

M.Sc. DEGREE EXAMINATION, APRIL- 2016

BRANCH : CHEMISTRY

SECOND SEMESTER

CHE 202 : ORGANIC CHEMISTRY-II

(Under CBCS & Non CBCS w.e.f. 2015-16)

(Common for both the CBCS with 70 marks & Non - CBCS with 80 marks)

(Common for supplementary candidates also ie., for the batch of students admitted in the year 2014-15)

Time : 3 Hours

Max. Marks : 70/80

Section - A

Answer any **Four** questions. All questions carry **equal** marks (4×5=20)

1. Write a note on pyrolytic syn elimination
2. Explain cross over experiments
3. Give the mechanism of wagner-Meerwein rearrangement.
4. Write the mechanistic pathway of claisen rearrangement.
5. Write the synthesis of oxetanes.
6. Explain Hantzsch - Widmann nomenclature
7. Write a note on isolation of alkaloids
8. Give the classification of alkaloids based on nitrogen heterocyclic ring.

Section - B

Answer **all** questions. All questions carry **equal** marks

(4×12½=50/4×15=60)

9. a) Discuss the different mechanisms for elimination reactions.

OR

- b) Write the uses of IR and NMR in the investigation of reaction mechanism

10. a) Discuss the following

- i) Baeyer - villiger rearrangement
- ii) Hofmann rearrangement

OR

b) Elaborate the following :

- i) Beckmann rearrangement
- ii) Favorski rearrangement

11. a) Write the synthesis and reactions of the following :

- i) Aziridines
- ii) Thietanes

OR

b) Explain the synthesis and chemical activity of the following :

- i) Oxiranes
- ii) Azetidines

12. a) Write a detailed note on general methods of structure elucidation of alkaloids.

OR

b) Describe the structure and synthesis of Quinine

M.Sc. DEGREE EXAMINATION, APRIL, - 2016
SECOND SEMESTER

Branch : CHEMISTRY (Affiliated Colleges)

CHE 202 : ORGANIC CHEMISTRY - II

(W.e.f. 2009-10)

(For Supplementary Candidates Only)

Time : 3 Hours

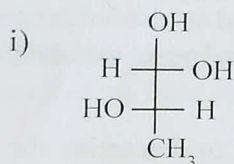
Max. Marks : 80

Answer any FOUR of the following. Choosing one from each unit.

Sub-divisions (a) (b) & (c) carries 4, 6, 10 marks respectively.

Unit - I

1. a) Write the sawhorse formulae of the following compounds



- ii) 2R, 3R-2 Bromo-3-chloro Butane (04)

- b) Draw the geometrical isomers of each of the following compounds and assign E or Z designations (06)

- i) 1-Bromo-2-chloropropene

- ii) 3-tert. butyl-1, 3- Pentadiene

- iii)
- α
- Phenyl Cinnamic acid

- c) Write down the New man projection formulae for the conformations of n-Butane and write the energy profile diagram depicting the conformations. (10)

(OR)

2. a) What is axial chirality? Explain with an example (04)
- b) Explain the difference in reactivity between axial and equatorial substituents by taking SN^1 and SN^2 reactions as examples. (06)

- c) Explain physical and chemical methods used for the determination of the configuration of geometrical isomers. (10)

Unit - II

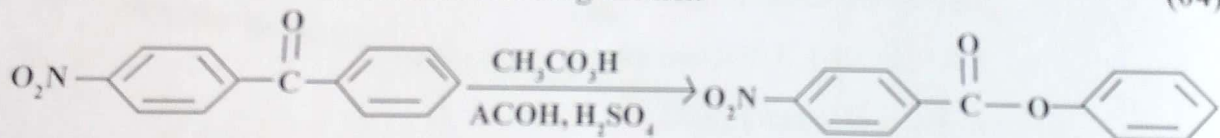
3. a) Write the order of stability of following carbocations with proper explanation. (04)
- Tropyllium cation
 - Benzyl Carbocation
 - Tert. butyl Carbocation
 - Ethyl Carbocation
 - Dicyclopophyl methyl Carbocation.
- b) Explain how the energy profile diagrams and transition states help to determine the mechanism of a reaction. (06)
- c) Explain the methods of generation and stability of carbanions (10)

