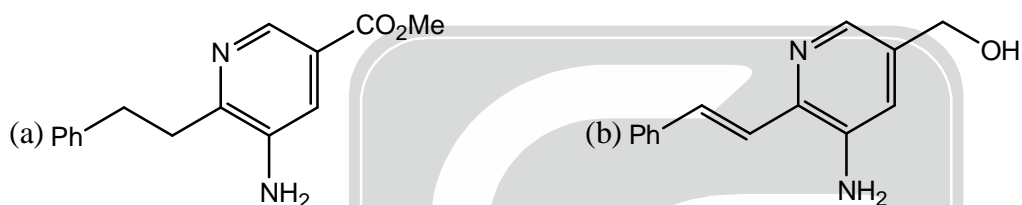
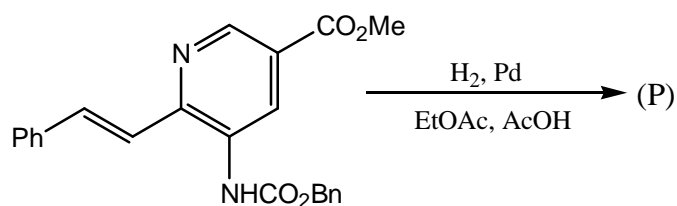


38. Identify the major product in the following reaction

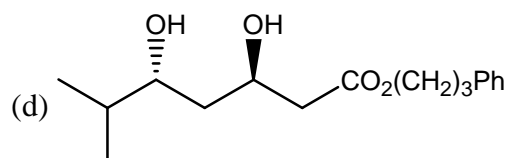
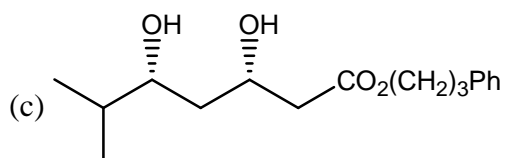
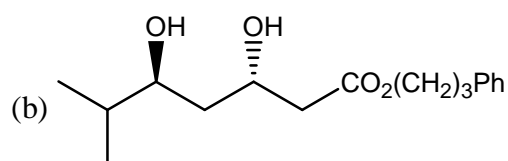
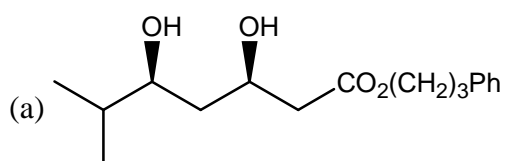
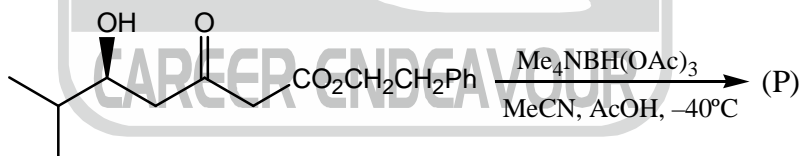




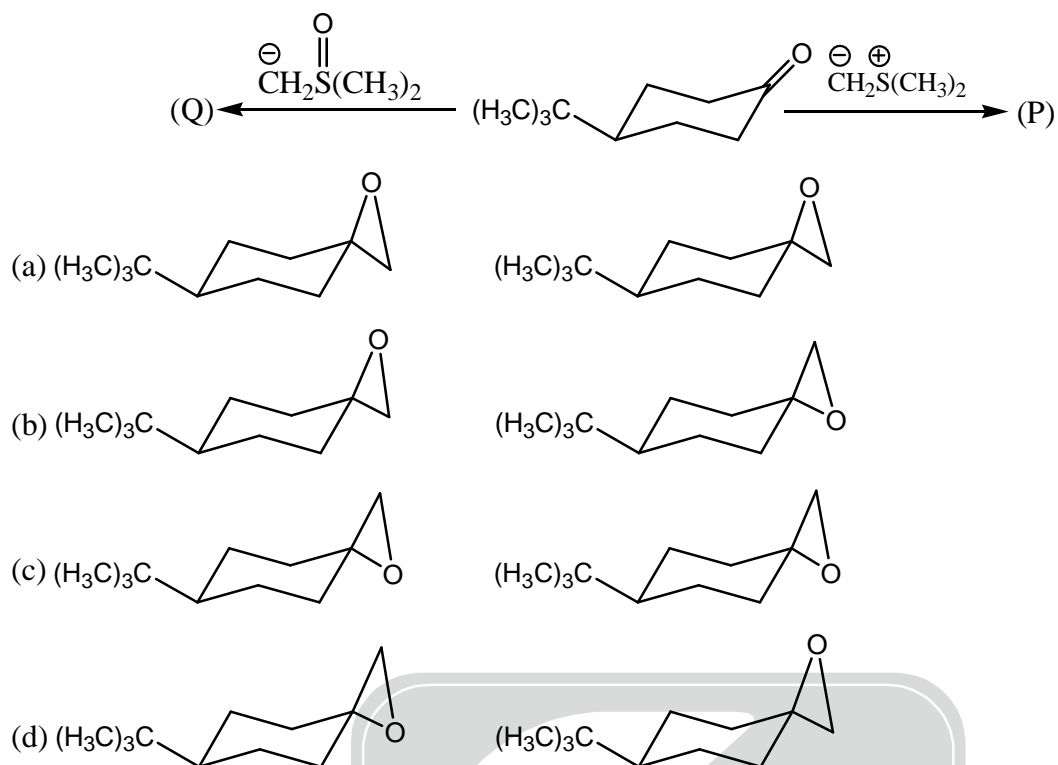
39. The major product in the following reaction is



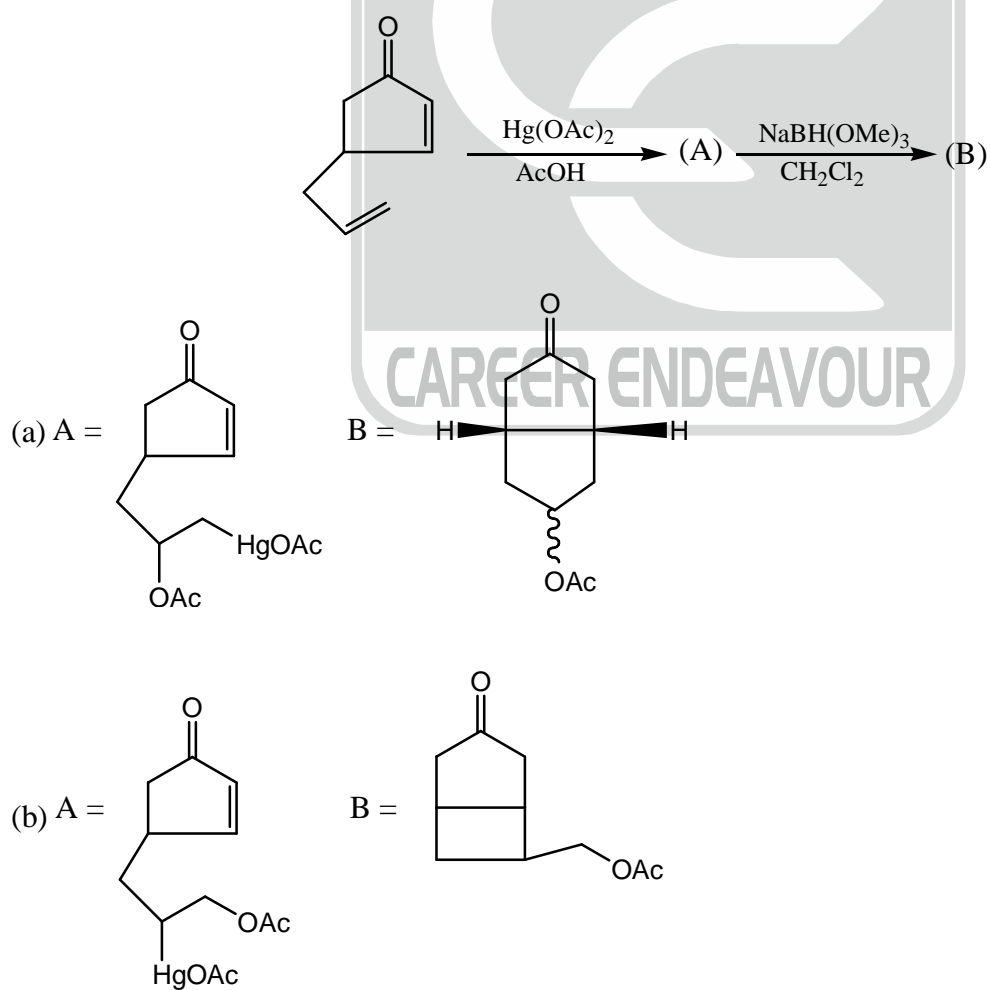
40. The major product formed in the following reaction is

