

Roll No _____

113530

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PG4S-107-B-23

M.Sc. IV Semester (CBCS) Degree Examination

CHEMISTRY

Physical Chemistry - IV

Paper : HCT-4.2

Time : 3 Hours

Maximum Marks :80

Instruction to Candidates:

- i) Answer all the questions.
- ii) All questions carry equal marks.

Answer any Eight of the following

(8×2=16)

1.
 - a) Define salvation number and decomposition potential.
 - b) What is electroplating? Give examples.
 - c) What are fuel cells? Give its types.
 - d) Comment on Miller indices and Weiss indices.
 - e) Explain space lattice.
 - f) Differentiate neutron diffraction with X-ray diffraction.
 - g) Give Born-Oppenheimer approximation.
 - h) What are stokes and antistokes lines?
 - i) Give physical properties of elastomers
 - j) What are conducting polymers? Give examples.
2.
 - a) Discuss Butler-Volmer equation.
 - b) Explain Jablonski diagram for photochemical reactions
 - c) Discuss primary and secondary batteries with examples.

(5+5+6=16)

(OR)

Explain photochemical kinetics of unimolecular process.

3.
 - a) Explain the experimental technique of single crystal rotation method
 - b) What is neutron diffraction? Explain scattering of neutrons by solids
 - c) Deduce Wierl's equation.

(5+5+6=16)

(OR)

Write notes on

- i) Fourier refinement
 - ii) Structure factor
4. a) Give classification of molecules based on their moment of inertia.
- b) Discuss quantum theory of Raman effect
- c) Describe the vibrational spectra of diatomic molecule (5+5+6=16)

(OR)

Write a note on fundamental, overtones and hot bands in infrared spectra.

5. a) Explain determination of molecular weight of polymer by end group analysis.
- b) Give physical properties and applications of plastics
- c) Explain chemical oxidation method for synthesis of polyaniline (5+5+6=16)

(OR)

Write a note on thermo-mechanical behavior of TMA and DMA

109506

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PG4S-016-B-23

M.Sc. IV Semester (CBCS) Degree Examination

ORGANIC CHEMISTRY

Medicinal Chemistry

Paper : SCT-4.2

Time : 3 Hours

Maximum Marks : 80

Instruction to Candidate:

- 1) Answer ALL questions.
- 2) ALL questions carry equal marks.

Answer any Eight of the following.

(8×2=16)

1.
 - a) What is pharmacokinetics? Mention its importance.
 - b) Differentiate between agonist and antagonist using induced fit theory.
 - c) What are active metabolites?
 - d) Outline the synthesis of antipyrine.
 - e) Formulate the synthesis of nitrogen mustards. Write its mode of action.
 - f) Write the structure of rifamycin. Mention its uses.
 - g) Give the nomenclature and structure of PGE.
 - h) Mention the biological importance of vitamins.
 - i) Differentiate between nucleosides and nucleotides.
 - j) State the concept of receptors.
2.
 - a) Give the account of nomenclature and literature of organic medicinal compounds.
 - b) Write briefly on factors influencing metabolism and metabolic changes in drugs.
 - c) Describe the relationship of chemical structure and biological activity of antihypertensive drugs.

(OR)

- c) With suitable examples explain the functions of antidepressants and anxiolytics.

(5+5+6=16)

3.
 - a) Discuss the occupancy theory of drug activity.
 - b) Sketch the synthesis and mode of action of 4-phenylpiperidine.
 - c) Illustrate with suitable examples mode of action of narcotics and non-narcotic analgesics.

(OR)

- c) Give the synthesis of norehadrone. Write its mode of action.

(5+5+6=16)

4. a) What are antineoplastic agents? Sketch the synthesis of 5-fluorouracil. Give its mode of action.
b) Sketch the synthesis of cis- and trans-platins. Describe their mode of action.
c) Illustrate with suitable examples stereochemistry and biological activities of natural penicillins.

(OR)

- c) Write an account on structural features and uses of norfloxacin and amoxicillin.

(5+5+6=16)

5. a) Give the structures of thiamine and riboflavin. Describe their biological activity.
b) Discuss the base pairing in DNA and its conformation.
c) Write note on recombinant DNA technology.

(OR)

- c) Describe the stereochemistry of PEG. Give the synthesis of key intermediates.

(5+5+6=16)

110931

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PG4S-014-B-23

M.Sc. IV Semester (CBCS) Degree Examination

ORGANIC CHEMISTRY

Recent Methods in Organic Synthesis

Paper : HCT 4.1

Time : 3 Hours

Maximum Marks :80

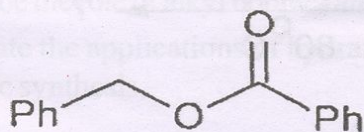
Instructions to Candidates:

- 1) Answer ALL questions.
- 2) ALL questions carry equal marks.

