MODEL QUESTION PAPER
K.V.R GOVERNMENT COLLEGE FOR WOMEN (A), KURNOOL
M Sc. ORGANIC CHEMISTRY
III SEMESTER SYLLABUS under CBCS
EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021

CHEM-301, Paper-I: ORGANIC SYNTHESIS-I

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Explain the terms 'target' & 'synthon' with suitable examples?
2. Explain chemoselectivity with suitable examples?
3. Explain the structural elucidation of androsterone?
4. Write the synthesis of citral?
5. Write note on intramolecular hydrozen bonding in glycol?
6. Explain monosubstituted cyclohexanes?
7. Write note on Peterson's Stereoselective defination?
8. Brief note on Mc Murrey reaction?

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. (i) Explain linear & convergent synthesis?
   (ii) Explain Umpolung reaction?

(or)

10. Write a note on (i) FGI, (ii) TM, (iii) Linear & Convergent synthesis?

Unit- II

11. Write isolation & structural elucidation of camphor?

(or)

12. Write isolation & synthesis of (i) Atropine, (ii) Nicotine?

Unit- III

13. Describe conformations di-substituted cyclohexane?

(or)

14. Describe effect of conformation on reactivity in mono di-substiruted cyclohexanes?

Unit- IV

15. Explain (i) Mukayama Aldol reaction, (ii) Baylis Hillman reaction?

(or)

16. Discuss about Buchwald-Hartwig coupling & Ugireaction?

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CHEM-302, Reaction Mechanism-II & Organic Photochemistry

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Explain neighbouring group participation of cyclo alkyl groups in nucleophile substitution reactions?
2. Write reaction & mechanism of Vonrichter rearrangement?
3. Explain (i) Aliphatic diazonium coupling, (ii) Halogenation?
4. Explain metalation with Organo metallic compounds?
5. Discuss singlet & triplet states of transition?
6. Write about Quantum yield?
7. Explain Photo fries arrangements?
8. Explain Barton reaction?

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Explain neighbouring group participation of halogens, aryl groups, alkyl groups in Nucleophilic substitution reactions?

(or)

10. Explain (i) Sommlet-Hauser rearrangements, (ii) Smiles rearrangements?

Unit- II

11. Explain (i) SE_1, SE_2 & SE_i mechanism?

(or)

12. Write (i) Haloform reaction, (ii) Haller-Baner reaction?

Unit- III

13. Explain about Jablonski diagram & Photo sensitization?

(or)

14. Describe Norrish type-II cleavage with its applications?

Unit- IV

15. Explain about Photochemistry of unsaturated system?

(or)

16. Explain photochemistry of aromatic compounds?

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CHEM-303, ORGANIC SPECTROSCOPY-I

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Discuss the effects of solvent on electronic transition?
2. Explain steric effect in biphenyls?
3. Write note on FT-IR?
4. Discuss the applications to identification of organic molecules?
5. Write note on Chemical-shift?
6. Write a note on coupling constant?
7. Explain Nitrogen rule?
8. Discuss mass spectral fragmentation patterns of acetone?

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Explain Woodward-Fieser rules for conjugated dienes & carbonyl compounds with example?

(or)

10. Explain ultraviolet spectra of Aromatic & Heterocyclic compounds?

Unit- II

11. Discuss principle & instrumentation of IR spectroscopy?

(or)

12. Discuss comparison of IR & Raman spectroscopy?

Unit- III

13. Explain (i) Spin-spin interactions, (ii) Deshielding, (iii) Spin decoupling?

(or)

14. Explain nuclear over Hauser & discuss virtual coupling?

Unit- IV

15. Explain (i) Molecular-ion Peak, (ii) Mc Lafferty rearrangement, (iii) Isotopic abundance?

(or)

16. Discuss Mass spectral fragmentation pattern of alkanes, aromatic compounds & Esters?

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CHEM-304, NATURAL PRODUCTS

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Synthesize Imidazole?
2. Synthesize Pyrazole?
3. Explain Isoelectric point?
4. Define peptide & Explain distinction between polypeptides & proteins?
5. Explain Isomerism in unsaturated fatty acids?
6. Explain about acid value?
7. Write about classification of nucleic acids?
8. Explain about gene mutation?

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Synthesis & reactivity of Indole, Quiniline?

(or)

10. Explain synthesis of Isoquinoline, Bezofuran, Pyrazine?

Unit- II

11. Explain classification & biological importance of proteins?

(or)

12. Explain in detail about Merrifield's method?

Unit- III

13.Explain (i) Saponification value, (ii) Iodine value, (iii) Reichert-Meissel value?