(OR)

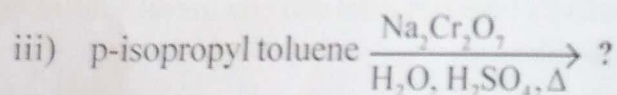
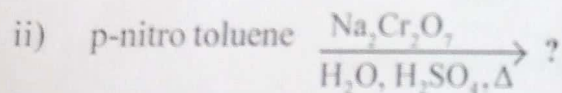
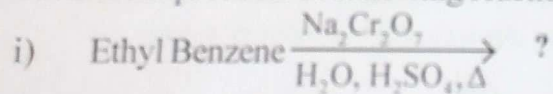
4. a) The hydrolysis of an ester to yield carboxylic acid and an alcohol proceeds through aryl-oxygen bond cleavage. Explain the reaction pathway by isotope labelling technique (04)
- b) What are intermediates? Explain the methods used to determine the presence of intermediates in a chemical reaction.. (06)
- c) Write the generation, stability and reactivity of free radicals. (10)

Unit - III

5. a) Write the mechanism of following reaction (04)



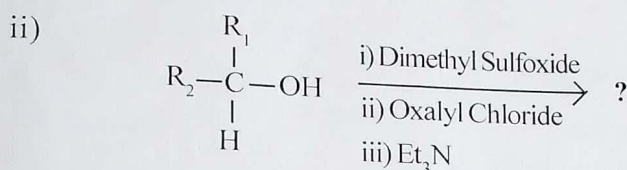
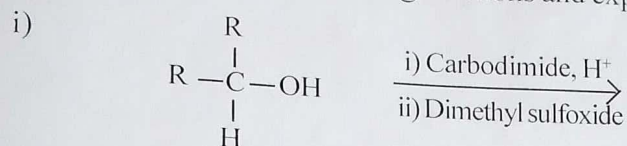
- b) Predict the products of following reactions (06)



- c) Explain the importance and use of sodium borohydride in organic synthesis (10)

(OR)

6. a) What is Birch reduction? Explain with an example (04)
 b) Explain the oxidative bond cleavage of alkenes by transition metals. (06)
 c) Write the products of following reactions and explain the reaction mechanism. (10)



Unit - IV

7. a) Write the structure of alkyl magnesium halide or aryl magnesium halide formed from each of the following compounds on reaction with Mg in dry ether
- P - Bromofluoro benzene
 - Allyl chloride
 - Iodo cyclobutane
 - 1 - Bromo cyclohexene (04)
- b) Write the methods of synthesis of primary secondary and tertiary alcohols using Grignard reagents. (06)
- c) Write the synthesis and applications of organo lithium compounds in organic synthesis (10)

(OR)

8. a) Suggest a combination of organic halide and copper reagent appropriate for the preparation of the following compound (04)
 2-methyl butane

[P.T.O.]

- b) Write about the following (06)
- i) Simmons - Smith reaction
 - ii) Oxymercuration
- c) Write the synthesis and applications of organo Rhodium compounds in organic synthesis. (10)
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M.Sc. DEGREE EXAMINATION — NOVEMBER/DECEMBER 2020.

SECOND SEMESTER

Branch — Chemistry

CHE 202 - Paper II — ORGANIC CHEMISTRY - II

(W.E. F 2016-2017)

(w.e.f 2016-2017 for both the CBCS with 70 marks and Non-CBCS with 80 marks)