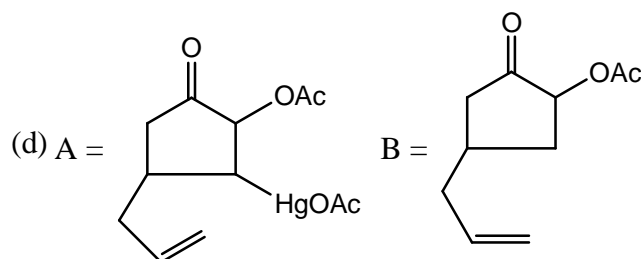
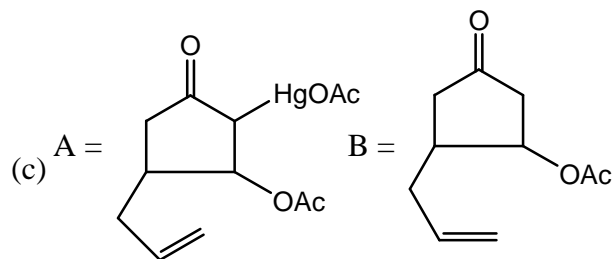


41. In the following reaction major product (P) and (Q) are formed respectively

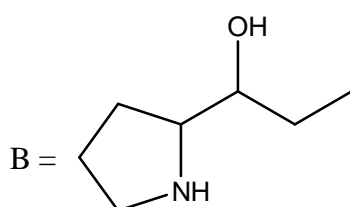
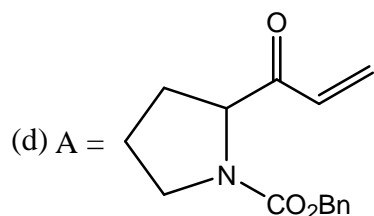
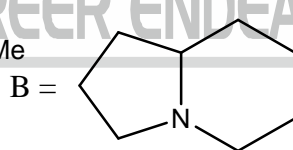
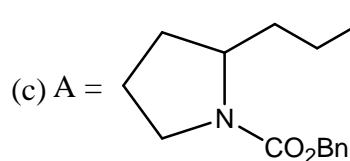
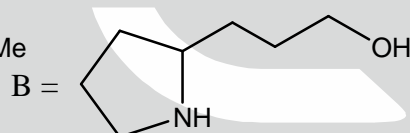
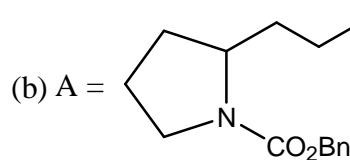
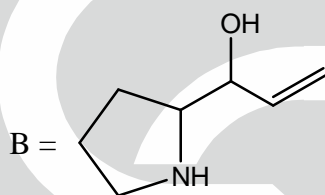
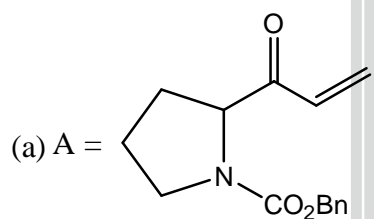
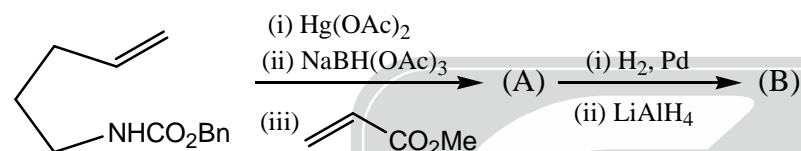


42. The major product A and B of the following reaction sequence are

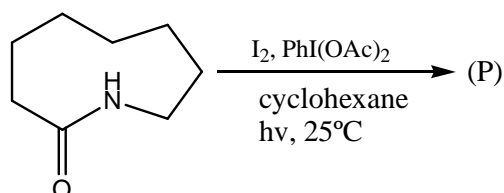


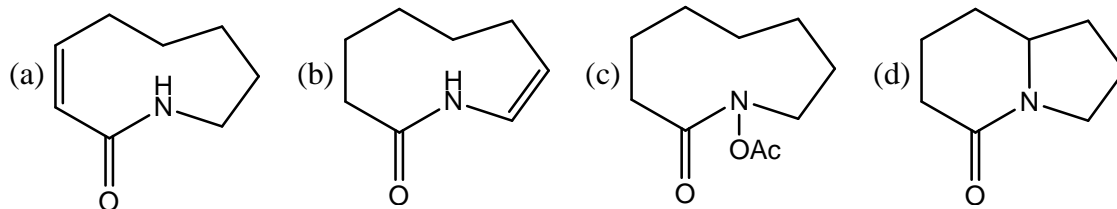


43. The major product A and B in the following reaction sequence are

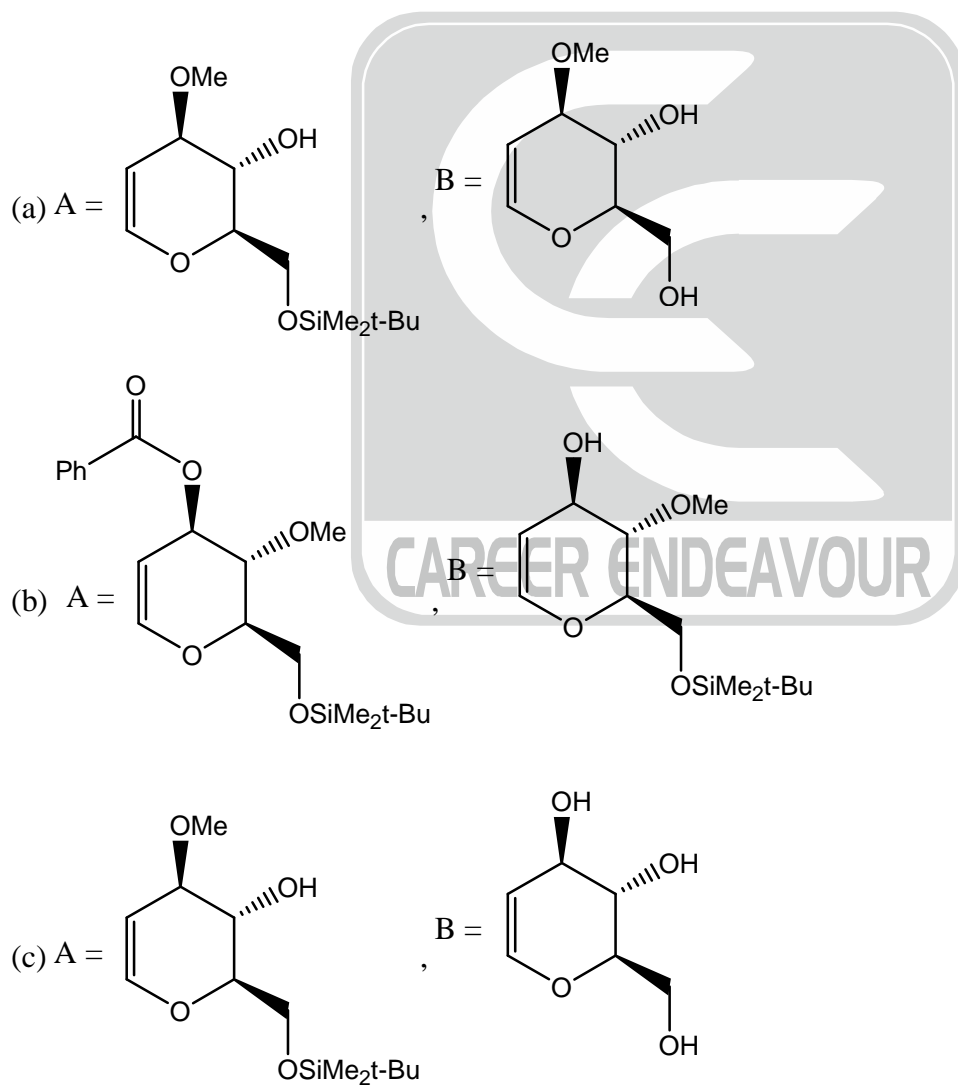
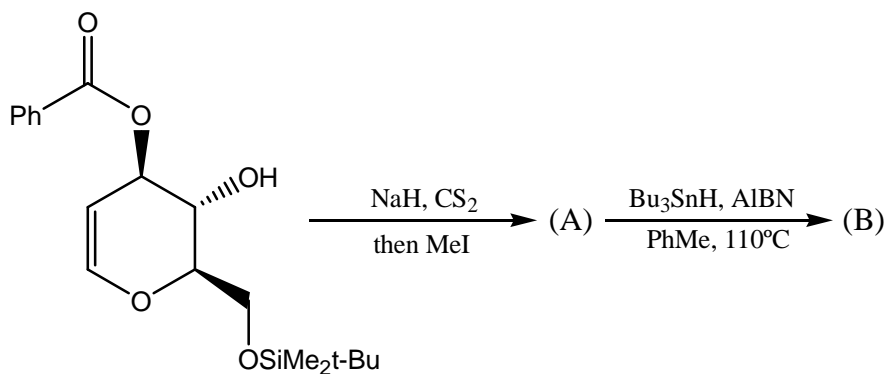


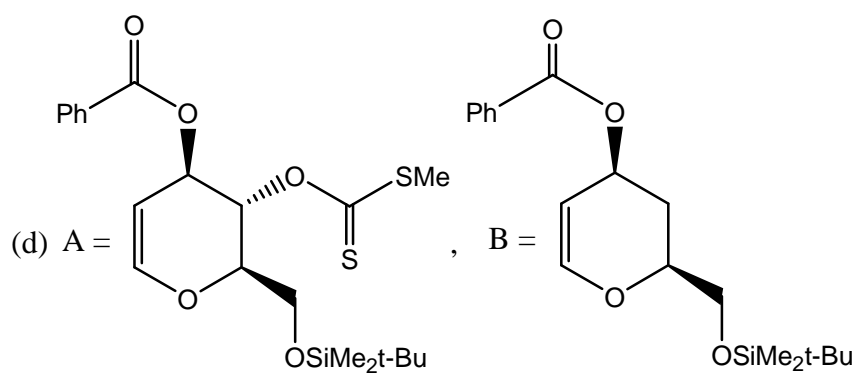
44. Predict the major product formed in the following reaction is



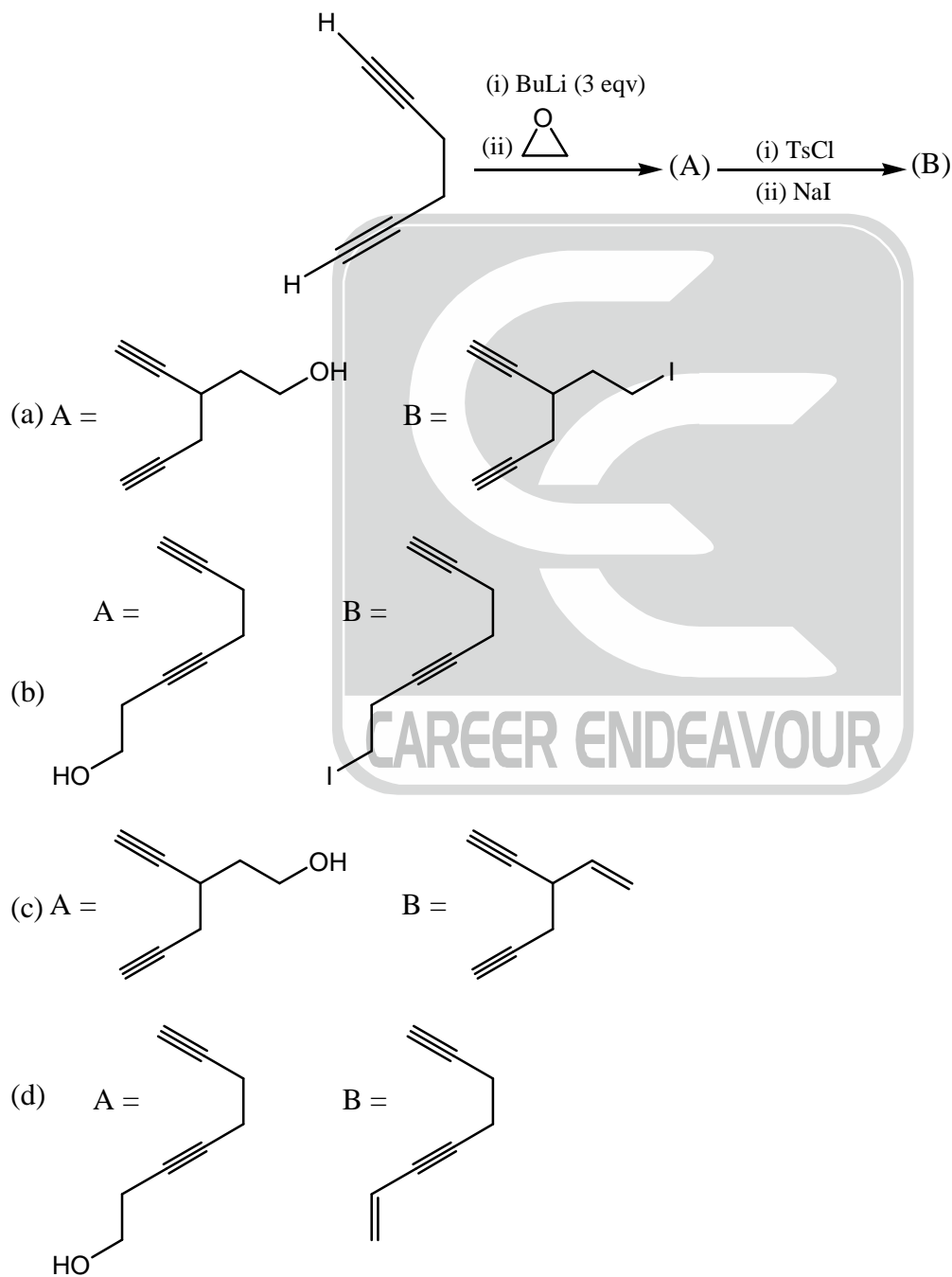


45. The products A and B in the following reaction sequence are

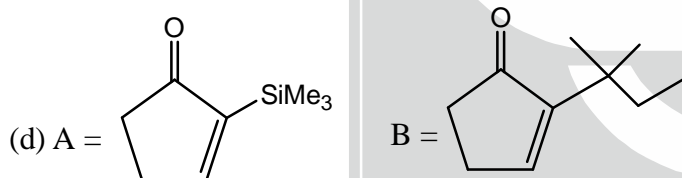
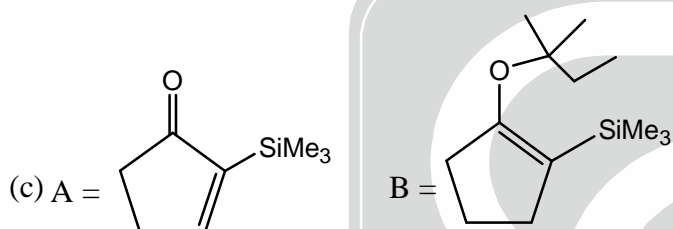
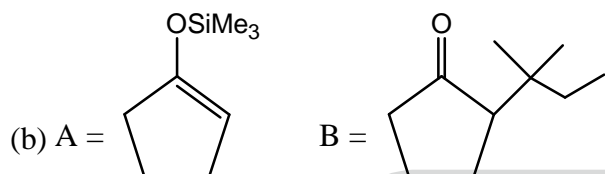
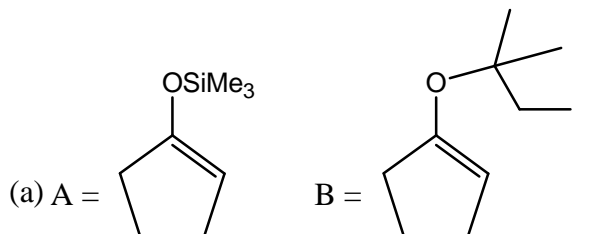
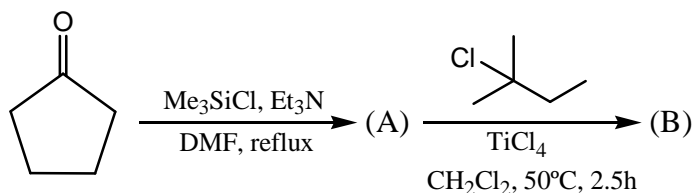




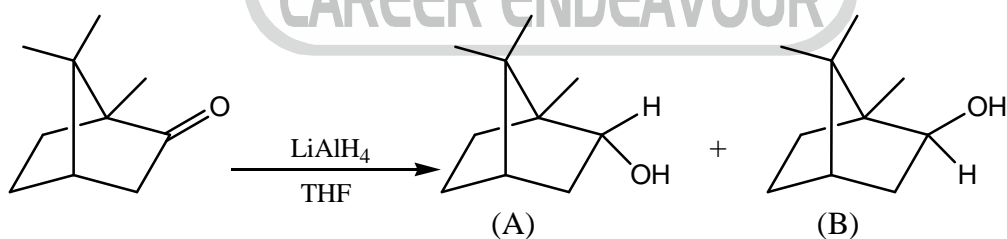
46. Products A and B formed in the following reaction sequence are



47. Products A and B in the following reaction sequence are

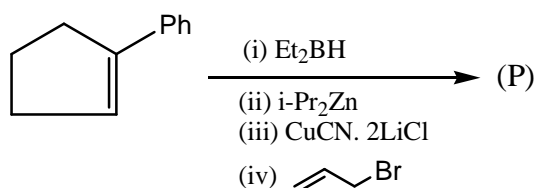


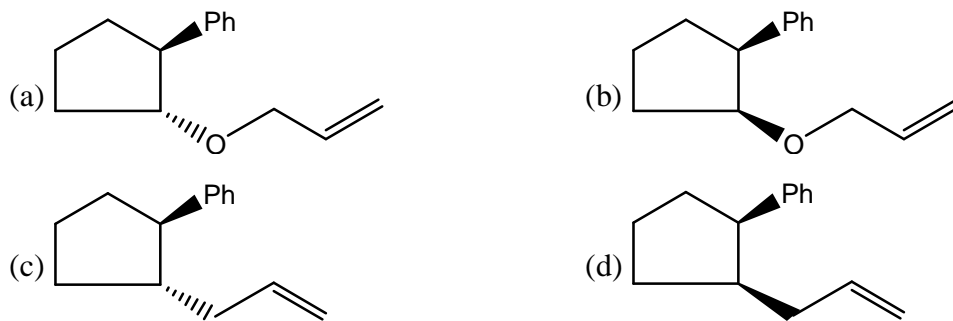
48. Which one of the following statements is true for the following transformation?