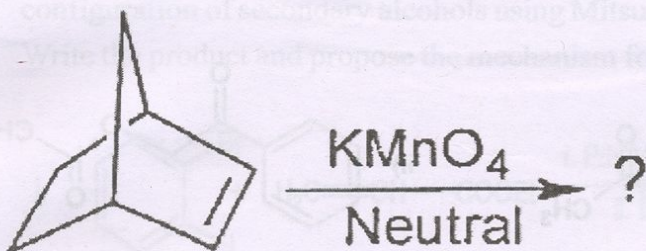
Answer any Eight of the following.

(8×2=16)

1. a) Define the terms synthons and synthetic equivalents using suitable examples.
- b) Give the retrosynthetic analysis and the corresponding synthesis for the following target molecule:

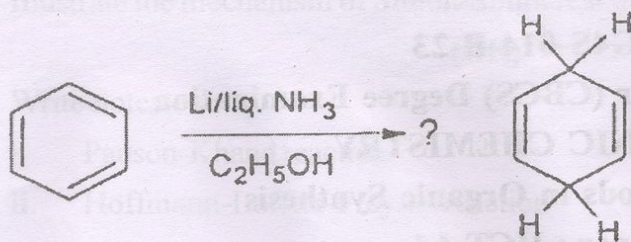


- c) Write the structure and mention the use of TBDMS and Fmoc as protecting groups in organic synthesis.
- d) Write Predict the product and propose the mechanism for the following:



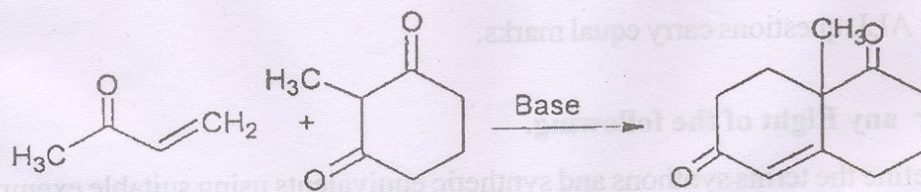
- e) Sketch the mechanism of Oppenauer oxidation with the help of suitable example.

f) Propose suitable mechanism for the following:

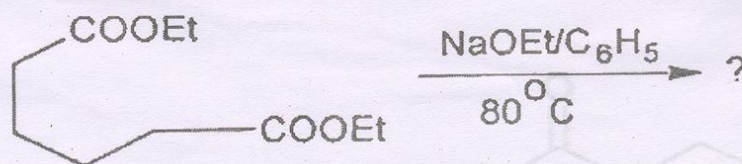


g) What is Wolf Kishner reduction? Illustrate its mechanism using appropriate example.

h) Propose suitable mechanism for the following transformation:



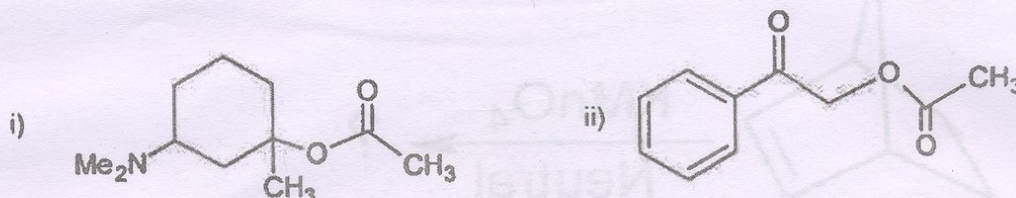
i) Write the product and propose mechanism for the following:



j) Write the structure of DDQ and give it's anyone application.

2. a) Explain the guidelines for choosing suitable disconnection by using appropriate example.

b) Write the retro synthetic analysis and the corresponding synthesis for the following target molecules.



c) Using disconnection approach write the retro synthetic analysis and the corresponding synthesis for longifolene.