Time : 3 hours

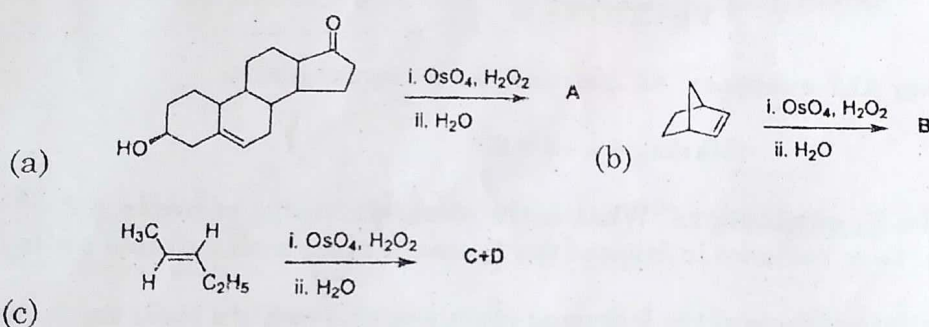
Max. Marks : 80

SECTION - A

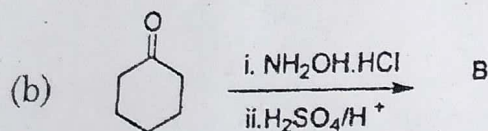
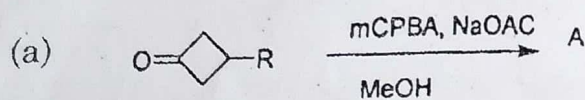
Answer any FOUR questions. all question carries equal marks.

(Marks : $4 \times 5 = 20$)

1. Describe the stereoselectivity of the following addition reactions.

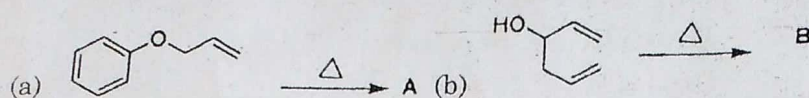


2. Explain energy profiles of determination of addition and elimination reactions.
3. Find out the possible products and explain the reaction mechanism.

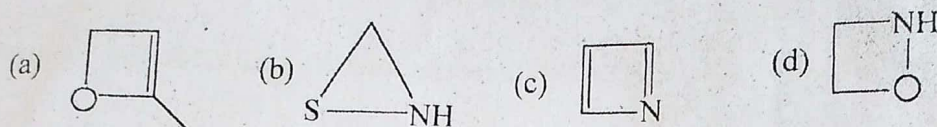


[P.T.O.]

4. Predict the possible products for the following reactions and explain the reaction mechanism.



5. Naming the following hetero cyclic compounds by Hantzsch-Widmann System.



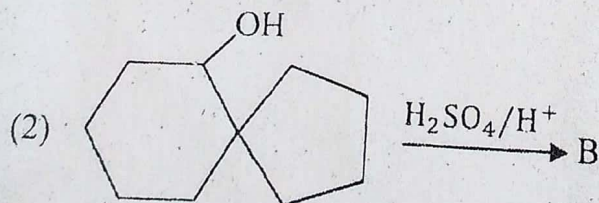
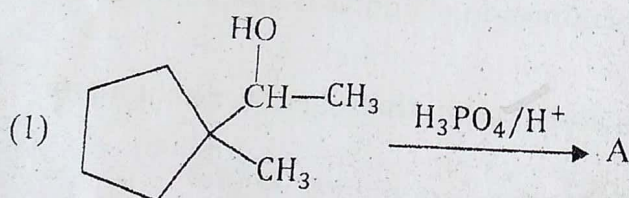
6. Write any two synthetic methods for the preparation of thiirane.
7. Describe the classification of alkaloids based on nitrogen heterocyclic ring and give suitable examples.
8. Write the isolation procedure for atropine.

SECTION - B

Answer ALL questions. All question carries equal marks.

(Marks : $4 \times 15 = 60$)

9. (a) (i) What are E_2 eliminations? What is the stereoelectronic requirement of an E_2 process? Give evidence in favor of the E_2 mechanism with suitable example.
- (ii) Predict the products of the following reactions and explain their mechanism.



Or

- (b) (i) Discuss the various factors which influence the E_1 and E_2 eliminations.
(ii) Explain Saytzeff and Hoffmann rules with suitable examples.
10. (a) Give two examples of rearrangements to electron rich carbon atom and explain their mechanism.

Or

- (b) Explain the following rearrangements with plausible mechanism.
(i) Demjono-vov rearrangement.
(ii) Wagner-Meerwein rearrangement.
11. (a) (i) Explain any three synthetic methods for the preparation of aziridine.
(ii) Write ring opening reactions of oxirane and oxetanes.

Or

- (b) (i) Write systematic nomenclature rules for monocyclic heterocycles by Hantzsch-Widmann System.
(ii) Describe any three synthetic methods for the preparation of oxetane.
12. (a) Explain the synthesis and structure elucidation of quinine.

Or

- (b) Write the isolation and structure elucidation of papaverine.
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B-206-02-02

M.Sc. DEGREE EXAMINATION, MAY-2017

SECOND SEMESTER

BRANCH : CHEMISTRY

CHE 201 : INORGANIC CHEMISTRY - II

(For supplementary candidates who appeared in 2014 and earlier)

Time : 3 Hours

Max. Marks : 80

Answer any **FOUR** of the following choosing **one** from each unit Sub-divisions (a) (b) & (C) carries **4, 6, & 10** marks respectively.

Unit - I

1. a) What are II-complexes?
b) Explain the nature of bonding in metal complexes.
c) Explain various nucleophilic attack on ligand

OR

2. a) Explain structure of Re_2Cl_9 complex.
b) Explain II-complexes with alkynes, arenes.
c) Explain nature of bonding, properties and preparation of any two II-complexes with alkynes.

Unit-II

3. a) What is Frank-Condon principle.
b) Explain charge transfer spectra.
c) Give Orgel diagrams of d^1, d^5, d^9 configuration in presence of strong field.

OR

4. a) What is ligand field spectra?
b) Derive term symbols for vacant, half filled p and d orbitals.
c) What is spin coupling? Explain the selection rules. Give TS diagram for F_2 .

Unit-III

5. a) Explain spin orbit coupling.
b) Explain paramagnetism in Ti(III), Fe(III), Cu(II)
c) Explain :
i) Hund's rule
ii) Curie law
iii) Weiss law

OR

6. a) Explain diamagnetism.
b) Explain orbital and spin contributions.
c) Explain ferromagnetism, anti-ferromagnetism and temperature independent magnetism.

Unit-IV

7. a) What are redox potentials?
b) Explain thermal decomposition of peroxydisulphate.
c) Explain H-Br chain reactions, S_2O_8 reactions.

OR

8. a) Explain reactions of oxy anions.
b) Explain Induced, free radical reactions
c) Explain factors affecting redox potentials and reactions involving Cu(II) and OS(VIII).



M.Sc DEGREE EXAMINATION – MAY, 2017

Branch : CHEMISTRY

SECOND SEMESTER

CHE 203 : PHYSICAL CHEMISTRY – II

(Under CBCS & Non CBCS w.e.f.2015-16)

(Common for both the CBCS with 70 marks & Non-CBCS with 80 marks)

(for Supplementary candidates, who appeared in 2015 and 2016 only)

Time: 3 Hours

Max. Marks: 70/80

SECTION – A

Answer any FOUR questions. All questions carry equal marks.

(Marks : 4 X 5 = 20)

1. Explain spin and antisymmetry.
2. Mention the calculations of π -bond order and charge density.
3. Derive Laplace equation.
4. What are surface active agents and give its classification.
5. Explain the integrated form of clapeyron equation.
6. Explain the Thermodynamic derivation of phase rule.
7. What are dissolution and deposition potentials.
8. Write a note on DC-polarography and AC- polarography.

SECTION – B

Answer all questions. Each questions carries 12 ½ / 15 marks.

(Marks: 4 x 12 ½ = 50 / 4 x 15=60)

9. a) Explain the following:
(i) Ladder operator
(ii) Slater determinant

Or

- b) Write the Huckel theory of Conjugated Systems and give applications.

