

Total number of printed pages-8

4 SEM PG CHM (CBCS) OC-V 404

2026

(June)

CHEMISTRY

Paper : 404 (C)

(Organic Chemistry-V)

Full Marks : 60

Time : Three hours

***The figures in the margin indicate
full marks for the questions.***

***Answer Unit-I and Unit-IV in one booklet and
Unit-II and Unit-III in another.***

UNIT-I

Marks : 15

1. Answer the following questions : **(any five)**
3×5=15

(a) Discuss *any four* types of interactions that occur between receptors and drug molecules with examples. Write the role of cell membrane in drug absorption.

2+1=3

(b) What are semisynthetic penicillins? Write about the mechanisms of antimicrobial actions of antibiotics.

1+2=3

(c) Discuss about phase-I drug metabolism with examples. Discuss the factors that affect drug metabolism.

1+1+1=3

(d) Write a short note on clinical trials.

(e) What are artemisininins? Give examples. Write the probable mechanism of actions of artemisininins.

1½+1½=3

(f) Write the synthesis of penicillin-II. Write briefly about structure activity relationship of penicillin.

2+1=3

(g) Write the synthesis and mechanism of action of chloroquine.

2+1=3

UNIT-II

Marks : 15

2. Answer the following questions : (*any three*)

2×3=6

(a) "Enzymes are specific". Justify this statement using an example.

(b) Based on the function of enzymes, describe *any two* classes of enzymes with example.

(c) Mention few functions of ATP.

(d) Write about the Watson and Crick double helix model of DNA.

3. Answer from the following : (*any three*)

3×3=9

(a) Elucidate the difference between a co-enzyme, co-factor and prosthetic groups.

(b) Write the mechanism of action of chymotrypsin.

(c) Elaborate the process of biosynthesis of proteins.

(d) Draw the structure of NAD⁺. Also elaborate the mechanism of action of NAD⁺ and NADP⁺.

1+2=3

(e) Write a note on PCR demonstrating the temperature cycle of a typical PCR.

UNIT-III

Marks : 15

4. Explain with proper example : **(any two)**
2×2=4

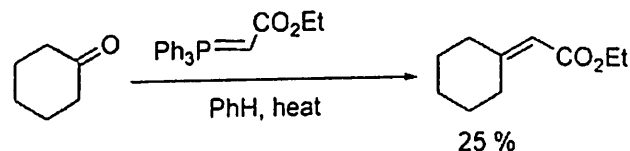
- (a) Stereochemistry of Aldol
- (b) Alkene metathesis
- (c) Julia olefination

5. Answer the following questions : **(any three)**
2×3=6

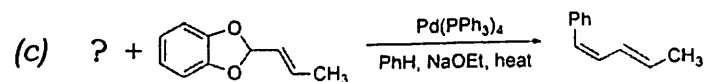
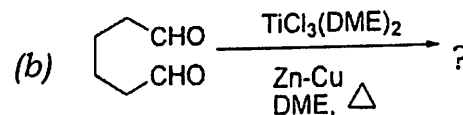
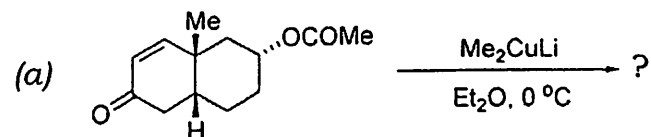
- (a) What are stabilized and non-stabilized ylides? Write their related isomeric product (*E* or *Z*) outcomes with proper justification and oxaphosphetane structure.
- (b) *E* and *Z*-alkene can be separately obtained from the product under different condition. Write the condition and required steps along with reagents for the stereoselective formation of *E* and *Z* isomer of the corresponding alkene.

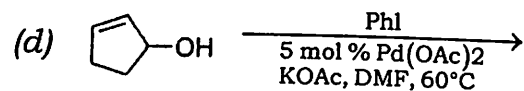


- (c) Horner-Wittig reaction with phosphine oxide can overcome the stereochemical outcome of Wittig reaction. Justify this statement citing proper example.
- (d) For the reaction below the yield is about 25%, what modification will you suggest to increase the yield. Show the modification with proper and condition reagents.



6. Write the major product/reagents for the following reactions : **(any three)** 1×3=3

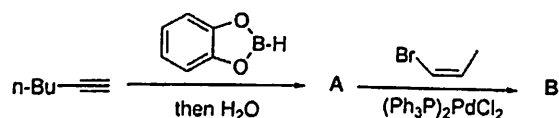




7. Answer of the following: **(any one)** $2 \times 1 = 2$

(a) Discuss the selectivity of Grignard reagent.

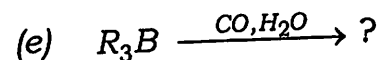
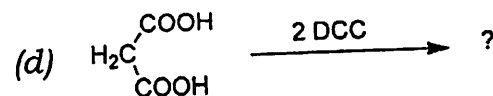
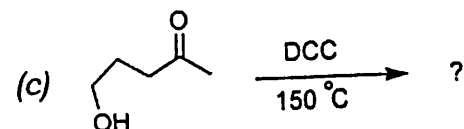
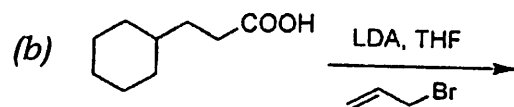
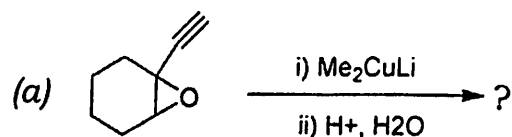
(b) Predict the product (A) and (B) for the reaction below:



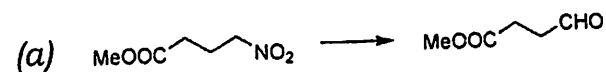
UNIT-IV

Marks : 15

8. Write the products of the following reactions :
(any four) $1 \times 4 = 4$



9. Write the reagents and suggest probable mechanism for the following conversions.
(any one) $2 \times 1 = 2$



10. Answer the following questions : **(any three)**
 $3 \times 3 = 9$

(a) Write the reaction and mechanism for the oxidation of alkene to alcohol.
 $1 + 2 = 3$

(b) Write about the preparation and selectivity of thexylborane.
 $1 + 2 = 3$

(c) What are enamines? Write the Stork-Enamine reaction with mechanism.
 $1 + 2 = 3$

- (d) Write *one* method of preparation for LDA. Write the regioselectivity of LDA on reaction with 2-methylcyclohexanone.

1+2=3

- (e) Write the Pfitzner-Moffatt reaction and its mechanism.

1+2=3
