

(8 pages)

Reg. No. : .....

Code No. : 5884

Sub. Code : PCHM41

M.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2020.

Fourth Semester

Chemistry — Core

ORGANIC CHEMISTRY — IV

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

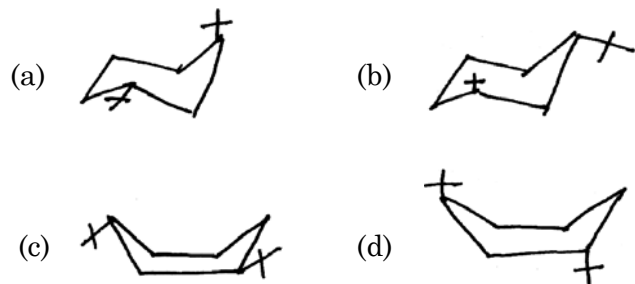
PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. In Reimer-Tiemann reaction product formation takes place by which reaction/s :  
(a)  $A_r SE$  (b)  $SN$  reaction  
(c) Elimination (d) All of these
2. Wittig reaction is given by  
(a) Only 1°-halide (b) Only 2°-halide  
(c) Only 3°-halide (d) 1° and 2° halides

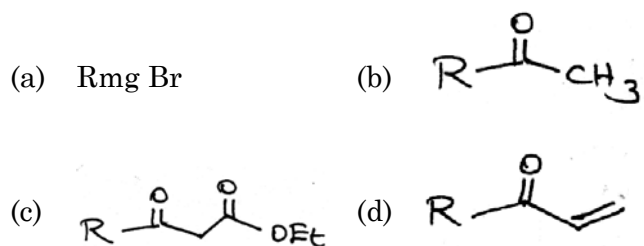
3. The more stable conformation of trans-1, 3-di-*t*-butylcyclohexane is



4. The number of butane gauche interaction  
Cis-decalin is

- (a) 2 (b) 3  
(c) 4 (d) 5

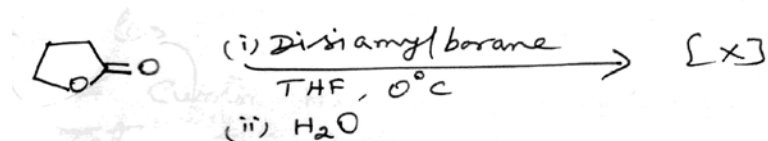
5. The synthetic equivalent for  $R^{\ominus}$  is



6. Which one of the following compounds act as blocking group for amines?

- (a) Benzyloxy carbonyl chloride
- (b) 9-Fluorenyl methyloxy carbonyl chloride
- (c) Benzoyl chloride
- (d) All of these

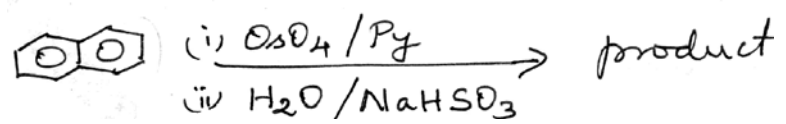
7. In the reaction sequence



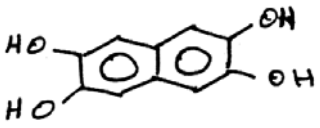
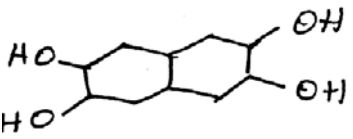
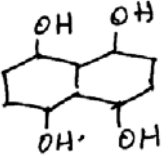
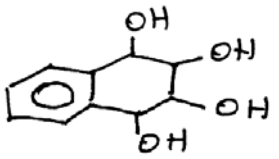
[X] will be

- (a)  $\begin{array}{cc} \text{CH}_2 & - & \text{CH}_2 \\ | & & | \\ \text{CHO} & & \text{CHO} \end{array}$
- (b)  $\begin{array}{cc} \text{CH}_2 & - & \text{CH}_2 \\ | & & | \\ \text{CH}_2\text{OH} & & \text{CH}_2\text{OH} \end{array}$
- (c)  $\begin{array}{cc} \text{CH}_2 & - & \text{CH}_2 \\ | & & | \\ \text{CH}_2\text{OH} & & \text{CHO} \end{array}$
- (d)  $\begin{array}{ccc} \text{HC} & = & \text{CH} \\ / & & \backslash \\ \text{H}_2\text{COH} & & \text{CHO} \end{array}$

8. In the reaction sequence



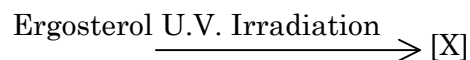
Product will be

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

9. The functional groups present in oestrone are

- (a)  $\text{—OH, —}\overset{\text{O}}{\underset{\text{||}}{\text{C}}}\text{—}$
- (b)  $\text{—COOH, —OH, —}\overset{\text{O}}{\underset{\text{||}}{\text{C}}}\text{—}$
- (c)  $\text{—CH}_3, \text{—OH}$
- (d)  $\text{—OH, —}\overset{\text{O}}{\underset{\text{||}}{\text{C}}}\text{—, —CHO}$

10. In the given reaction



[X] will be

- (a) 7-Dehydrocholesterol
- (b) Ergocalciferol
- (c) Vitamin D<sub>5</sub>
- (d) Vitamin D<sub>3</sub>

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Discuss the mechanism of
- (i) Julia olefination
- (ii) Mc Murry coupling

Or

- (b) Illustrate Bamford-Stevens reaction with suitable examples.

12. (a) (i) State Curtin-Hammett principle. Give its limitations.  
(ii) What is conformational free energy of difference?

Or

- (b) Discuss the stability of Cis and Trans decalins.
13. (a) Discuss the role of activating groups in organic synthesis.

Or

- (b) Give an account of functional group interconversion.
14. (a) Reaction with  $\text{OsO}_4$  is the best method for Cis-perhydroxylation of alkenes. Explain with mechanism.

Or

- (b) Narrate the mechanism of Suzuki coupling.
15. (a) Give an account on prostoglandins.

Or

- (b) Bring out the relationship between oestrone, oestradiol and oestriol and also state how they are interconvertible.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write short notes on :
- (i) Acyloin condensation
  - (ii) Baeyer-Villiger oxidation
  - (iii) Pschorr reaction

Or

- (b) Describe the reaction mechanism for halolactonisation and Gomberg-Bachmann reactions.
17. (a) Explain how conformational features affect the reactivity of cyclohexyl systems in the following reactions :
- (i) Oxidation of alcohols
  - (ii) Elimination reactions

Or

- (b) (i) Give the preferred conformation of trans-syn-trans, cis-anti-cis and trans-anti-trans perhydrophenanthrenes.
- (ii) Trans 4-*t*-butylcyclohexane carboxylic esters hydrolyse faster than the corresponding cis-esters. Explain.

18. (a) (i) Analyse the synthetic plan for preparing 2, 4-dimethyl-2-hydroxypentanoic acid.  
(ii) Bring out the importance of protecting groups in organic synthesis.

Or

- (b) (i) Give an account on Robinson annulations reaction.  
(ii) Write about the Retro-synthetic scheme for Cis-Jasmone.

19. (a) Indicate the applications of the following reagents in organic synthesis :  
(i) DDQ,  
(ii) 9-BBN

Or

- (b) Describe any four synthetic uses of  $\text{RuO}_2$ .

20. (a) How will you confirm the following in the structure of cholesterol?  
(i) Presence of – OH group.  
(ii) Nature and position of side chain.

Or

- (b) (i) Formulate the conversion of cholesterol into progesterone.  
(ii) Discuss the conformational structure of coprostane.