10. a) Explain the following :
(i) Gibbs adsorption isotherm
(ii) Estimation of surface area from BET equation.

Or

- b) Discuss the following :
(i) Emulsions
(ii) Helmholtz perrin model
(iii) Reverse micelles

11. a) Explain the following :
(i) Congruent fusion and incongruent fusion.
(ii) One salt forms hydrate and two salts form hydrates.

Or

- b) Give a detailed note on clausius –clapeyron equation.

(P.T.O.)

12. a) (i) Derive Butler-Volmer equation.
(ii) Concentration overvoltage.

Or

- b) (i) Write the principle and instrumentation of polarography.
(ii) Write the equation for half wave potential.

M.Sc. DEGREE EXAMINATION, MAY- 2017

SECOND SEMESTER

Branch : CHEMISTRY

CHE 204 : GROUP THEORY AND ANALYTICAL METHODS

(for supplementary candidates who appeared in 2014 and earlier)

Time : 3 Hours

Max. Marks : 80

Answer any **FOUR** of the following choosing one from each unit Sub-divisions (a) (b) & (c) carries 4, 6, & 10 marks respectively.

UNIT - I

1. a) Explain plane of Symmetry with one example.
b) Discuss relation b/w order of a fine group and its sub group.
c) Describe the great orthogonality theorem.

OR

2. a) Write about Schoenflies Symbols.
b) Write the Axis of Symmetry and plane of Symmetry of following molecules
i) CH_4
ii) Staggered C_2H_6
iii) NH_3
c) Describe the representation of C_{nh} , C_{nr} groups by matrices with examples.

UNIT - II

3. a) Discuss the theory of Thermogravimetry.
b) Write the DSC applications to chlorates and perchlorates.
c) Discuss the principle and instrumentation of differential thermal analysis.

OR

4. a) Explain the Themogram to $\text{CaCO}_3 \cdot (\text{COO})_2 \cdot 2\text{H}_2\text{O}$.
b) Discuss the applications of DTA to clays, minerals and coals (levels).
c) Explain the Instrumentation and working principle of DTA.

UNIT - III

5. a) Write about the sources used in AAS.
b) Discuss the Interferences in flame photometry.
c) Discuss
i) Applications of AAS
ii) Comparison b/w AAS and flame photometry.

OR

6. a) Discuss the principle involved in flame photometry.
b) Discuss the Interferences and methods of minimization in AAS.
c) Describe the Theory and Instrumentation of flame photometry.

UNIT - IV

7. a) Write about solid membrane electrodes.
b) Explain amperometric titration
c) Discuss
i) HMDE
ii) Anode stripping voltammetry

OR

8. a) Discuss about gas sensing membrane electrodes.
b) Explain coulometry at controlled potential.
c) Write a note on:
i) Potentiometry
ii) Cyclic voltammetry
iii) Glass electrodes



M.Sc DEGREE EXAMINATION – MAY, 2017

Branch: CHEMISTRY

SECOND SEMESTER (CBCS)

CHE 204 : GENERAL CHEMISTRY-II

(for supplementary candidates who appeared in 2015 and 2016 only)

Time: 3 Hours

Max. Marks: 70/80

Part - A**Answer any FOUR Questions. Each question carries 5 marks.
(Marks: 4 x 5 = 20)**

1. Define Reducible and Irreducible representations.
2. What are Axioms of group.
3. Write the working principle of Cyclic Voltametry.
4. Describe the construction of glass electrode.
5. Define Zero point energy and hot bands.
6. Explain Mutual exclusion principle.
7. Explain the terms Retardation factor and development of plate in TLC.
8. Derive Van-Deemter equation.

Part – B**Answer ALL questions. Each question carries 12 ½ / 15 marks.
(Marks: 4 x 12 ½ = 50 / 4 x 15=60)****UNIT - I**

9. a) Define orthogonality , theorem and write its Implication.

Or

- b) Define Schoenflies symbols and write the Mulliken rules for character table.

UNIT - II

10. a) Explain the theory of Amperometric titration. Draw and explain the amperometric titration curves.

