BCHCT-135

ASSIGNMENT BOOKLET

Bachelor's Degree Programme
(BSCG/BSCM)

SOLUTIONS, PHASE EQUILIBRIUM, CONDUCTANCE, ELECTROCHEMISTRY & FUNCTIONAL GROUP ORGANIC CHEMISTRY-II

Valid from 1st January, 2026 to 31st December, 2026

School of Sciences
Indira Gandhi National Open University
Maidan Garhi
New Delhi-110068
(2026)

Dear Student,

Please read the section on assignments in the Programme Guide for B. Sc. that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment is in this booklet, and it consists of two parts, Part A and B. It covers all blocks of the course. The total marks of all the parts are 100, of which 35% are needed to pass it.

Instructions for Formatting Your Assignments

Before attempting the assignment please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ROLL NO.: ……

NAME: ……

ADDRESS: ……

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COURSE CODE: …….

COURSE TITLE: …….

ASSIGNMENT NO.: ……..…

STUDY CENTRE: ……..….. **DATE:** …….……...

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) Solve Part (A) and Part (B) of this assignment, and **submit the complete assignment answer sheets within the due date.**

6) The assignment answer sheets are to be submitted to your Study Centre within the due date. **Answer sheets received after the due date shall not be accepted.**

   We strongly suggest that you retain a copy of your answer sheets.

7) This assignment is **valid from 1st January, 2026 to 31st December, 2026**. If you have failed in this assignment or fail to submit it by December, 2026, then you need to get the assignment for the year 2027, and submit it as per the instructions given in the Programme Guide.

8) **You cannot fill the examination form for this course** until you have submitted this assignment.

We wish you good luck.

ASSIGNMENT

Solutions, Phase Equilibrium, Conductance, Electrochemistry & Functional Group Organic Chemistry-II

Core Course in Chemistry

Course Code: BCHCT-135
Assignment Code: BCHCT-135/TMA/2026

Note: Attempt all questions. The marks for each question are indicated against it.

Maximum Marks: 100

	PART-(A)		**(50)**
1.	Define the following terms: (i) Molarity (*M*) (ii) Molality (*m*) (iii) Normality (*N*) (iv) Mole fraction (*x*) (v) Parts per million Also give their units.		(5)
2.	(a)	State Raoult's Law. Also, give its mathematical form.	(3)
	(b)	Give any two applications of solvent extraction.	(2)
3.	(a)	Draw and explain the mutual miscibility curve for phenol – water system.	(3)
	(b)	Discuss the effect of impurities on CST values.	(2)
4.	(a)	Define the following terms: (i) Phase (ii) Components (iii) Degrees of freedom	(3)
	(b)	Write the integrated form of Clausius-Clapeyron equation. What were the two assumptions made by Clausius?	(2)
5.	Draw and explain the phase diagram of water highlighting its important features.		(5)
6.	(a)	Define conductivity and give its units.	(2)
	(b)	The conductivity of a 0.1 M aqueous solution of acetic acid is found to be 5.3×10^{-4} S cm^{-1}. Calculate the molar conductivity of acetic acid solution at the given concentration.	(3)
7.	(a)	Explain ionic mobility and give its units. Briefly explain the factors affecting it.	(2)
	(b)	List the applications of conductivity measurement.	(3)
8.	(a)	Draw the schematic diagram of a Daniell cell and give the reactions taking place at the electrodes.	(3)
	(b)	What are the functions of a salt bridge?	(2)
9.	(a)	Give an example of a concentration cell with transference.	(2)
	(b)	What is quinhydrone electrode? Give its advantageous and disadvantageous.	
10.	(a)	Discuss any two applications of electrolysis.	(3)
	(b)	Briefly explain the process of electrolysis.	(2)
	PART-(B)		
11.	Explain the mechanism of Fischer esterfication reaction.		(5)

12.	(a)	Arrange the different carboxylic acid derivatives in the decreasing order of their reactivity towards nucleophilic substituted reactions and give reason for your answer.	(3)
	(b)	What is Rosenmund reduction? Give an appropriate example for this reaction.	(2)
13.	(a)	Briefly explain the following reactions: (i) Curtius rearrnagement (ii) Schmidt rearrangement	(2)
	(b)	Write the products of reduction of nitrobenzene in basic medium under different conditions.	(3)
14.	(a)	What is diazotisation reaction? Give the products formed by the diazotisation of the following: (i) ethanamine (ii) benzenamine	(3)
	(b)	What is reductive amination? Give the product of the reductive amination of diazonium salt formed by 2,4,6-tribromoaniline.	(2)
15.		Explain the products formed by the nitrosation reactions of primary, secondary and tertiary amines.	(5)
16.	(a)	How will you obtain valine using Gabriel phthalimide synthesis? Explain.	(3)
	(b)	How will you detect a 2-amino acid using ninhydrin?	(2)
17.	Discuss Edman degradation of *N*-terminal identification of peptides giving suitable reactions.		(5)
18.	Briefly describe the primary, secondary, tertiary and quaternary structures of the peptides and proteins.		(5)
19.	(a)	Write the Fischer projection of D-glucose. Also write the Haworth projections of α–D-glucose and β -D-glucofuranose.	(3)
	(b)	Explain mutarotation using glucose as the example.	(2)
20.	(a)	Write the structures of β-lactose and sucrose with appropriate labelling.	(3)
	(b)	Differentiate between amylose and amylopectin.	(2)