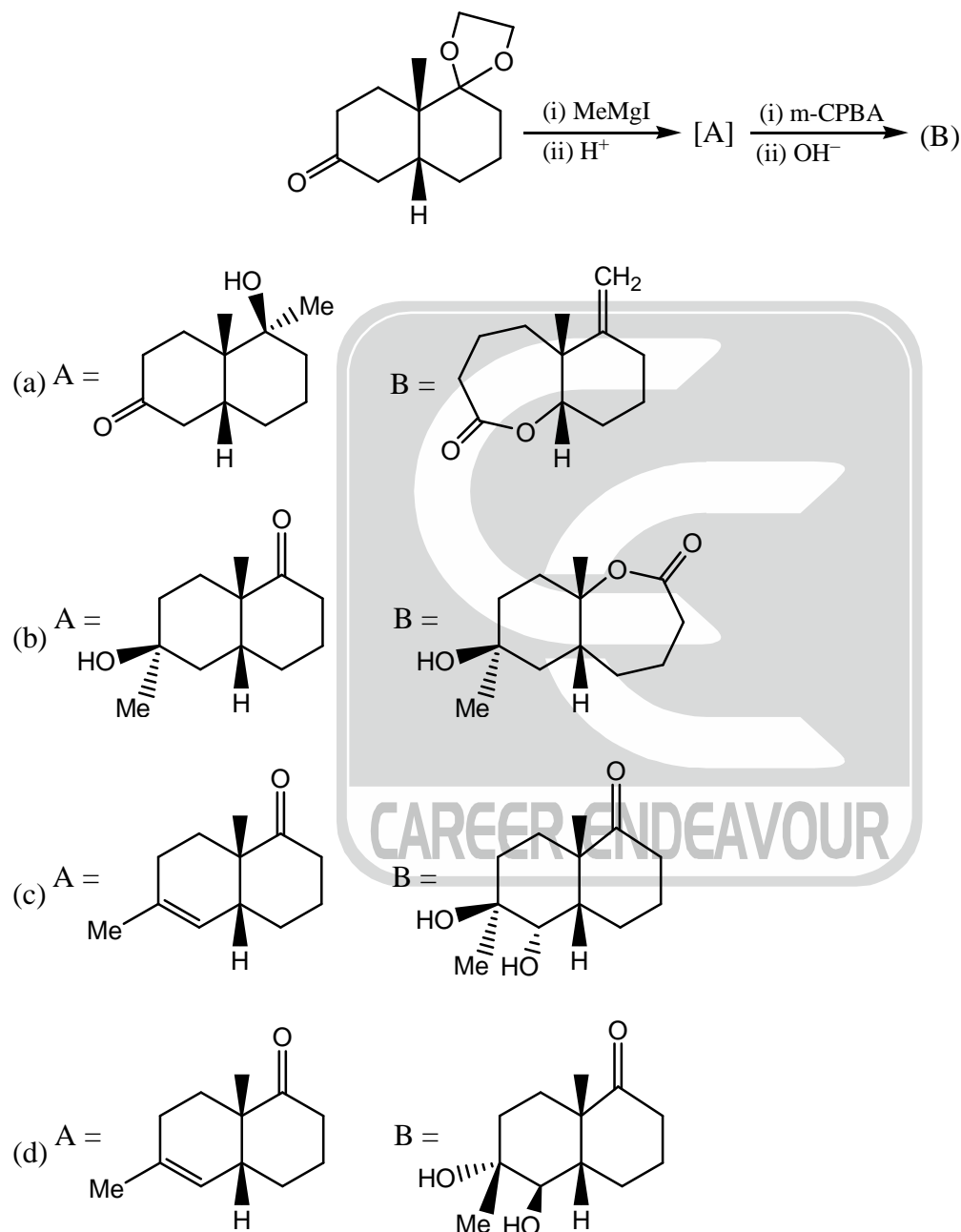
- (a) A is the major product and reaction is diastereoselective
 (b) B is the major product and reaction is diastereoselective
 (c) A is the major product and reaction is enantioselective
 (d) B is the major product and reaction is regioselective

49. Predict the major product in the following reaction sequence

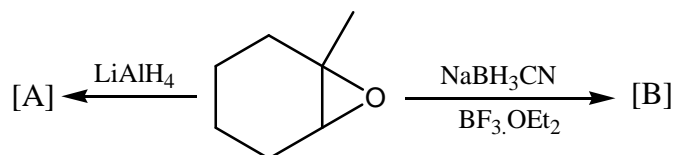


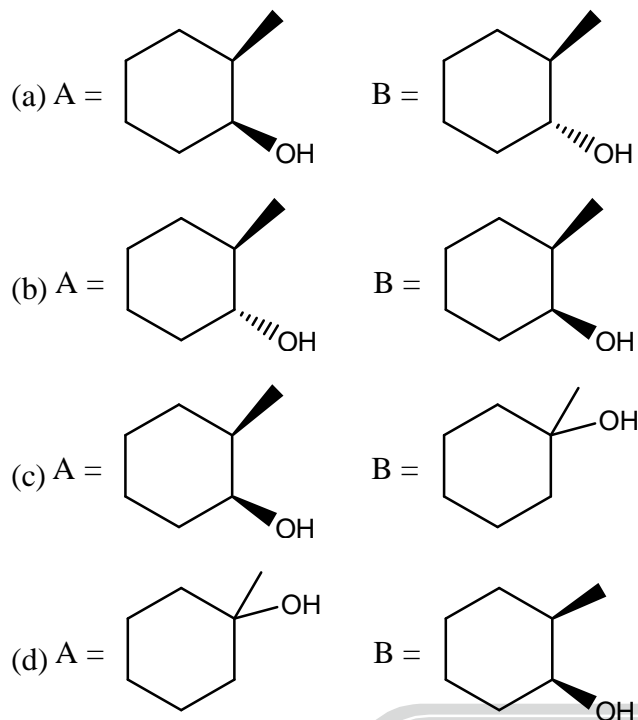


50. Predict the major products (A) and (B) in the following reaction sequence

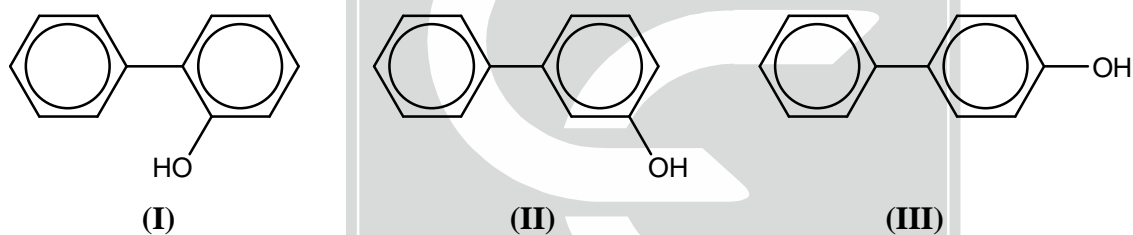


51. The major product (A) and (B) formed in the following reaction is



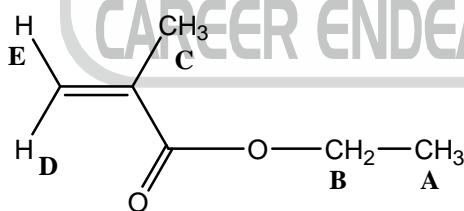


52. The number of distinct peaks in the proton decoupled ^{13}C NMR spectra of the following compounds I-III, respectively,



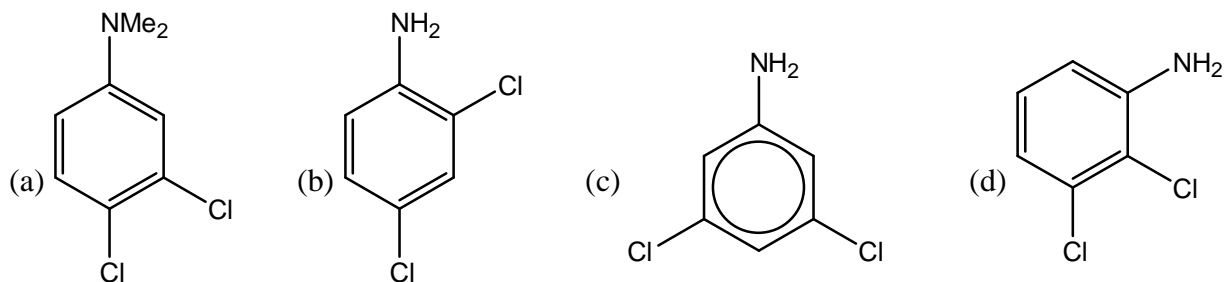
- (a) 7, 7, 6 (b) 6, 7, 7 (c) 8, 10, 9 (d) 10, 10, 8