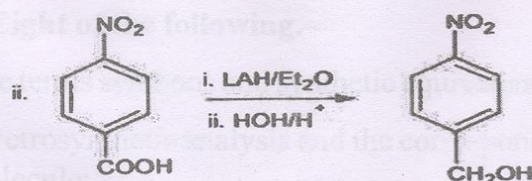
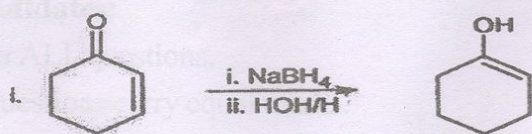
(OR)

c) Illustrate the methods for protection and deprotection of a carbonyl group in acidic and basic medium. (5+5+6=16)

3. a) Illustrate with suitable examples applications of HIO_4 and SeO_2 in organic synthesis.
 b) Describe the role of $\text{Pb}(\text{OAc})_4$ reagent in organic synthesis.
 c) Discuss the synthetic applications of OsO_4 and ozone in synthetic organic chemistry.

(OR)

- c) Write briefly on the role of $\text{K}_2\text{Cr}_2\text{O}_7$ and DCC in organic synthesis. (5+5+6=16)
4. a) Propose suitable mechanism for the following transformations:

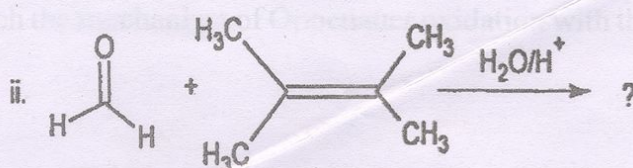
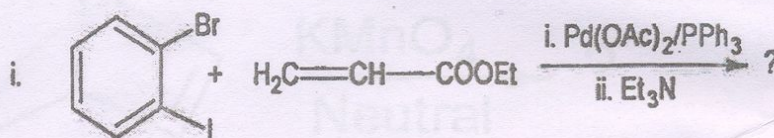


- b) Describe the role of alkyl boranes and trialkylborohydride reagents in organic synthesis.
 c) Illustrate the applications of hydrazine and Meerwein-Ponndorf-Verley reduction in organic synthesis.

(OR)

- c) Write briefly on: (5+5+6=16)
 i. Rosenmund reduction
 ii. Wilkinson catalytic reduction

5. a) Explain with appropriate example how will you bring about the inversion of configuration of secondary alcohols using Mitsunobu reaction?
 b) Write the product and propose the mechanism for the following:



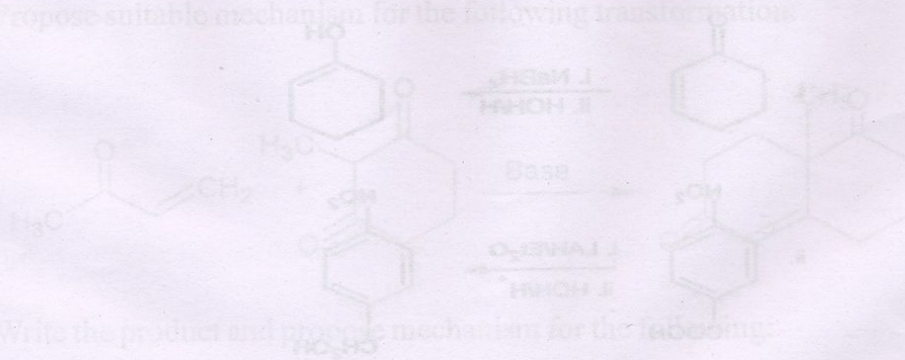
c) Illustrate the mechanism of Simon-Smith reaction and give its applications.

(OR)

c) Write notes on :

(5+5+6=16)

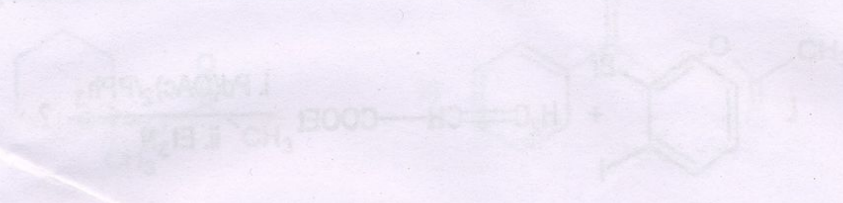
- i. Pauson-Khand reaction
- ii. Hoffmann-Löffler-Freytag reaction



b) Describe the role of alkyl boranes and allyl borohydride reagents in organic synthesis.
c) Illustrate the applications of hydrazine and Meisenheimer-Fordover-Vedey reduction in organic synthesis.

(OR)

c) Write briefly on:
i. Rosenmund reduction
ii. Wilkinson catalytic reduction
a) Explain with appropriate example how will you bring about the inversion of configuration of secondary alcohols using Mitsunobu reaction?
b) Write the product and propose the mechanism for the following:



c) Using retrosynthetic analysis write the retro synthetic analysis and the corresponding guidelines for the synthesis of longitolene.
b) Write the product and propose the mechanism for the following: