

Reg. No.:



Name:

University of Kerala

U9044

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

CHEMISTRY

UK2DSCCHE105 - BIOMOLECULES & BIOPHYSICAL CHEMISTRY - I

Academic Level: 100-199

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark Each.Answer all questions

Qn No.	Question	CL	CO
1	What is normality ?	RE	3
2	Draw the pyranoside structure of glucose.	RE	1
3	How will you convert glucose to gluconic acid ?	UN	1
4	Give one synthesis of peptide.	UN	2
5	The scattering of light by colloidal particle is called	UN	3
6	Characterize the basic structure of metalloporphyrins.	UN	4

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Differentiate nucleosides and nucleotides	UN	2
8	Give examples of alkali and alkaline earth metals and their role in biological systems.	UN	4
9	How would you distinguish reducing and non-reducing sugars experimentally?	AP	1
10	Calculate the molality of the NaOH solution made by mixing 20 g of NaOH (Molar mass = 40 g/mol) and 180 g of water.	AP	3

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) Explain why D-glucose and D-fructose give the same osazone Elaborate your answer with reasons. OR B) Illustrate the physical and chemical properties of glucose?	AP	1, 1
12	A) Analyze the major differences between DNA and RNA with special significance to structure, and physiological properties. OR	AN	2, 2

Qn No.	Question	CL	CO
	B) How would you apply the carbobenzoxy protection group strategy in the synthesis of peptide with the multiple reactive amino group?		
13	A) The K_a values of acetic acid and propionic acid are 1.8×10^{-5} and 1.3×10^{-5} respectively. From the values (a) calculate pK_a values for both the acids (b) Compare the acidity of two acids based on their K_a and pK_a values (c) Predict the outcome of the reaction between the acid mixture and NaOH (d) Calculate the pH of the resulting solution assuming the reaction goes to completion OR B) Critically assess the statement: "Osmosis is the most essential process for water regulation in multicellular organisms." Justify your answer with biological evidence.	EV	3, 3
14	A) Construct a chart indicating the role of alkali and alkaline earth metals in biological systems OR B) Develop an innovative ecosystem model that integrates both biological nitrogen fixation and carbon fixation to enhance soil fertility and mitigate climate change	CR	4, 4