53. Appropriate ^1H NMR chemical shifts (δ) for the protons A-D for the following compounds are

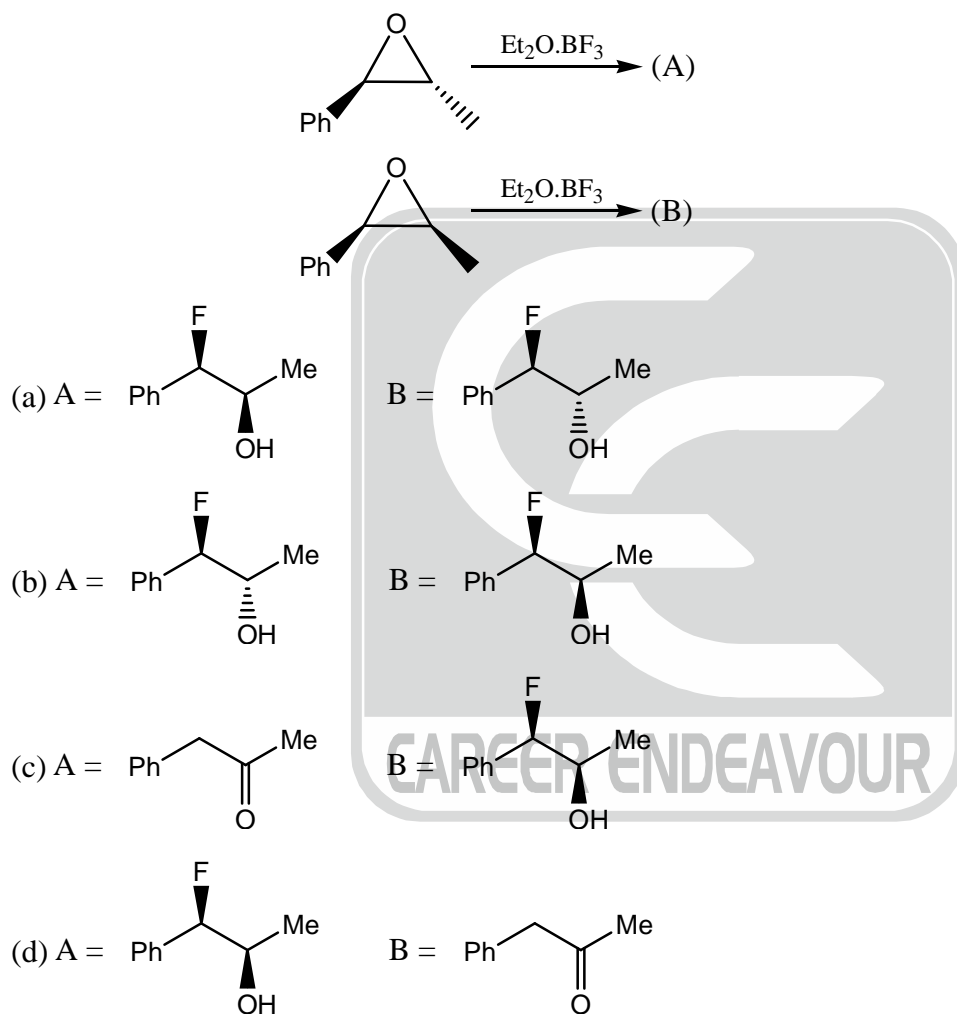


- (a) A = 1.99; B = 4.21; C = 1.31; D = 5.51; E = 6.15
 (b) A = 1.31; B = 4.21; C = 1.99; D = 6.15; E = 5.51
 (c) A = 1.99; B = 1.31; C = 4.21; D = 5.51; E = 6.15
 (d) A = 1.31; B = 1.99; C = 4.21; D = 6.15; E = 5.51

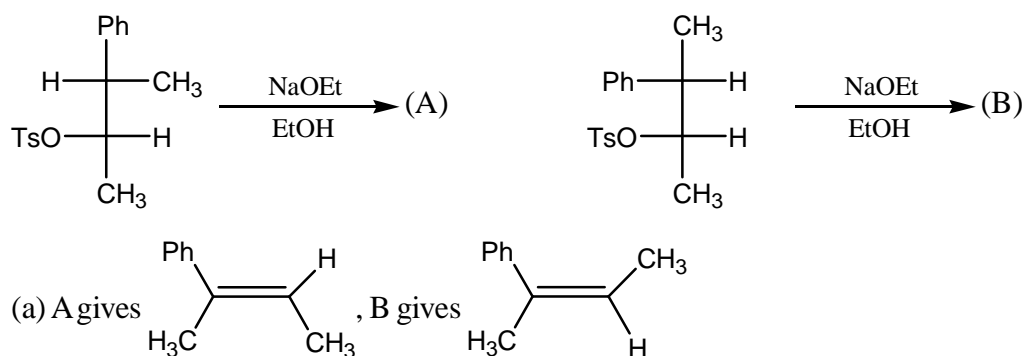
54. An organic compound exhibited the following spectral data:
 $^1\text{H NMR}$: δ 3.9 (brs); 6.6 (d, $J = 7\text{Hz}$); 6.9 (dd); 7.2 (d, $J = 3\text{Hz}$)
 The compound is

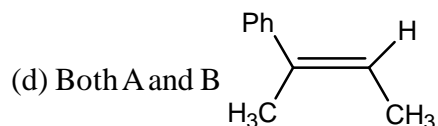
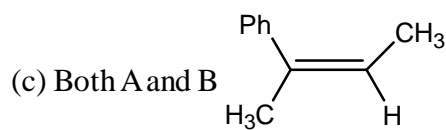
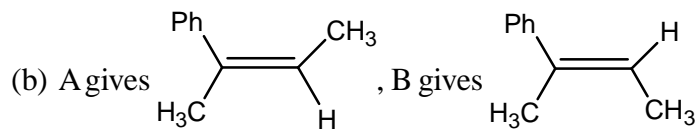


55. Predict the major products A and B in the following reaction

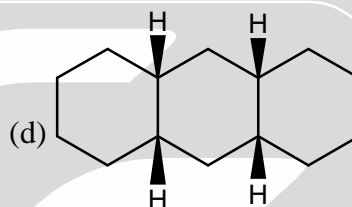
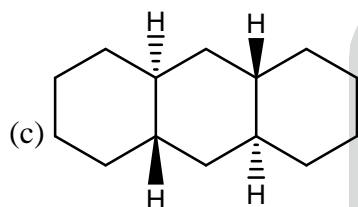
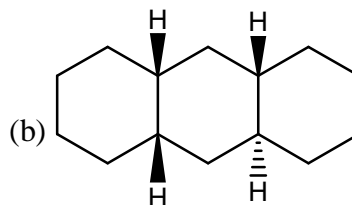
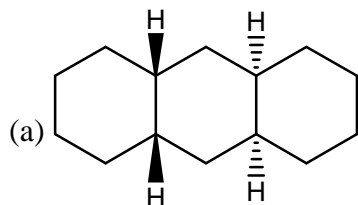


56. For the following two reactions A and B, the correct statement is

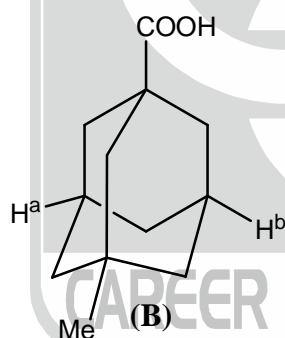
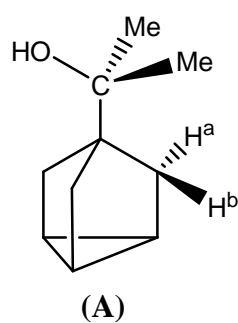




57. The most stable conformations of perhydroanthracenes in the following isomers



58.



The correct relationship between H^a/H^b in compound (A) and (B) respectively.

