

**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**

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**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 hydrogen bonding in glycol?
6. Explain monosubstituted cyclohexanes?
7. Write note on Peterson's Stereoselective definition?
8. Brief note on Mc Murry 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-substituted cyclohexanes?

**Unit- IV**

15. Explain (i) Mukayama Aldol reaction, (ii) Baylis Hillman reaction?  
(or)
16. Discuss about Buchwald-Hartwig coupling & Ugi reaction?

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**III SEMESTER SYLLABUS under CBCS**  
**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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) Sommet-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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**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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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**M Sc. ORGANIC CHEMISTRY**  
**III SEMESTER SYLLABUS under CBCS**  
**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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, Quinoline?  
(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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**M Sc. ORGANIC CHEMISTRY**  
**IV SEMESTER SYLLABUS under CBCS**  
**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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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**M Sc. ORGANIC CHEMISTRY**  
**IV SEMESTER SYLLABUS under CBCS**  
**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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 Sol-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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**EFFECTIVE FROM THE ACADEMIC YEAR 2020-2021**  
**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  $^{13}\text{C}$  NMR spectra.
4. Discuss the applications of DEPT method.
5. Write about the classification of 2D-experiments.
6. Explain NOESY of 9-benzyl anthracene.
7. Write note on g-factor.
8. Explain significance of hyperfine splitting.

**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  $^{13}\text{C}$  NMR chemical shifts & factors affecting the chemical shifts of organic compounds.

(or)

12. Write about Homo nuclear & hetero nuclear coupling.

**Unit- III**

13. Explain HOMO COSY spectrum of m-dinitro benzene and isopentyl acetate.

(or)

14. Write about Hetero COSY of isopentyl acetate and HMBC of codeine.

**Unit- IV**

15. Write about (i) Super hyperfine coupling, (ii) Kramer's degeneracy.

(or)

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