

(8 pages)

Reg. No. : .....

Code No. : 7165

Sub. Code : PCHM 41

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2019.

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. When  $\alpha$ -silyl Carbanions react with Carbonyl compound,  $\beta$ -silyl alcohol derivative is formed. This on treatment with a base gives alkene. This reaction is called \_\_\_\_\_ reaction.

(a) Stobbe condensation  
(b) Julia olifination  
(c) Peterson olefination  
(d) Oxymercuration

2. The intermediate formed in Gomberg-bechmann reaction is \_\_\_\_\_ radical.

(a) Aryl (b) Alkyl  
(c) Acyl (d) Acyloxy

3. The number of Chiral Carbon present in Perhydropheanthrene is \_\_\_\_\_

(a) 1 (b) 2  
(c) 3 (d) 4

4. The chair form of cyclohexanone possess \_\_\_\_\_ strain.

(a) angle  
(b) torsional  
(c) bond length distortion  
(d) both (a) and (b)

5. The protective group for acid is \_\_\_\_\_.

(a) Ester (b) Acetal  
(c) Ether (d) Ketal

6. The appropriate synthetic equivalent for  $\text{CH}_3^-$  is \_\_\_\_\_.

(a)  $\text{CH}_3\text{OAC}$  (b)  $\text{CH}_3\text{Li}$   
(c)  $\text{CH}_3\text{Cl}$  (d)  $\text{CH}_3\text{OTf}$

Page 2

Code No. : 7165



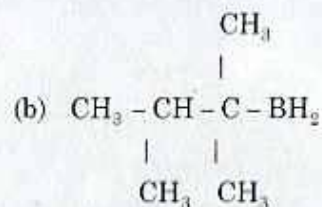
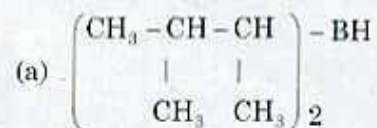
7. Which among the following is a androgens?

- (a) Oestrone (b) Oestriol  
(c) androsterone (d) progesterone

8. Which among the following is a bile acid?

- (a) Etianic acid  
(b) lithocholic acid  
(c)  $5\alpha$ -cholic acid  
(d)  $5\beta$ -cholic acid

9. Disiamyl borane is \_\_\_\_\_.



10. Which among the following is a superhydride?

- (a)  $(\text{CH}_3)_2\text{CuLi}$  (b)  $\text{LiAlH}_4$   
(c)  $\text{NaBH}_4$  (d)  $\text{Li}(\text{C}_2\text{H}_5)_3\text{BH}$

Page 3

Code No. : 7165

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Write notes on Mc Murray coupling reaction.

Or

(b) What are Gomberg-Bechmann and Pschorr reactions? Give an example for each.

12. (a) Cis - 1, 3-dimethyl cyclohexane is more stable than Cis - 1, 2-dimethyl cyclohexane. Give explanation.

Or

(b) (i) Axial-2-bromo cyclohexanone is more stable than its equatorial isomer. Give reason.

(ii) Why is Cis-4-t-butyl cyclohexane Carboxylic acid undergo esterification at a slower rate than its Trans isomer?

13. (a) Robinson annulation sequence reaction is more useful for organic chemists. Explain it with two examples.

Or

(b) Discuss the retero synthesis and total synthesis of 2, 4 - dimethyl-2-hydroxy pentanoic acid.

Page 4

Code No. : 7165

IP T O I

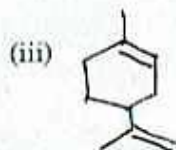


14. (a) (i) Explain Suzuki Coupling reaction with an example.  
 (ii) What is Dess-Martin reagent? Write its special use.

Or

- (b) What is Adams Catalyst? What happens when the following compounds are subjected to reduction in presence of this catalyst

- (i) benzene  
 (ii) 1, 2 - dimethyl cyclohexene



15. (a) Discuss the conformational structure of  $5\alpha$  - cholestane and  $5\beta$  - cholestane.

Or

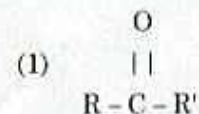
- (b) How will you convert  
 (i) Oestrone into oestriol and  
 (ii) Oestriol into Oestrone?

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) (i) Write notes on Petersons olefination reaction.  
 (ii) What happens when the following compounds are oxidised with peracids?

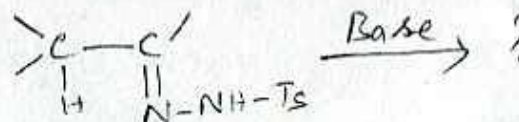


- (2) acetophenone  
 (3) Cyclopentanone.

What is the name of this reaction? Give the mechanism for the first reaction only.

Or

- (b) (i) Explain Darzen condensation reaction with its mechanism.  
 (ii) Complete and give mechanism for the following reaction.



17. (a) (i) Why is trans-decalin is more stable than 9-methyl trans decalin?  
(ii) Write down the preferred conformer of trans - 1, 3-di-t-butyl-cyclohexane. Give explanation.

Or

- (b) What do you mean by conformational energy? Discuss the stability of various conformers of perhydrophenanthrene.
18. (a) (i) Define protecting group. With an example, explain the protection of alcohol and its deprotection in Organic synthesis.  
(ii) Discuss the disconnection approach and total synthesis of Cis-Jasmone.

Or

- (b) (i) Explain the terms retero synthesis, synthons and synthetic equivalent.  
(ii) What is the appropriate key intermediate as considered in the disconnection approach of Twistone? By Robinson annulation reaction how will you synthesise the intermediate? Write down the total synthesis of Twistane, the target molecule.

Page 7

Code No. : 7165

19. (a) (i) What is DDQ? Give three of its application.  
(ii) Write down the importance of triaklyl silyl halide.

Or

- (b) (i) Explain Heck reaction with an example.  
(ii) What is the action of  $\text{OsO}_4 - \text{H}_2\text{O}_2$  with the following compounds.  
(1) Propenal  
(2) Allyl alcohol  
(3) 2-methyl-1-propene  
(4) Cyclohexene  
(5) Trans-2-butene.

20. (a) Discuss the positions of double bond and hydroxyl group in cholesterol.

Or

- (b) How will you synthesise  
(i) Progesterone  
(ii)  $5\alpha$ -cholic acid and  
(iii) Testosterone from cholesterol.

Page 8

Code No. : 7165