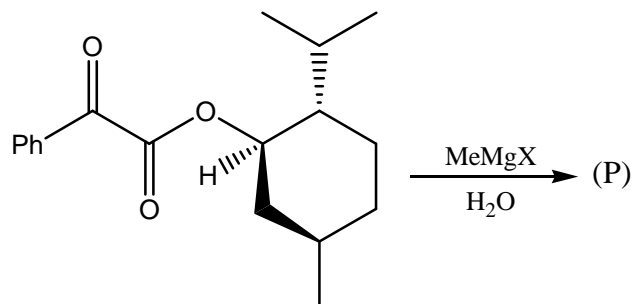
(a) Diastereotopic, Homotopic

(b) Enantiotopic, Enantiotopic

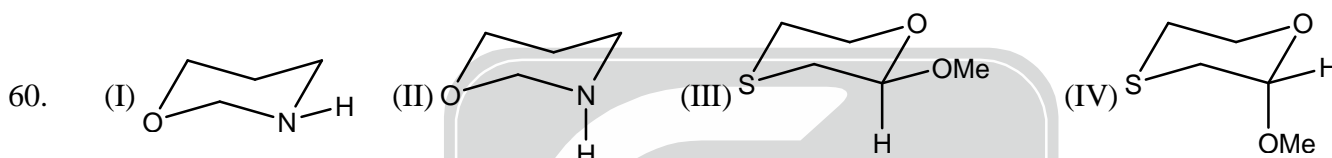
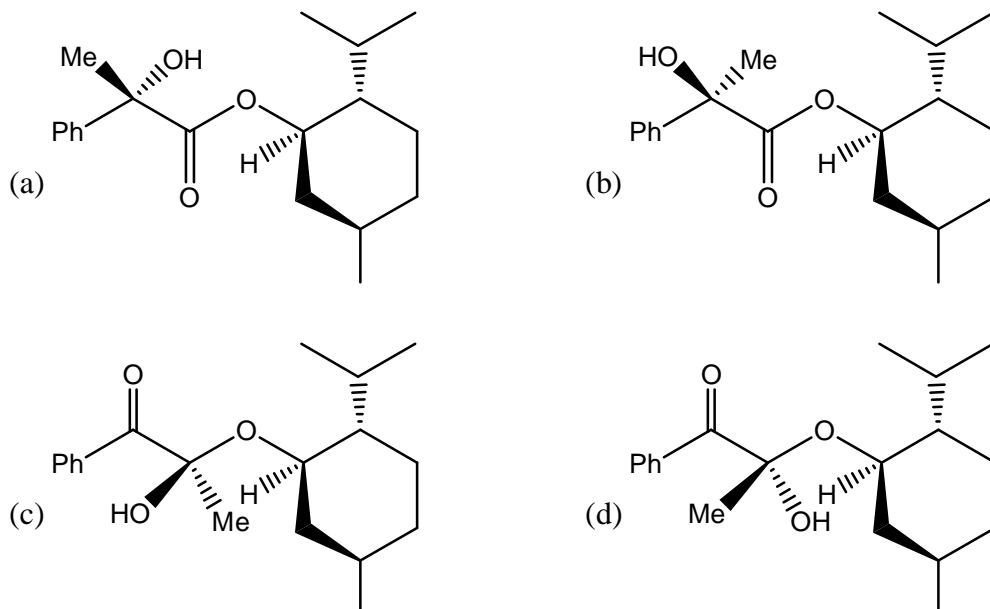
(c) Diastereotopic, Enantiotopic

(d) Homotopic, Diastereotopic

59.



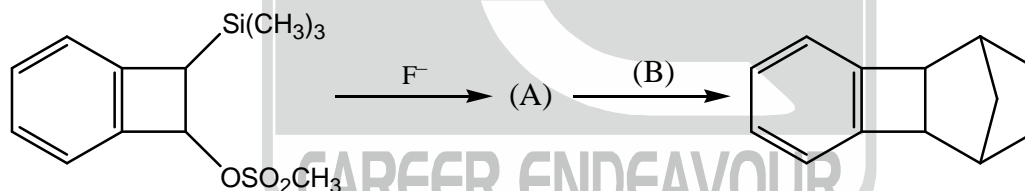
The major product formed in the above reaction



Correct statement regarding the above conformations

- (a) (I) is more stable than (II), (III) is more stable than (IV)
 (b) (I) is more stable than (II), (IV) is more stable than (III)
 (c) (I) is equally stable to (II), (III) is equal to (IV)
 (d) (I) is less stable than (II), (III) is more stable than (IV)

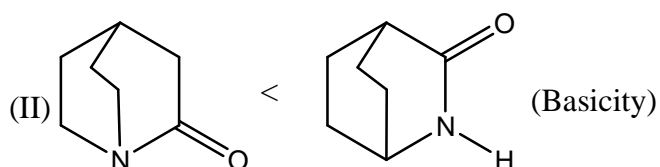
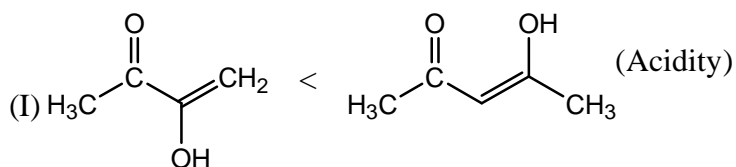
61. Consider the following sequence of reaction

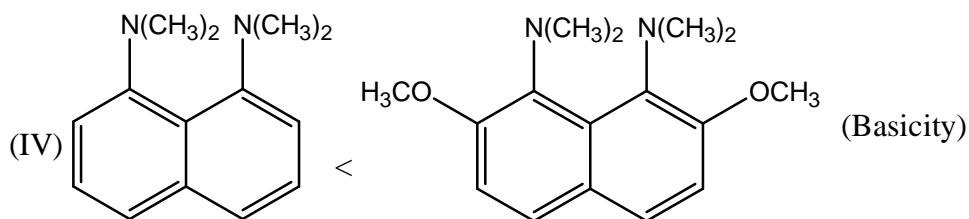
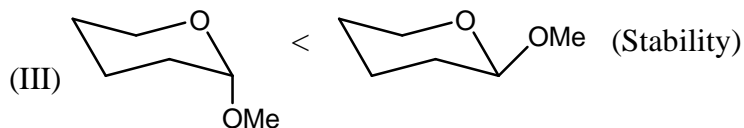


B on reaction with Na in presence of FeCl_2 gives a well known organometallic compound C. Identify the correct statement in the above reaction sequence.

- (a) A is an aromatic compound
 (b) A is an aromatic compound, while B and C both are non-aromatic
 (c) All A, B and C are aromatic compound
 (d) A and B are not aromatic, while C is an aromatic compound

62. Choose the correct order against the given properties in brackets

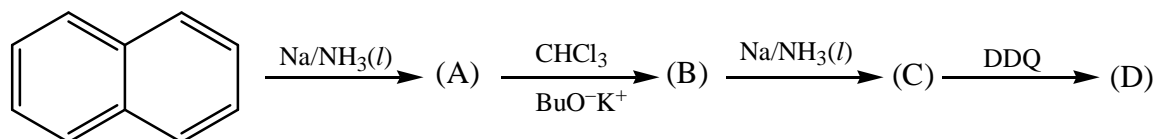




- (a) I and III are correct order
(c) III and IV are correct

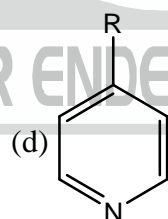
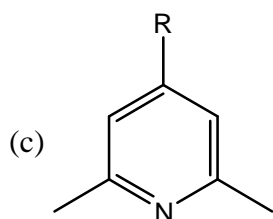
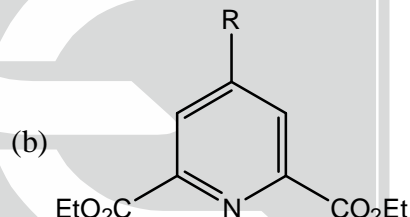
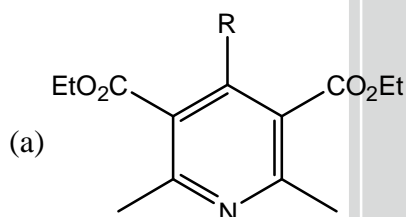
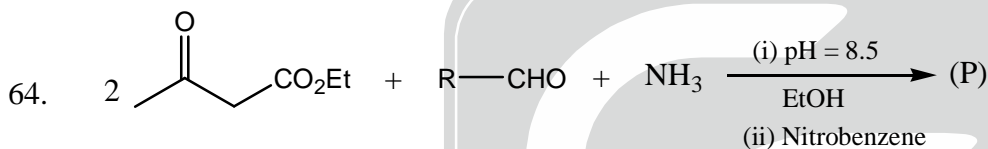
- (b) I, III and IV are correct
(d) none of the above