(or)

14.Define Waxes & write physiological importance of Waxes?

Unit- IV

15. Write structures of DNA & RNA and differences between DNA & RNA?

(or)

16. Explain translation of genetic material in detail?

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CHEM-401, Paper-I: ORGANIC SYNTHESIS-II

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Explain Topicity in molecules?
2. Discuss about chemo selectivity.
3. Explain Asymmetric Aldol reaction?
4. Write about Assymmetric reductions using BINAL-H?
5. Explain about the organoboranes?
6. Write note on Horner words worth-Emmons reactions?
7. Write note on Robinson annulations?
8. Explain the Shapiro reaction?

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Explain about prochirality nomenclature with examples?

(or)

10. Write a note on (i) Enantioselectivity, (ii) Diastereoselectivity?

Unit- II

11. Discuss cram's rule & Felkin-Anh model?

(or)

12. Explain about asymmetric hydrogenations using chiral Wilkinson biphosphine & Noyor icatalysts?

Unit- III

13. Explain (i) Wittig's reactions, (ii) Sulphur ylides?

(or)

14. Discuss about reactivity & applications of simple boranes and hindered boranes?

Unit- IV

15. Discuss the protection of amines by Hydroxy, Amino group, Carbonyl group with examples?

(or)

16. Explain (i) Mannich reaction, (ii) Stork-enamine reaction?

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CHEM-402, Paper-II: SEPARATION TECHNIQUES & GREEN CHEMISTRY

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Write a note on R_f values.
2. Write note on significance of Van-Deemter equation.
3. Explain Bio-chemical reduction.
4. Describe the transition metal catalysis.
5. Write note on phase transfer catalysis.
6. Write note on solvent free techniques reaction on solid mineral supports.
7. Explain So-gel synthesis.
8. Write note Micro emulsions.

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Describe the principle & instrumentation of gas chromatography

(or)

10. Explain the principle & instrumentation of high performance liquid chromatography

Unit- II

11. Describe the Mukaiyama reaction & Ullmann's coupling

(or)

12. Describe the Reformatsky reaction & Wurtz reaction, Pinacol coupling.

Unit- III

13. Write note on C-alkylation, N-alkylation, S-alkylation & Darzen's reactions

(or)

14. Write note on types of Ionic liquids & Synthesis of Ionic liquids

Unit- IV

15. Explain (a) Chemical precipitation, (b) Co-precipitation, (c) Solvothermal synthesis.

(or)

16. Describe the characterization of Nano materials by XRD & SEM.

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CHEM-403, Paper-III: ORGANIC SPECTROSCOPY-II

Time: 3 Hrs. **Max.Marks: 80**

SECTION – A (4 x 5 = 20 marks)

(Answer Any FOUR Questions. Each Question Carries 5 marks)

(The Paper setter is to be requested to set two questions from each unit)

1. Explain Phenomenon of ORD & CD.
2. Explain Octant rule.
3. Explain types of ^{13}C NMR spectra.
4. Discuss the applications of DEPT method.
5. Write note on g-factor.
6. Explain significance of hyperfine splitting.
7. Explain Spectral identification of Ethanol & Isobutanol by using IR & ^{1}H NMR.
8. Explain Spectral identification of Anisole & Acetone by using IR & ^{1}H NMR.

SECTION-B (4 x 15= 60 marks)

(Answer ALL Questions)

Unit- I

9. Explain cotton effect curved & their applications.

(or)

10. Write about the octant rule & its application to alicyclic ketones.

Unit- II

11. Define 13C NMR chemical shifts & factors affecting the chemical shifts of organic compounds.

(or)

12. Write about Homo nuclear & hetero nuclear coupling.

Unit- III

13. (i) Super hyperfine coupling, (ii) Kramer's degeneracy.

(or)

14. Explain (i) Methyl radical, (ii) Benzene anion, (iii) Isoquinine.

Unit- IV

15. Describe by interpretation of IR, ^{1}H NMR, Mass Spectral data of the following compounds (a) Benzaldehyde, (b) Benzoic acid, (C) Ethyl Benzoate.

(or)

16. Explain Spectral identification of by using IR, ^{1}H NMR, Mass Spectral data of the

following compounds (a) Trans-crotanaldehyde, (b) Ethyl Methyl ketone, (C) N, N-Dimethyl aniline.