Or

- b) Discuss the working principle and theory of Anodic stripping voltammetry and Linear Sweep voltammetry.

UNIT – III

11. a) Describe the PQR structure of a Vibrational – rotational spectra.

Or

- b) Discuss the classical quantum theories of Raman effect.

UNIT - IV

12. a) Discuss the theory and Instrumentation of HPLC.

Or

- b) Describe the column efficiency and detections in GLC.
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B-206-02-04

M.Sc. DEGREE EXAMINATION — NOVEMBER/DECEMBER 2020

SECOND SEMESTER

Branch — Chemistry

Paper IV (CHE 207) — GENERAL CHEMISTRY — II

(Under CBCS and Non-CBCS w.e.f 2016-2017)

Time : 2 hours

Max. Marks : 40

SECTION - A

Answer any TWO of the following questions. Each question carries 5 marks.

(Marks : $2 \times 5 = 10$)

1. Write a short note on gas sensing membrane electrodes. ✓
2. Give an account on theory of potentiometry. .
3. Discuss on classification of chromatography ✓
4. Explain the advantages of thin layer chromatography.

SECTION - B

Answer ALL questions. Each question carries 15 marks.

(Marks : $2 \times 15 = 30$)

5. (a) Discuss in detail about ✓
 - (i) Cyclic Voltammetry
 - (ii) Amperometric titrations
 - (iii) Glass electrodes.

Or

[P.T.O.]

(b) Give an account on

- (i) Cation and anion sensitive electrodes
- (ii) Differential pulse polarography.
- (iii) Linear sweep voltammetry.

6. (a) Describe in detail any three of the detectors used in GLC.

Or

(b) Describe theory, columns and delivery systems of HPLC.

P.G. DEGREE EXAMINATION, MAY- 2017
SECOND SEMESTER
HUMAN VALUES AND PROFESSIONAL ETHICS - II
(W.E.F. 2016 - 2017)

(Common Paper for University Colleges and Affiliated Colleges)

Time : 3 Hours

Max. Marks : 80

Section - A

Answer any **Five** questions. Each question carries **4** marks.

(5 × 4 = 20)

1. Discuss value Education.
2. Define Medical Ethics.
3. Explain social Justice in health care.
4. Describe Business Ethics.
5. Evoluate Ethical standards of business.
6. Examine Environmental Ethics.
7. Explain climate change.
8. Discuss pollution and waste.
9. Define social Ethics.
10. Define Ethical Media.

Section - B

Answer **ALL** questions. Each question carries **12** marks.

(5 × 12 = 60)

11. a) What is the definition of value Education.

OR

- b) Explain the status of women in Family and society.

12. a) Discuss on Medical Ethics.

OR

b) Examine the code of Ethics for medical and health - care professionals.

13. a) Describe the Ethical standards of business.

OR

b) Define characteristics of Ethical problems in management.

14. a) Discuss Environmental Ethics.

OR

b) Explain Ecological crises.

15. a) Write an essay on Feminist Ethics.

OR

b) Describe Human Rights violation and social disparities.



M.Sc. DEGREE EXAMINATION, MAY-2017

SECOND SEMESTER

Branch : CHEMISTRY

CHE 204 : GENERAL CHEMISTRY - II

(For campus students and affiliated college students admitted from the year 2016-17)

Time : 3 Hours

Max. Marks : 40

Section - A

Answer any **TWO** of the following questions. Each question carries **5** marks. (2×5=10)

1. Discuss the types of ion sensitive electrodes.
2. Describe Anode stripping voltammetry.
3. Write the applications of HPLC.
4. Derive van-reemitter equation.

Section - B

Answer **All** questions. Each question carries **15** marks. (2×15=30)

5. a) Discuss chronoamperometry, chronopotentiometry and cyclic voltammetry.

OR

- b) Explain differential pulse polarography and square wave voltammetry.

6. a) Write the principle and instrumentation of GLC.

OR

- b) Describe the theory and instrumentation of HPLC.