63. The product (D) of the following reaction will be

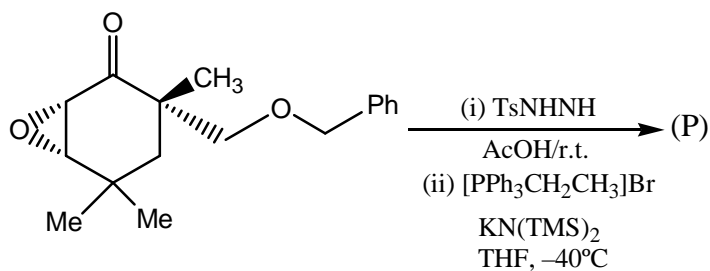


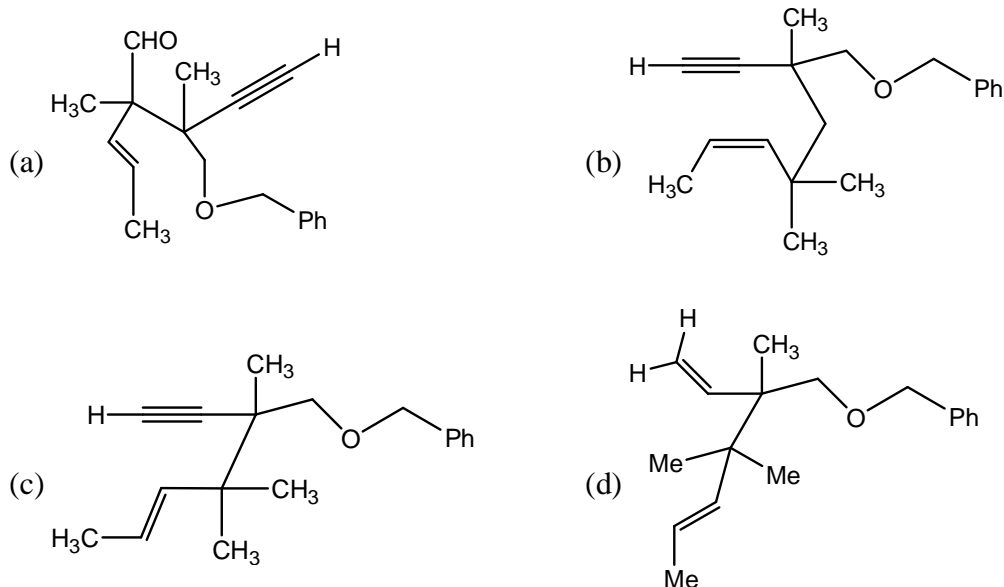
- (a) [14]-annulene
(c) Dehydro [14] annulene

- (b) 1, 6-methano [10] annulene
(d) [10] Annulene

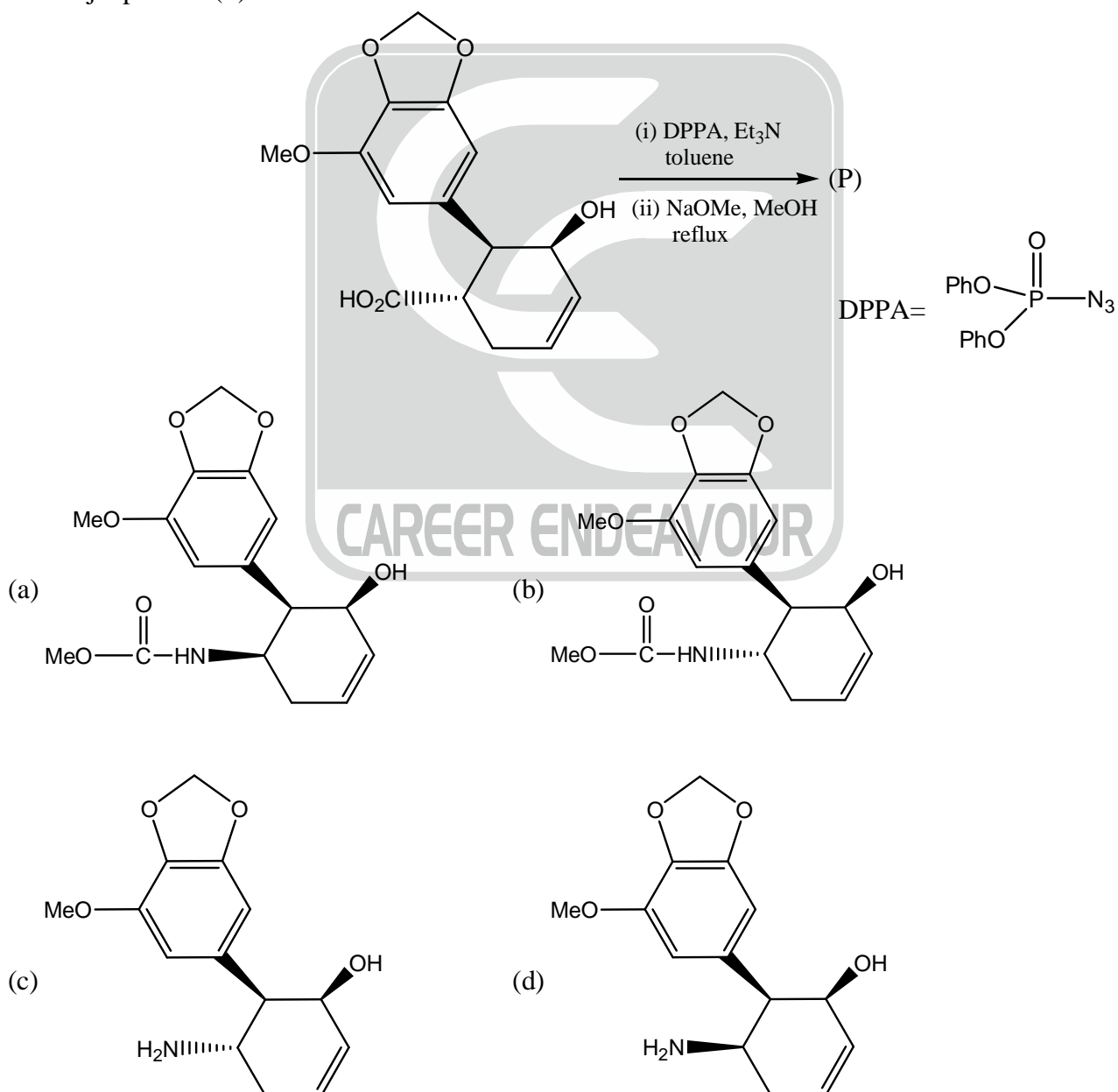


65. The major product (P) is

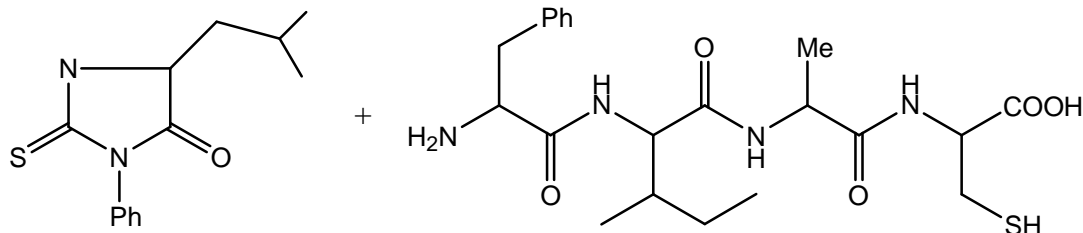




66. The major product (P) is



67. A pentapeptide gives the following amino acids upon Edman degradation. The pentapeptide is



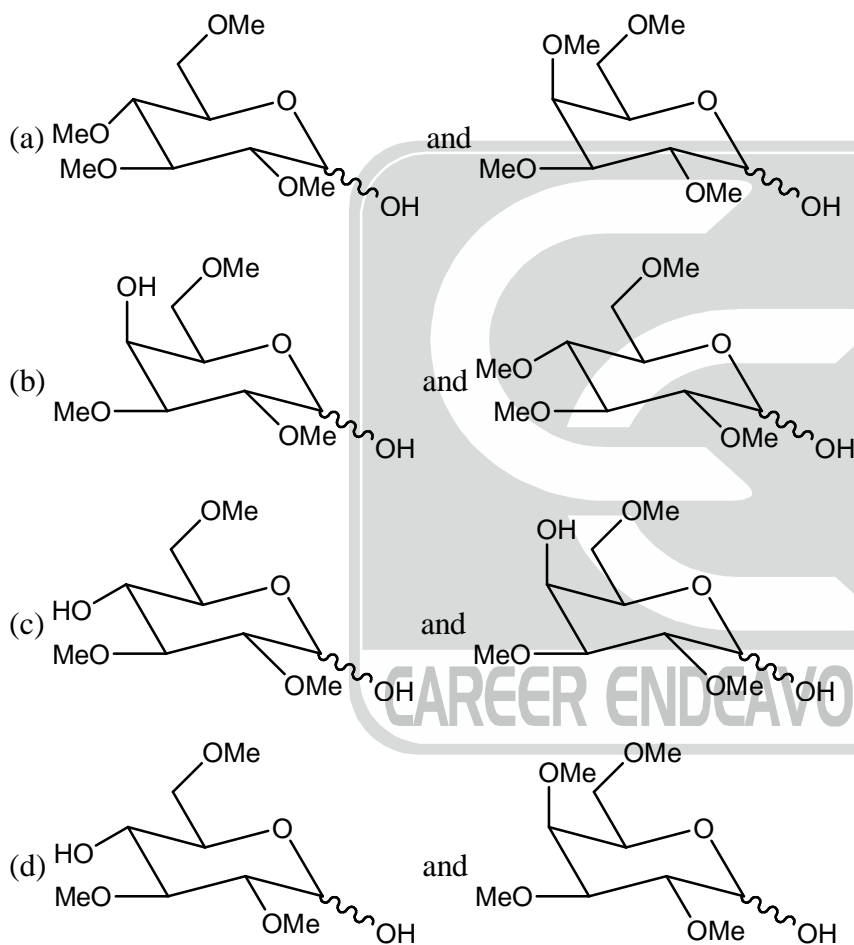
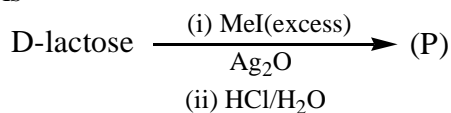
(a) Phe-Ile-Ala-Cys-Leu

