Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.

(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., CHEMISTRY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
VI	PART-III	CORE	U21CH611	ORGANIC CHEMISTRY - IV

Date & Session: 24.04.2025/FN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	A freshly prepared solution of glucose has specific rotation of +112° but for keeping on some time it changes to +52.7°. This phenomenon is known as a) Mutarotation b) Epimerisation b) Epimerisation d) None of these
CO1	K2	2.	How many isomeric aldohexoses are possible for the molecular formula $C_6H_{12}O_6$? a) 2 b) 4 c) 8 d) 16
CO2	K1	3.	Perkin reaction is related to a) aldol condensation b) cannizaro reaction c) Wittig reaction d) Mannich reaction
CO2	K2	4.	Ortho substituted benzoic acids irrespective of its electron donating or withdrawing a) stronger acids than benzoic acid b) weaker acids than benzoic acid c) No effect d) none of these
CO3	K1	5.	With accompanying 1,2- rearrangement, an α-diazo carbonyl compound is converted into a ketene by loss of which of the following compound ? a) dioxygen b) dinitrogen c) disulphur d) ammonia
CO3	K2	6.	The benzylic acid rearrangement reaction of a cyclic diketone leads to a) Ring expansion b) Ring contraction c) Ring Fusion d) isomers
CO4	K1	7.	The general formula of terpene is a) $(C_5H_8)n$ b) (C_5H_8) c) $(C_5H_5)n$ d) $(C_8H_5)n$
CO4	K2	8.	Which is not characteristic features of alkaloid? a) complex molecular structure b) basic in nature c) biosynthetically derived d) acidic in nature only
CO5	K1	9.	The frequency shift of the carbonyl absorption in the cyclohexane carboxaldehyde is a) 1600 cm^{-1} b) 1700 cm^{-1} c) 1835 cm^{-1} d) 1730 cm^{-1}
CO5	K2	10.	Which of the following cannot detected with the help of UV absorption spectra? a) functional group b) conjucation c) optical isomerism d) geometrical isomerism

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Identify the anomeric carbon atom in glucose. Draw anomers of D-glucose? **(OR)**
CO1	K3	11b.	What are carbohydrate? How are they classified?
CO2	K3	12a.	Give reasons to justify the following statement: i) p-nitrophenol is more acidic than phenol. ii) How will you convert salicylaldehyde to catechol? **(OR)**
CO2	K3	12b.	Apply knoevenagel reaction mechanism for the synthesis of α,β-unsaturated acid.
CO3	K4	13a.	Illustrate the rearrangement to electron deficient carbon -1.2 shift with the evidence of pinacol rearrangement. **(OR)**
CO3	K4	13b.	Deduce the aromatic rearrangement from oxygen to ring carbon using Fries rearrangement
CO4	K4	14a.	How will you prove the following i) citral is an unsaturated aldehyde ii) camphor is a cyclic ketone. **(OR)**
CO4	K4	14b.	Suggest the heterocyclic units occurring in nicotine. Outline the method for the synthesis of di-nicotine.
CO5	K5	15a.	Can UV spectral data be useful to distinguish the compounds in the following pairs? Give reasons. i) ethyl benzene and styrene ii) CH_2=CH-CH_2-CH=CH_2 and CH_2-CH=CH-CH=CH_2 **(OR)**
CO5	K5	15b.	Assess the schematic NMR spectra of acetone and anisole.

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	How would you explain about the structure of glucose? **(OR)**
CO1	K3	16b.	Interpret the following (a) Glucose does not react with $NaHSO_3$ or NH_3 (b) Fructose although a keto hexose, reduce Fehling's solution.
CO2	K4	17a.	Give two methods for preparing phthalic acid and how will you convert it into i) benzene ii) phthalimide iii) phenolphthalein iv) Anthranilic acid **(OR)**
CO2	K4	17b.	Write the suitable chemical reactions for preparation of the following compounds i) cresol ii) resorcinol iii) quinol iv) euginol
CO3	K4	18a.	Analyse the rearrangement to electron-deficient oxygen by Bayer – Villiger oxidation. **(OR)**
CO3	K4	18b.	Suggest a scheme to synthesise 2, 3 –dimethyl-2-butene utilising a rearrangement reaction. Give the mechanism of the above reaction.
CO4	K5	19a.	A) What do you understand by the terms i) isoprene rule ii) special isoprene rule B) How are the terpenoids classified?
CO4	K5	19b.	**(OR)** Establish the structure of piperine.
CO5	K5	20a.	i) Give the principle of UV spectroscopy in brief ii) How will you differentiate between CH_3-CH_2-CHO and CH_2=CH-CH_2-OH using IR spectra?
CO5	K5	20b.	**(OR)** Explain and discuss the applications of the term chemical shift and spin-spin coupling as used in NMR spectroscopy.