(b) leu-Ile-Phe-Ala-Cys

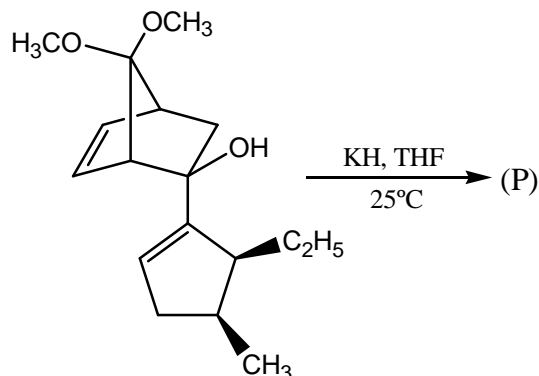
(c) Leu-Phe-Ile-Ala-Cys

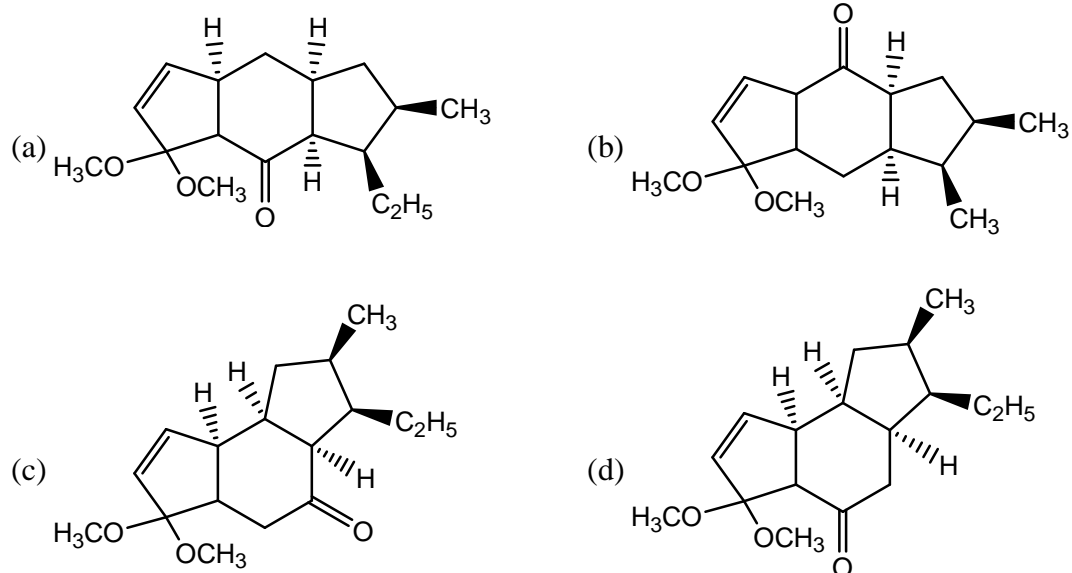
(d) Leu-Cys-Ala-Ile-Phe

68. The major product (P) is

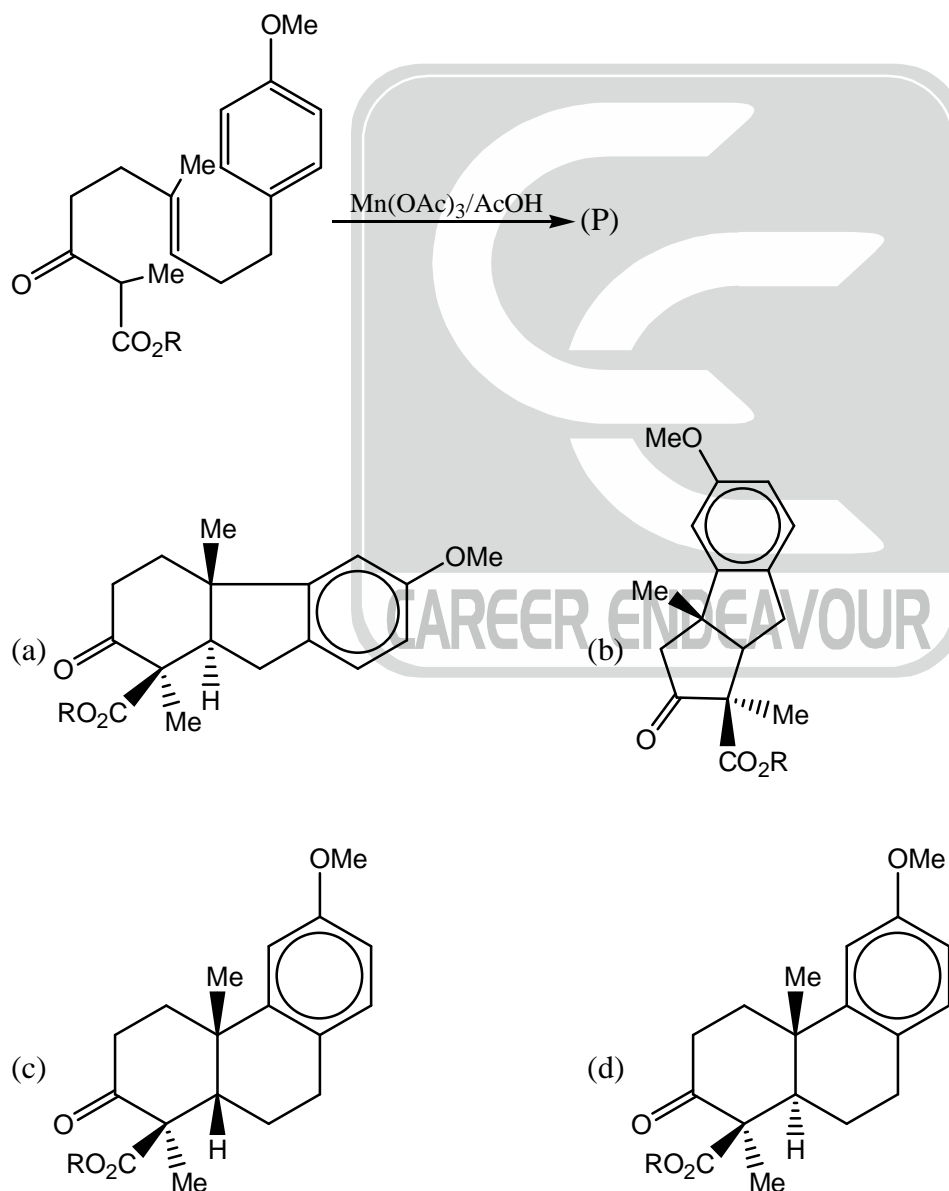


69. The major product (P) is





70.



Space for rough work



South Delhi : 28-A/11, Jia Sarai, Near-IIT Hauz Khas, New Delhi-16, Ph : 011-26851008, 26861009

North Delhi : 33-35, Mall Road, G.T.B. Nagar (Opp. Metro Gate No. 3), Delhi-09, Ph: 011-65462244, 65662255

ANSWER KEY

PART-A

1. (b)	2. (b)	3. (c)	4. (a)	5. (a)	6. (a)	7. (c)
8. (a)	9. (c)	10. (d)	11. (d)	12. (c)	13. (b)	14. (c)
15. (b)	16. (d)	17. (b)	18. (d)	19. (c)	20. (a)	21. (a)
22. (c)	23. (b)	24. (c)	25. (c)	26. (a)	27. (b)	28. (a)
29. (a)	30. (a)					

PART-B

31. (c)	32. (a)	33. (b)	34. (a)	35. (b)	36. (c)	37. (c)
38. (a)	39. (a)	40. (b)	41. (d)	42. (a)	43. (c)	44. (d)
45. (d)	46. (a)	47. (b)	48. (b)	49. (c)	50. (c)	51. (d)
52. (d)	53. (b)	54. (b)	55. (d)	56. (d)	57. (b)	58. (b)
59. (b)	60. (d)	61. (d)	62. (d)	63. (b)	64. (a)	65. (b)
66. (b)	67. (c)	68. (d)	69. (c)	70. (d)		

